Week 1: Introduction and Science

POLS0007
Principles of Social Science Research

University College London

1. Introduction
2. What Does Q-Step Give You?
3. What Does This Class Give You?
4. The Scientific Process
5. Seminar

Preview

- Does political messaging encourage people to vote more?
- Does rewarding student achievement lead to better outcomes?
- Do female role models make women more likely to take maths?
- Do social networks help your economic success?

Goals

- Give you a good overview of what modern social sciences are.
- Train you to recognize weaknesses and problems in existing research designs.
- Provide you with the conceptual knowledge to design your own projects.

Q-Step - Your Key to the Future

- Teaches transferable skills
- Provides you the tools necessary to conduct social scientific research.
- Allows you to engage in real research during your UG career.
- Helps you better understand and evaluate causal claims.

You Pick Your Job

Career Development Tips

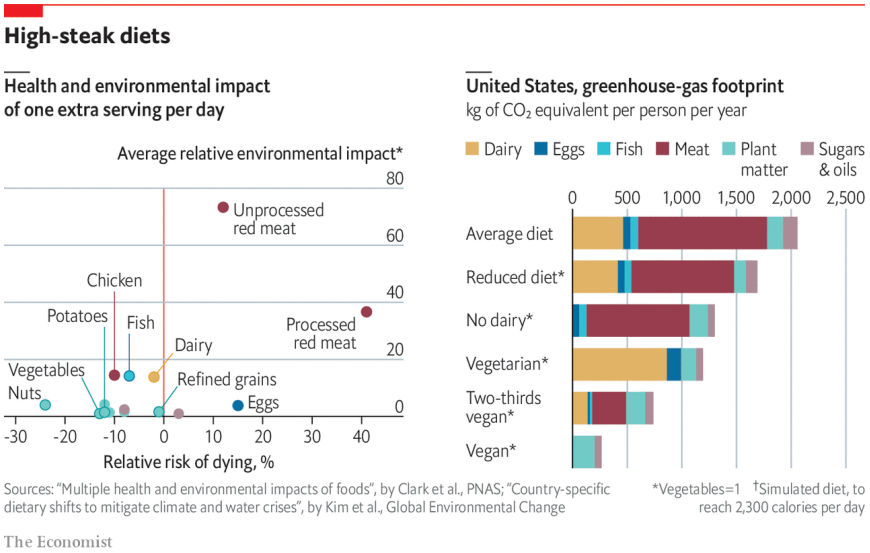
Top Hard Skills Employers Look For

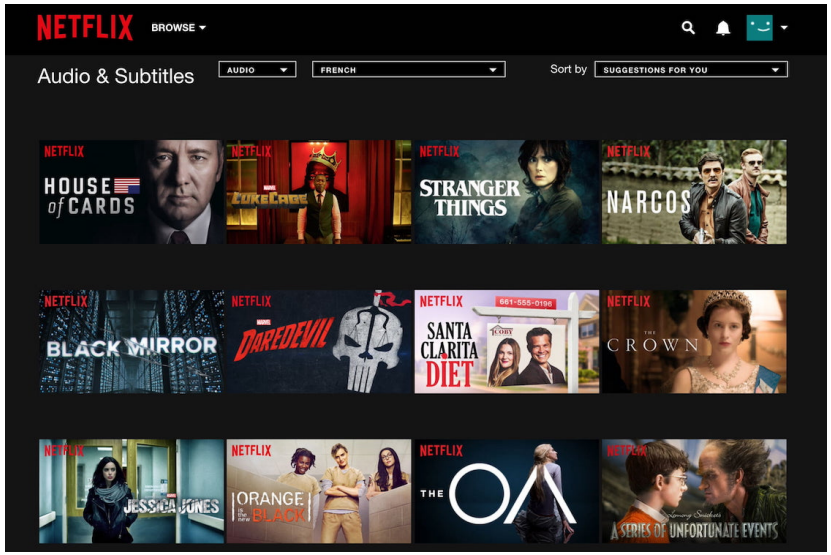
Posted by Glassdoor Team
Career Advice Experts
Last Updated June 29, 2021

Top 5 hard skills that are most likely to get you hired in 2021 according to Glassdoor:

1. Data analysis
2. Technical skills
3. Design and marketing skills
4. Management skills
5. Computer skills

What Can Q-step Give You?





Teaching Team

- **Dr Per Engzell**: Week 1-5. Associate Professor of Sociology at UCL Social Research Institute. Research Interests: Educational inequalities, social mobility.
- **Dr Tobias Rüttenauer**: Week 6-10. Lecturer in Quantitative Social Science at UCL Social Research Institute. Research Interests: Environmental sociology, spatial demography.
- **Seminar leaders**:
  - **Charlotte Constable Fernandez**, PhD Candidate, MRC Unit for Lifelong Health and Ageing, UCL.
  - **Ricardo Mellado Labbe**, PhD Candidate in Quantitative Social Science at UCL Social Research Institute.
  - **Michaela Šedovič**, PhD Candidate in Population Studies/ Demography, Department of Social Policy, LSE.

