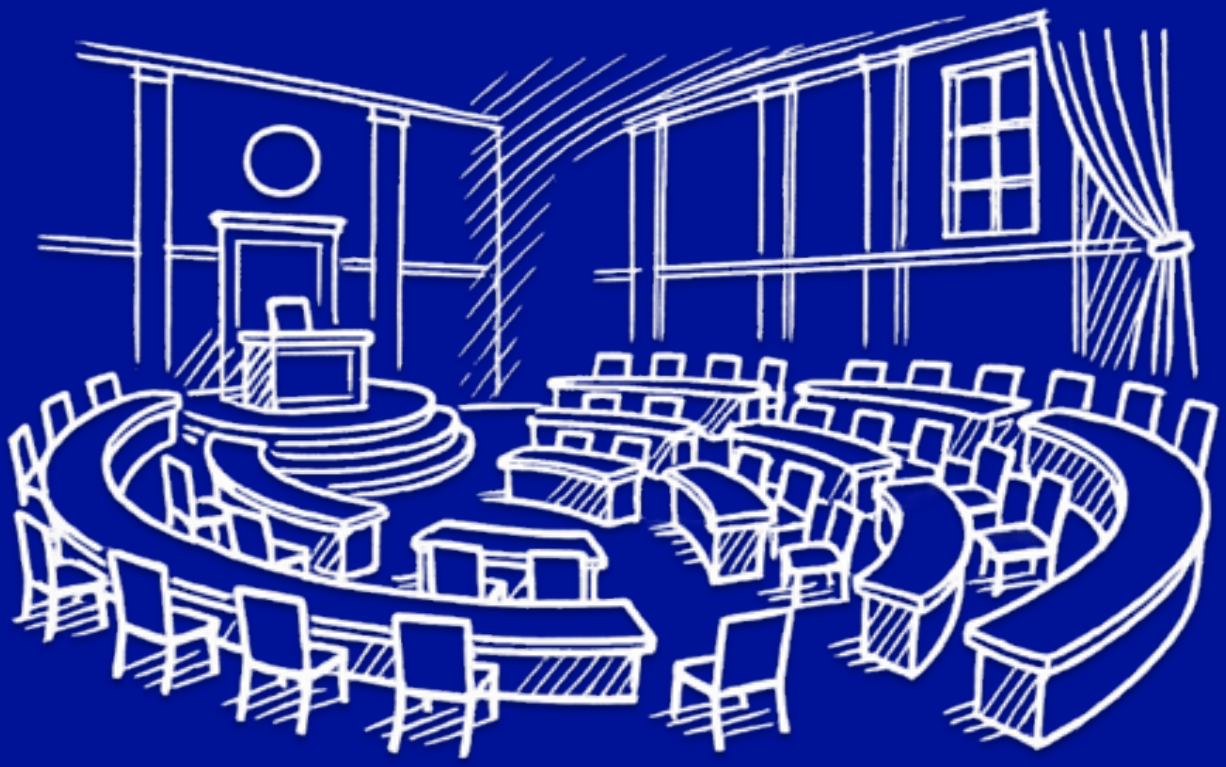
Sci4Pol

COMMUNICATING SCIENCE FOR POLICY

Empowering Researchers to Engage with Decision-Makers



TRAINING WORKBOOK

This workbook offers a series of exercises to support research experts in developing their own pathways to communicate science for policy and engage with decision-makers, or in learning from others by analyzing case studies. The exercises are being developed in tandem with an open-access textbook, which is scheduled for publication in 2026. As such, the workbook is subject to updates. The most current version can be found at:
https://www.communicatingscienceforpolicy.org/workbook

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CONTENTS

Learning Outcome

CONCEPTUALIZING YOUR GOALS AND OBJECTIVES

Exercise Outline

In this workbook—and the associated textbook and training—we recommend that researchers take a strategic approach in planning their policy engagement and communication, grounded in an understanding of the policy issue, relevant policy actors, and institutional contexts. We believe that researchers who understand their own long-term goals and immediate objectives for engaging in policy will be best equipped to choose the most appropriate and efficacious pathways for themselves. However, it is essential to recognize that these goals and objectives are likely to evolve over time. Indeed, they may change from meeting to meeting with decision-makers. Researchers who are drawn to a specific policy issue based on their area of expertise may find themselves needing to redefine their goals and objectives to meet the vicissitudes of policy processes, while others may decide to choose specific types of engagement based on their own priorities.

Most of this training will focus on selecting tactics within the context of a specific policy issue:

1) deciding whether more technocratic decision-making or pluralistic, deliberative approaches are more appropriate;
2) identifying and analyzing key policy actors;
3) establishing what types of evidence are needed by the decision-maker;
4) selecting a communicative mode and role;
5) building relationships; and
6) communicating complex science and uncertainty.

Task 1

At the outset of this training, what is your broad goal for engaging in policy, that might take you years to achieve, and your shorter-term objectives? **Fill in the table below.**

Goals & objectives	**Check one or more boxes from each category**
What is your broad goal?	**Affect change in:** ☐ public policy (e.g., increased evidence-informed policymaking) ☐ the research enterprise (e.g., what research is produced and how) ☐ connections between the research community and decision-makers ☐ other_____
What short-term objectives do you have?	☐ Raise awareness of a policy issue's importance ☐ Increase understanding of an issue among decision-makers ☐ Motivate a policy decision or action ☐ Increase the societal relevance and usability of research ☐ Increase communication and accessibility of evidence for decision-makers ☐ Other_____

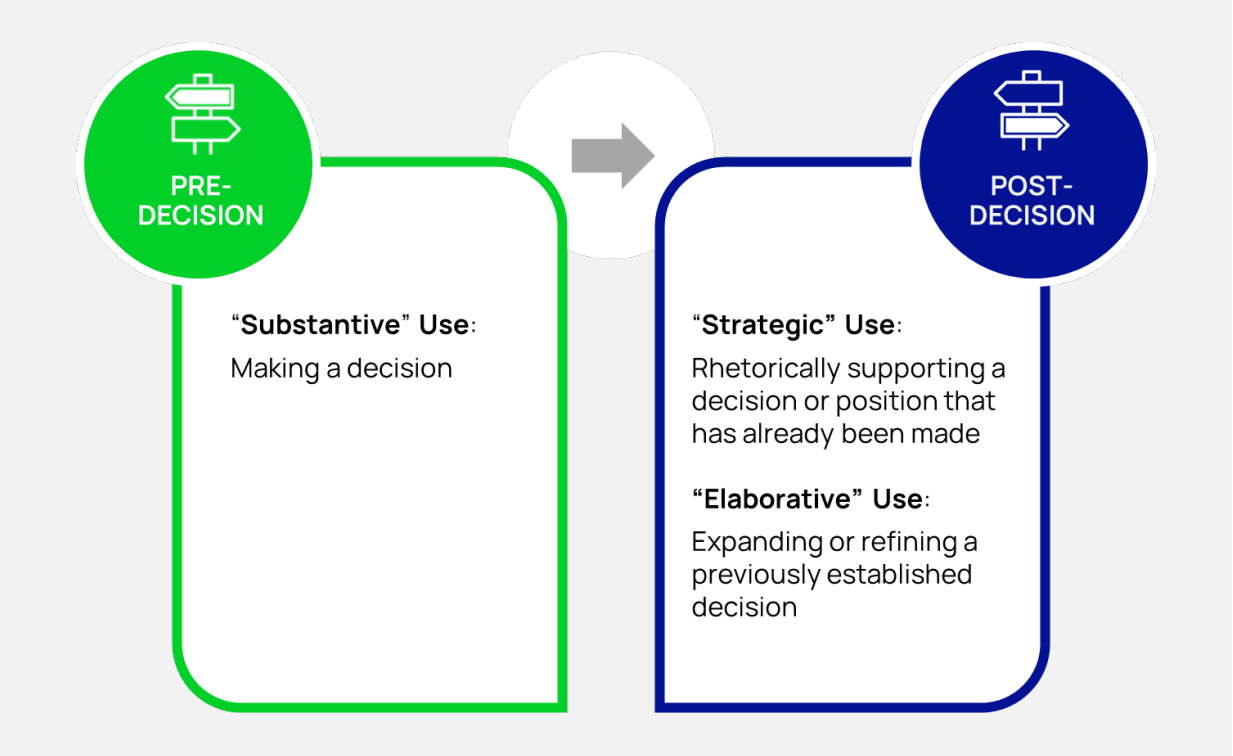
Learning Outcome

EVIDENCE USE BY POLICYMAKERS

Exercise Outline

Policymakers can use research evidence in many ways. One typology that describes policymakers' evidence use characterizes it in relationship to the status of a decision.[1] Substantive use of evidence occurs before a policy decision, allowing for research evidence to inform the weighing of alternatives and the decision-maker's choice. Alternately, strategic use of evidence takes place after a decision has been made, in which the evidence serves as rhetorical justification and an authoritative means of persuading others. Finally, elaborative use of evidence involves refinements or adjustments to a policy decision, considering new information. In this exercise, you will consider how the research expert's objectives may, or may not, align with the decision-maker's likely forms of evidence use.

[1] Whiteman, D. (1985). The fate of policy analysis in congressional decision making: Three types of use in committees. *Western Political Quarterly, 38*(2), 294-311.



Task 1

Select a case study from the Appendix or a policy issue of interest to you.

Name of Case Study/Policy Issue:

_____

What is the primary short-term objective for the research expert in this case study/policy issue? **Check the box below.**

- ☐ Raise awareness of a policy issue's importance
- ☐ Increase understanding of an issue among decision-makers
- ☐ Motivate a policy decision or action
- ☐ Increase the societal relevance and usability of research
- ☐ Increase communication and accessibility of evidence for decision-makers
- ☐ Other_____

What is the status of the policy decision and the likely type of decision-maker evidence use? **Check one box in each column below.**

Decision stage	**Type of research evidence use**
☐ Pre-decision	☐ Substantive use
☐ Post-decision	☐ Strategic use ☐ Elaborative use

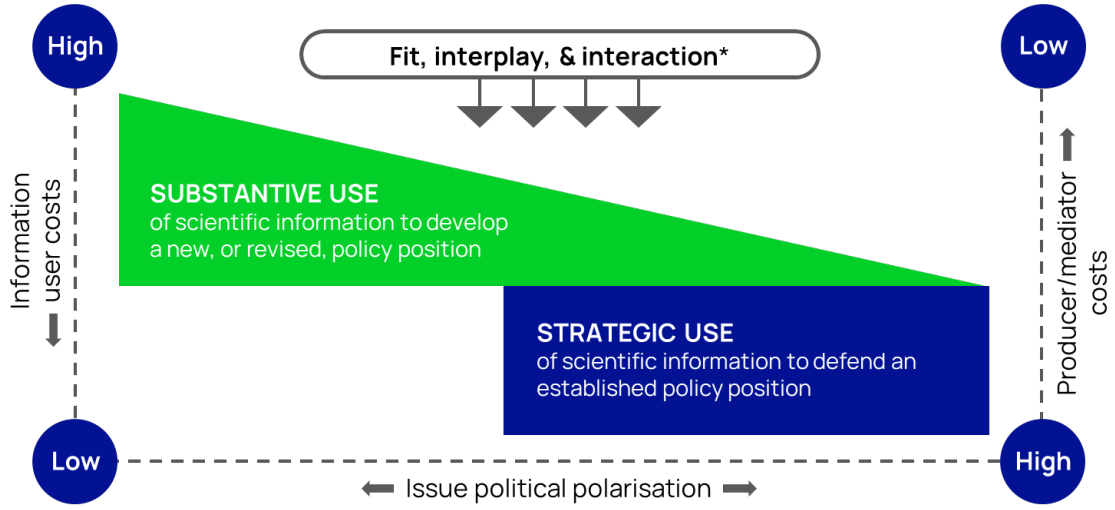
Task 2

Is there a conflict between the research expert's objectives and the decision-maker's likely form of evidence use? For example, if the objective is to motivate a policy decision or action (substantive use), and the decision-maker has already publicly stated their position and is primarily interested in the research evidence that supports it (strategic use), conversations between the expert and decision-maker may not be terribly productive. However, there may be opportunities instead for working with the policymaker to elaboratively use evidence, adapting the position, or setting the stage for new, related, decisions in the future. **Use the box below to describe what, if any, conflicts may arise between the research expert's primary objective and the likely current form of evidence use by the decision-maker.**

If there appears to be a potential conflict between the research expert's primary objective and the likely form of evidence use by the decision-maker, what should the researcher do? Change their objective? Engage with a different decision-maker? **Write your response below.**

Task 3

Many research experts are interested in contributing to "substantive use" of research evidence in policy processes. Substantive use of research to make decisions is most likely to occur at low levels of issue political polarization and requires decision-makers to expend considerable time and resources to find the information they need (see figure below). Fewer people are motivated to provide research evidence to decision-makers for issues that are not a priority on the political agenda. This can be an opportunity for research experts. Thinking of the case study/policy identified above, is there some aspect of it that may, as of yet, be less polarized and hence an opportunity for substantive use if the expert can meet the policymaker's needs for information (i.e., "fit"), adapt to the requirements of the decision context ("interplay"), and build strong relationships ("interaction")?



