Reading for Rhetoric
The Art of Reading Research Articles

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Learning Objectives

• By the end of this seminar, you will be able to:
  • identify key rhetorical elements of research articles
  • summarize research articles in terms of these rhetorical elements
  • reflect on the way in which these rhetorical elements are inflected in your own discipline
Outline of Presentation

• Reasons to read for rhetoric
• Classical Definition of Rhetoric
• Definition of “genre” and “genre analysis”
• Brief description of ESP (English for Specific Purposes) genre analysis
• John Swayles’ C.A.R.S. (Create a Research Space) model
• My simplified version of that model
• Genre/rhetorical analysis of three articles in different disciplines
Reasons to Read for Rhetoric

• To improve your comprehension. The ability to identify rhetorical elements gives you “advance organizers” for the material you’re reading, and keeps you from being overwhelmed by detail.

• To increase your reading speed. At least initially, you can ignore the overwhelming detail that can slow you down.

• To improve your recall. A simple narrative is easier to remember, and when you are ready to attend to detail, your sense of the overall narrative helps you to attach relevant details to it in a memorable way.
Reasons to Read for Rhetoric

• To gain explicit knowledge of the rhetorical norms of your discipline. These norms rarely rise to the level of explicit discourse. This knowledge is crucial when it comes time to write.
In Classical Terms, Rhetoric Is the Art of Persuasion
ARISTOTLE’S 3 RHETORICAL MODES OF PERSUASION

• **LOGOS**: persuasion by means of logical argument

• **PATHOS**: persuasion by appeal to the audience’s emotions, interests, values.

• **ETHOS**: persuasion by convincing an audience of the speaker’s good character and expertise
A genre is defined by its “organization, language, intended audience and purpose”.

Genre analysis identifies the organization, language, intended audience and purpose of a given genre.

https://eltc-language-resources.group.shef.ac.uk/lessons/what-is-genre-analysis/
ESP Genre Analysis

• Combines genre analysis with ESP
• Inaugurated by John Swales in the ‘80s
• Based on the idea that “linguistic features are connected to social context and function”.
• Goal of ESP Genre Analysis is to help students “grasp the system in which texts are created so that they can create similar texts, by teaching them the relationship between language and social function.”
• My methodological approach in this presentation

https://en.wikipedia.org/wiki/Genre_studies
Swales’ “C.A.R.S.” Model for Introductions

• Move 1: Establishing a Territory
  Step 1: Claiming importance and/or
  Step 2: Making topic generalizations and/or
  Step 3: Reviewing items of previous research

• Move 2: Establishing a Niche
  Step 1a: Counter-claiming or
  Step 1b: Indicating a gap or
  Step 1c: Question-raising or
  Step 1d: Continuing a tradition
Swales’ “C.A.R.S.” Model for Introductions

• Move 3: Occupying the Niche
  Step 1a: Outlining purposes or
  Step 1b: Announcing present research
  Step 2: Announcing principle findings
  Step 3: Indicating article structure
My Simplification of Swales’ Model

• Introduce the research problem
• State the importance of the problem
• Summarize how other researchers have approached the problem (background)
• Identify the research gap (what previous researchers have gotten wrong or left out)
• State purpose of your study (your intention to fill gap)
• Tell reader what methods you will use/have used
• Present a summary of your results
• Give the reader a “road map” of how your paper is organized
1. Science (Oceanography)

“Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
“Extreme re-listening: Songs people love ... and continue to love”
3. Engineering (Safety Engineering)

“A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control”
Reading for the Research Problem
(broadly defined)
Reading for the Research Problem (broadly defined) in Our Engineering Article,

“A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control”
In which of the introductory sentences below do we find reference to the research problem?

1. “Given that mechanized coal mining has become increasingly popular in recent years, coal dust has become a significant problem in underground mines, causing safety hazards in coal production.

2. According to the statistics released by the Ministry of Health of China, more than 300,000 coal miners suffered from pneumoconiosis by the end of 2007, accounting for 50% of the total number of pneumoconiosis patients in China .... On average, 2500 Chinese miners die from pneumoconiosis every year.”

3. A number of methods have been widely adopted in controlling coal dust concentrations. The most popular technologies are ventilation, water spraying, water infusion, water/wetting agent spraying, and dust collection using fans. (9–12)

4. Although these technologies play an important role in dust control, they have certain limitations.”
In which of the introductory sentences below do we find reference to the research problem?

1. “Given that mechanized coal mining has become increasingly popular in recent years, coal dust has become a significant problem in underground mines, causing safety hazards in coal production.

