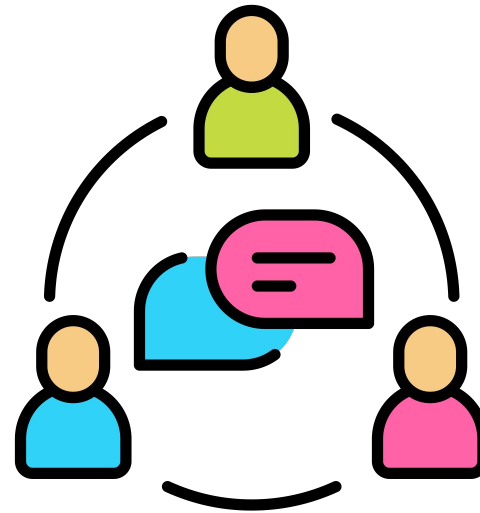# 4.1

Psychological Interventions and their Implementation
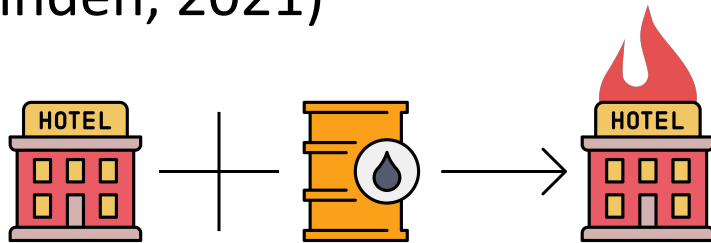
Note

- Interactive symbol: tasks for groups

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Debunking

- **Definition**
  - Separating facts from falsehoods and publicly uncovering the fraudulent and misleading nature of false information, while simultaneously publishing the true facts in that matter
  - Misinformation experiment with a fictitious story (Lewandowsky & van der Linden, 2021)

  Source: own illustration

  - Build groups: Discuss briefly what you think will happen in this setup
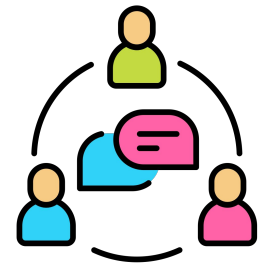
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Debunking

- **Definition**
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Debunking

But why so much black smoke?

Source: own illustration

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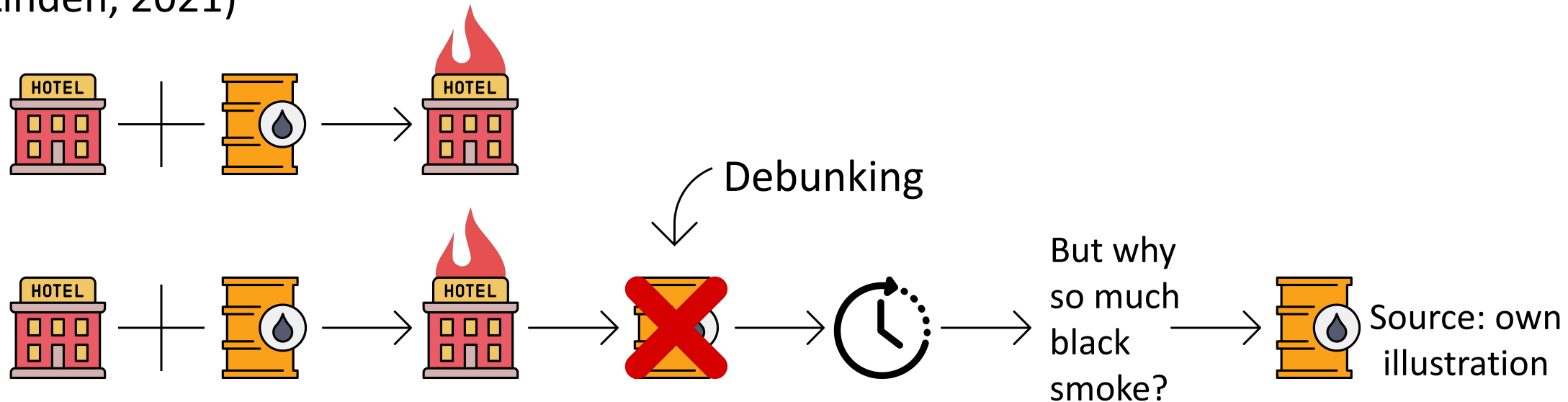
Debunking

- Persistence of political misinformation in public memory despite debunking
  - Studies show that **in "real-life** political events involving complex and messy situations," a substantial proportion of **people remembers fabricated news stories** (37%), compared to the proportion of people who correctly recall true news stories (56%) (Lewandowsky & van der Linden, 2021; Murphy et al., 2019)
  - **Persistence of political misinformation**, e. g., the false story that WMD were the reason for the US invasion in Iraq in 2003 (Lewandowsky & van der Linden, 2021)

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Debunking

- Debunking leaves feelings untouched
  - Studies show that debunking and fact-checking have an **impact on peoples' beliefs** in true and false information, with stronger belief in true information and weaker belief in false information
  - However, fact-checking leaves **feelings untouched**. For example, Trump supporters are not less likely to support Trump after statements of his were proven wrong (for an overview: Lewandowsky & van der Linden, 2021)

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Debunking

- Making debunking more effective
  - In your group: How would you do it with the hotel fire example?