*Communication factors that decrease user costs.

Akerlof, K.L., Lemos, M. C., Cloyd, E. T., Heath, E., Nelson, S., Hathaway, J., & Timm, K. M. (2024). Science communication in Congress: for what use?. *Evidence & Policy, 20*(3), 300-319.

In the box below, describe an aspect of the policy issue that might be ripe for substantive use.

Learning Outcome

UNDERSTANDING THE POLICY ISSUE

Exercise Outline
For the purpose of this exercise, you will need to identify a policy issue, whether related to your research expertise, one that interests you personally, or a case study from the Appendix.

Over a series of four tasks, you will develop an *understanding of the policy issue* by describing it and then assessing it on three dimensions:

1. Is it about "science for policy" or "policy for science"?
2. How structured is the problem based on the level of scientific uncertainty and public agreement?
3. What is the appropriate level of public participation and dialogue?

Task 1

Write the name of your policy issue or the case study you are using to complete the exercise.

Name of Case Study/Policy Issue:

_____

Task 2

How would you characterize the policy issue? Is it "policy for science" or "science for policy"?

- "Science for policy" refers to the use of research evidence for decision-making.
- "Policy for science" refers to decision-making, including on funding and governance, that directly affects the research enterprise.

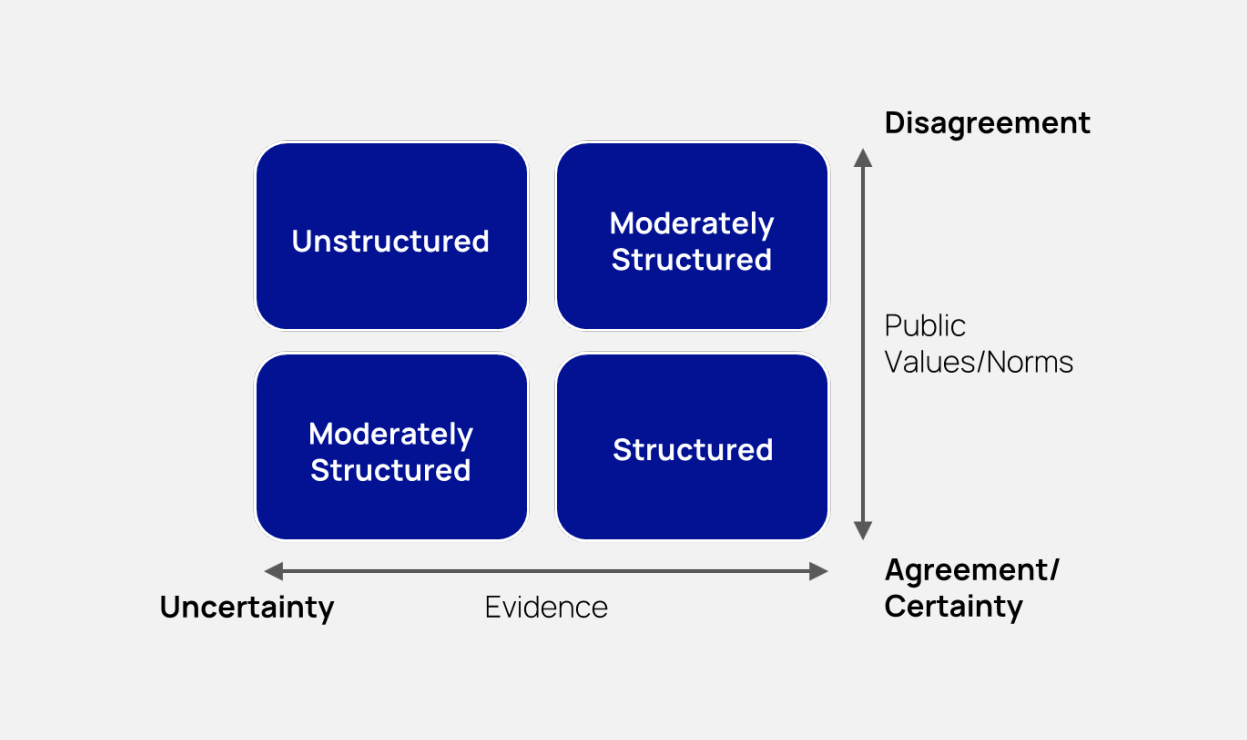
How would you describe your issue? **Check one** of the following options:

☐ Science for policy
☐ Policy for science

Brooks, H. (1964). The scientific advisor. In Gilpin, R., & Wright, C. (Eds.) *Scientists and national policy-making*. Columbia University Press, New York, pp. 73–96.

Task 3

How structured is the policy issue based on the level of uncertainty regarding scientific evidence and public agreement on values/norms?



Check one of the following options:

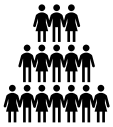
- ○ Unstructured (scientific uncertainty + disagreement on values/norms)
- ○ Moderately structured (scientific uncertainty + agreement on values/norms)
- ○ Moderately structured (scientific certainty + disagreement on values/norms)
- ○ Structured (scientific certainty + agreement on values/norms)

Hisschemöller, M. (1993). De democratie van problemen: de relatie tussen de inhoud van beleidsproblemen en methoden van politieke besluitvorming. Universiteit van Amsterdam.; Hisschemöller, M., & Hoppe, R. (1995). Coping with intractable controversies: The case for problem structuring in policy design and analysis. *Knowledge and Policy, 8*(4), 40–60.

Task 4

Based on the *structure of the policy issue* that you just analyzed, differing levels of public participation and dialogue are needed.

Consider your assessment of the policy issue structure above and **check below** whether it is "structured," "moderately structured," or "unstructured." Review how your policy issue's structure relates to the appropriate level of public participation and deliberation.

☐ **Structured** ➡	☐ **Moderately structured** ➡	☐ **Unstructured**
 **Low public participation**	 **High public participation**	 **High public participation**
Technocratic policymaking, delegated power, public education	Seeking consensus on the scientific or values dimensions by exploring and discussing underlying assumptions	Broad public deliberation, exploring and discussing perspectives on both the scientific and values dimensions

Hurlbert, M., & Gupta, J. (2015). The split ladder of participation: A diagnostic, strategic, and evaluation tool to assess when participation is necessary. *Environmental Science & Policy, 50*, 100-113.

Learning Outcome

IDENTIFYING AND ANALYZING POLICY ACTORS

Exercise Outline

Science and innovation occur within the dynamic interplay of ongoing interactions among the research community, policymakers, industry, and civil society. Actors from each sector may play a role in shaping policy outcomes, whether as decision-makers or interested parties. Understanding the interests and roles of various actors can help researchers decide whom to engage and how, as well as which types of information are most relevant to communicate.

For any policy issue, the range and number of potential actors from across the four sectors—the research community, policy community, industry, and civil society—may differ greatly. Actors may include individuals and groups identified by common interests or characteristics, as well as organizations and institutions. To guide you in identifying the **key actors** for your policy issue, consider the results from the previous exercise on the level of public deliberation. If little public deliberation is required due to the certainty of the research evidence and broad agreement on what should be done, focus on those actors who have the power to make decisions, while ensuring the public remains informed. Alternatively, if your policy issue requires high levels of expert and public dialogue to resolve areas of disagreement over the evidence and/or the values underlying policy options, identify a broad range of actors for inclusion.

Examples of actors from across the four categories include:

- **research community**—national and state academies, professional and scientific societies, scientific advisory groups, universities, and prominent research experts;
- **government**—legislative, executive, and judicial branches;
- **industry**—companies and trade associations; and
- **civil society**—members of the public, community organizations, civil society groups, unions, campaigns, and movements.

Carayannis, E. G., & Campbell, D. F. (2009). 'Mode 3' and 'Quadruple Helix': toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management, 46*(3-4), 201-234.

Task 1

Which actors have an impact on, or are impacted by, your policy issue? Identify potential groups across all four sectors. Depending on your policy issue and geographic area of interest, consider potential actors at the local, state, federal, and international levels, and among Indigenous groups. Remember that the greater the need for *public deliberation regarding your issue*, the more extensively you will need to include public and civil society actors.

For one of the case studies in the Appendix, or your own policy issue of interest, **write the names, or descriptions,** of relevant groups in the table on the next page. Looking for research tips? See p. 14.

Name of Case Study/Policy Issue:

_____

POLICY ACTORS				
	SECTOR			
LEVEL	Government	Public/ Civil Society	Industry	Research Community
Local				
State				
Regional				
Federal				
International				
Indigenous/ Tribal				

Research Tips

Identifying potential policy actors:

- For most issues, you can find online news media that highlight relevant actors, such as articles reporting on the actions and public positions they are taking. If it is an emerging issue on which there is little news coverage, take a guess who might be interested and/or affected.

Finding relevant government decision-makers:

- Identify the level, or levels, of governance that have decision-making authority over the issue: local, state, regional, federal, international, and Indigenous/tribal.
- At the level of governance that you have identified, what are the *relevant decision-making bodies*? For example, it might be a city council or department, agency or legislature at the state or federal level, or the judicial branch.
    - For a *legislative body*, ask yourself, for example, who is the legislator for the constituency where the policy issue is most urgent? Which is the relevant committee with oversight over the issue, and who chairs it? Who are their key staff members for this issue?
    - When thinking about an *executive department or agency*, ask yourself, which department/ministry/agency is responsible for this issue? Under which portfolio does it fall? Which unit on their organizational chart is likely to handle this issue?

Task 2

After identifying the full range of potentially *relevant decision-makers and other actors*, conducting initial research will help you to prioritize whom to engage. Over the next three tasks, you will analyze the characteristics, sensitivity, and capacity of at least three groups to prioritize their engagement. Whenever possible, include quantitative data. The column on the left provides the type of information needed and examples. A sample policy actor analysis is provided in the Appendix.

In the table below, **describe the general characteristics of the actors for your policy issue**, such as their demographics, interests, and any relevant beliefs or cultural aspects.

Research Tips

You will typically need to conduct research to thoroughly analyze each group. Leverage publicly available information, such as demographic statistics, organizational membership and financial reports, white papers from think tanks or interest groups, and academic research studies.

CHARACTERISTICS			
	Actor 1	**Actor 2**	**Actor 3**
Name or description of the decision-maker or other potential actors			
Demographics/Attributes For individuals and groups: age, gender, ethnicity, nationality For organizations: location/jurisdiction, size/membership			
Mission/Interest Represent constituents or members, enforce laws, protect public health, etc.			
Other important characteristics Belief systems, culture, language, religion, etc.			

Task 3

How sensitive are these actors to policy action or inaction (i.e., the benefits and harms they experience)? **Assess their financial, and non-financial, sensitivity** using the table below. Search for data to quantify the impacts (see example analysis in the Appendix).

SENSITIVITY			
Name or description of the decision-maker or other potential actors	**Actor 1**	**Actor 2**	**Actor 3**
Financial sensitivity Estimate of financial harm or benefits from policy action or inaction, per capita	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High
Non-financial sensitivity Estimate of health, social, cultural, or other harm or benefits from policy action or inaction, per capita	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High
OVERALL ASSESSMENT Sensitivity	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High

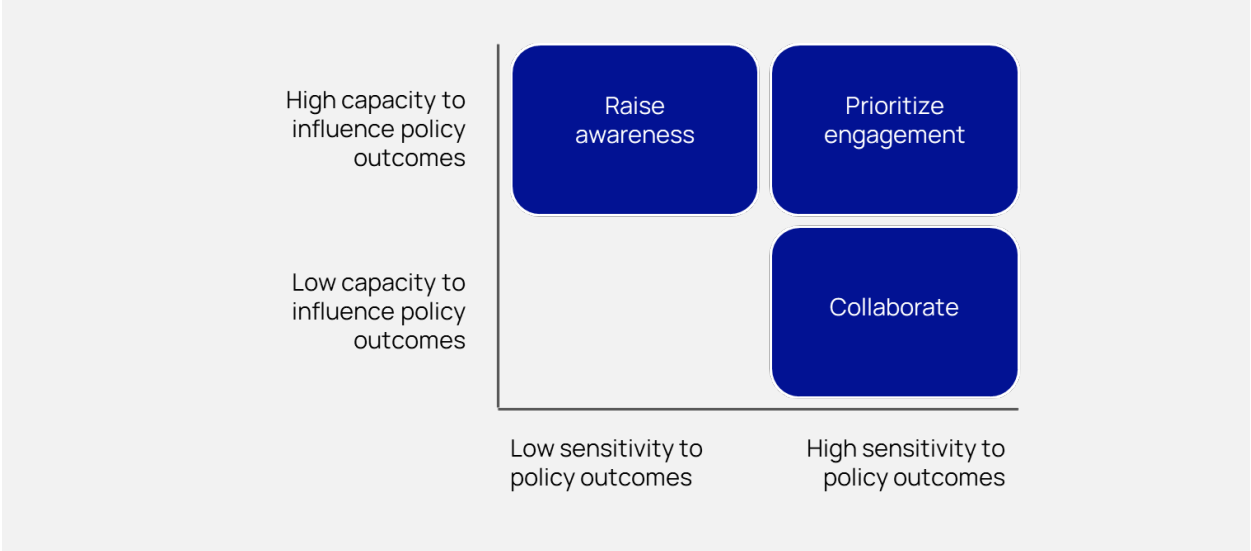
Task 4

What is the capacity of the actors to influence the policy outcome based on their numbers, resources, ability to mobilize, and decision-making authority? In this final table, **assess the actors' capacity.**

CAPACITY			
Name or description of the decision-maker *or other potential actors*	**Actor 1**	**Actor 2**	**Actor 3**
Size/Representation Group size, or number of members/constituents represented			
Resources Financial resources, time, information, social capital	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High
Cost of mobilizing Ease of communication and coordination, such as among group members	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High
Decision-making authority Ability to make laws, regulations, or court decisions, or set community social norms	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High
Legal protections and rights Rights under the law, such as for Indigenous groups	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High
OVERALL ASSESSMENT Actor capacity	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High	☐ Low ☐ Medium ☐ High

Task 5

Based on your analysis of each of your actors' overall capacity to influence policy outcomes (Low-Medium-High) and overall sensitivity to policy outcomes on this issue (Low-Medium-High), decide on your engagement strategy based on the figure below. Prioritize those actors who are both most motivated to take action on an issue due to their sensitivity *and* have the capacity to influence policy outcomes. At the same time, collaborate with those actors who are concerned about the issue to determine the best course of action and work to raise awareness among those who could influence outcomes.