2. According to the statistics released by the Ministry of Health of China, more than 300,000 coal miners suffered from pneumoconiosis by the end of 2007, accounting for 50% of the total number of pneumoconiosis patients in China. On average, 2500 Chinese miners die from pneumoconiosis every year.

3. A number of methods have been widely adopted in controlling coal dust concentrations. The most popular technologies are ventilation, water spraying, water infusion, water/wetting agent spraying, and dust collection using fans.

4. Although these technologies play an important role in dust control, they have certain limitations.”
Reading for the Research Problem
In Our Oceanography Article

“Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
In which of the introductory sentences below do we find a statement of the research problem?

1 “The ocean wave climate is obviously important to maritime safety, as well as many other areas of society. Ships and other marine and coastal structures are designed in order to withstand normal and extreme environmental loads imposed by the forces of wind and waves at sea. However, the potential impact of climate change on the ocean wave climate is often neglected, and there is also a lack of knowledge on how the future ocean wave climate will change as a result of climate change. Recently, a Bayesian hierarchical space-time model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean.”
“The ocean wave climate is obviously important to maritime safety, as well as many other areas of society. Ships and other marine and coastal structures are designed in order to withstand normal and extreme environmental loads imposed by the forces of wind and waves at sea. However, the potential impact of climate change on the ocean wave climate is often neglected, and there is also a lack of knowledge on how the future ocean wave climate will change as a result of climate change. Recently, a Bayesian hierarchical space-time model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean.”
Reading for the Research Problem in our sample Psychology article,

“Extreme re-listening: Songs people love ... and continue to love”
In which of the introductory sentences below do we find reference to the research problem?

1. People may listen to favorite songs very frequently, even though listening to familiar songs yields few surprises – and surprise has been identified as one reason people find songs enjoyable (e.g., Huron, 2006). Yet, we assume listeners love the songs they listen to most often; otherwise it seems unlikely they would continue to listen to them.

2. Jakobovits (1966) demonstrated that songs played frequently on the radio and on jukeboxes in the 1960s (the ‘Hit Parade’) grew in popularity until a critical point when this growth reversed despite continued exposure. He suggests that such “exposure saturation” produces semantic saturation – an inhibitory effect in neural response due to rapid, repeated firing of neurons in response to repeated presentation of a stimulus.

3. So how is it that someone like KaEe Arnold-Ratliff (2012) can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? Jakobovits predicted just the opposite.
In which of the introductory sentences below do we find reference to the research problem?

1. People may listen to favorite songs very frequently, even though listening to familiar songs yields few surprises – and surprise has been identified as one reason people find songs enjoyable (e.g., Huron, 2006). Yet, we assume listeners love the songs they listen to most often; otherwise it seems unlikely they would continue to listen to them.

2. Jakobovits (1966) demonstrated that songs played frequently on the radio and on jukeboxes in the 1960s (the ‘Hit Parade’) grew in popularity until a critical point when this growth reversed despite continued exposure. He suggests that such “exposure saturation” produces semantic saturation—an inhibition in neural response due to rapid, repeated firing of neurons in response to repeated presentation of a stimulus.

3. So how is it that someone like KaEe Arnold-Ratliff (2012) can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? Jakobovits predicted just the opposite.
Our sample research problem in Oceanography is to correlate climate change and ocean wave climate, and develop a predictive model.

Our sample research problem in Engineering is to mitigate levels of coal dust in underground coal mines.

Our sample research problem in Psychology is to explain the psychological phenomenon whereby listeners repeatedly enjoy their favourite songs despite the absence of surprise.

What is a typical research problem (broadly defined) in your discipline?

If you’ve already begun thinking about your own research project, is the problem you intend to work on discipline-appropriate?
Reading for the Importance of the Research Problem
How to Read for the Importance of the Research Problem (broadly defined)

• They should be solutions to the research problem, broadly defined. If they aren’t, then they’re something else (possibly, theory or methods borrowed from another research area).

• The risk here is confusing a previous solution to the research problem with the researcher’s own solution.
Reading for the Importance of the Research Problem in Our Oceanography Article,

“Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
In which introductory sentences below do we find reference to the importance of the research problem?

1.“The ocean wave climate is obviously important to maritime safety, as well as many other areas of society. Ships and other marine and coastal structures are designed in order to withstand normal and extreme environmental loads imposed by the forces of wind and waves at sea.

2. However, the potential impact of climate change on the ocean wave climate is often neglected, and there is also a lack of knowledge on how the future ocean wave climate will change as a result of climate change.

3. Recently, a Bayesian hierarchical space-time model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic Ocean.”
In which introductory sentences below do we find reference to the importance of the research problem?

