Science Communication

What is science communication?

Rui Mata, HS 2024

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Course instructors

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http://cds.unibas.ch

https://www.superdot.studio

Learning goals (for the course as a whole)

This course aims to give a broad introduction to science communication. By completing the course you can expect to…

- Get an overview of theories and principles of science communication
- Learn to develop visual communication strategies for science communication
- Learn to critically evaluate and reflect on science communication

Goals for today

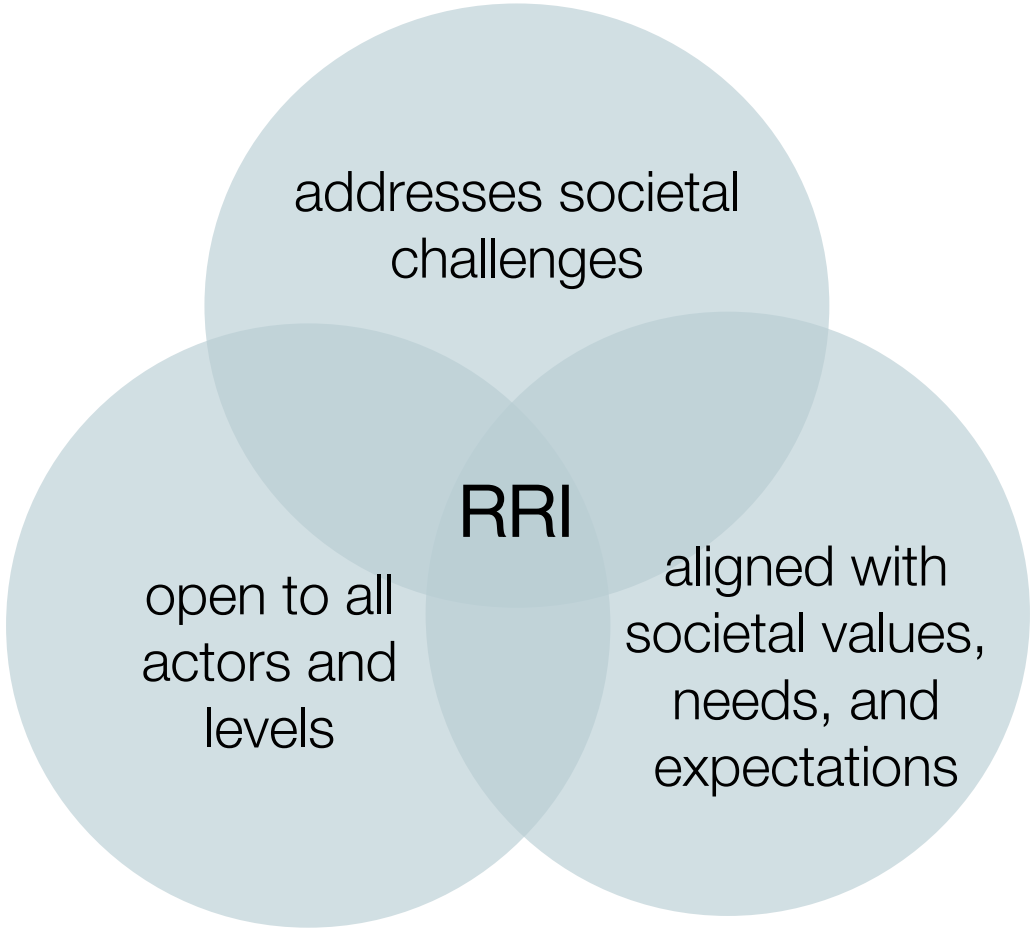
- Recognize the need for effective communication between science and the public, and reflect on the responsibility of scientists (including psychologists) in communicating science effectively

- Grasp the definition of science communication, including various forms and goals

- Become familiarized with the course structure, readings, and website

Science with and for society…

Responsible **Research & Innovation** (RRI)



Bertemes, J. P., Haan, S., & Hans, D. (Eds.). (2024). *50 essentials on science communication*. De Gruyter. https://doi.org/10.1515/9783110763577