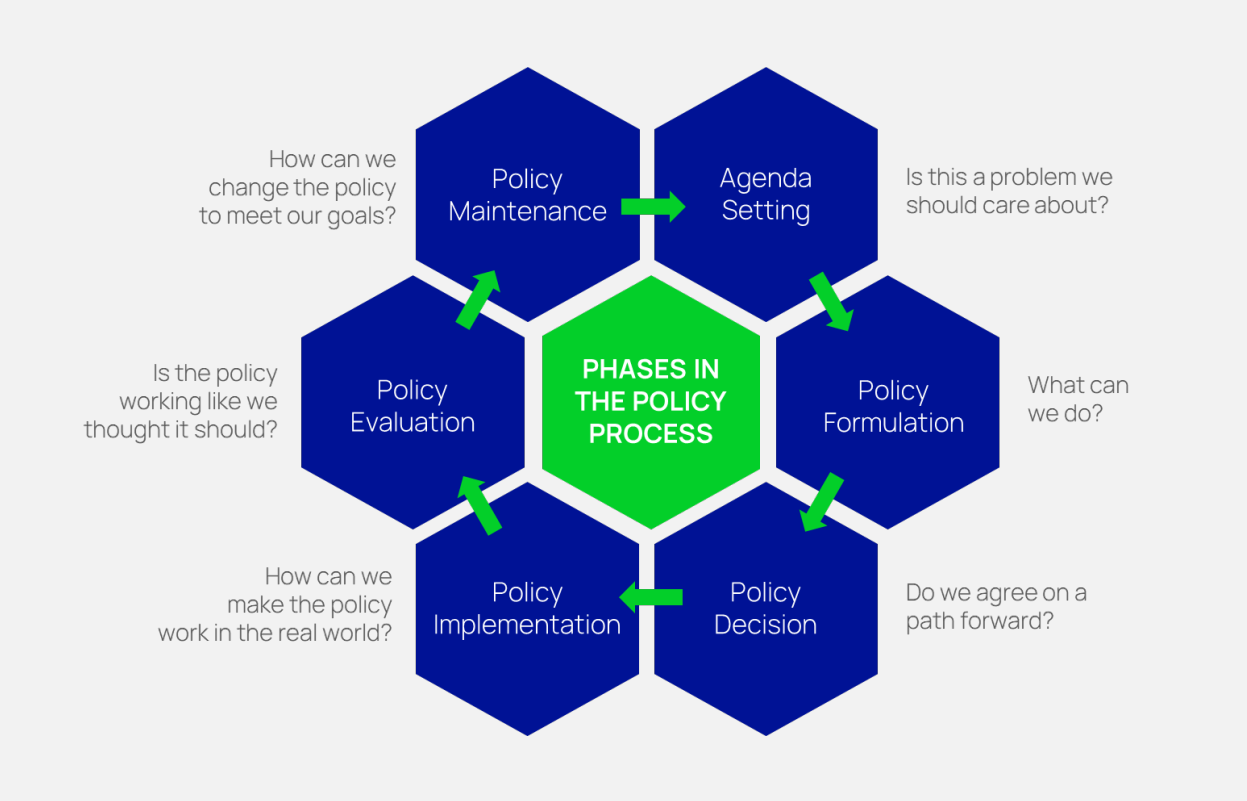


Below, write which of the actors you will focus on for the purpose of collaborating, raising awareness, or prioritizing engagement.

Prioritize engagement:
Raise awareness:
Collaborate:

Learning Outcome

RECOGNIZING EVIDENCE NEEDS ACROSS POLICY STAGES



Adapted from: Bardach, E., & Patashnik, E. M. (2023). *A practical guide for policy analysis: The eightfold path to more effective problem solving*. CQ Press; Wagner, N., Canino, H., Kölbel, A., Zoth, L., & Sorge, A. (2023*). Transformatives Regieren für systemischen Wandel: Für eine neue Art der Politikgestaltung in Deutschland*. Institut für Innovation und Technik (iit).

Exercise Outline

As issues mature in the policy space, they progress through different phases, often in a non-linear, iterative, and dynamic manner. The policy cycle model can serve as a useful analytical tool for identifying the types of research evidence needed across different phases. However, it is important to note that the oversimplified representation does not fully capture the complexity of these processes. For example, decision-makers may not be in the same phase of addressing a policy issue at different levels of governance. A city may be in the process of implementing a law that was passed years ago, while the federal government is still weighing options.

Task 1

For one of the case studies in the Appendix, or your own policy issue, use the table on the next page to identify the stage in the policy cycle for each of the *individuals or groups you plan to prioritize* and consider the associated types of evidence they may require.

Name of Case Study/Policy Issue:

_____

Write the name or description of each priority actor next to the stage of the policy cycle they are in, **checking the box** for which types of evidence you believe that they may need. Add **notes** to indicate any *specific* evidence needs that they may have.

	Actors/ Decision-makers	**Typical evidence needs**	**Specific evidence needs**
Agenda Setting		☐ Defining the problem	
		☐ Measuring the problem	
		☐ Diagnosing the problem	
Policy Formulation		☐ Proposals for new policy options	
		☐ Amendments to existing policy options	
		☐ Outcome projections	
Policy Decision		☐ Evidence on the criteria to compare policy options	
Policy Implementation		☐ Proposals for new implementation options	
		☐ Amendments to existing implementation options	
		☐ Evidence on the criteria to compare implementation options	
		☐ Collection of evidence for evaluation	
Policy Evaluation		☐ Analysis of evidence from the implementation phase	
		☐ Compare implementation to other jurisdictions, policy areas	

Continued

	Actors/ Decision-makers	Typical evidence needs	Specific evidence needs
Policy Maintenance		☐ Proposals for new policy adaptation options	
		☐ Amendments to existing policy adaptation options	
		☐ Evidence on the criteria to compare policy adaptation options	

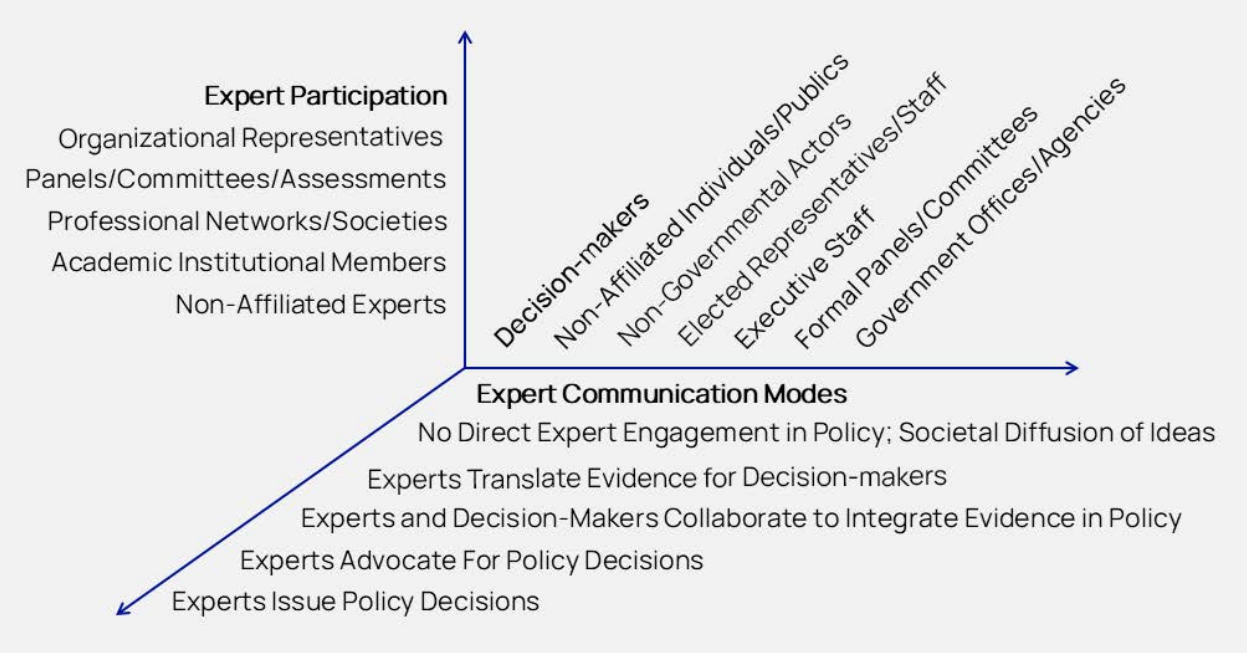
Adapted from: Bardach, E., & Patashnik, E. M. (2023). *A practical guide for policy analysis: The eightfold path to more effective problem solving*. CQ Press; Wagner, N., Canino, H., Kölbel, A., Zoth, L., & Sorge, A. (2023). *Transformatives Regieren für systemischen Wandel: Für eine neue Art der Politikgestaltung in Deutschland*. Institut für Innovation und Technik (iit).

Learning Outcome

UNDERSTANDING RESEARCHERS' ROLES ACROSS INSTITUTIONAL CONTEXTS

Exercise Outline

Research experts' roles in policy are defined by their own institutional contexts, those of the decision-makers with whom they engage, and the communicative modes appropriate to both. In this exercise, you will use a case study or your own policy example to identify the institutional contexts for the researcher's participation, that of the decision-maker, and the expert communicative mode.



Akerlof, K. L. (2025, February 15). *Training scientists to communicate with policymakers: New tools and approaches*. AAAS Annual Meeting, Boston, MA.; Steel, B., Lach, D., List, P., & Shindler, B. (2000). The role of scientists in the natural resource and environmental policy process: A comparison of Canadian and American publics. *Journal of Environmental Systems, 28*(2), 133–155.

Task 1

For one of the case studies in the Appendix, or your own policy issue, **fill in the table below** with the respective institutional contexts of you/the researcher and the decision-maker, and the expert communicative mode.

Name of Case Study/Policy Issue:

_____

Expert participation	**Decision-maker**	**Expert communicative mode**
☐ Non-affiliated experts ☐ Academic institutional member ☐ Professional network/society ☐ Panel/committee/assessment ☐ Organizational representative	☐ Non-affiliated individuals/publics ☐ Non-governmental actors ☐ Elected representatives/staff ☐ Executive office staff ☐ Formal panels/committees ☐ Government offices/agencies	☐ No direct policy engagement; societal diffusion of ideas ☐ Translate evidence ☐ Collaborate with decision-makers to integrate evidence in policy ☐ Advocate for specific policies ☐ Issue policy decisions

Learning Outcome

CONCEPTUALIZING YOUR ROLE AND COMMUNICATIVE MODE

Exercise Outline

Both researchers and decision-makers can engage with each other individually or through various groups and institutional arrangements. The communicative modes that experts adopt in these contexts range from traditional academic activities such as reporting findings in journals to advocating for specific policies and issuing decisions. The choice of mode depends on the form of expert participation and the institutional context of the decision-maker. In these exercises, we will explore the collective nature of scientific and policy knowledge as well as the extent to which there are trade-offs between communicative freedom and epistemic authority (i.e., serving as a trusted source of expertise). Finally, using a specific policy example, you will decide what role you, or a research expert from a case study, *should* take.