1. “The ocean wave climate is obviously important to maritime safety, as well as many other areas of society. Ships and other marine and coastal structures are designed in order to withstand normal and extreme environmental loads imposed by the forces of wind and waves at sea.

2. However, the potential impact of climate change on the ocean wave climate is often neglected, and there is also a lack of knowledge on how the future ocean wave climate will change as a result of climate change.

3. Recently, a Bayesian hierarchical space-Eme model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean.”
Reading for the Importance of the Research Problem (broadly defined) in Our Engineering Article,

“A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control”
In which introductory sentences below do we find reference to the importance of the research problem?

1. “Given that mechanized coal mining has become increasingly popular in recent years, coal dust has become a significant problem in underground mines, causing safety hazards in coal production. According to the statistics released by the Ministry of Health of China, more than 300,000 coal miners suffered from pneumoconiosis by the end of 2007, accounting for 50% of the total number of pneumoconiosis patients in China. On average, 2,500 Chinese miners die from pneumoconiosis every year.”

2. A number of methods have been widely adopted in controlling coal dust concentrations. The most popular technologies are ventilation, water spraying, water infusion, water/wetting agent spraying, and dust collection using fans.

(9–12) 4. Although these technologies play an important role in dust control, they have certain limitations.”
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1. “Given that mechanized coal mining has become increasingly popular in recent years, coal dust has become a significant problem in underground mines, causing safety hazards in coal production. According to the statistics released by the Ministry of Health of China, more than 300,000 coal miners suffered from pneumoconiosis by the end of 2007, accounting for 50% of the total number of pneumoconiosis patients in China. On average, 2500 Chinese miners die from pneumoconiosis every year.”

2. A number of methods have been widely adopted in controlling coal dust concentrations. The most popular technologies are ventilation, water spraying, water infusion, water/wetting agent spraying, and dust collection using fans. (9–12)

3. Although these technologies play an important role in dust control, they have certain limitations.”
Reading for the Importance of the Research Problem in our sample Psychology article,

“Extreme re-listening: Songs people love ... and continue to love”
In which of the introductory sentences below do we find reference to the importance of the research problem?

1. People may listen to favorite songs very frequently, even though listening to familiar songs yields few surprises – and surprise has been identified as one reason people find songs enjoyable (e.g., Huron, 2006). Yet, we assume listeners love the songs they listen to most often; otherwise it seems unlikely they would continue to listen to them. 2. Jakobovits (1966) demonstrated that songs played frequently on the radio and on jukeboxes in the 1960s (the ‘Hit Parade’) grew in popularity until a critical point when this growth reversed despite continued exposure. He suggests that such “exposure saturation” produces semantic saturation – an inhibitory effect in neural response due to rapid, repeated firing of neurons in response to repeated presentation of a stimulus.

3. So how is it that someone like KaEe Arnold-Ratliff (2012) can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? Jakobovits predicted just the opposite.
This one’s a bit of a trick question

• Some research problems in some disciplines do not call for an explicit justification in terms of their importance. In the present case, for instance, explaining the psychological phenomenon of “extreme re-listening” is considered inherently worthwhile.

• Attempts to attach practical importance to the research (e.g. for the insights into musical consumption that it affords music-industry marketers) is unnecessary and even misguided.
Summary and Reflection

The importance of the problem in Oceanography (lack of info on future wave-ocean climate) is that it may compromise marine safety.

The importance of the problem in Engineering (high coal-dust levels) is health and safety-related as well as economic.

The importance of the problem in Psychology (unexplained phenomenon of extreme re-listening) is implicit. Human psychology is considered inherently interesting.

What importance attaches to research problems (broadly defined) in your discipline?

If you’ve already begun thinking about your own research project, what is the importance of the research problem (broadly defined) that you are or will be working on?
Reading for Previous Solutions to the Problem
How to Read for Previous SoluEons

• They are usually expressed in the past tense, and cite another researcher’s work.

• They should be soluEons to the research problem, broadly defined. If they aren’t, then they’re something else (possibly, references to theory or methods borrowed from another research area).

• The risk here is confusing a previous soluEon to the research problem with the researcher’s own soluEon.
Reading for Previous Solutions
in our sample psychology article,

“Extreme re-listening: Songs people love ... and continue to love”
In which of the introductory sentences below do we find reference to previous solutions?

1. People may listen to favorite songs very frequently, even though listening to familiar songs yields few surprises – and surprise has been identified as one reason people find songs enjoyable (e.g., Huron, 2006). Yet, we assume listeners love the songs they listen to most often; otherwise it seems unlikely they would continue to listen to them.