Module Structure

- 10 weeks, 1-hour lectures, Denys Holland Lecture Theatre, Tuesdays 9AM
  - Lecture slides available on Moodle the day before lecture
- 1-hour seminar every week, Tuesday afternoon, different groups/rooms
  - Summary/solution available on Moodle after each seminar
- Lectures and seminars are mandatory
- All readings and materials available on Moodle. Read the material before the lecture, especially the readings for the seminars
- Midterm Exam: Essay, 1,500 words, 50%; Due on 14/11/2022
  - Reading week: 7–11th of November
- Final Exam: Essay, 1,500 words, 50%; Due on 09/01/2022
- Make use of us! Office hours, Moodle forum

Seminars

Tuesdays after the lecture — Leader

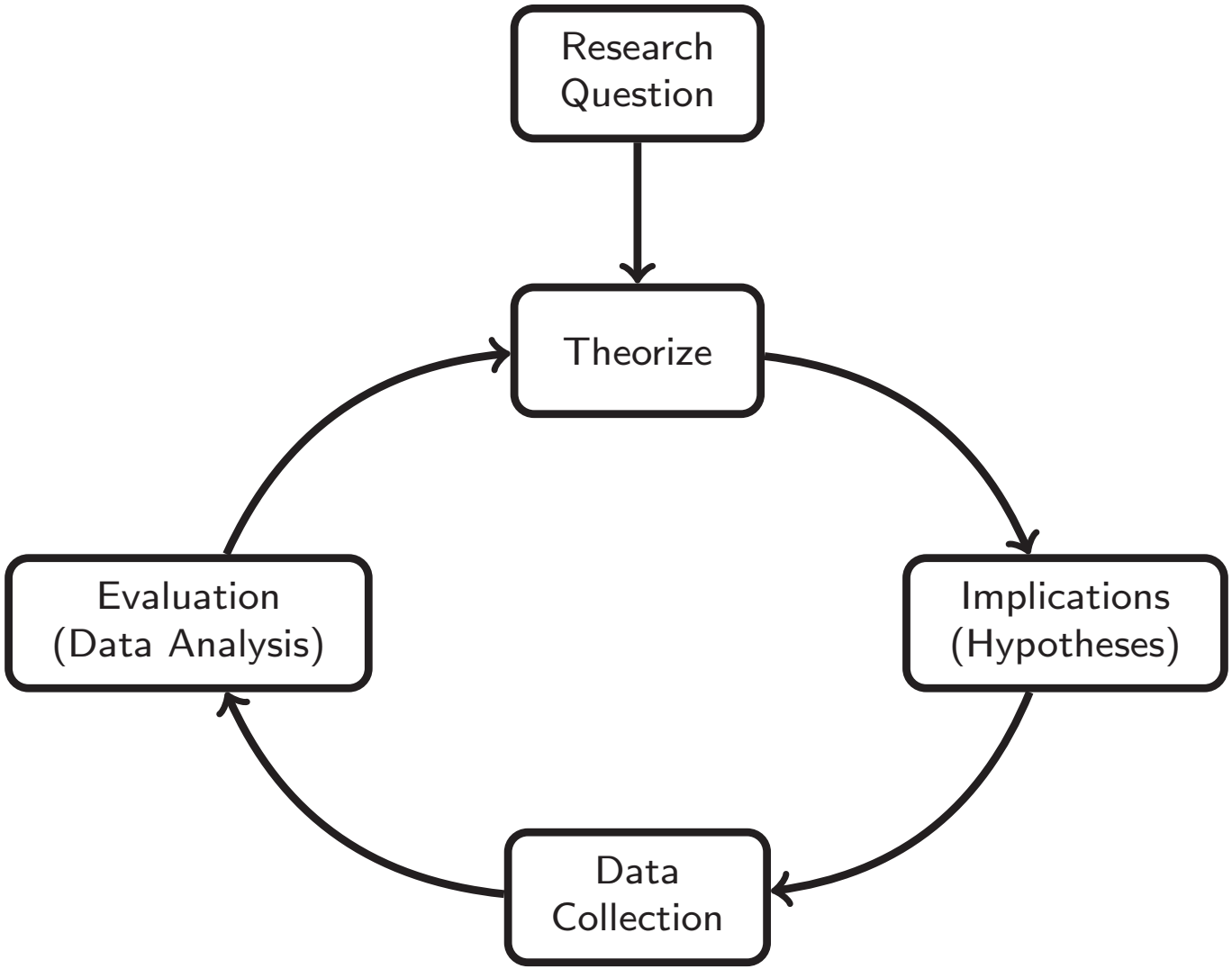
- Seminar 1: 12:00-13:00 Central House G01 — Charlotte
- Seminar 2: 13:00-14:00 Foster Court 243 — Ricardo
- Seminar 3: 13:00-14:00 Birkbeck Gordon Sq (43) B01 — Charlotte
- Seminar 4: 15:00-16:00 Central House 112 Jevons — Ricardo
- Seminar 5: 16:00-17:00 Central House 112 Jevons — Michaela
- Seminar 6: 17:00-18:00 Central House 112 Jevons — Michaela

Do you know in which seminar group you are? Each of you has been allocated to ONE seminar group.

Read all of the material ahead of the seminar.

