Did I Hear You Right?:

Garbled Science and the Game of Telephone

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This lesson, aimed at mid- to upper-level undergraduates, discusses how research findings can be over-inflated, distorted, or misrepresented as the research is shared outside of its original context. Students will build on their fact-checking skills to trace claims back to their source. The lesson uses a flipped classroom approach to introduce students to multiple perspectives on this issue and its impact on the information ecosystem. In the classroom, students will demonstrate this issue in a potentially familiar scenario, a large-group game of telephone. To reinforce their skills, students will review news pieces that are derived from research, identify the claims, locate the original research cited in the article, and compare the findings to the claims shared in the news. Students will understand more about the publishing lifecycle and research integrity; how distorted research can have sociopolitical impacts; and how to be a responsible consumer and disseminator of information through critical thinking and analysis. Although the lesson refers to science, the issue of misrepresented research is interdisciplinary, and students will undoubtedly encounter claims in their everyday lives that will fall out of their area of expertise and need to know how to check them.

Time: 50 minutes, with options for longer classes.

Number of Students: There are enough worksheets for 21 students. If you have a larger class, you can put students in larger groups for the large group activity, or pull additional article examples to create more worksheets.

## By the end of this class, students should…

1. Understand how science (and research in any discipline) can be misrepresented in media.

2. Build skills to fact-check scientific claims they see online, thinking critically about research and its scope, aims, applications, and limitations.

3. Be able to apply these skills as they conduct their own research and apply them to academic contexts in their discipline.

Mapped to UNCW Information Literacy SLOS 1 & 2

[Critical Thinking, Global Citizenship, Information Literacy]

## Before class, you should:

1. Assign the students three readings (estimated 15-20 min):
	1. Resnick, B. (2019, June 11). Hyped-up science erodes trust. Here’s how researchers can fight back. *Vox*. <https://www.vox.com/science-and-health/2019/6/11/18652225/hype-science-press-releases>
	2. Fu, A. (2022, March 8). Journalists tend to understate — not exaggerate — scientific findings, study finds. *Poynter Institute*. <https://www.poynter.org/reporting-editing/2022/science-reporting-scientific-study-journalism-exaggerate-understate/>
	3. McCausland, (2021, March 2). How to spot misleading science reporting. *QB3 Berkeley (California Institute for Quantitative Biosciences)*. <https://qb3.berkeley.edu/news/how-to-spot-misleading-science-reporting/>
2. Assign the students this prompt:
	1. Reflecting on the readings, why might over-stating, under-stating, or misrepresenting claims from research be problematic? What are some steps you could take to ensure you’re accurately communicating the evidence of other research (and your own research) as you complete your project?
3. Print out the telephone game sheet. Cut them into strips so each strip only has one numbered line, and the quotation is on its own strip.
4. Print out the group worksheets (attached).
5. Tell students to bring their laptops to class (or hold this class session in a computer lab).

## In-Class Lesson Plan

|  |
| --- |
| **Introduction** |
| * Share the SLOs and explain the goals of today’s class.
 | :02 |
| * Tell students that we’re going to start with a game of telephone. Ask students if they’ve ever played it before, and have a student who has played before volunteer to share what the game is. Explain that we are going to apply this game to an academic context. Tell students that you are going to hand out a snippet of a real scholarly journal abstract (explain what an abstract is if that’s not already a concept you have covered in your class) and play the game based on that abstract. Share an example: Imagine you got a strip that said, “This study, conducted via survey of 100 first-year college students, explored whether students prefer cats or dogs as pets. Results showed that while 51% of overall students preferred dogs, there is a strong correlation between students who were Engineering majors and preference for cats.” Ask the class for answers as to how they might summarize that in their own words.
 | :03 |
| * Ask for 3 volunteers to demonstrate the game. Assign each of the volunteers a number, 1-3. Explain the rules:
	+ Person #1 receives two strips: the abstract and a strip with the number one on it. Person #1 will summarize – *in their own words –* the major concepts or claims it shares.
	+ Person #1 will hold on to the abstract strip and pass on their #1 strip to Person #2 to summarize what Person #1 wrote, *in their own words*.
	+ Each person will only see the summary the person before them wrote (not the original abstract). They will only pass on what they have written and keep what the previous person wrote.
	+ When Person #3 finishes, all the strips will go back to you.
* Tell them not to overthink this and to summarize as quickly as possible. Just like a journalist reporting on new research, we have deadlines to meet! Remind students that this should be a judgment-free zone – this won’t be graded, and to just try to put this in your own words as quickly as you can (with chaos ensuing being one point of the exercise!). Give the students a minute or so each to complete this.