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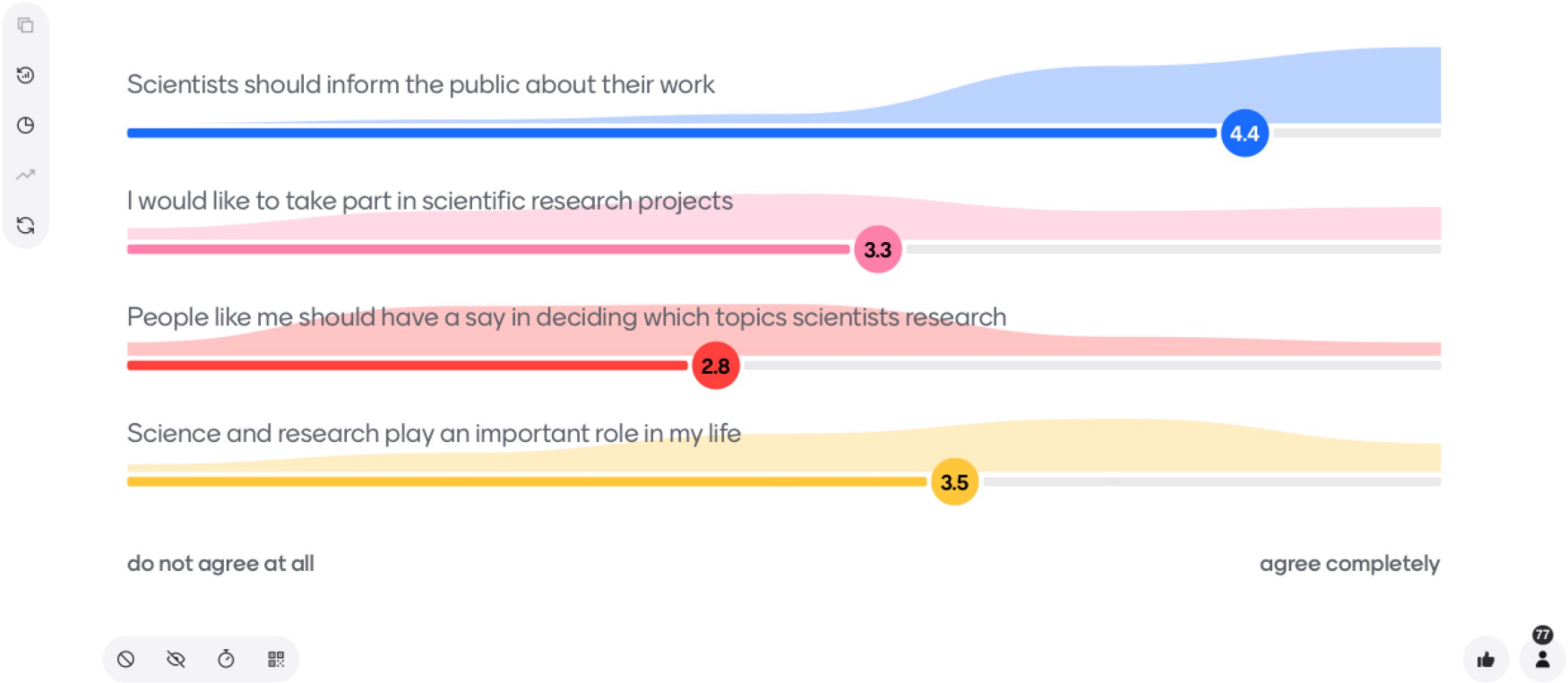
Mentimeter



WIE SOLLTE DAS VERHÄLTNIS ZWISCHEN WISSENSCHAFT UND BÜRGER:INNEN AUSSEHEN?

QUELLE RELATION LA SCIENCE DEVRAIT-ELLE ENTRETENIR AVEC LES CITOYENNES ET LES CITOYENS ?

Die Mehrheit der Schweizer Bevölkerung findet, dass Wissenschaftler:innen die Öffentlichkeit über ihre Arbeit informieren sollten – allerdings stimmen weniger Menschen zu als vor der Corona-Pandemie. 39% würden gern in wissenschaftlichen Projekten mitforschen, 25% möchten mitentscheiden, zu welchen Themen geforscht wird. Im Leben von 42% der Schweizer:innen spielen Wissenschaft und Forschung eine wichtige Rolle.

stimme überhaupt nicht zu

stimme voll und ganz zu

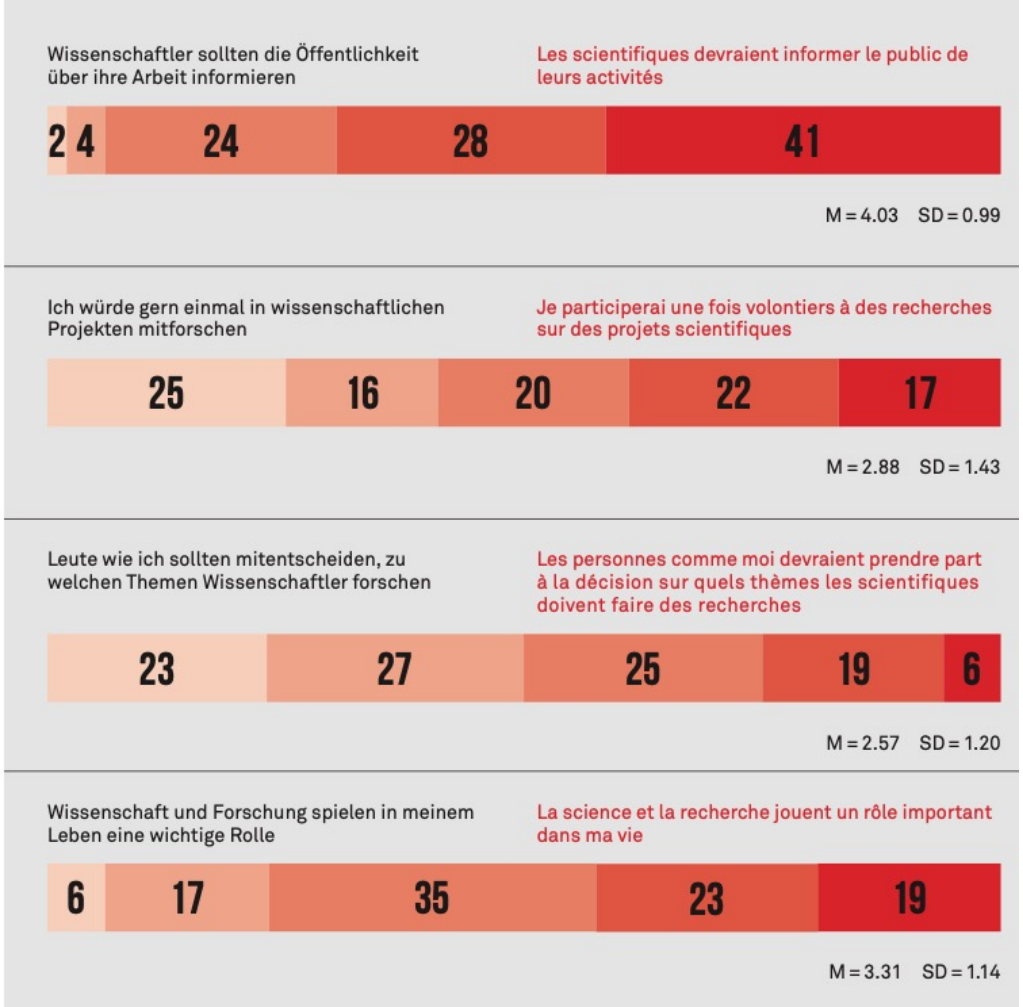
Basis: 1045 – 1052 Befragte; Angaben in Prozent – Rundungsdifferenzen möglich