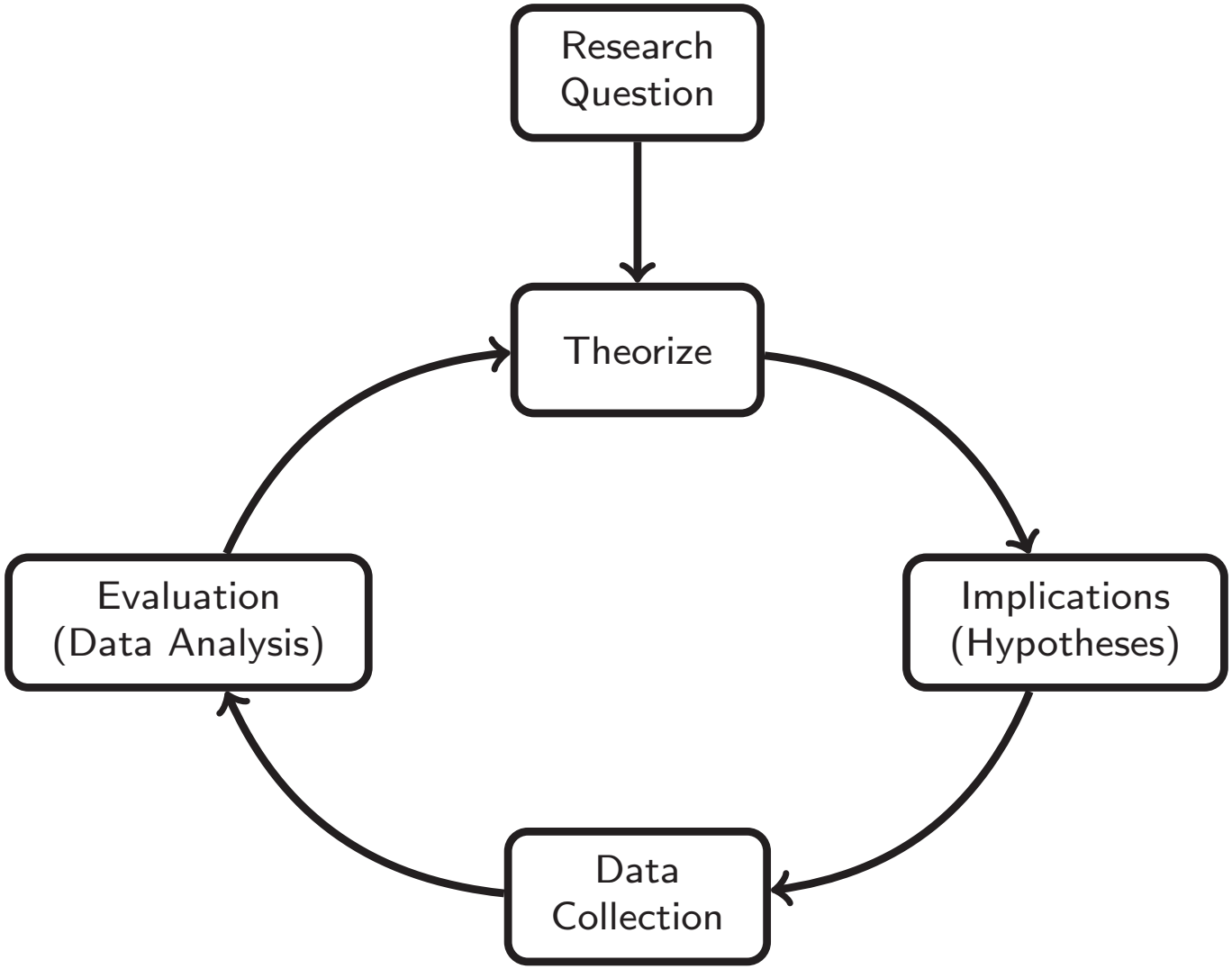
The Scientific Process

The Scientific Process



Research Questions

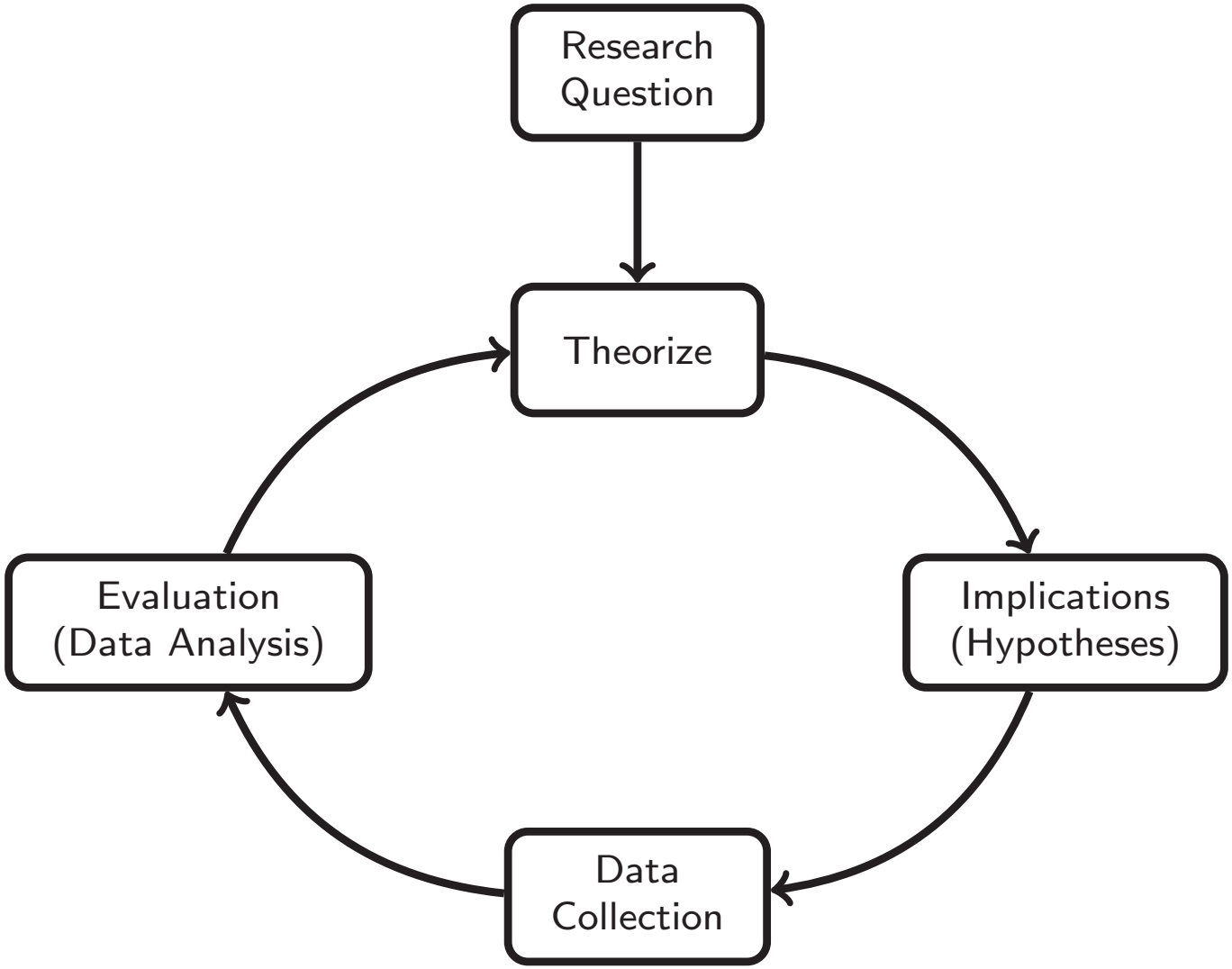
- A brief **question** that clearly identifies the problem or puzzle one seeks to answer
- All scientific research starts with a research question!
- How will you know if you have identified a good research question?
  1. Do you find the question interesting?
  2. Do your advisor and your friends find the question interesting?
  3. Can it be answered through empirical research?
  4. Is discovering the answer feasible?
  5. Is the existing literature unable answer the question?
  6. Does the question have broad applicability or implications?