Source: own illustration

12/05/2025
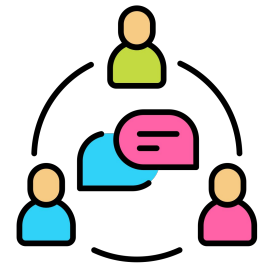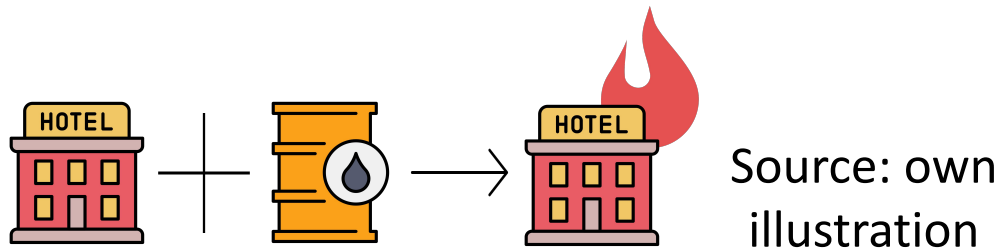
Debunking

- Making debunking more effective
  - **Arousing suspicions over source**: E. g., jurors in trials stop relying on tainted evidence when they come to question the trustworthiness of the source
  - **Giving alternative explanations**: For example, it was arson, not negligence, that caused the fire (Lewandowsky & van der Linden, 2021)
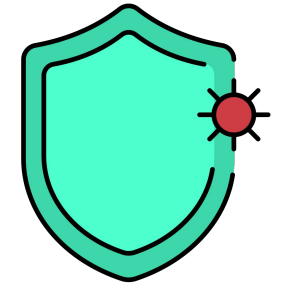

Debunking

But why so much black smoke?

Source: own illustration
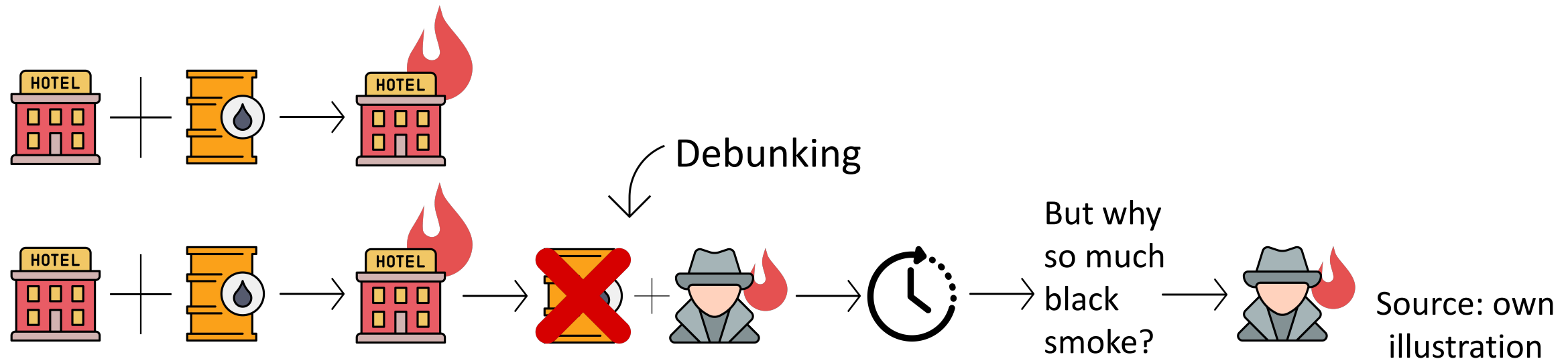
Inoculation

- Inoculation Theory
  - In your group: What does inoculation mean? What does it have to do with disinformation?

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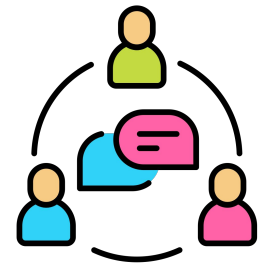
Inoculation

- Inoculation Theory
  - **Metaphoric idea**: "Just as **injections** containing a **weakened dose** of a virus can trigger **antibodies** in the immune system to confer resistance against future infection, the same can be achieved with information by **cultivating mental antibodies** against misinformation" (Roozenbeek & van der Linden, 2019)
  - **Approach**: Creating mental antibodies against persuasion attempts (Compton et al., 2021)

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Inoculation

- Elements
 - **Forewarnings** to generate threat perception and motivate resistance against misinformation
  - **Refutational preemption** to provide content for counterarguing (Compton et al., 2021; Lewandowsky & van der Linden, 2021)
- Effects
  - Making **people aware** of their own **vulnerability**
  - **generate** more **talk** and **deeper thinking** about an issue
  - possible **cross-protection** (Compton et al., 2021)