La majorité de la population suisse estime que les chercheurs devraient informer le public de leurs travaux. Toutefois, moins de personnes sont d'accord sur ce sujet qu'avant la pandémie de coronavirus. 39% souhaiteraient participer à des projets scientifiques, 25% aimeraient intervenir dans les décisions concernant les thèmes de recherche. La science et la recherche jouent un rôle important dans la vie de 42% des Suisses et Suissesses.

N'approuve pas du tout

Approuve totalement

Base: 1045 – 1052 personnes interrogées; données en pourcentage – des différences d'arrondi sont possibles



«Baromètre Scientifique Suisse 2022 / WissensCHaftsbarometer Schweiz 2022»; https://wissenschaftsbarometer.ch/ergebnisse-2022/

IS SCIENCE COMMUNICATION IMPORTANT?

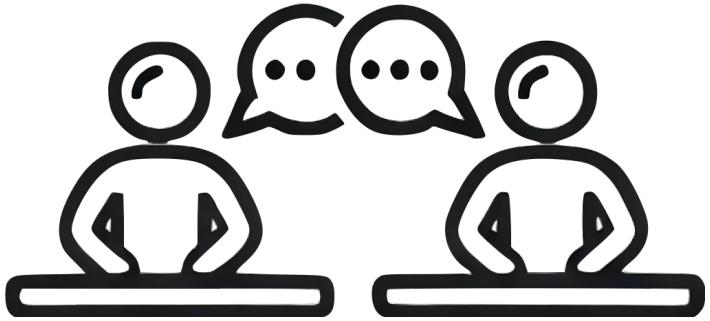


Photo by Matthew Ball on Unsplash

Photo by Mika Baumeister on Unsplash

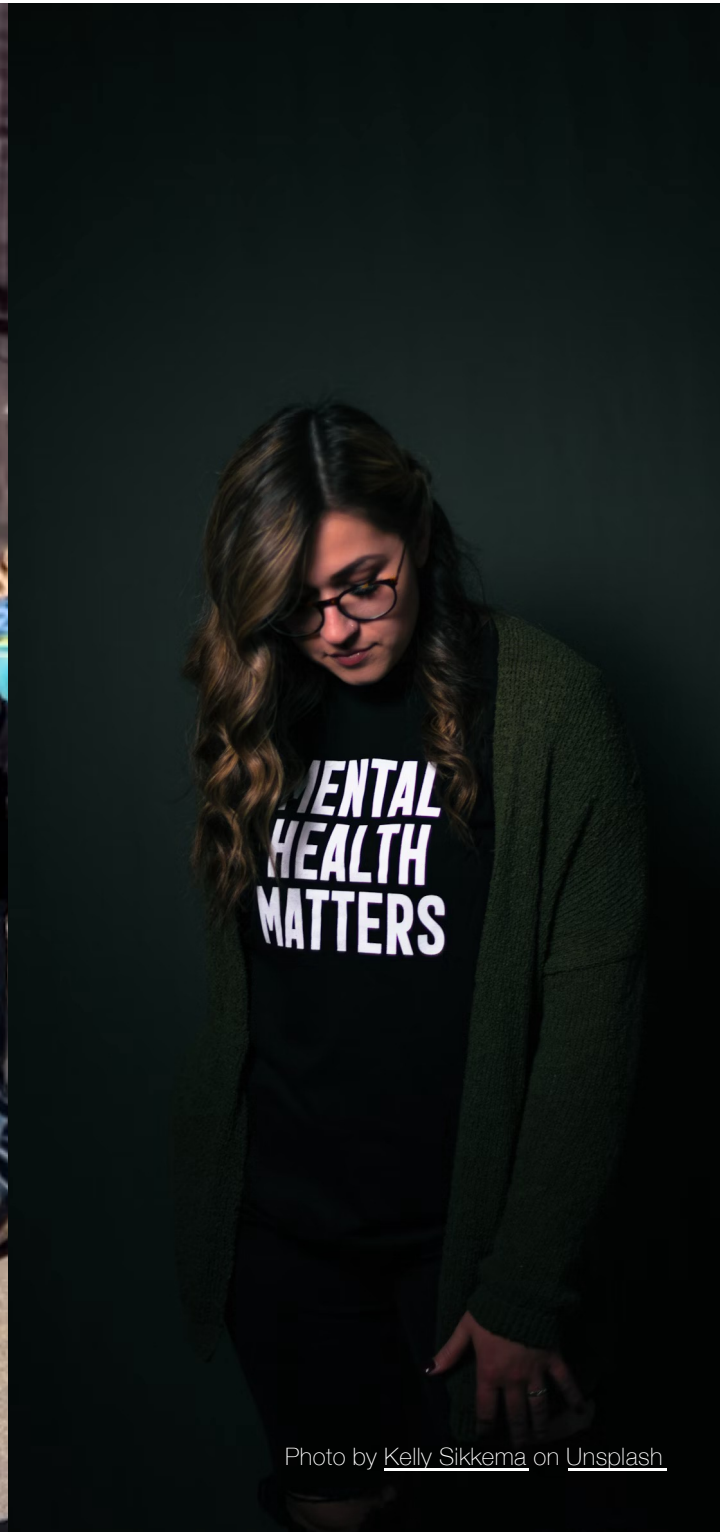


Photo by Kelly Sikkema on Unsplash

«three new studies all indicate that combined oral contraceptives (…) are associated with around a two-fold increase in the risk of thromboembolism»

U.K. Committee on Safety of Medicines, 1995

Gigerenzer G, Gaissmaier W, Kurz-Milcke E, Schwartz LM, & Woloshin S. (20027). Helping doctors and patients make sense of health statistics. *Psychological Science in the Public Interest, 8*(2):53-96. https://doi.org/10.1111/j.1539-6053.2008.00033.x

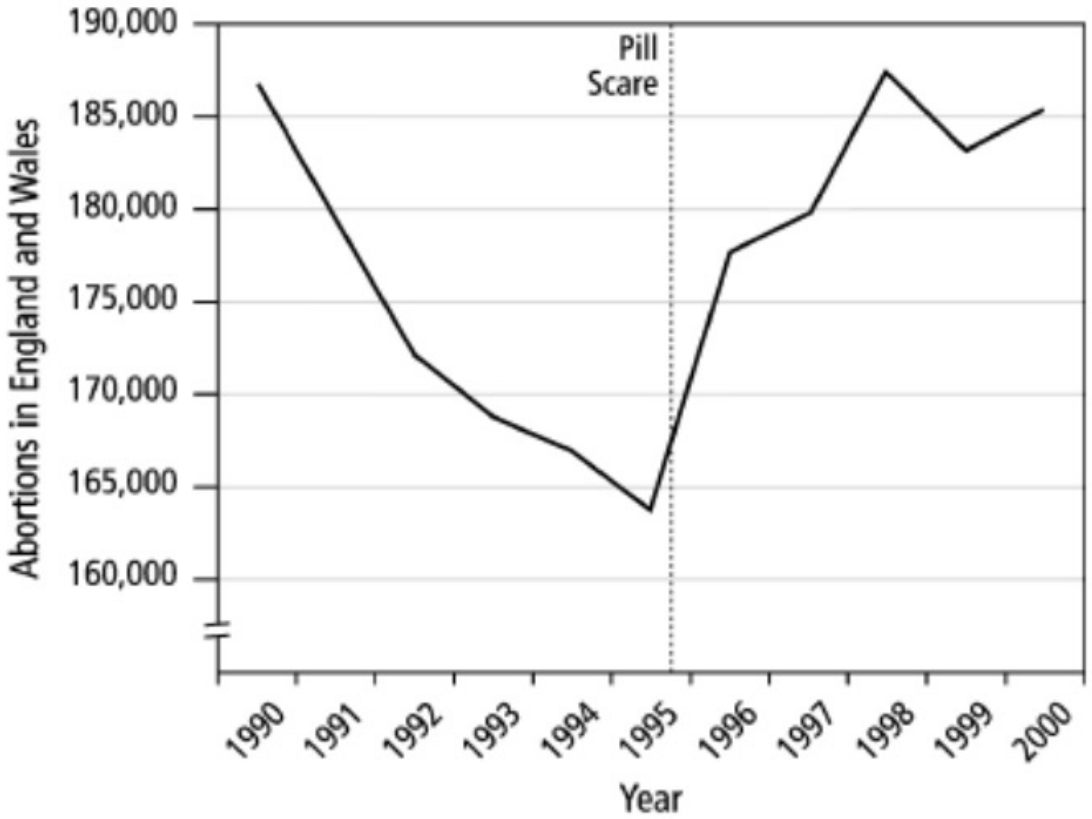


Fig. 1. Reversal of downward trend in number of abortions in England and Wales following the 1995 pill scare.