\*\*If you would like to give the whole class the opportunity to participate, you can print extra strips of the abstract and have them each write their own summary as the 3 volunteers are working on theirs. After you’ve discussed the summary of the 1st volunteer, compare with the rest of the class – did they all glean something different from that abstract?\*\* | :05 |
| **Full-Class Discussion** |
| * As a class, compare and discuss the first person’s summary to the last person’s summary. Do they sound similar or different? What aspects have gotten lost in the chain? Go back to the original abstract – how do these compare to the original quote?
 | :05 |
| **Mini-Lecture** |
| * Explain why it’s vital that we try to communicate research accurately – that overinflating the findings of research can be misleading. Imagine a new study, exploring if drinking Coca-Cola increases the rate of cancer in mice, finds a 2% increase in the incidence of colon cancer in mice that had Coca-Cola instead of water everyday. A news story covering this study shares the headline, “Coca-Cola causes cancer, new study finds.” But is that what the study found? The study didn’t say specifically that Coca-Cola *caused* that cancer – just that there was a higher incidence in those mice, but they might elaborate on other reasons that account for that in their study. The headline also leaves out the population: they were studying mice, not people, so their findings may not be applicable in humans. And how much were they given? The headlines also mentions cancer writ-large, not the specific cancer in their findings. This has real effects – people may change their behavior based on the news story. Misrepresenting research, or framing it so limitations and other details aren’t mentioned, can muddy the waters of information.
* Share that this doesn’t mean journalists intentionally induce panic or willfully muddy the waters – research is very complex! If the reporter is not an expert in that area of research, they may have a hard time parsing through that data or understanding confusing disciplinary jargon. Remind students that they have probably read articles that have parts they don’t understand, and let them know if that has happened to you, too, especially outside your own area of research. Reinforce what they read about in their homework: that researchers often write in convoluted ways that makes their findings unclear, and that university press releases about new research – which is often what journalists are basing their articles on – can also miss or misdescribe details in the research that cause that garbled game of telephone.
* Explain that there are simple ways to navigate this on our own – just go back to the source! Ask students if they’ve ever been told not to cite a source cited in another article without actually reading the original source? Explain that they’ll want to do the same thing here. When you encounter a news story that cites research from a study, find that study and compare the claims. Is that what the author claimed? Is their study more limited in population, scope, or application than the news story implies? Are their findings more or less concrete or certain than what is shared in the news article? Do they interview the authors as part of the story, or do they interpret the research on their own? All of these are good questions to ask yourself as you compare.

\*\* If you have not covered how to locate articles in the library’s resources in your class, this would be a good opportunity to briefly demonstrate how to do so, or cover ahead of this lesson. \*\* | :07 |
| **Small Group Activity** |
| * Tell the students that you are going to take some real-world examples and explore together. Break the students in to groups or allow them to self-select groups of 5-7 people. Give each group a worksheet and have them choose a recorder and a reporter. Explain that they will each pull up and read the news story on their computers, then come back together as a group to discuss and write down what the article claims. They will then pull up the journal article or conference presentation that the news story mentions, skimming through it to answer the remaining questions. They can either work collectively or assign the remaining questions to members of the group to investigate. The recorder will write down their answers and the reporter will share their responses with the class. Give them 20 minutes to complete these.

\*\* In a longer class, you can give students more time, and they may be able to answer questions in more detail \*\* | :20 |
| **Full Class Discussion & Wrap-Up** |
| * Have the reporters share their group’s responses and discuss. Points that might come up include: how a news story overinflated or underemphasized the research; how a study’s population size might have been too small to be conclusive; how a headline focused on one aspect of the research to draw attention, but buried significant details in the body of the article; etc.