Task 1

Researchers can choose to engage decision-makers individually or join collectively with other experts in more formal, institutionalized processes. Why might knowledge or research evidence from scientific advisory committees or assessments be more robust than that from individual scientists? **Write your answer below.**

Task 2

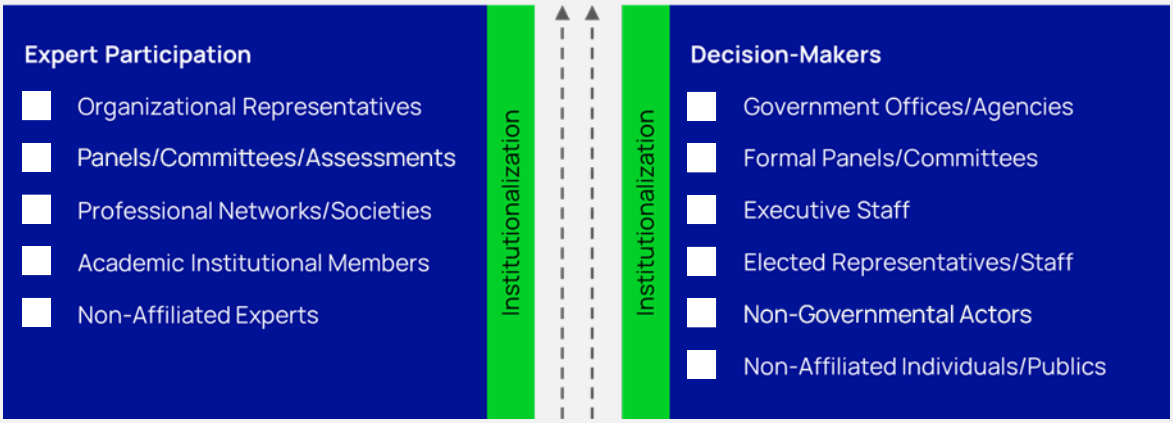
Why might there be differences in experts' freedom to communicate with policymakers while serving on an advisory panel or committee, as opposed to acting individually? **Write your answer below.**

Task 3

Choose a case study from the Appendix, or a policy issue of interest to you, for the purpose of the exercise. **Check** the type of expert participation and decision-maker in the box below.

Name of Case Study/Policy Issue:

_____



Task 4

In the case study or policy issue that you chose, are epistemic authority and communicative freedom low or high for the expert and the decision-maker(s)? **Check the boxes below that reflect the level of epistemic authority for the expert and decision-maker, and then those for communicative freedom.**

Epistemic Authority	
Expert	Low ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ High
Decision-maker(s)	Low ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ High

Communicative Freedom	
Expert	Low ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ High
Decision-maker(s)	Low ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ High

Task 5

What are some specific reasons why expert evidence might be more or less robust in this specific case? **Write your answer below.**

Task 6

Why might the expert's communication be more or less restricted? **Write your answer below.**

Task 7

Which expert communicative modes are considered acceptable or desirable according to the respective institutional contexts and social norms of the expert and the decision-maker? **Check the box(es) below** for each acceptable mode that aligns with the expert's institutional context, and then that of the decision-maker. *(Please note: The range of acceptable modes for the expert and decision-maker may differ.)*

Acceptable expert communicative mode	**Expert institutional context**	**Decision-maker institutional context**
No direct policy engagement; societal diffusion of ideas	☐	☐
Translate evidence	☐	☐
Collaborate with decision-makers to integrate evidence into policy	☐	☐
Advocate for specific policies	☐	☐
Issue policy decisions	☐	☐

Task 8

What are the acceptable/desirable expert modes of communication that align with **both** the expert's and decision-maker's contexts? **Write your answer below.**

Task 9

Now that you have reviewed the trade-offs and potential expert communicative modes associated with your case study or policy issue, would you choose a different form of expert participation, such as working with a group instead of acting as an individual, or vice versa? **Check the box below.**

- ◯ Yes
- ◯ No

If so, why? **Write your answer below.**

Task 10

What type of expert participation would you select instead? **Write your answer below.**

Learning Outcome

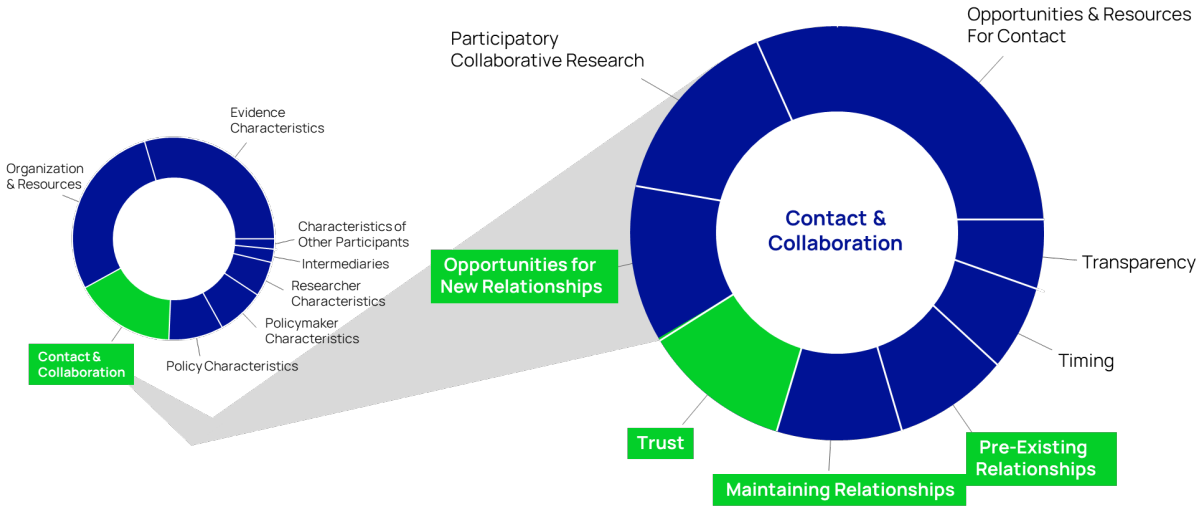
BUILDING INTERPERSONAL RELATIONSHIPS AND TRUST

Exercise Outline

A 2025 study by Cologna and colleagues[1] illustrated that many people across the globe hold positive views of scientists as a professional class. Most countries report medium-to-high levels of trust, with a global average of 3.62 on a scale of 1 (low) to 5 (high). But whether decision-makers feel like they can rely on any given research expert for advice depends in large part on their own interpersonal interactions with them over time. A systematic review of a decade of research on the factors related to evidence use found building one-on-one relationships and establishing trust with decision-makers to be key.[2] The table on the next page details seven tactics for developing these types of interpersonal connections and becoming known as a go-to source for research evidence. In this exercise, you will explore ways that these tactics might be used in a specific context.

[1] Cologna, V., Mede, N. G., Berger, S., Besley, J., Brick, C., Joubert, M., ... & Metag, J. (2025). Trust in scientists and their role in society across 68 countries. *Nature Human Behaviour, 9*, 713–730.

[2] Oliver, K., et al. (pre-print). *What factors influence evidence use in policymaking? An updated systematic map.* https://transforming-evidence.org/projects/what-influences-the-use-of-research-evidence-in-policy



Oliver, K., et al. (pre-print)

Task 1

Review the following tactics for building interpersonal relationships and trust before advancing to Task 2 on the next page.

Building trust and relationships	Tactics
1. Identify common ground[1]	Identify areas of common ground with the decision-maker, such as shared norms and values, experiences, or social groups.
2. Engage in small talk	Share information about yourself, including any personal connections.
3. Build rapport[2]	Use strategies to establish rapport, such as being approachable, listening, and showing personal interest in the decision-maker.
4. Ask questions[3]	Ask questions to better understand the decision-makers' needs.
5. Be transparent[4]	Be transparent and honest about what is known and what isn't.
6. Be timely[5]	Understand the decision-maker's policy timelines and provide information when it is needed.
7. Demonstrate reliability[6]	Build trust by being reliable.

[1] Van Dijk, T. A. (2014). *Discourse and knowledge: A sociocognitive approach*. Cambridge University Press,; Gabbert, F., Hope, L., Luther, K., Wright, G., Ng, M., & Oxburgh, G. (2021). Exploring the use of rapport in professional information-gathering contexts by systematically mapping the evidence base. *Applied Cognitive Psychology, 35*(2), 329–341.

[2] Gabbert, F., Hope, L., Luther, K., Wright, G., Ng, M., & Oxburgh, G. (2021). Exploring the use of rapport in professional information-gathering contexts by systematically mapping the evidence base. *Applied Cognitive Psychology, 35*(2), 329–341.

[3] Hart, E., VanEpps, E. M., & Schweitzer, M. E. (2021). The (better than expected) consequences of asking sensitive questions. *Organizational Behavior and Human Decision Processes, 162*, 136–154.; Huang, K., Yeomans, M., Brooks, A. W., Minson, J., & Gino, F. (2017). It doesn't hurt to ask: Question-asking increases liking. *Journal of Personality and Social Psychology, 113*(3), 430–452.; VanEpps, E. M., & Hart, E. (2022). Questions and deception: How to ask better questions and elicit the truth. *Current Opinion in Psychology, 47*, 101383.

[4] Auger, G. A. (2014). Trust me, trust me not: An experimental analysis of the effect of transparency on organizations. *Journal of Public Relations Research, 26*(4), 325–343.

[5] Lemos, M.C., Kirchhoff, C.J. and Ramprasad, V. (2012) Narrowing the climate information usability gap, *Nature Climate Change, 2*(11), 789–94.

[6] Cairney, P., & and Wellstead, A. (2021). COVID-19: Effective policymaking depends on trust in experts, politicians, and the public. *Policy Design and Practice, 4*(1), 1–14.; Gollust, S. E., Seymour, J. W., Pany, M. J., Goss, A., Meisel, Z. F., & Grande, D. (2017). Mutual distrust: Perspectives from researchers and policy makers on the research to policy gap in 2013 and recommendations for the future. *INQUIRY, 54*, 0046958017705465.

Task 2

Select a case study from the Appendix or a policy issue of interest to you.

Name of Case Study/Policy Issue:

_____

Identify a research expert and decision-maker from the policy issue/case study and describe an instance in which they are interacting that you will analyze. **Use the table below to write your answers.**

Research expert:	
Decision-maker:	
Describe the context for their interaction:	

Task 3

[#1-Identify common ground] What types of common ground do the research expert and decision-maker share? For example, do they have similar values relevant to the policy issue, live in the same area, or share a passion, such as for a sport? Refer to the individuals' websites, social media, and other easily accessible information as needed. **Write your response below.**

[#2-Engage in small talk] Which of the connections that you identified above might be most important for the research expert to mention during small talk at the start of the conversation? Why? **Write your response below.**

[#3-Show personal interest; be attentive and approachable] Thinking of the context in which the research expert and decision-maker are interacting that you described in Task 1, how might the expert build rapport? For example, how might they demonstrate personal interest in the decision-maker and indicate that they are paying attention and approachable? Remember to think not only about what is said, but also about active listening and bodily indicators of engagement (eye contact, head nodding, smiling, tone of voice, and empathy). **Write your response below.**

[#4-Ask questions] What questions should the research expert ask of the decision-maker? For example, they might ask about what types of research evidence would be most helpful, or what policy actions are coming up. **Write your response below.**

[#5-Be timely] What appear to be the most critical policy timelines for the research expert to meet? **Write your response below.**

[#6-Be transparent] One of the challenges in communicating science for policy is that you can't realistically provide all information relevant to a specific issue, such as the entire corpus of data or articles written on the topic. You must make choices about what information is needed and will be most meaningful given the decision context. In doing so, aim to be as comprehensive and transparent as possible regarding what is known, and what isn't, for the questions of interest to the decision-maker. For your case study/policy issue, how might the research expert most honestly convey the state of the research evidence? **Write your response below.** *(Communicating uncertainty will be explored in a subsequent exercise.)*

[#7-Demonstrate reliability] How might the research expert demonstrate reliability to the decision-maker? Are there follow-up actions that they might take after the interaction? What might they be? **Write your response below.**

Learning Outcome

COMMUNICATING COMPLEX SCIENCE

Exercise Outline

Research evidence is inherently complex and can be cognitively challenging to understand, even for subject matter experts, let alone lay audiences. But the creation of new knowledge is also the product of complicated social processes involving members of the research community and potentially wider sets of actors. As a result, making science easier to understand involves not only choosing language and scientific terminology that will fundamentally make the subject matter more accessible and easier for the decision-maker to grasp, but also providing information about the social context in which it was developed: its credibility and legitimacy.[1] Credibility refers to the expert nature and trustworthiness of scientific and technical evidence and arguments, while legitimacy reflects the extent to which differing points of view were considered. The table below depicts four tactics for communicating complex science. In the exercise, use a specific case study or policy issue to come up with a strategy for addressing these various forms of complexity.

Conveying complex science	Tactics
1. Emphasize credibility[1]	Convey the credibility and trustworthiness of the research evidence.
2. Speak to the evidence's legitimacy[1]	Establish the legitimacy of the knowledge production process as considering diverse viewpoints.
3. Use plain language[2]	Emphasize the most important points through simple words and phrases in short, concise sentences.
4. Beware of misleading scientific terms[3]	Choose scientific terms carefully, selecting ones that will be meaningful to the audience.

[1] Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., Jäger, J., & Mitchell, R. B. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences, 100*(14), 8086–8091.; Posner, S. M., McKenzie, E., & Ricketts, T. H. (2016). Policy impacts of ecosystem services knowledge. *Proceedings of the National Academy of Sciences, 113*(7), 1760–1765.

[2] Mazur, B. (2000). Revisiting plain language. *Technical Communication: Journal of the Society for Technical Communication, 47*(2), 205-211.