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Inoculation

- Prior limitations and further research
  - Developed in the 60s, Inoculation Theory is a "grandparent theory" (Compton et al., 2021)
  - Needs an update for the 21st century: "We now know that the propagation of misinformation through **online social networks** closely resembles the spread of a virus: **rapidly transmitting highly infectious** information from one host to another but **without the need for physical contact**" (Lewandowsky & van der Linden, 2021)

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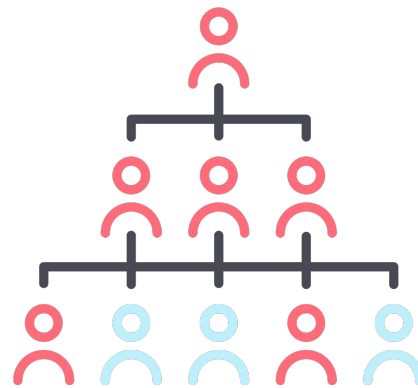
Inoculation

- Extending the Metaphor
  - "**Booster shots**", as people might forget and lose motivation to defend their beliefs over time (Compton et al., 2021)
  - "**Herd immunity**": The more people talk about an issue and reassure each other, the stronger their resistance becomes. Known as "post-inoculation talk"
  - Spill-over "to related but untreated attitudes" (Roozenbeek & van der Linden, 2019)
  - Works also in the sense of "**therapeutic vaccines**", when the individual has already been exposed to misinformation (Roozenbeek & van der Linden, 2019)

Inoculation

- Study on climate change dis- and misinformation (Van der Linden et al., 2017)
    - **Experiment on the "Global Warming Petition Project"**: False claims that over 31K US climate scientists have signed a petition that there is no scientific evidence for human-caused climate change
    - **Exp. condition 1**: **only forewarning**: "Some politically motivated groups use misleading tactics to try to convince the public that there is a lot of disagreement among scientists"
    - **Exp. condition 2**: **additional refutational preemption** : Fewer than 1% of the signatories have a background in climate science (Van der Linden et al., 2017)

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Inoculation

- Study on climate change dis- and misinformation (Van der Linden et al., 2017)
  - **Three control groups**: (1) **only a factual message** ("97% of climate scientists have concluded that human-caused global warming is happening"), (2) **only the false petition** claim; (3) **both**
  - **Main results**: Both inoculation conditions had a significant immunising effect against the disinformation with $\frac{1}{3}$ and $\frac{2}{3}$ **of the effect of the factual message-only condition**
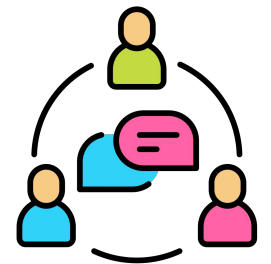
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Nudging

- Types of misinformation interventions
  - **Targeted interventions** (1 - **debunking** and 2 - **inoculation**; however, this can have a general effect, too)
  - **Generalised interventions** that yield an effect **across topic domains** (3 - **nudging**)

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Nudging

- Nudging theory
  - In your group: What is nudging?

Nudging

- Nudging theory
  - Introducing minor changes to the "architecture of a space" (also information spaces) to influence peoples' choices (Butler et al., 2024)

"Stairs to the Metro in Stockholm turned into a grand piano" Source: medium.com (link)

Nudging

- **Types** of nudge-based misinformation interventions (on social media platforms)
  - **Accuracy nudges**, or **accuracy prime**: priming* people to **consider** the **veracity** of information
  - **Social-norm nudges**: priming people to **consider** the **attitudes** and **behaviours** of others

*an unconscious process in which a first stimulus (a) influences the response to a subsequent stimulus (b). For example, making people think about money (a) influences their subsequent evaluation of free-market capitalism (b) (Source: van der Linden & Rozenbeek, 2021)

Nudging

- Empirical findings
  - **Meta-analysis**: Behavior change with a small to medium effect, dependent on technique and domain (Mertens et al., 2021)
  - **Nudge-based interventions** have a **beneficial**, though **small**, counter **impact** (Butler et al., 2024)
  - Although results are oftentimes retrieved in experimental settings with some unrealistic properties (e. g. 50% of information verifiably wrong), Butler et al. (2024) show that under more realistic conditions, nudge interventions also work

Nudging

- Empirical findings
  - Replication study on misinformation about the Corona virus found **significant** but **small effect of** an **accuracy prime** (n=1600) (van der Linden & Rozenbeek, 2021)
  - Task: Read 15 true and 15 false headlines about Corona and discern true and false statements
  - **Prime: participants in the experimental group evaluated the accuracy of an unrelated headline**
  - 54% participants in the experimental group had improved news sharing decisions
  - Minor effect, but still meaningful in a social media environment with millions of users

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Literature

Butler, L. H., Prike, T., & Ecker, U. K. H. (2024). Nudge-based misinformation interventions are effective in information environments with low misinformation prevalence. Scientific Reports, 14(1). https://doi.org/10.1038/s41598-024-62286-7

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Van Der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). Inoculating the Public against Misinformation about Climate Change. Global Challenges, 1(2). https://doi.org/10.1002/gch2.201600008

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