Research Question
Theorize
Implications (Hypotheses)
Data Collection
Evaluation (Data Analysis)

Theory

There are two categories:

- **Deterministic theories:** Theories that describe relationships in a very mechanical fashion, e.g. if A then B.
  - Example: The variant of the ABCC11 gene in your DNA determines whether you have wet or dry earwax.
- **Probabilistic theories:** Theories which are not stated in certainty but describe relationships we should, on average, observe, e.g. higher X leads to more Y.
  - Example: Smoking causes cancer because of certain substances in the smoke that increase the chance that a cell mutates.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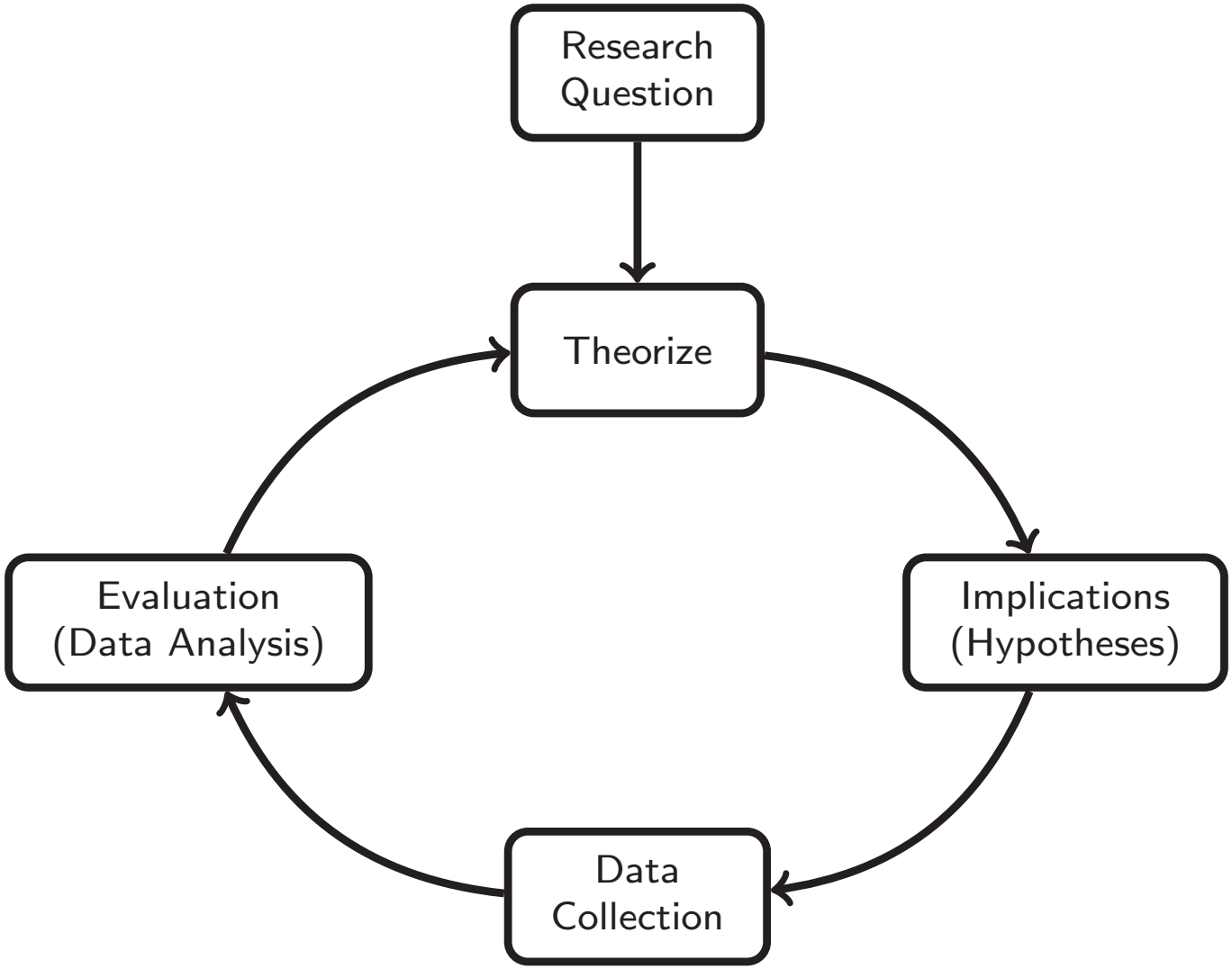
Implications (Hypotheses)

A good hypothesis is ...