[3] Somerville, R. C. J., & Hassol, S. J. (2011). Communicating the science of climate change. *Physics Today, 64*(10), 48–53.

Task 1

Select a case study from the Appendix or a policy issue of interest to you.

Name of Case Study/Policy Issue:

_____

What is the research evidence that the expert is communicating in this policy issue/case study? **Use the table below to write your answer.**

Research evidence:	

Task 2

[#1-Emphasize credibility] What characteristics make the research evidence, in this case, credible? For example, has the work been subject to peer review, follows accepted methodologies, and adheres to agreed-upon standards, such as regarding conflicts of interest? Is the researcher and/or institution a subject matter expert? Do the findings align with other research or the observations of key actors? What would be most important to emphasize in this case? **Write your response below.**

[#2-Speak to the evidence's legitimacy] The process of knowledge production can privilege certain perspectives and voices, or it can be structured in ways that are more inclusive. For example, researchers who drop into communities to collect data and write papers on their findings, but do not partner with local leaders and community members in understanding and addressing specific challenges, may be viewed as exploitative. In what ways was the research evidence in this case conducted in ways that were more inclusive of differing types of knowledge within the academic community and external to it, such as that of practitioners, and local and Indigenous groups? What might be most important to communicate to convey the legitimacy of the research evidence? **Write your response below.**

[#3-Use plain language] Plain language entails using shorter words when at all possible, emphasizing the important points first, being concise, and organizing written information in short sections, with descriptive headings. **Write a sentence on the research topic from this case using plain language.**

[#4-Beware of misleading scientific terms] Are there any scientific terms related to this case study/policy issue that are likely to be misunderstood by decision-makers and other key actors? **Write those terms below, along with how they might be misinterpreted, and your recommendations for a better choice of words.**

	Scientific term	Public meaning	Better choice
Term 1			
Term 2			
Term 3			

Learning Outcome

NAVIGATING PSYCHOLOGICAL BIASES AND MENTAL MODELS

Exercise Outline

People use "heuristics," efficient strategies for problem-solving, to make decisions quickly and easily. Heuristics such as "availability," which refers to examples that can be easily recalled, and "anchors," which are salient number values used to assess subsequent information, can strongly influence choices. For example, if previous outcomes from making a natural resource decision are both easily recalled and relevant to current decisions, they may serve as a good guide to a park manager. However, if the current circumstance differs in an important way that is non-intuitive, those previous experiences may be misleading. Furthermore, decision-makers may hold differing mental models of scientific processes from those of experts, which can lead to fundamental misunderstandings. One tactic to make information more accessible and help decision-makers fully grasp information relevant to the context is to use transformative explanations, as described below.

Psychological barriers	Tactics
Choices may be influenced by biases stemming from previous experiences or the decision context.[1]	If decision-makers' biases are likely to lead them to incorrect conclusions, use "transformative explanations."[2] **How to develop a transformative explanation**[2]: 1) State the lay theory and acknowledge its apparent reasonableness. 2) Create dissatisfaction with the lay view by noting familiar experiences inconsistent with it. 3) Explain the more accepted view.
Lay mental models of the scientific process contribute to fundamental misunderstandings.[2]	

[1] Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *Science, 185*(4157), 1124-1131.; Wilke, A. & Mata, R. (2017*). Cognitive bias. Reference module in neuroscience and biobehavioral psychology.* Elsevier.

[2] Rowan, K. E., Botan, C. H., Kreps, G. L., Samoilenko, S., & Farnsworth, K. (2020). Risk communication education for local emergency managers: Using the CAUSE model for research, education, and outreach. In *Handbook of risk and crisis communication* (pp. 168-191). Routledge.

Task 1

Select a case study from the Appendix or a policy issue of interest to you.

Name of Case Study/Policy Issue:

_____

Which of the following factors might contribute to decision-makers' misunderstanding of the research evidence, and in what ways? **Use the table below to write your answers.**

Previous experiences:	
Decision context:	
Misleading mental model:	

Task 2

Develop a transformative explanation that addresses one of the psychological barriers that decision-makers may face in understanding the research evidence. **In the space below:**

1) state the lay theory and acknowledge its apparent reasonableness;
2) create dissatisfaction with the lay view by noting familiar experiences inconsistent with it;
3) and explain the more accepted view.

Learning Outcome

DECIDING WHAT UNCERTAINTIES TO COMMUNICATE

Exercise Outline

As research evidence is produced, many factors can contribute to the uncertainty of the findings that may be relevant to decision-makers, such as the assumptions guiding the study design, sampling methods, accuracy of the measures, missing data, and statistical confidence intervals. The type of uncertainty information that a decision-maker needs depends on the choice that they are making. In this exercise, we investigate which types of uncertainty to convey based on the decision context. Review the figure and table below before starting Task 1.

Which types of uncertainty are important to convey? [1]
Is it time to act? Decision-makers need two pieces of information: 1) what is the uncertainty of science, and 2) what is the decision rule underlying the recommendation? When do we know enough to cross a threshold?
What options are possible? How well-known are the scientific processes shaping outcomes? Decision-makers need to understand the scientific processes and related uncertainties to consider their options.
Which options are best? How good are the predictions of outcomes? If outcome information is important to the choice, what are the sources and degree of uncertainty in the predictions? Present the pros and cons in the same way so that they can be compared fairly.
How can others be persuaded? What are the forms of research evidence that have higher levels of certainty and may be most persuasive as decision-makers seek to build support for a policy? [2]

[1] Fischhoff, B., & Davis, A. L. (2014). Communicating scientific uncertainty. *Proceedings of the National Academy of Sciences, 111*(supplement_4), 13664–13671.

[2] Our addition to the Fischhoff & Davis (2014) tripartite typology.

Task 1

Select a case study from the Appendix or a policy issue of interest to you.

Name of Case Study/Policy Issue:

_____

Using the table below, **check the box that aligns with the types of uncertainty information needed by the decision-maker.**

Uncertainty informational needs:	☐ Is it time to act? ☐ What options are possible? ☐ Which options are best? ☐ How can others be persuaded?

Task 2

Based the uncertainty informational needs you identified above, what might be some examples of the types of research evidence and associated uncertainties that you might include in a memo to the decision-maker? **Write your answer in bullet points below.**

Learning Outcome

COMMUNICATING UNCERTAINTY CLEARLY

Exercise Outline

Most people, including policymakers, are not accustomed to accounting for uncertainty when considering problems and making decisions. Jargon, the use of numbers, and varying methods of presenting probabilities can all impact the interpretation of research evidence, with implications for decision-making. Furthermore, uncertainty can arise at all stages of research and evolve over time, necessitating transparency regarding its sources and implications. We suggest considering five factors in communicating uncertainty and associated tactics (see the table below).

Communicating uncertainty	Tactics to improve understanding
1. Use numbers and words[1]	Use both numbers and words, but make sure to use the same words consistently for specific levels of uncertainty after defining them. For example, you might describe 90-100% probability as "very likely."
2. Provide a range[2]	Use ranges to show the scope of uncertainty. For example, instead of "the high temperature will be 76°F," state "the high temperature will be between 74° and 78°F."
3. Explain when and how the uncertainty might change[3]	Will timing affect the uncertainty of the evidence? If it is likely to change over time, be sure to include when and how the evidence's uncertainty may shift.
4. Say how you know what you know[4]	The quality and strength of evidence depends on how it was gathered, the amount of data, its generalizability, and the analytic processes used. For example, is the research evidence derived from cross-sectional data, randomized controlled trials, or systematic reviews? Are the data fully representative of the population?

[1] Budescu, D. V., Broomell, S., & Por, H.-H. (2009). Improving communication of uncertainty in the reports of the Intergovernmental Panel on Climate Change. *Psychological Science, 20*(3), 299–308.

[2] Morss, R. E., Demuth, J. L., & Lazo, J. K. (2008). Communicating uncertainty in weather forecasts: A survey of the U.S. public. *Weather and Forecasting, 23*(5), 974–991.

[3] Gretton, J. D., Meyers, E. A., Walker, A. C., Fugelsang, J. A., & Koehler, D. J. (2021). A brief forewarning intervention overcomes negative effects of salient changes in COVID-19 guidance. *Judgment and Decision Making, 16*(6), 1549–1574.

[4] Murad, M. H., Asi, N., Alsawas, M., & Alahdab, F. (2016). New evidence pyramid. *BMJ Evidence-Based Medicine, 21*(4), 125–127. ; Murad, M. H., Katabi, A., Benkhadra, R., & Montori, V. M. (2018). External validity, generalisability, applicability and directness: A brief primer. *BMJ Evidence-Based Medicine, 23*(1), 17.

Task 1

Select a case study from the Appendix or a policy issue of interest to you. Which tactics should the research expert use to communicate the uncertainty of the research evidence? **Develop a strategy using the boxes below.**

Name of Case Study/Policy Issue:

_____

Task 2

[#1-Use numbers and words] How might a combination of numbers and words be used to convey uncertainties in this case? **Write them below.**

[#2-Provide a range] If estimates from the research evidence are available, how might the full range of statistically likely results be conveyed? **Write how to do so below.**

[#3-Explain when and how the uncertainty might change] Will the uncertainty change over time? If so, how could the research expert describe the timeline and the implications for the decision-maker? **Describe a possible approach below.**

[#4-Say how you know what you know] Describe where the evidence is coming from, what the overall quality of the evidence is, and what it can and can't tell the decision-maker. **What should be the main points communicated to the decision-maker? Write them below.**

Task 2

Uncertainty can arise from many sources—not just variability in data, but also biases from judgment, assumptions, and methodological practices in the development of research evidence. How might the research expert address these various sources of uncertainty in communicating with their audience? **Summarize the main points that would be of importance for the decision-maker.**

Learning Outcome

DESIGNING COMMUNICATION OF RESEARCH EVIDENCE

Exercise Outline

In this next section, you will apply what you have learned so far to begin designing communication of research evidence for your own policy issue or a case study from the Appendix, starting with a few key bullet points. Be sure to remember the **tactics for communicating complex and uncertain science** that were discussed in the previous exercises.

Task 1

Name of Case Study/Policy Issue:

_____

Using the table below, define a relevant decision-maker for the policy area and the research evidence that might be relevant, along with the expert's communication objectives.

Decision-maker:	
Policy stage:	
Evidence needs:	
Research expert's communication objectives:	

Task 2

Considering the audience's evidence needs and the expert's communication objectives**, write a series of bulleted informational points** that should be prioritized in reports to the decision-maker.

Reminders

- Have you addressed all the potential questions and concerns of the target audience?
- What are the possible misunderstandings, and have you pre-emptively addressed them?
- Offer a fair description of all existing evidence, clarifying not only what is known but also how we know that, clearly reflecting the quality and relevance of the underlying evidence.
- When you don't know, say so; say what you are going to do to find out, and by when.
- Have you considered all types of uncertainty and explicitly included those?

Learning Outcome

SUMMING UP YOUR OWN POLICY ISSUE AND CHOOSING YOUR GOALS, OBJECTIVES, AND TACTICS

Exercise Outline

Before planning your own engagement in policy — your goals, objectives, and potential tactics — you will want to summarize what you know about the issue and potential policy actors. Each policy issue will have different types of opportunities for engagement. As discussed in a previous exercise, policymakers typically receive less information and face higher barriers in accessing evidence on emerging issues that are not yet politicized.[1] Alternately, research evidence aligned with specific policy positions will be readily available to decision-makers on topics that are highly polarized, as coalitions mobilize to promote preferred courses of action. In each of these cases, decision-makers' needs and the potential to achieve specific objectives are likely to be quite different.

[1] Akerlof, K. L., Lemos, M. C., Cloyd, E. T., Heath, E., Nelson, S., Hathaway, J., & Timm, K. M. (2024). Science communication in Congress: for what use?. *Evidence & Policy, 20*(3), 300-319.

Task 1

Using the table below, start planning your communication strategy by summarizing the policy context, as demonstrated in the previous exercises. **In the table below, identify the issue dimensions and the key actors.**

Policy issue context	**Write your answers here**
Policy issue Briefly describe the issue.	
Issue dimensions Check one for each dimension.	◯ Policy for science ◯ Science for policy
	◯ **Unstructured** – disagreement on values/norms and high scientific uncertainty ◯ **Moderately structured** – scientific uncertainty ◯ **Moderately structured** – disagreement on values/norms ◯ **Structured** – public agreement on values/norms and low scientific uncertainty
Key actors/Decision-makers Write the names of the individuals or organizations.	

Task 2

Conduct research on one or more of the **government decision-makers** that you identified in your policy actor analysis to understand their authority and scope of interest in the issue. Why should they care? **Answer the questions below.**

Research on the decision-maker(s)	**Write your answers here**
What types of actions could the decision-maker take on this issue?	
Why might the decision-maker be interested in this issue?	
Has the decision-maker already taken action on this issue? Search for their previous sponsored legislation/votes or policies and programs over which they have oversight.	