Gigerenzer G, Gaissmaier W, Kurz-Milcke E, Schwartz LM, & Woloshin S. (20027). Helping doctors and patients make sense of health statistics. *Psychological Science in the Public Interest, 8*(2):53-96. https://doi.org/10.1111/j.1539-6053.2008.00033.x

What is science communication?

"We understand science communication as all forms of communication focused on scientific knowledge or scientific work, both inside and outside institutionalised science, including its production, content, use, and effects"

Bertemes, J. P., Haan, S., & Hans, D. (Eds.). (2024). *50 essentials on science communication*. De Gruyter. https://doi.org/10.1515/9783110763577

What is science communication?

SCIENCE COMMUNICATION (SciCom) may be defined as the use of appropriate skills, media, activities, and dialogue to produce one or more of the following personal responses to science (the vowel analogy)

Awareness, including familiarity with new aspects of science

Enjoyment or other affective responses, e.g. appreciating science as entertainment or art

Interest, as evidenced by voluntary involvement with science or its communication

Opinions, the forming, reforming, or confirming of science-related attitudes

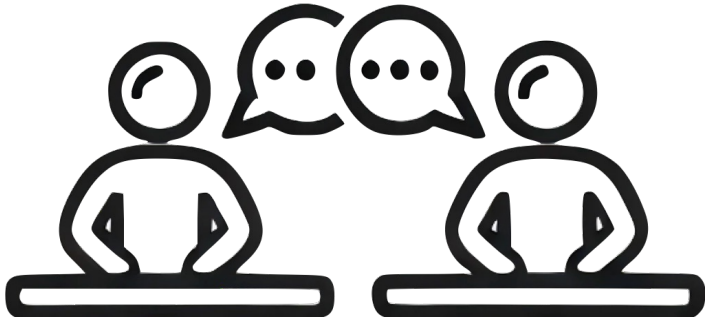
Understanding of science, its content, processes, and social factors

Science communication may involve science practitioners, mediators, and other members of the general public, either peer-to-peer or between groups.

Figure 1. The AEIOU definition of science communication. This definition clarifies the purpose and characteristics of science communication and provides a basis for evaluating its effectiveness

Burns, T. W., O'Connor, D. J., & Stocklmayer, S. M. (2003). Science communication: A contemporary definition. *Public Understanding of Science, 12*(2), 183–202. https://doi.org/10.1177/09636625030122004

FORMS OF SCIENCE COMMUNICATION?



Forms of science communication

Form of Science Communication	Description	Examples
Institutional Science Communication	Communication from scientific institutions or organizations to a non-scientific public.	Universities communicating research to the general public.
Science PR (Public Relations)	Interest-driven communication aimed at building reputation. Part of institutional science communication.	Universities promoting their research to enhance reputation.
Non-institutional Science Communication	Science communication by smaller associations, individuals, or teachers outside institutional settings.	Teachers or individuals sharing their passion for science.
Science Journalism	Reporting on scientific topics by journalists, distinct from institutional science communication.	News articles or reports about scientific discoveries.
Internal Science Communication (Scholarly Communication)	Exchange of scientific information within the scientific community, often during conferences or publications.	Presentations or discussions at academic conferences.
External Science Communication	Science communication aimed at audiences outside the scientific community.	Public talks or popular science books for the general public.
Science Education	Education-focused science communication, often aimed at teaching and inspiring interest in science.	School science programs, public lectures, and outreach.
Knowledge Transfer	Communication between science and industry or societal actors, often for practical applications.	Collaborations between universities and industry.

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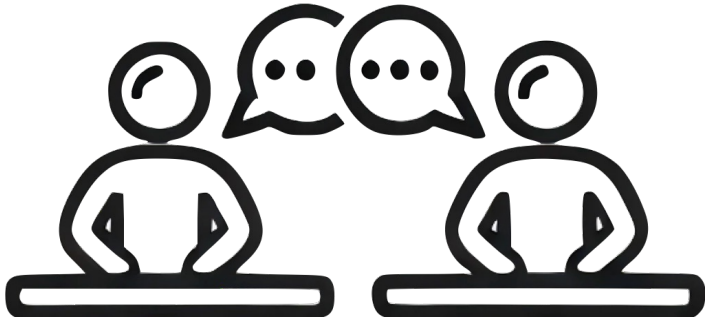
GOALS OF SCIENCE COMMUNICATION?