\*\* In a longer class, the discussion may continue \*\** As you wrap-up, remind students that they were able to catch some important differences in a short amount of time. They have the tools they need to put claims in their original context, which they’ll use as they continue with their research and in their everyday lives.
 | :08 |

## Handout 1: Telephone Game Sheet

“This exploratory study included 524 undergraduate students (360 women…and 164 men…) enrolled in introductory psychology sections who completed the Empathy in Pet Dogs and Cats Scale to assess their attitudes regarding how much domestic dogs and cats show vicarious experiencing of the thoughts, feelings, or attitudes of their owners… Women gave significantly higher ratings than men regarding dogs' and cats' knowing when their owners are happy, sad, or angry. Women also gave significantly higher ratings than men regarding dogs' and cats' feeling love and compassion for their owners.”

Vitulli, W. F. (2006). Attitudes toward empathy in domestic dogs and cats. *Psychological Reports, 99*(3), 659-1010. doi:10.2466/PR0.99.3.981-991

1. Summarize this quote in your own words.
2. Summarize this quote in your own words.
3. Summarize this quote in your own words.

## Handout 2: Group Worksheets

Open this news story in your browser: <https://www.huffingtonpost.co.uk/2016/01/08/a-glass-of-red-wine-is-the-equivalent-to-an-hour-at-the-gym-says-new-study_n_7317240.html>

In your groups, work together to investigate this story and answer the following questions:

1. What are the claims this news article makes? Are there details in the body of the article that are missing in the headline?

Then open the original study: <https://physoc.onlinelibrary.wiley.com/doi/epdf/10.1113/jphysiol.2012.230490>

1. What are the researchers studying? What is their hypothesis? Is their research question different from what the news story described?
2. What are the major claims this article shares? (Hint: these may be highlighted in the abstract, but you may also find other claims a Discussion/Conclusion section.)
3. What are the other findings the researchers share in this article? Hint: you may wish to check the Results, Analysis, Discussion, or Conclusion sections to explore these. Are these different from what the news story described (or absent from the news story entirely)?
4. Discuss anything else that stands out to you between the two pieces.
	1. For example: Do the researchers list any limitations to their research? Is the population size small or methods specific to a particular scenario? Are the researchers more or less conclusive/certain in their results than the news story implies? Does the news story draw conclusions or state implications that are outside the scope of their research?

Open this news story in your browser: <https://nypost.com/2016/03/30/being-a-vegetarian-could-kill-you-science-warns/>

In your groups, work together to investigate this story and answer the following questions:

1. What are the claims this news article makes? Are there details in the body of the article that are missing in the headline?

Then open the original study: <https://pubmed.ncbi.nlm.nih.gov/27188529/>

1. What are the researchers studying? What is their hypothesis? Is their research question different from what the news story described?
2. What are the major claims this article shares? (Hint: these may be highlighted in the abstract, but you may also find other claims a Discussion/Conclusion section.)
3. What are the other findings the researchers share in this article? Hint: you may wish to check the Results, Analysis, Discussion, or Conclusion sections to explore these. Are these different from what the news story described (or absent from the news story entirely)?
4. Discuss anything else that stands out to you between the two pieces.
	1. For example: Do the researchers list any limitations to their research? Is the population size small or methods specific to a particular scenario? Are the researchers more or less conclusive/certain in their results than the news story implies? Does the news story draw conclusions or state implications that are outside the scope of their research?

Open this news story in your browser: <https://www.fox5atlanta.com/news/study-chocolate-good-for-fetal-development>

In your groups, work together to investigate this story and answer the following questions:

1. What are the claims this news article makes? Are there details in the body of the article that are missing in the headline?

Then open the original study: [https://www.ajog.org/article/s0002-9378(15)01352-6/fulltext](https://www.ajog.org/article/s0002-9378%2815%2901352-6/fulltext)

1. What are the researchers studying? What is their hypothesis? Is their research question different from what the news story described?
2. What are the major claims this presentation shares? (Hint: these may be highlighted in the abstract, but you may also find other claims a Discussion/Conclusion section.)
3. What are the other findings the researchers share in this presentation? Hint: you may wish to check the Results, Analysis, Discussion, or Conclusion sections to explore these. Are these different from what the news story described (or absent from the news story entirely)?
4. Discuss anything else that stands out to you between the two pieces.
	1. For example: Do the researchers list any limitations to their research? Has it undergone peer review? Is the population size small or methods specific to a particular scenario? Are the researchers more or less conclusive/certain in their results than the news story implies? Does the news story draw conclusions or state implications that are outside the scope of their research?