Task 3

What are you trying to achieve in engaging? What is your broad goal, that might take you years to achieve, and your short-term objectives? **Fill in the table below.**

Goals & objectives	**Check one or more boxes from each category**
What is your broad goal?	**Affect change in:** ☐ public policy (e.g., increased evidence-informed policymaking and research impact) ☐ the research enterprise (e.g., what research is produced and how) ☐ connections between the research community and decision-makers ☐ other_____
What short-term objectives do you have?	☐ Raise awareness of a policy issue's importance ☐ Increase understanding of an issue among decision-makers ☐ Motivate a policy decision or action ☐ Increase the societal relevance and usability of research ☐ Increase communication and accessibility of evidence for decision-makers ☐ Other_____

Task 4

Based on what you know about the policy context and your own objectives, what tactics should you use? **Fill in the table below.**

Tactic	Check one or more boxes
Whom should you engage? Is this a more technocratic problem that can be solved by experts, or one requiring broader public deliberation?	☐ Low public participation ☐ High public participation and deliberation
Who are the priority actors/ decision-makers for engagement?	☐ Government ☐ Civil society ☐ Industry ☐ Research community
What is your selected institutional context and that of the prioritized actor? **Name/description of prioritized actor:**	**Research expert's participation–institutional context** ☐ Non-affiliated expert ☐ Academic institutional member ☐ Professional network/society ☐ Panel/committee/assessment ☐ Organizational representative **Decision-makers' institutional context** ☐ Non-affiliated individuals/publics ☐ Non-governmental actors ☐ Elected representatives/staff ☐ Executive office staff ☐ Formal panels/committees ☐ Government offices/agencies

Continued

Tactic	Check one or more boxes
What types of evidence are needed by the decision-maker?	**Agenda Setting** ☐ Defining the problem ☐ Measuring the problem ☐ Diagnosing the problem **Policy Formulation** ☐ Proposals for new policy options ☐ Amendments to existing policy options ☐ Outcome projections **Policy Decision** ☐ Evidence on the criteria to compare policy options **Policy Implementation** ☐ Proposals for new implementation options ☐ Amendments to existing implementation options ☐ Evidence on the criteria to compare implementation options ☐ Collection of evidence for evaluation **Policy Evaluation** ☐ Analysis of evidence from the implementation phase ☐ Compare implementation to other jurisdictions, policy areas **Policy Maintenance** ☐ Proposals for new policy adaptation options ☐ Amendments to existing policy adaptation options ☐ Evidence on the criteria to compare policy adaptation options
Which communicative mode is most appropriate to your and the decision-makers' institutional contexts?	☐ No direct policy engagement; societal diffusion of ideas ☐ Translate evidence ☐ Collaborate with decision-makers to integrate evidence into policy ☐ Advocate for specific policies ☐ Issue policy decisions

Continued

Tactic	Check one or more boxes
How might you build rapport and trust?	☐ Identify areas of common ground with the decision-maker, such as shared norms and values, experiences, or communities ☐ Engage in small talk, sharing information about yourself ☐ Use strategies to establish rapport, such as being approachable, listening, and showing personal interest in the decision-maker ☐ Ask questions to better understand the decision-makers' needs ☐ Be transparent and honest about what is known and what isn't ☐ Understand the decision-maker's policy timelines and provide information when it is needed ☐ Build trust by being reliable
How can you best communicate complex evidence?	☐ Convey the credibility and trustworthiness of the research evidence ☐ Establish the legitimacy of the knowledge production process as considering diverse viewpoints ☐ Use plain language, emphasizing the most important points through simple words and phrases in short, concise sentences ☐ Choose scientific terms carefully, selecting ones that will be meaningful to the audience ☐ Provide transformative explanations if the audience's prior mental models or psychological biases may serve as a barrier to understanding the evidence

Continued

Tactic	Check one or more boxes
What types of uncertainty should be addressed?	**Is it time to act?** ☐ What are the uncertainties related to the decision rule for when we know enough to cross a threshold? **What options are possible?** ☐ How well-known are the scientific processes shaping outcomes and what are their uncertainties? **Which options are best?** ☐ What are the sources and the degree of uncertainty for the predictions of outcomes? **How can I persuade others?** ☐ What are the forms of research evidence that have high certainty that can be employed for persuasion?
How can you best convey uncertainty?	☐ Use numbers and words (e.g., "likely, 66%-90%") ☐ Provide a range, not an estimate (e.g., "the high temperature will be between 74-78 degrees") ☐ Explain when and how the uncertainty might change ☐ Say how you know what you know, describing the quality and strength of the research evidence

Learning Outcome

PRACTICING FORMAL MODES OF COMMUNICATION

Exercise Outline

In this exercise, you will use the policy issue research that you conducted for the previous exercise and practice writing: 1) to inform a decision-maker about the status of current research evidence, detailing the array of potential policy options they can consider, or 2) to persuade a decision-maker to take a specific policy position based on the state of the evidence.

Task 1

Name of Case Study/Policy Issue *[Same as Previous Set of Exercises]*:

_____

Choose one of two communicative modes for writing the policy memo. In doing so, be sure to consider the institutional contexts you listed in the previous exercise. **Check below which mode is most appropriate.**

Expert communicative mode	☐ Advocate for a policy issue or position *(persuasion)* ☐ Translate evidence *(informing)*

Task 2

Conduct research to identify and **fill in the policy memo template below**. The memo should be no longer than 2 pages in length. Be succinct! Use a combination of paragraphs, text, and bullet points. *Use hyperlinked text to enable the reader to easily find the sources of any cited information.*

Considerations:

1. If the issue is unstructured, how could the public or other actors, including the research community, be included in the decision-making process?
2. Are you citing the types of evidence that are needed based on the stage of the policy process and type of decision?
3. What are your recommendations to the decision-maker? Are there actions that they can take based on your understanding of their authority? Do they align with their interests?

Template	**Your memo text**
Section 1: Add the decision-maker's name, your name, the date, and the policy topic.	To: From: Date: Re:
Section 2: In the first paragraph, concisely describe the issue and make specific, actionable recommendations regarding policy options. • **Translation/ collaboration:** Be comprehensive in detailing the full range of available options. • **Advocacy:** Narrow the range of recommended options to just one.	
Section 3: Title this section according to the topic. Provide additional background information about the issue and the policy option(s), citing statistics or other types of research evidence.	

Continued

Template	Your memo text
Sections 4-5: Title these sections "Pros" and "Cons." Identify the issue, policy actors, and the pros and cons of each of the policy option(s) from their perspective, such as: a) political feasibility (are the policy alternatives likely to be actionable, e.g., passed into law or accomplished by some other means?); b) economic costs and benefits; and c) non-economic effects, such as equity and environmental impacts.	Pros: Cons:
Section 6: Title this section "Analysis." Describe the rationale behind your policy recommendation. Use bullet points as needed to make any additional points.	Analysis:
Section 7: Title this section "Relevance to [name of the representative's district or organization]." Describe how the policy will affect constituents or the organization.	Relevance to [_____]:

Learning Outcome

CONTACTING DECISION-MAKERS

Exercise Outline

Now that you have identified the decision-makers you would like to engage and have a policy memo ready to share with them, the next step is to reach out and arrange a meeting. One of the primary ways you will communicate with decision-makers and their staff is through email and phone. In this exercise, you will find contact information and compose an email requesting a meeting. Remember to keep in mind the tactics discussed in the exercise on "Building interpersonal relationships and trust."

Task 1

Research by Penn State's Research-to-Policy Collaboration[1] has shown that personalized emails are more likely to be opened. Hence, the first task is to conduct background research on who you will be contacting for the policy issue that you have selected. **Review the exercise tips below and then fill in the box on the next page.**

[1] Scott, T., Pugel, J., Fernandes, M., Cruz, K., Long, E. C., Giray, C., Storace, R., & Crowley, D. M. (2023). Cutting through the noise during crisis by enhancing the relevance of research to policymakers. *Evidence & Policy, 19*(2), 178-195.

Name of Case Study/Policy Issue *[Same as Previous Set of Exercises]*:

_____

Tips for finding decision-makers' information

- **Are you contacting an elected representative**? Look online at their website or call the office to find out which staff member covers your policy topic. Ask for their email address over the telephone, explaining that you are a researcher trying to contact the staff member and briefly describe the policy issue that you believe will be of interest to them.
- **Are you contacting a staff member in an executive office?** Look online for an organizational chart and contact information.
- **Finding common ground.** Review the following sources of potential information about the decision-maker:
  - ☐ social media accounts such as X, Bluesky, and Linkedin
  - ☐ news articles
  - ☐ biographical and policy-related information from individual and organizational websites (i.e., campaign, office, organization)
  - ☐ any shared professional contacts; reach out to them for information

Decision-maker contact information	Write your answers here
What is the name of the elected representative or executive office organization?	
What is the name of the staff member?	
What is their full title?	
For which policy area are they responsible?	
What is their email address?	
What is their phone number?	
Do you have any shared connections, similar experiences, people you know, etc.? ☐ mutual acquaintances ☐ shared experiences ☐ areas you have lived in ☐ school/college ☐ professional field ☐ organizational membership (e.g., union, professional association, club, etc.) ☐ personal interests (e.g., sports, hobbies, etc.) ☐ common values (e.g., respect for tradition, protecting the environment, economic security, etc.) Examples: • "Attended the University of Texas at Austin a decade before I did" • "Knows the president of my organization"	

Task 2

Now that you know something about the person with whom you wish to set up a meeting, **write your email using the template below**! Clearly establish possible locations where the meeting will be held, whether online, in their office, or at a different location.

Example email:

Subject line: Meeting request; ways that [ADD OFFICE NAME] can address [POLICY ISSUE]

Dear [NAME OF STAFFER],

I am a [PHYSICIST/CHEMIST/PSYCHOLOGIST] from [CITY/STATE]. I saw that you cover [POLICY AREA] for the office and would like to meet with you about [POLICY ISSUE].

As a researcher with expertise in [X, Y, Z], I would like to better understand your interests and priorities in case I could be of assistance as an independent resource.

Do you have any time [LIST DATES/TIMES] to meet at your [LOCATION] office?

I look forward to speaking with you.

Sincerely,

[YOUR NAME]
[YOUR AFFILIATION–IF ANY]

Your turn:

Template	**Your Email Text**
Subject Line Include the meeting topic and the name of the district and/or the office.	
Email Body Describe how you could be of assistance to the office and request a meeting.	
Signature Which affiliation are you using? Use an appropriate email account and signature.	

Learning Outcome

PREPARING FOR A MEETING

Exercise Outline

After setting up a time, the next step is to prepare for the meeting. In advance of the meeting, you will need to gather the following:

- Business cards
- A notebook
- Key points to be conveyed (See below)
- A 1- to 2-page handout or leave-behind, such as the previously developed memo

Task 1

In developing your key points for the meeting, you will want to be prepared to show how your expertise could potentially help the office, but also to demonstrate that you are interested in the way that the office is thinking about the policy issue and their evidence needs. Review what you do and do not know about the decision-maker's position, policy stage, and evidence needs. If you are uncertain on any of the above based on your actor analysis and additional online research, it is important to ask the decision-maker directly at the start of the meeting to guide the meeting in the direction that will be most useful for them. **Use the template on the following page to identify what you want to cover in the meeting.**

Template	Meeting agenda
Introductions What is your area of expertise? Why did you reach out? Do you share anything in common with the staff member?	
How you can help Describe why you think your expertise might be relevant to the office. For example, is it an important issue for the office? Are new policies on the topic being considered?	
Questions for the staff member Examples: ☐ Where are you at in thinking about this policy issue? ☐ What is your position on the issue? ☐ What is your key question at this stage? ☐ What evidence have you relied on so far? ☐ What evidence do you need at this stage? ☐ What barriers are you facing in acquiring or interpreting evidence (e.g., timeliness, credibility, legitimacy, accessibility, actionability, etc.)?	
Action items What are the next steps for you after the meeting? Can you help them find evidence or translate it?	

Learning Outcome

FOLLOWING UP AFTER A MEETING

Exercise Outline

After the meeting, email the staff member to follow up on the action items—further establishing the relationship and a potential next meeting. **Use the template below to write your email.**

Example email:

Subject line: Thank you for meeting today

Dear [NAME OF STAFFER],

I enjoyed meeting with you today to discuss [XX]. I will work on [ACTION ITEMS] and get back to you shortly.

Sincerely,

[YOUR NAME]
[YOUR AFFILIATION–IF ANY]

Your turn:

Template	Your Email Text
Subject Line Respond to the most recent of your previous emails with the staff member or create a new "thank you" email.	
Email Body Thank the staff member and summarize your action items.	
Signature Which affiliation are you using? Use an appropriate email account and signature.	