2. Jakobovits (1966) demonstrated that songs played frequently on the radio and on jukeboxes in the 1960s (the ‘Hit Parade’) grew in popularity until a critical point when this growth reversed despite continued exposure. He suggests that such “exposure saturation” produces semantic saturation—an inhibitory effect in neural response due to rapid, repeated firing of neurons in response to repeated presentation of a stimulus.

3. So how is it that someone like KaEe Arnold-Ratliff (2012) can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? Jakobovits predicted just the opposite.
In which of the introductory sentences below do we find reference to previous solutions?

1. People may listen to favorite songs very frequently, even though listening to familiar songs yields few surprises – and surprise has been identified as one reason people find songs enjoyable (e.g., Huron, 2006). Yet, we assume listeners love the songs they listen to most often; otherwise it seems unlikely they would continue to listen to them.

2. Jakobovits (1966) demonstrated that songs played frequently on the radio and on jukeboxes in the 1960s (the ‘Hit Parade’) grew in popularity until a critical point when this growth reversed despite continued exposure. He suggests that such “exposure saturation” produces semantic satiation—inhibitory in neural response due to rapid, repeated firing of neurons in response to repeated presentation of a stimulus.

3. So how is it that someone like KaEe Arnold-Ratliff (2012) can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? Jakobovits predicted just the opposite.
Reading for Previous Solutions in Our Engineering Article, “A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control”
A number of methods have been widely adopted in controlling coal dust concentrations. The most popular technologies are ventilation, water spraying, water infusion, water/wetting agent spraying, and dust collection using fans. Although these technologies play an important role in dust control, they have certain limitations.
In which of the introductory sentences below do we find reference to previous solutions?

1. “Given that mechanized coal mining has become increasingly popular in recent years, coal dust has become a significant problem in underground mines, causing safety hazards in coal production. According to the statistics released by the Ministry of Health of China, more than 300,000 coal miners suffered from pneumoconiosis by the end of 2007, accounting for 50% of the total number of pneumoconiosis patients in China. On average, 2500 Chinese miners die from pneumoconiosis every year.”

2. A number of methods have been widely adopted in controlling coal dust concentrations. The most popular technologies are ventilation, water spraying, water infusion, water/wetting agent spraying, and dust collection using fans. (9–12)

3. Although these technologies play an important role in dust control, they have certain limitations.”
Reading for Previous Solutions in Our Oceanography Article, “Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
In which of the introductory sentences below do we find a reference to previous solutions?

1. “Recently, a Bayesian hierarchical space-Eme model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean.”

2. “In Vanem et al. (2012a) the initial model is presented and a revised model with a logarithmic transformation of the data is presented in Vanem et al. (2012b).”

3. “Furthermore, it is demonstrated in Vanem and Bitner-Gregersen (2012) how estimated trends and future projections can be taken into account in calculations of ship structural loads and responses and it was suggested that these trends are not negligible.”
In which of the introductory sentences below do we find a reference to previous solutions?

1. “Recently, a Bayesian hierarchical space-Eme model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean.

2. In Vanem et al. (2012a) the initial model is presented and a revised model with a logarithmic transformation of the data is presented in Vanem et al. (2012b)....

3. Furthermore, it is demonstrated in Vanem and Bitner-Gregersen (2012) how estimated trends and future projections can be taken into account in calculations of ship structural loads and responses and it was suggested that these trends are not negligible.”
Reading for Limitations of Previous Solutions
also known as the Research Gap
How to Read for the Limitations of Previous Solutions

- If previous solutions to the research problem (broadly defined) were sufficient, there would be no justification for the current research.
Reading for Limitations of Previous Solutions in Our Engineering Article,

“A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control”
In which of the introductory sentences below do we find reference to the limitations of previous solutions?

1. According to the statistics released by the Ministry of Health of China, more than 300,000 coal miners suffered from pneumoconiosis by the end of 2007, accounting for 50% of the total number of pneumoconiosis patients in China."

2. A number of methods have been widely adopted in controlling coal dust concentrations. The most popular technologies are ventilation, water spraying, water infusion, water/wetting agent spraying, and dust collection using fans.

3. Although these technologies play an important role in dust control, they have certain limitations. For instance, water infusion requires complicated equipment and a considerable amount of water. Water spray nozzles are easily blocked, thereby reducing the dust precipitation rate. Dust collection fans have an equipment structure that is complicated....
In which of the introductory sentences below do we find reference to the limitations of previous solutions?

1. According to the statistics released by the Ministry of Health of China, more than 300,000 coal miners suffered from pneumoconiosis by the end of 2007, accounting for 50% of the total number of pneumoconiosis patients in China.