- ... a deduction of the theory (given our theory, what empirical implications does it have)
- ... falsifiable
- ... maybe even surprising

Examples:

- People with benzopyrene in their blood tend to have a higher cancer risk.
- Inhaled smoke has benzopyrene in it and it is transferred via the lungs to the blood stream.
- The more you smoke, the higher your risk of cancer.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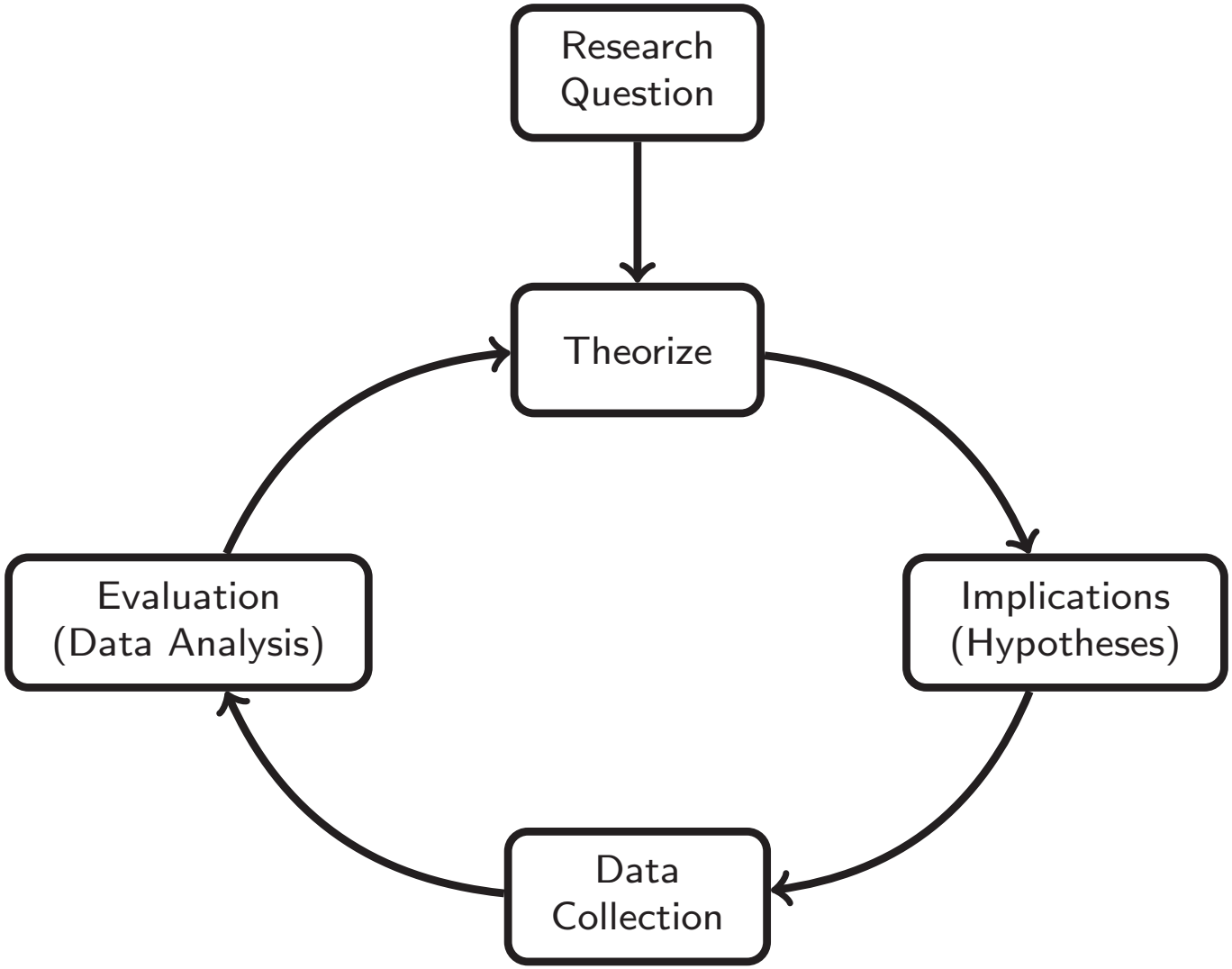
Data Collection

This can entail any of the following forms:

- Comparison of two objects (countries, cases, villages, ...)
- Historical analysis
- Experiments
- Interviews with subjects
- Large data analysis (statistics)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Evaluation (Data Analysis)

- Does the data support the hypothesis?