Learning Outcome

CHECKING FOR COMMUNICATIVE BEST PRACTICES

Exercise Outline

The following table summarizes tactical considerations for engaging in policy: 1) deciding whether technocratic decision-making or pluralistic approaches are more appropriate; 2) identifying and analyzing key policy actors; 3) establishing what types of evidence are needed by the decision-maker based on the policy stage; 4) selecting an expert communicative mode; 5) building relationships; and 6) communicating complex science and uncertainty. **Use the checklist below to review your written and oral communication for your policy engagement to ensure you have covered each of these dimensions.** *A short version of the checklist may also be downloaded at: www.communicatingscienceforpolicy.org/checklist*

Tactical considerations	Options	Is the tactic being used appropriately?	What could be improved?
Whom should the research expert engage? Is this a more technocratic problem that can be solved by experts alone, or one requiring broader public deliberation?	☐ Low public participation ☐ High public participation and deliberation	☐ Yes ☐ No ☐ Not sure	
Who are the priority actors/ decision-makers for engagement?	☐ Government ☐ Civil society ☐ Industry ☐ Research community	☐ Yes ☐ No ☐ Not sure	
What is the selected institutional context of the research expert?	**Researcher's participation–institutional context** ☐ Non-affiliated expert ☐ Academic institutional member ☐ Professional network/society ☐ Panel/committee/assessment ☐ Organizational representative	☐ Yes ☐ No ☐ Not sure	

Continued

Tactical considerations	Options	Is the tactic being used appropriately?	What could be improved?
What is the selected institutional context of the prioritized decision-maker? **Name/description:**	**Decision-makers' institutional context** ☐ Non-affiliated individuals/publics ☐ Non-governmental actors ☐ Elected representatives/staff ☐ Executive office staff ☐ Formal panels/committees ☐ Government offices/agencies	☐ Yes ☐ No ☐ Not sure	
What types of evidence are needed by the decision-maker?	**Agenda Setting** ☐ Defining the problem ☐ Measuring the problem ☐ Diagnosing the problem **Policy Formulation** ☐ Proposals for new policy options ☐ Amendments to existing policy options ☐ Outcome projections **Policy Decision** ☐ Evidence on criteria to compare policy options **Policy Implementation** ☐ Proposals for new implementation options ☐ Amendments to existing implementation options ☐ Evidence on criteria to compare implementation options ☐ Collection of evidence for evaluation	☐ Yes ☐ No ☐ Not sure	

Continued

Tactical considerations	Options	Is the tactic being used appropriately?	What could be improved?
What types of evidence are needed by the decision-maker?	**Policy Evaluation** ☐ Analysis of evidence from the implementation phase ☐ Compare implementation to other jurisdictions, policy areas **Maintenance** ☐ Proposals for new policy adaptation options ☐ Amendments to existing policy adaptation options ☐ Evidence on criteria to compare policy adaptation options	☐ Yes ☐ No ☐ Not sure	
Which communicative mode is most appropriate to the researcher's and the decision-makers' institutional contexts?	☐ No direct policy engagement; societal diffusion of ideas ☐ Translate evidence ☐ Collaborate with decision-makers to integrate evidence in policy ☐ Advocate for specific policies ☐ Issue policy decisions	☐ Yes ☐ No ☐ Not sure	
How might the research expert build rapport and trust?	☐ Identify areas of common ground with the decision-maker, such as shared norms and values, experiences, or communities ☐ Engage in small talk, sharing information about yourself ☐ Use strategies to establish rapport, such as being approachable, ☐ listening, and showing personal interest in the decision-maker	☐ Yes ☐ No ☐ Not sure	

Continued

Tactical considerations	Options	Is the tactic being used appropriately?	What could be improved?
Continued	☐ Ask questions to better understand the decision-makers' needs ☐ Be transparent and honest about what is known and what isn't ☐ Understand the decision-maker's policy timelines and provide information when it is needed ☐ Build trust by being reliable	☐ Yes ☐ No ☐ Not sure	
How can research experts best communicate complex evidence?	☐ Convey the credibility and trustworthiness of the research evidence ☐ Establish the legitimacy of the knowledge production process as considering diverse viewpoints ☐ Use plain language, emphasizing the most important points through simple words and phrases in short, concise sentences ☐ Choose scientific terms carefully, selecting ones that will be meaningful to the audience ☐ Provide transformative explanations if the audience's prior mental models or psychological biases may serve as a barrier to understanding the evidence	☐ Yes ☐ No ☐ Not sure	

Continued

Tactical considerations	Options	Is the tactic being used appropriately?	What could be improved?
What types of uncertainty should be addressed?	**Is it time to act?** ☐ What are the uncertainties related to the decision rule for when we know enough to cross a threshold? **What options are possible?** ☐ How well-known are the scientific processes shaping outcomes, and what are their uncertainties? **Which options are best?** ☐ What are the sources and the degree of uncertainty for the predictions of outcomes? **How can others be persuaded?** ☐ What are the forms of research evidence that have higher levels of certainty and may be most persuasive?	☐ Yes ☐ No ☐ Not sure	
How can experts best convey uncertainty?	☐ Use numbers and words (e.g., "likely, 66%-90%") ☐ Provide a range, not an estimate (e.g., "the high temperature will be between 74-78 degrees") ☐ Explain when and how the uncertainty might change ☐ Say how you know what you know	☐ Yes ☐ No ☐ Not sure	

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APPENDIX

APPENDIX 1 I U.S. CASE STUDIES

CASE STUDY 01 CONGRESSIONAL TESTIMONY ON ACADEMIC PUBLISHING PRACTICES REGARDING THE COVID-19 LAB LEAK THEORY

Country	United States
Policy issue domain	Scientific claims regarding COVID-19 origins
Research domain	Virology, epidemiology
Research expert	Holden Thorp, Editor-In-Chief, *Science* family of journals, American Association for the Advancement of Science (AAAS)
Lead government institution(s)	U.S. House of Representatives, Select Subcommittee on the Coronavirus Pandemic
Additional policy actors	• Authors of "The Proximal Origin of SARS-CoV-2," published in *Nature Medicine* • Editors of *Nature* and *The Lancet* • Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases (NIAID) from 1984 to 2022 • Francis Collins, director of the National Institutes of Health (NIH) from 2009 to 2021
Time period of engagement	Congressional testimony given on April 16, 2024[1]
Research expert's role	Holden Thorp, a chemist by training, testified to Congress as the editor-in-chief of *Science* to explain its peer review, editorial, and news processes, and how it handled scientific debate over the origins of COVID-19 and the lab leak theory.
Researcher expert's institutional affiliation and representation	Thorp acted as a representative of *Science* and the American Association for the Advancement of Science; his testimony was crafted with the assistance of a team from the organization.
Communicative mode	Thorp translated and explained publishing practices within a leading scientific journal, set within the larger context of how corrective processes within science work as new data emerges.

Ethical or legal challenges encountered	Government emails are subject to the Freedom of Information Act (FOIA), as were Thorp's emails with Fauci and Collins. The subcommittee obtained and discussed Thorp's emails, exchanged with Fauci and Collins, prior to the journal's publication of a letter in *Science*[2] calling for an investigation of COVID-19 origins.
Other challenges	Discourse surrounding the origins of COVID-19 has been highly politically polarized. Thorp had tweeted his personal criticisms of the lab leak theory, on which he was questioned by the subcommittee.
Outcome(s) and/or impact	Thorp was the only one of three invited editors to appear before the subcommittee. Representative Brad Wenstrup (R-OH), the panel chairman, thanked Thorp for his courage in testifying and describing the peer review process. The testimony received little media attention, which Thorp views as an indicator that it did not further contribute to the controversy surrounding the origins of COVID-19.

Case study narrative:

Mr. Thorp goes to Washington
By H. Holden Thorp
Published in *Science* on May 9, 2024 [3]

On 2 April, I received an email that changed the course of the next 2 weeks. The Select Subcommittee on the Coronavirus Pandemic, chaired by United States Congressman Brad Wenstrup, invited me to testify along with my counterparts at *Nature* and *The Lancet*. The purpose of the public hearing (Academic Malpractice: Examining the Relationship Between Scientific Journals, the Government, and Peer Review) was to determine whether government officials, specifically former National Institutes of Health leaders Francis Collins and Anthony Fauci, steered journals to publish papers suppressing the idea that COVID-19 may have arisen from a lab accident in Wuhan, China. I was not subpoenaed to appear but made the decision to testify voluntarily. My counterparts, who are based in the United Kingdom, decided not to attend.

Most of the hearing was spent explaining the scientific process and the steps involved in publication. Some subcommittee members questioned why science changes when there are new data, something scientists take for granted. I explained how science is a work in progress, that scientists are opinionated people who argue about scientific findings, and when evidence emerges that changes thinking, new papers are published. This process has produced countless scientific advances, including those related to the pandemic. It is also what makes my job interesting. I also described that

when *Science* publishes a paper, the journal commits to moderating discussions that happen after the fact and to making any corrections or changes that may be required to maintain the scientific record.

I knew that I would face questions about my personal remarks on social media that were critical of the lab origin theory. The chairman fortunately addressed this first, asking me about a tweet in which I compared the lab leak evidence to a mediocre episode of Homeland (an American TV series on US national security). I've since left Twitter, and like many tweeters, I regret a few of my posts, including that one. Although I and many others still consider a natural origin of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) more likely, the lab origin theory has not been ruled out.

I described a Letter published in *Science*, signed by many prominent researchers in the field (Bloom et al.), calling for a thorough investigation of a possible lab origin. At the same time, I posted a *Science* blog saying that good science required a thorough investigation and that the Chinese government should allow for it. Publication of the Letter recognized that the lab origin idea was dismissed prematurely by earlier commentary published elsewhere as well as by informal statements on social media and in the news. As a courtesy, I sent an email to Collins and Fauci a few hours before the Letter was published. *Science* does this occasionally for commentaries because the pieces are accessible to 8,000 reporters, under embargo, several days before publication, and it sometimes seems appropriate to give the principals a heads-up. Both wrote back that they supported a thorough investigation. The subcommittee asked me if either official discouraged *Science* from publishing the Letter, and I told them that in fact they said the opposite.

I also described two research papers published in *Science* (Worobey et al. and Pekar et al.) supporting, but not proving, a natural origin for SARS-CoV-2. I explained how these papers evolved from their initial posting as preprints to their eventual appearance in the journal. The subcommittee asked about how some of the more definitive statements in the preprints asserting a natural origin were softened or removed by the time Science published the papers. I explained that this was typical of how journals respond to changing information and to peer review. In these cases, peer review indicated that the evidence was supportive, but not dispositive, of a natural origin.

I am proud to have represented science and scientific publishing before the subcommittee and especially to represent my colleagues at *Science*. Despite my disagreements with Chairman Wenstrup about most policy matters, he and his staff were gracious and kept their promises about how the hearing would be run. I am pleased that the true nature of how science works—that it is a living work in progress—is now in the Congressional Record.

[1] Academic Malpractice: Examining the Relationship Between Scientific Journals, the Government, and Peer Review, Select Subcommittee on the Coronavirus Pandemic, U.S. House of Representatives (2024) (Testimony of Holden Thorp), https://oversight.house.gov/wp-content/uploads/2024/04/Written-Testimony-_HThorp-_-Select-Subcommittee-on-the-

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CASE STUDY 02 SUPPORTING THE LONG BEACH COVID-19 INCIDENT MANAGEMENT TEAM

Country	United States
Policy issue domain	Public health emergency management
Research domain	Public health, epidemiology, emergency operations, behavioral science
Research expert	Dr. Tepring Piquado, neuroscientist, Chief Policy Director of the California Issues Forum, Policy Researcher at RAND Corporation, Professor at The RAND Graduate School of Public Policy
Lead government institution(s)	City of Long Beach Incident Management Team (IMT)
Additional actors	• Long Beach Fire Department • Long Beach Police Department • Long Beach Health and Human Services • City council officials • Long Beach residents
Time period of engagement	March 2020 – April 2020
Research expert's role	Piquado served as an embedded advisor on the City of Long Beach Incident Management Team, supporting intelligence coordination, public health response strategies, and communication design.
Researcher expert's institutional affiliation and representation	The City of Long Beach Incident Management Team, on which Piquado served as an advisor, was formalized through the local emergency response structure under the city's emergency operations plan.
Communicative mode	Piquado worked collaboratively to develop situation reports, health advisories, real-time dashboards, public briefings, inter-agency coordination calls, and internal policy memos to translate evidence and meet the evolving information needs of emergency responders.

Ethical or legal challenges encountered	Managing data privacy and balancing transparency with urgency in communicating with the public were difficult due to the need for rapid responses.
Other challenges	Navigating evolving U.S. Centers for Disease Control and Prevention (CDC) and state guidance, responding to vaccine hesitancy, and adapting team responses with new data were similarly challenging due to short decision timelines.
Outcome(s) and/or impact	The Incident Management Team strengthened inter-agency coordination and rapid decision-making, improved local capacity for data-driven public health responses, and supported equitable vaccine distribution strategies. The lessons learned from the group's work were subsequently integrated into future emergency preparedness planning.

Case Study Narrative:
Taking a team approach: A neuroscientist integrates COVID-19 evidence into a city's pandemic response
By Dr. Tepring Piquado

When COVID-19 reached California in early 2020, the City of Long Beach was among the first municipalities to activate a formal Incident Management Team (IMT) within its Department of Health and Human Services. Drawing on the National Incident Management System framework, the IMT brought together public health officials, emergency planners, and scientific advisors to coordinate the city's evolving pandemic response.

Researchers and technical experts played key roles from the start. Operating as embedded advisors within the IMT structure, they translated emerging scientific evidence into operational strategies, provided predictions based on real-time public health data, and supported communication efforts. These individuals included behavioral scientists, epidemiologists, and emergency preparedness professionals, some of whom had prior experience advising on H1N1, Zika, or public health equity strategies.