Goals of science communication

Goals of Science Communication	Description	Examples
Disseminating Information	To inform the public about research activities and findings, fulfilling an ethical obligation.	Researchers sharing findings through public talks or papers.
Building Trust in Science	To enhance the credibility and trustworthiness of researchers and institutions by being visible and transparent.	Open access publications, public outreach by universities.
Preventing Misinformation	To ensure that public discourse is based on academic reality rather than individual beliefs or misinformation.	Clear communication on topics like climate change or vaccines.
Encouraging Critical Thinking	To help the public understand that uncertainty and controversy are natural parts of the scientific process.	Engaging in dialogue about scientific ambiguity and debates.
Supporting Informed Public Decision-Making	To provide the public with accurate information, allowing for informed, democratic decisions on scientific issues.	Public debates or campaigns around science-related policies.
Engaging in Public Dialogue	To create a two-way communication where scientists also consider societal needs and interests in their research.	Public forums or discussions where scientists and public interact.
Creating a Competitive Edge	To differentiate institutions or researchers by showcasing scientific achievements, though potentially controversial.	Researchers or universities promoting breakthroughs to attract funding.

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Summary

- **Responsible Research & Innovation:** aspirational, collaborative approach to R&I that addresses societal challenges, involves all actors at various levels, and aligns with societal values, needs, and expectations.
- **Science communication:** the use of various skills, media, and activities to engage diverse audiences in science, fostering **A**wareness, **E**njoyment, **I**nterest, **O**pinions, and **U**nderstanding of science through dialogue and interaction of multiple actors (AEIOU mnemonic).
- Science communication entails **multiple forms** and **goals:** ranging from institutional (e.g., universities) and non-institutional efforts (e.g., small associations, individuals), science journalism, among others, emphasizing the diversity of approaches used to engage different audiences in science-related content; each form can serve different goals, such as dissemination and knowledge transfer, but also critical thinking (because scientific results are not always clear cut), or reputation building (which can pose challenges to unbiased, truthful communication).

Course structure

Session information

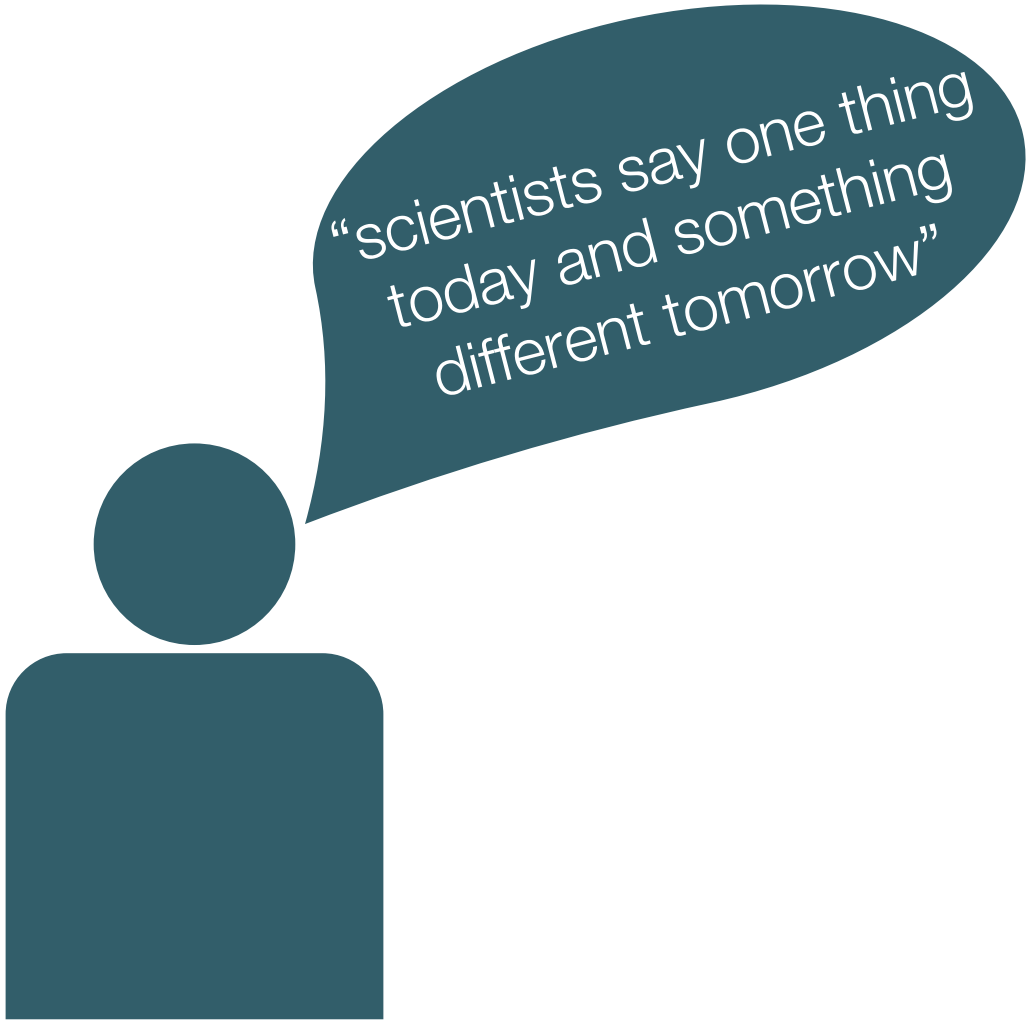
Sessions take place Thursdays, 8.15-9.45, Biozentrum, Hörsaal U1.131.