Deterministic relationship

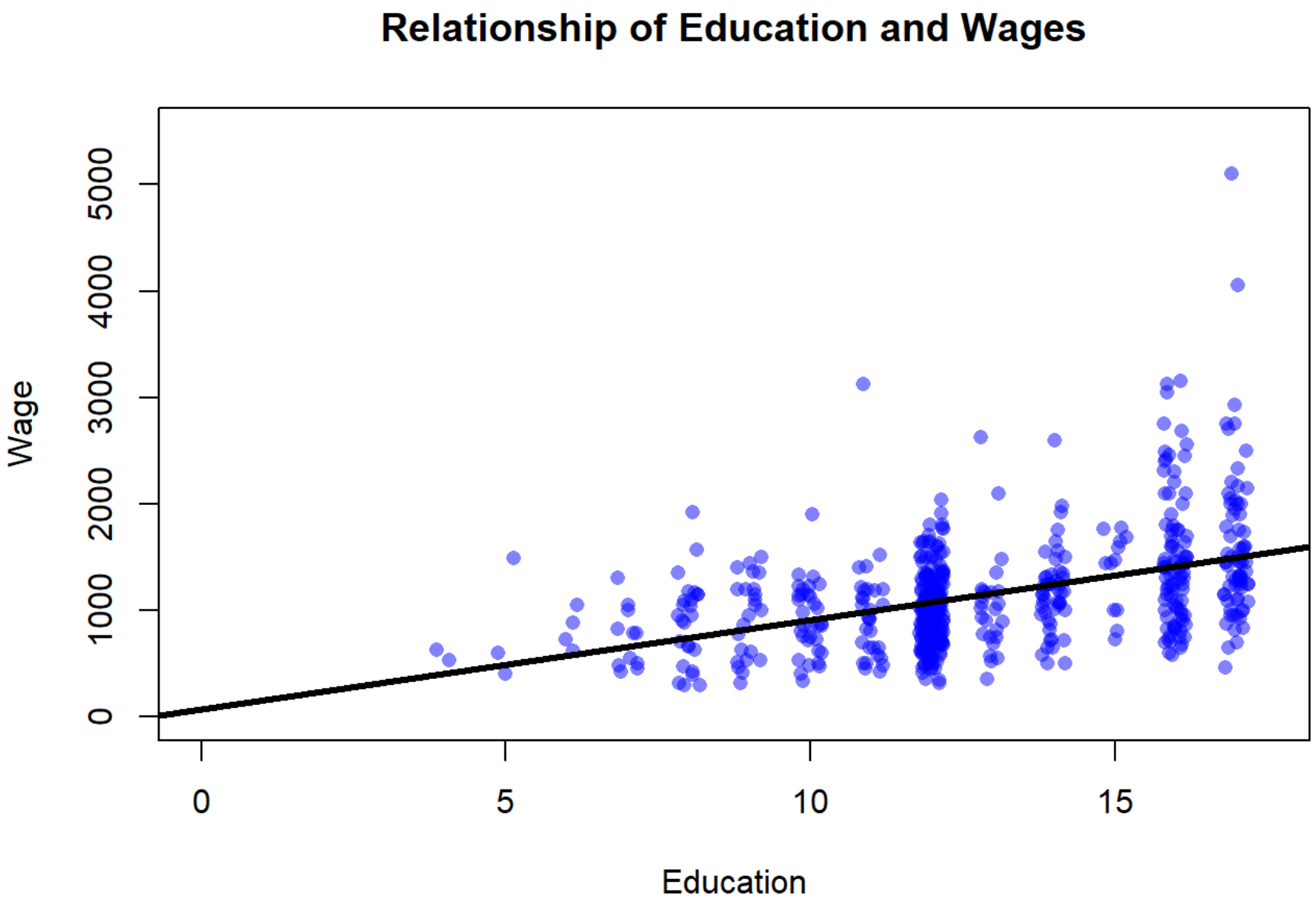
Your DNA determines whether you have wet or dry earwax.

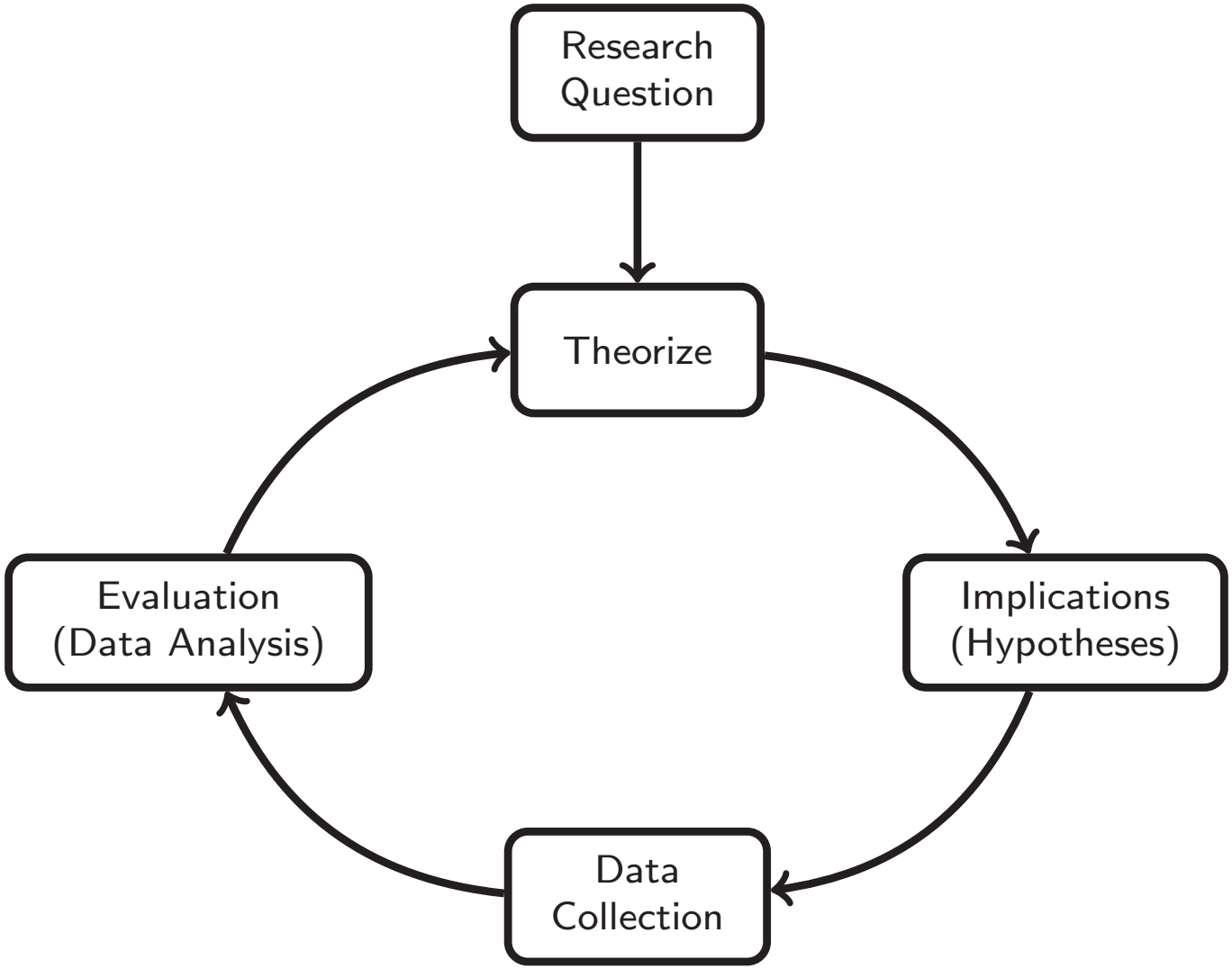
		Ear wax		
		Dry	Wet	
ABCC11 genotype	AA	100	0	100
	GA/GG	0	200	200
		100	200	

