Seminar 7

Misinformation, Disinformation, and Hypothesis Testing

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Today

1. Misinformation/disinformation as a research problem
2. Turning broad claims into testable hypotheses
3. Group work: applying these steps to seminar tasks
4. Whole-class discussion

Reading anchors for today:

- Wardle & Derakhshan on information disorder
- West & Bergstrom on misinformation in and about science
- Additional reading on fake news / platform dynamics

Quick discussion with your neighbor

Have you recently seen a piece of information online that seemed credible at first, but later turned out to be misleading? What made it convincing initially?

Why do you think misinformation spreads so effectively online: because people believe it, because platforms reward it, or because it is emotionally engaging?

Why study misinformation in political science?

Misinformation is not only a problem of *false content*. It is also a problem of:

- **infrastructure** — the internet has made it easier to spread information
- **institutions** — weak information environments distort policy debate
- **distribution** — platforms amplify some claims over others
- **measurement** — how we identify, classify, and test effects empirically

For political science, the key question is usually not simply:

"Is this claim false?"

It is more often:

"How does exposure to this claim affect beliefs, trust, behaviour, or policy outcomes?"

We therefore have a strong case for rigorous **research design**, not just digital media literacy.

Information disorder

A useful way to structure the topic is to break it into stages:

1. **Creation** — who produces a misleading claim, and why?
2. **Production** — how is it formatted, framed, or made persuasive?
3. **Distribution** — how does it spread across platforms, networks, or media systems?

This matters because different misinformation strategies sit at different stages:

- Content-based propaganda may focus on synthetic **creation/production**
- Platform campaigns may target systematic and widespread **distribution**
- A distortion of public-opinion may focus on **exposure** and **beliefs**

So before analyzing a media ecosystem, be precise about **which part of the process** you are studying.

Misinformation in and about science

Some misleading information concerns the objects of (natural and social) science directly: climate change, vaccines, public health, conflict and party support.

But there is also misinformation about the role or practice of science:

- exaggerating certainty resulting from originally weak evidence
- selective and biased reporting, emphasizing or exaggerating dramatic findings
- amplifying single studies as if they settle a debate one-sidedly
- uncertainty is often strategically and systematically used to reduce trust in institutions or slow policy action

What makes hypotheses scientifically testable?

A good (rigorous) hypothesis should be:

- **clear** — precise about cause and outcome
- **measurable** — variables can be observed or coded
- **falsifiable** — evidence could show it is wrong
- **feasible** — realistic given available data and methods

So we move from broad, general, and ambiguous claims such as:

"Misinformation is bad for democracy."

to more testable claims like:

"Higher exposure to climate misinformation is associated with lower support for climate policy."

"Greater exposure to digital misinformation is associated with a higher likelihood of endorsing political views that are at the margins of mainstream public discourse."

How would we test it?

Possible strategies:

- **Survey design:** measure self-reported exposure and attitudes
- **Experiment:** randomly assign exposure to different information treatments
- **Online and big data:** link the integrity of information environments to social media or news media engagement

In each case, ask:

- How is **exposure** measured?
- How is **misinformation** classified?
- What alternative explanations could account for the result?
- Would another researcher be able to replicate the procedure?

A tractable example

Example question:
Does exposure to digital misinformation reduce support for centrist candidates?

Example hypothesis:
Individuals exposed to false political media content will express support for more unpopular and extreme candidates than students exposed to a neutral factual message (like a news headline from a reputable source).

Simple operationalisation:

- X = treatment condition (exposure to misleading vs neutral information)
- Y = party/candidate support on a 1–5 scale
- Test = compare group means

Group task 1: build the research design

Choose a research question:

1. Is social media use (or Gen AI use) related to the incidence of mental health issues?
2. Does rising household poverty increase food insecurity equally across working-age, elderly, and single-parent households in the UK?
3. How does misinformation about science affect trust in expert knowledge or belief in common knowledge?

Discuss the following:

- **Background research:** what kinds of sources would you consult for a literature review?
- **Hypothesis:** what is the main claim you want to test?
- **Data:** would qualitative or quantitative evidence be more useful?
- **Case selection / sample:** what observations, cases, or respondents would you need?

Group task 2: measurement, analysis, communication

Then move to the second stage:

- **Measures:** what specific indicators would you use for each concept?
- **Reliability / validity:** are your measures credible?
- **Analysis:** what would count as support for the hypothesis?
- **Communication:** who is the relevant audience, and how would you present the findings?

As you discuss, ask:

> *Could another researcher understand and replicate exactly what we did: why and how?*

That is a useful minimum standard for transparent research design.

Whole-class discussion

After group work, we will compare answers and discuss:

- Which hypotheses were easiest to make testable?
- Where did measurement become difficult?
- Which designs looked strongest: qualitative, quantitative, or mixed?
- Does the scientific method resemble how research actually works in practice?
- Does it matter if real research is messier than the ideal model?

The key takeaway:

> *A strong research design makes complexity tractable and manageable.*

Indicative references

- Wardle, C. and Derakhshan, H. *Information Disorder: Toward an Interdisciplinary Framework*.
- West, J.D. and Bergstrom, C.T. (2021). *Misinformation in and about science*.
- Additional seminar reading on fake news, platform dynamics, and information credibility.