#	Date	Topic	Instructor(s)	Slides
1	19.09.2024	What is science communication?	Mata	pdf
2	03.10.2024	Models and elements of science communication	Mata	pdf
3	10.10.2024	Scientific uncertainty and trust in science	Mata	pdf
4	17.10.2024	Guidelines for science communication	Mata	pdf
5	24.10.2024	Science communication gone wrong	Mata	pdf
6	31.10.2024	Practical: Knowledge and Data Visualization	Hil/Lachenmeier	pdf
7	07.11.2024	Practical: Modular Information Design	Hil/Lachenmeier	pdf
8	14.11.2024	Practical: Modular Information Design	Hil/Lachenmeier	pdf
9	21.11.2024	Practical: Modular Information Design	Hil/Lachenmeier	pdf
10	28.11.2024	Practical: Modular Information Design	Hil/Lachenmeier	pdf
11	05.12.2024	Practical: Modular Information Design	Hil/Lachenmeier	pdf
12	12.12.2024	Practical: Modular Information Design	Hil/Lachenmeier	pdf
13	19.12.2024	Exam		

Models and elements of science communication

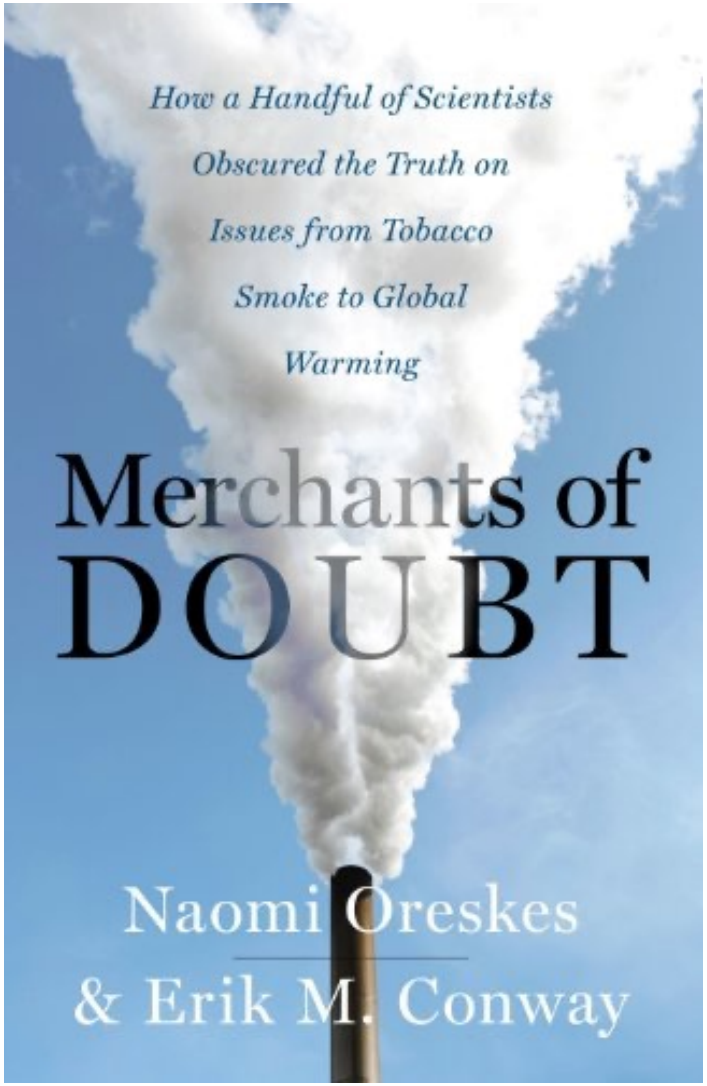
Lasswell model of communication

Scientific uncertainty and trust in science

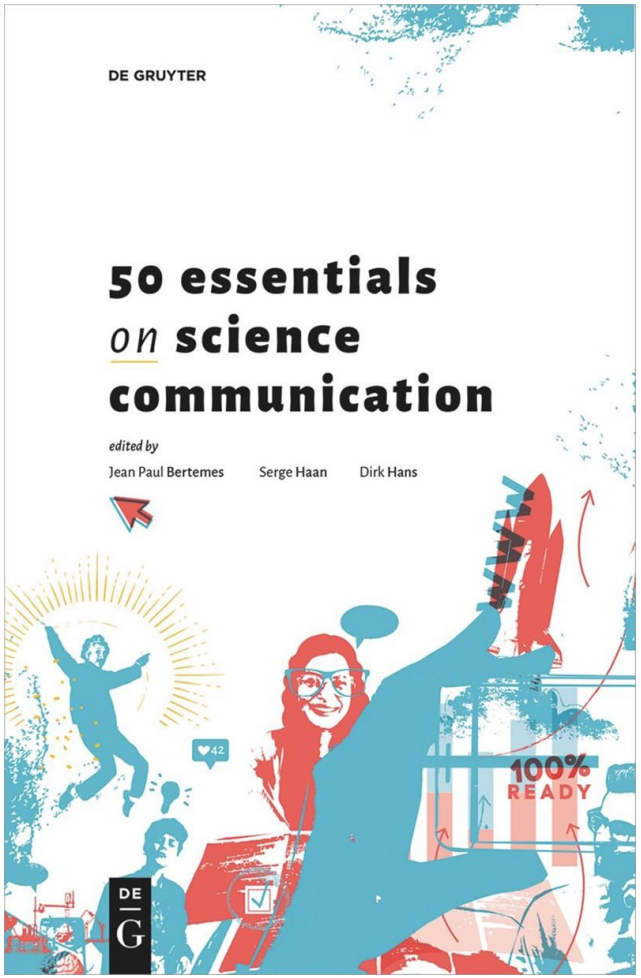


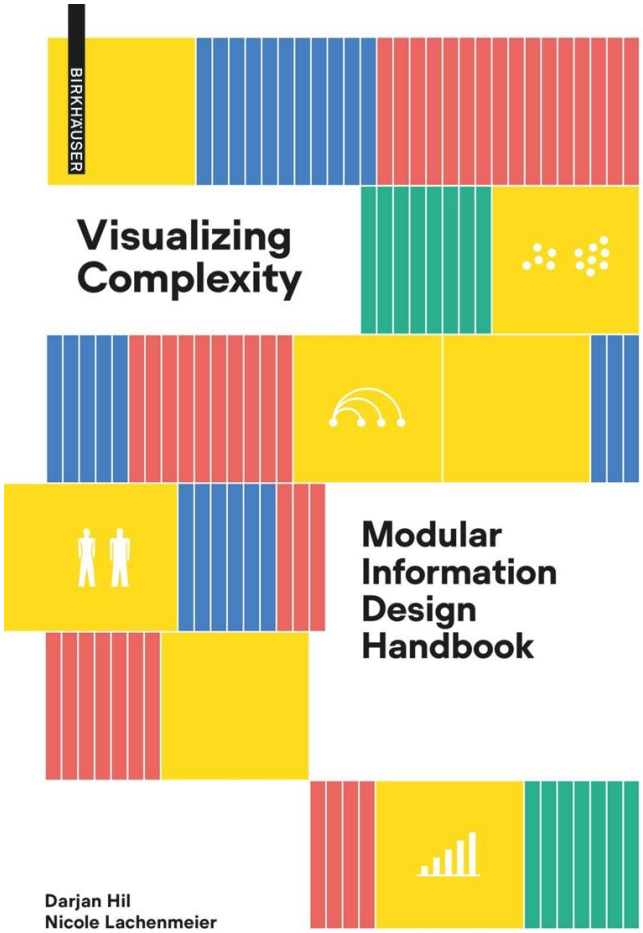