The team faced a uniquely complex and high-pressure environment. Rapid surges in cases required continuous updates to isolation protocols, testing deployment, and contact tracing systems. IMT staff co-produced data dashboards, coordinated with local hospitals on capacity metrics, and advised on behavioral messaging to reduce community transmission. Formal communication channels—such

as situation reports and policy memos—were used in tandem with direct inter-agency calls and informal coordination mechanisms to ensure rapid, aligned responses.

A key feature of the Long Beach IMT model was its institutional grounding. Unlike ad hoc advisory efforts in other cities, Long Beach's IMT operated within an established emergency management structure. This allowed researchers to engage as part of decision-making units with defined roles, enhancing the integration of evidence into operational policy. Researchers contributed to the city's vaccine rollout planning, drawing on social vulnerability indices and behavioral research to recommend strategies for equitable access. Their work helped guide symptom questionnaires, public health outreach, and data-informed prioritization of neighborhoods.

Despite the formal structure, the team encountered critical challenges. Public guidance evolved frequently, requiring constant adaptation and communication calibration. Researchers also navigated data privacy constraints, especially when integrating syndromic surveillance data or fatalities. At times, the IMT had to balance public transparency with the need to avoid premature disclosures of evolving scientific understanding.

Nonetheless, the Long Beach experience stands out as an example of successful science-policy collaboration during a crisis. The researchers' contributions were credited with improving the city's real-time decision-making capacity, informing responsive messaging, and building public trust. Several operational tools were developed during this period, including dashboards and outbreak maps, which were retained for future preparedness efforts.

The IMT's integrated model helped ensure that science was not merely a reference point but a core component of the city's COVID-19 policy response. As Long Beach transitions from emergency response to preparedness planning, the IMT experience offers valuable lessons in embedding research expertise into local governance structures, particularly under conditions of uncertainty and urgency.

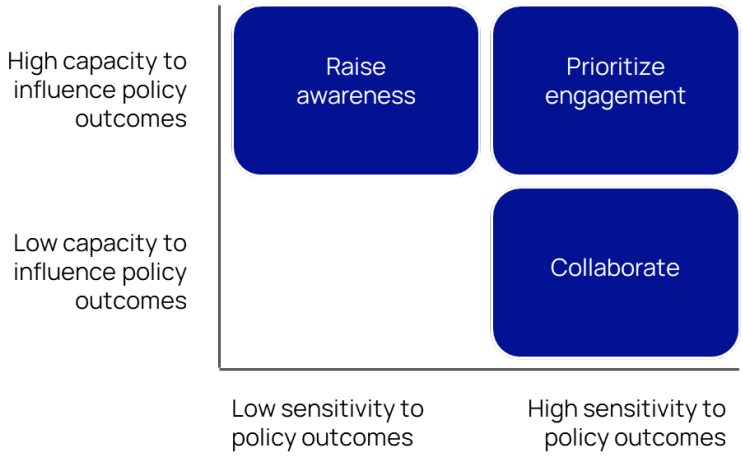
APPENDIX 2 I EXAMPLE POLICY ACTOR ANALYSIS

If you are an environmental scientist in Las Vegas, Nevada, and your research and policy issue of interest is changes in the frequency of extreme heat events due to climate change, one of your potential groups for engagement may be the unhoused population in Clark County (including Las Vegas). The table below provides a brief policy actor analysis for this group, followed by a summary of the results and prioritization for engagement.

ANALYSIS	
Policy actor description	Unhoused population in Clark County, NV
CHARACTERISTICS	
Demographics/Attributes For individuals and groups: age, gender, ethnicity, nationality For organizations: location/jurisdiction, size/membership	**Age:** 35-44 largest group[1] **Gender:** Around ⅔ female[2] **Ethnicity:**[1] • 42% African American • 34% White • 11% Hispanic • 8% Multiracial • 2% Asian • 1% American Indian, Alaska Native, or Indigenous, • 1% Native Hawaiian or Pacific Islander
Mission/Interest Represent constituents or members, enforce laws, protect public health, etc.	Community members are concerned about health risks from extreme heat exposure and a lack of housing.
Other important characteristics Belief systems, culture, language, religion, etc.	Differences in the status of the unhoused—whether they have access to shelters—can result in starkly different rates of reported health conditions,[1] such as mental illness, substance abuse, and HIV/AIDS. These conditions are more likely to be recognized and reported among individuals in shelters, even though the true prevalence rate may be similar.

SENSITIVITY		
Financial sensitivity Estimate of financial harm or benefits from policy action or inaction, per capita	☐ Low ☐ Medium ☐ High	• Heat-related hospitalization median cost: $8,965[3]
Non-financial sensitivity Estimate of health, social, cultural, or other harm or benefits from policy action or inaction, per capita	☐ Low ☐ Medium ☐ High	• 100x stronger association between heat and mortality among the unhoused relative to the general population[4] • 50.1% of deaths attributable to heat[5] • 47% higher vulnerability for women[6]
OVERALL ASSESSMENT **Sensitivity**	☐ Low ☐ Medium ☐ High	
CAPACITY		
Size/Representation Group size or # represented	Around 8,000[1]	
Resources Financial resources, time, information, social capital	☐ Low ☐ Medium ☐ High	• Low financial and social capital
Cost of mobilizing Ease of communication and coordination, such as among group members	☐ Low ☐ Medium ☐ High	• Housing and health challenges make organizing difficult
Decision-making authority Ability to make laws, regulations, or court decisions, or set community social norms	☐ Low ☐ Medium ☐ High	• Legal authority is limited
Legal protections and rights Rights under the law, such as for Indigenous groups	☐ Low ☐ Medium ☐ High	
OVERALL ASSESSMENT **Capacity**	☐ Low ☐ Medium ☐ High	

Actor analysis results: The unhoused population in Clark County, NV, is prioritized for **collaboration**, as it is highly sensitive to policy outcomes but has limited capacity. Community organizations that work with the unhoused in this area are likely to have more resources and higher capacity to mobilize and thus should be prioritized for engagement along with this group of actors.



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APPENDIX 3 I ROLE PLAY SCENARIO

	Sarah Lane, a member of the Board of Education	**Michelle Dean, neuroscientist**	**Critique of the interactions**
Exchange# 1	Welcome, thank you for coming to my office today. I am Sarah Lane, a Member of the Board of Education for the Gran Pacifica Unified School District. As you know, our school district covers the major metropolitan area of Gran Pacifica with many students with different needs.	Thank you for having me, Board Member Lane. I am Michelle Dean, I am a neuroscientist and a professor at the University of California, Gran Pacifica. I am aware you're an alumni; go Sea Otters! I am also a member of the Society for Neuroscience (SfN).	Dr. Dean clearly reflected on and communicated her expertise (neuroscientist), her institutional affiliations (UC Gran Pacifica, SfN), and her level of "expert participation" (affiliated expert, a faculty and professional society member). Dr. Dean established rapport with the Board of Education member by highlighting that she is an alumna of the same university where Dr. Dean is a faculty member (UC Gran Pacifica, home of the Sea Otters).
Exchange# 2	Great, I appreciate that you reached out to discuss school closures in the Gran Pacifica Unified School District as we see how the COVID-19 virus develops.	Yes, I look forward to discussing evidence related to school closures as we navigate this crisis. I have some concerns about some of the policy options on the table at the moment. I really think that the policy on school closures needs to change.	Dr. Dean is interested in advocating for specific policy changes (as her communicative mode) while she is representing herself as a faculty member of the (public) University of California. She needs to check with her institution whether she is allowed to take an advocacy position based on their institutional rules.
Exchange# 3	Yes, I can speak for the entire Board of Education when I'm saying that this question has been a struggle for us.	I understand that it's a difficult problem at the moment because we still don't know as much as we'd like to about COVID-19 and at the same time, there is substantial disagreement among your constituents on how to balance physical health, mental health, and learning outcomes.	Dr. Dean clearly understood and explained in plain language that this is an "unstructured problem" because a scientific uncertainty and disagreement on public values coincide.

	Sarah Lane, a member of the Board of Education	Michelle Dean, neuroscientist	Critique of the interactions
Exchange# 4	Absolutely. I've been deeply involved in the district-level negotiations on school closures so give me the elevator pitch, what are your thoughts on the issue?	I am currently working on a review study on the impacts of school closures and it looks like overall, the harms of school closures on child and adolescent health seem to exceed some indicators of positive health care system effects. We need teachers to get back to a consistent teaching schedule, using video platforms if in-person learning is impossible.	Dr. Dean should have been aware based on her actor analysis that Board member Lane was helping broker a deal and had the background on what her policy stance is. The statement reflects advocacy for a specific policy position, involving values, but is couched as only based on the research evidence.
Exchange# 5	Hmm, the Gran Pacifica Unified School District just finalized a deal with the teacher's union—you should have seen it on the news. The teachers' union, which I am a former leader of, won the concessions that teachers can create their own flexible schedules, work a minimum of two hours daily, and are not required to use video platforms for students not returning to the classroom. It's a huge win for the union and an end to the micro-management of teachers.	Oh, I didn't realize that this was already agreed on. But this is not best for the students and the teachers should want what's best for students. I was hoping to discuss the evidence on adolescent health impacts with you that I believe should be considered in this decision.	Dr. Dean was clearly unaware her recommendation ran counter to the decision-maker's policy position! She neglected to acknowledge this in her framing of the evidence. Dr. Dean was also not aware of the policy stage and that there had already been a policy decision (the deal between the school district and the teachers' union). She was under the impression that the Board of Education was still in the "agenda setting" or "policy formulation" stages and did not prepare the right type of evidence.
Exchange# 6	Well, what evidence is your team producing that you think is relevant to upcoming decisions on school closures in Gran Pacifica?	We have unbiased evidence that school closures negatively impact child and adolescent mental health, including increased anxiety, loneliness, sadness, frustration, and physical health morbidity. For example, we see increases in BMI measures, that is "body mass index," a measure of body fat based on height and weight.	Dr. Dean used the term "unbiased" which has different connotations in the research community and for members of the public. On the positive side, Dr. Dean used an abbreviation (BMI) and explained what it means in simple terms.

	Sarah Lane, a member of the Board of Education	Michelle Dean, neuroscientist	Critique of the interactions
Exchange# 7	And what about the learning outcomes?	It is hard to say at this point as school closures at this scale and time of year are a new phenomenon. We hope to know more in about three months as several survey studies at UC Gran Pacifica conclude their data collection and can share early analytical results. However, one study looking at loss of learning progress over summer school holidays identified a loss of 1.8 to 4 months of progress, depending on the subject.	Dr. Dean explained the nature of the uncertainty (new phenomenon) and when the uncertainty might change (in three months, as studies conclude data collection). Dr. Dean indicated how new evidence is produced (through survey studies). Dr. Dean highlighted a range estimate for learning loss (1.8 to 4 months) and indicated where the uncertainty stems from (variation across subjects).
Exchange# 8	Interesting, I personally never felt that my learning suffered any setbacks from the summer school holidays.	I agree, intuitively it does not feel like our learning stalls over the summer school holidays. However, you probably experienced that when a fellow Board Member puts an issue on the agenda, you familiarize yourself with the subject, but if it doesn't come back up for a few months, then returns to the agenda, you have to immerse yourself in the details again. Children and adolescents have a similar experience when school's out for the summer.	Dr. Dean identified a bias based on personal experience and developed a "transformative explanation." First, she stated the lay theory and acknowledged its apparent reasonableness (the Board Member's memory of their experience in school). Second, she created dissatisfaction with the lay view by noting familiar experiences inconsistent with it (repeated interactions with an agenda item). Third, she explained the more accepted view (the evidence on school holidays).
Exchange# 9	Thank you for sharing these insights, Dr. Dean, I will share my thoughts on them with the teachers' union leadership and my fellow Board Members.	I appreciate your taking the time, Board Member Lane. I am a big champion of teachers, and my dad and grandma were both teachers and I hope you can agree to a policy solution that balances all parties' interests.	Dr. Dean built rapport with Board Member Lane by identifying common ground (their shared support for teachers).

	Sarah Lane, a member of the Board of Education	Michelle Dean, neuroscientist	Critique of the interactions
Exchange# 10	Do you have a brief summary of the evidence you mentioned in our conversation?	I don't have one on hand, but I would be happy to prepare a brief one- to two-page handout and email it to you tomorrow. Here is my business card if you have any questions on our evolving state of knowledge on this issue. I would love to schedule a follow-up meeting when we conclude our study–since it's a review study of the best available evidence, I would be in a great position to bring you up to date on our state of knowledge.	It's great that Dr. Dean has business cards to exchange with the Board Member. She could have also anticipated the need for a brief written summary and brought it to the meeting—but even without a one-pager, she can still capitalize on this chance to follow up by providing additional information and continuing the conversation.
Exchange# 11	That sounds excellent, I look forward to continuing our conversation. Please keep me apprised if there is any new, policy-relevant evidence that comes up. Feel free to email me directly!	*[No last comment]*	*[No last comment]*

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