Probabilistic relationship

Smokers have a higher probability of developing lung cancer.

		Lung cancer		
		No	Yes	
Smoker	Never	98	2	100
	Current	84	16	100
		182	18	


Relationship of Education and Wages
Wage
0
1000
2000
3000
4000
5000
0
5
10
15
Education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Answer or new Theorizing

If hypothesis is refuted...

You are back at the start - need to come up with a new theory.

If hypothesis is not refuted...

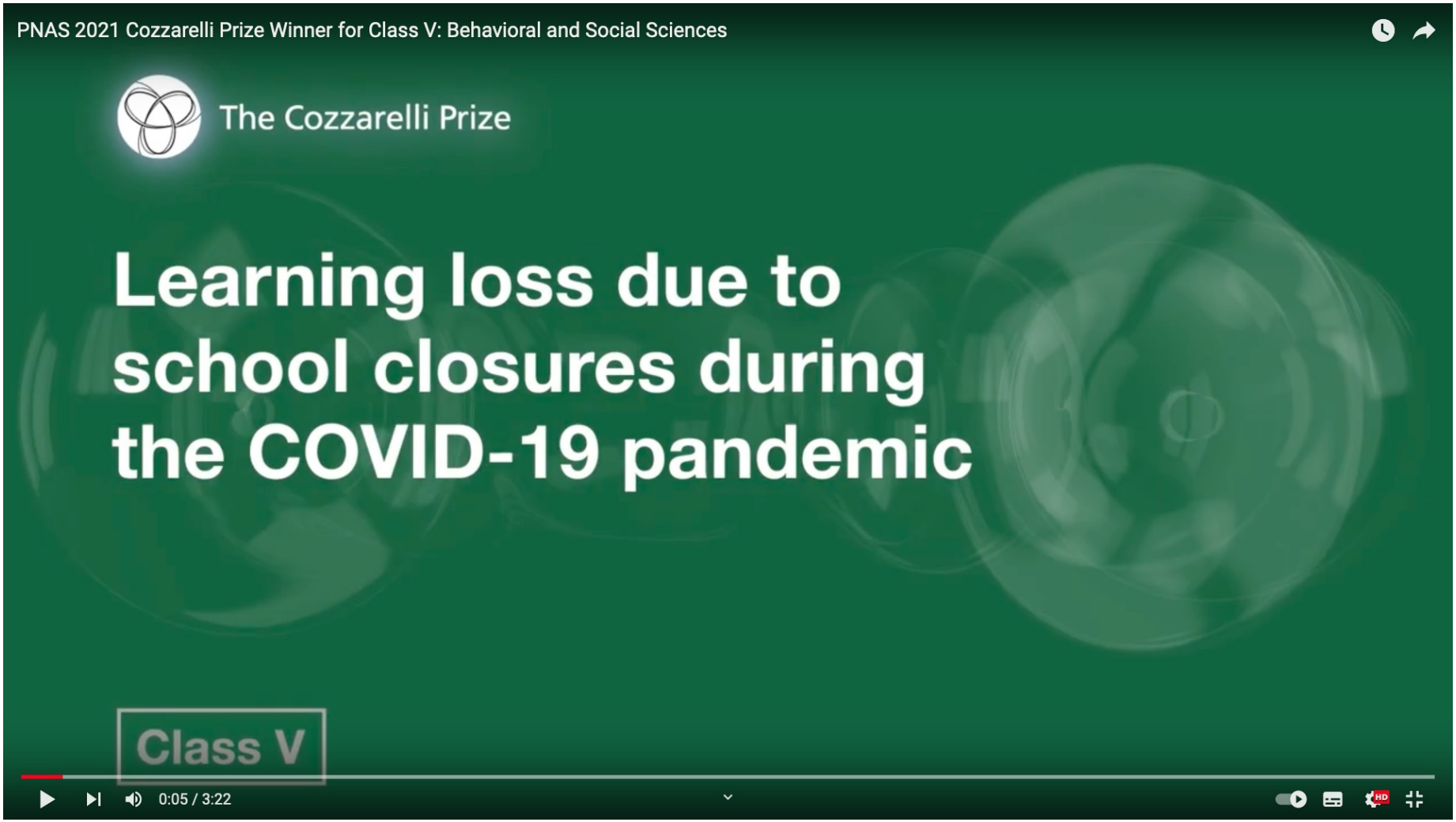
You have, for the moment, found empirical support and can communicate your theory.