Guidelines for scientific communication

Science communication gone wrong



Course readings





Grading

The final grade for the course will be based on two components:

- **Exam** (40%): At the end of the semester, a multiple-choice exam will test your understanding of core concepts covered in lectures and readings. You can find information about the location and time of the exam in the course directory.

- **Assignments** (60%): The majority of the grade will come from practical assignments, which involve applying the principles learned to specific applications. Both timely submission and the quality of work will be key factors in determining your grade for this component. Assignments should be submitted via ADAM by the designated deadlines. More information will follow soon.

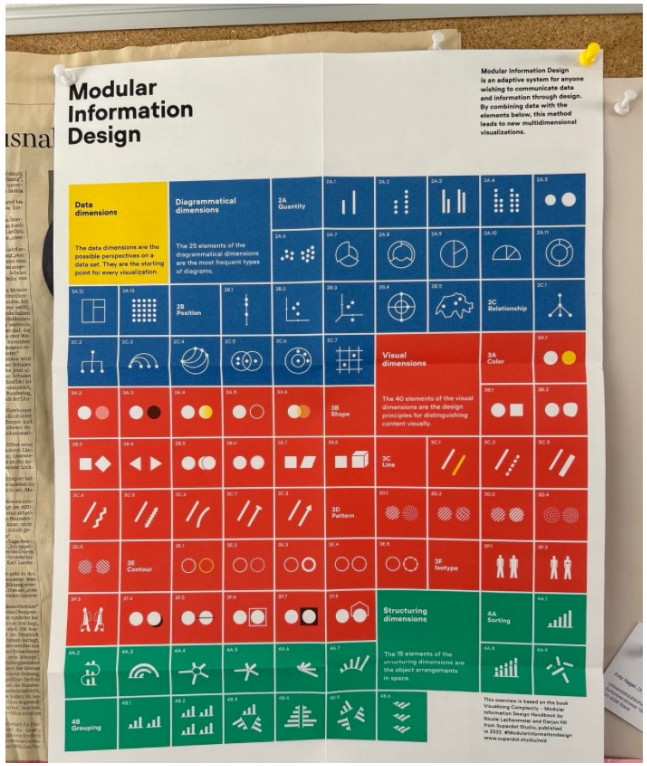
Course website

Science Communication

Science Communication (73168-01), FS24, University of Basel

Instructors: Darjan Hil, Nicole Lachenmeier, and Rui Mata

WEBSITE UNDER CONSTRUCTION: Last updated Tue Sep 10 08:54:05 2024



https://matarui.github.io/SCICOM_HS24/