$\rightarrow$ You have not proven a physical law, but rather provided a theory and a specific answer to a question. This is a *tentative* theory until somebody can show that a proper hypothesis of your theory is empirically refuted.

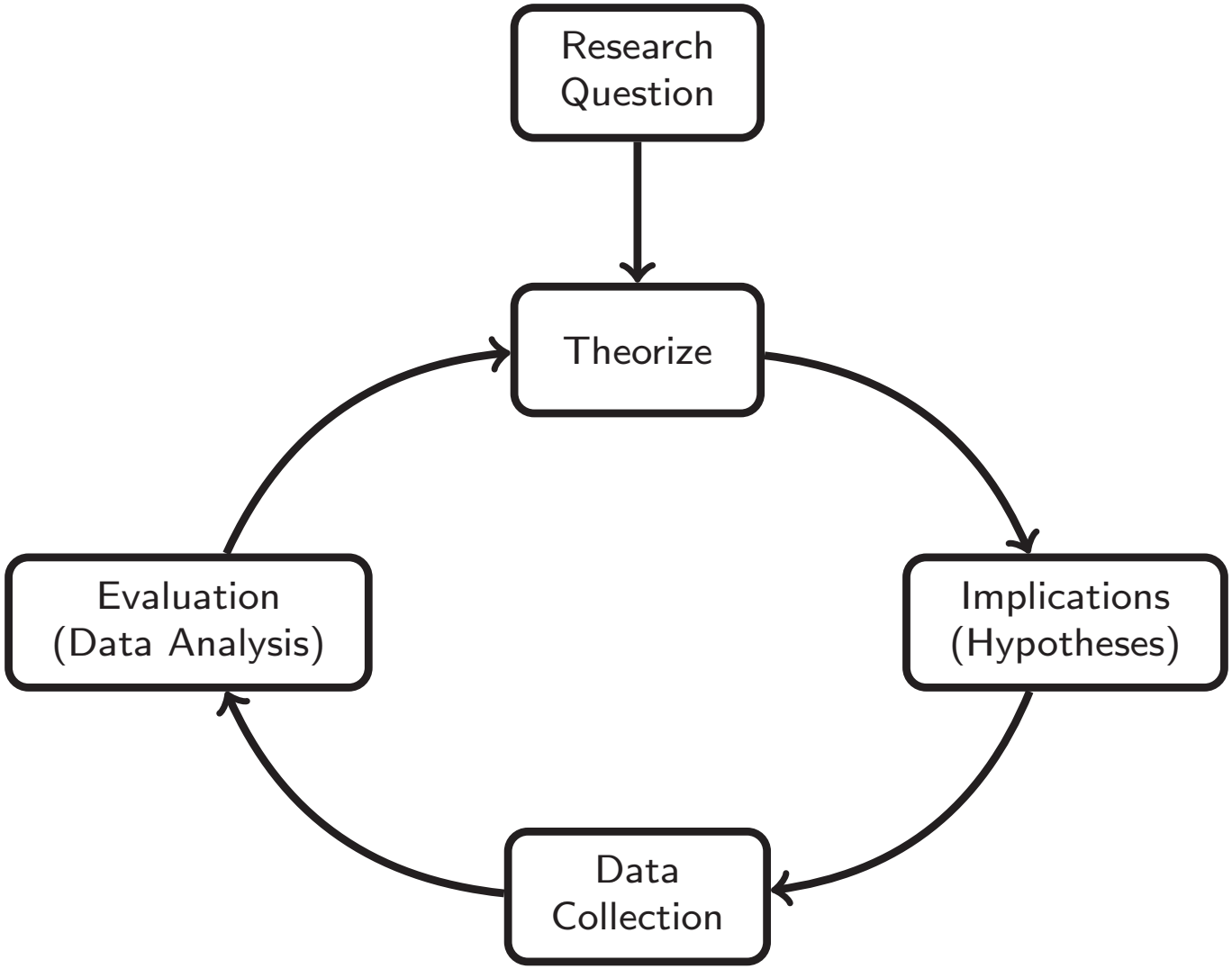
Questions?

The road to wisdom? — Well, it's plain and simple to express: Err and err and err again, but less and less and less.

Piet Hein



https://www.youtube.com/watch?v=Yhuv1yJrdC4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Seminar questions

What are the differences between the two articles? (*Financial Times* and Engzell, Frey, & Verhagen 2021)

Key 5 questions about Engzell et al:

1. What is the research question? (Is it interesting? Is it relevant? What implications does it have?)
2. What is the mechanism that links COVID-19 to learning? (Are there alternative explanations?)
3. What are the hypotheses? What is the theory behind them?
4. What is the analytical strategy? (Which data, which sample, what is the comparison group?)
5. What are the conclusions of the article?