2. A number of methods have been widely adopted in controlling coal dust concentrations. The most popular technologies are ventilation, water spraying, water infusion, water/waterfing agent spraying, and dust collection using fans.

3. Although these technologies play an important role in dust control, they have certain limitations. For instance, water infusion requires complicated equipment and a considerable amount of water. Water spray nozzles are easily blocked, thereby reducing the dust precipitation ratio. Dust collection fans have an equipment structure that is complicated....
Reading for Limitations of Previous Solutions in Our Oceanography Article,

“Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
In which of the introductory sentences below do we find a reference to limitations of previous solutions?

1. Recently, a Bayesian hierarchical space-Eme model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean.

2. In Vanem et al. (2012a) the initial model is presented and a revised model with a logarithmic transformation of the data is presented in Vanem et al. (2012b).

3. Furthermore, it is demonstrated in Vanem and Bitner-Gregersen (2012) how estimated trends and future projections can be taken into account in calculations of ship structural loads and responses and it was suggested that these trends are not negligible.

4. However, all previous results pertain to a specific area in the North Atlantic ocean.
In which of the introductory sentences below do we find a reference to limitations of previous solutions?

1. Recently, a Bayesian hierarchical space-Eme model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean.

2. In Vanem et al. (2012a) the initial model is presented and a revised model with a logarithmic transformation of the data is presented in Vanem et al. (2012b).

3. Furthermore, it is demonstrated in Vanem and Bitner-Gregersen (2012) how estimated trends and future projections can be taken into account in calculations of ship structural loads and responses and it was suggested that these trends are not negligible.

4. However, all previous results pertain to a specific area in the North Atlantic ocean.
Reading for LimitaEons of Previous SoluEons in our sample psychology arEcle,

“Extreme re-listening: Songs people love ... and conEnue to love”
In which of the introductory sentences below do we find reference to the limitations of previous solutions?

1. Jakobovits (1966) demonstrated that songs played frequently on the radio and on jukeboxes in the 1960s (the ‘Hit Parade’) grew in popularity until a critical point when this growth reversed despite continued exposure. He suggests that such “exposure saturation” produces semantic satiation—an inhibition in neural response due to rapid, repeated firing of neurons in response to repeated presentation of a stimulus.

2. So how is it that someone like Karle Arnold-Ratliff (2012) can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? Jakobovits (1966) predicted just the opposite.

3. What might account for the difference in her experience from that of listeners contributing to the Hit Parade in the 1960s? Is Arnold-Ratliff’s experience an extreme case or an example of a different phenomenon than Jakobovits examined?
In which of the introductory sentences below do we find reference to the limitations of previous solutions?

1. Jakobovits (1966) demonstrated that songs played frequently on the radio and on jukeboxes in the 1960s (the ‘Hit Parade’) grew in popularity until a critical point when this growth reversed despite continued exposure. He suggests that such “exposure saturation” produces semantic satiation—an inhibition in neural response due to rapid, repeated firing of neurons in response to repeated presentation of a stimulus.

2. So how is it that someone like KaEe Arnold-Ratliff (2012) can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? Jakobovits (1966) predicted just the opposite....

3. What might account for the difference in her experience from that of listeners contributing to the Hit Parade in the 1960s? Is Arnold-Ratliff’s experience an extreme case or an example of a different phenomenon than Jakobovits examined?
To sum up, the limitations of previous solutions may include (but are by no means limited to):

- **Practical limitations** of previous solutions (in this case, dust-reduction technologies)
- **Limitations in scope** (in this case, geographical scope) of previous solutions
- Inability of previous solutions to account for a **new phenomenon** (in this case, extreme re-listening)
- **What are typical research gaps in your own discipline?**
Reading for How the (Possibly Redefined) Problem Will Be Solved

also known as Methods, Materials
Reading for How the Problem Will Be Solved in Our Oceanography Article,

“Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
In which of the sentences below do we find a description of how the problem will be solved?

1. Recently, a Bayesian hierarchical space-Eme model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean. In Vanem et al. (2012a) the initial model is presented and a revised model with a logarithmic transformation of the data is presented in Vanem et al. (2012b)....

2. However, all previous results pertain to a specific area in the North Atlantic ocean, and in this paper, it will be investigated how the model performs on 11 alternative areas of the world's oceans.Estimated long-term trends and future projections towards the year 2100, obtained by the ... model, will be presented for the following ocean areas:
In which of the sentences below do we find a description of how the problem will be solved?

1. Recently, a Bayesian hierarchical space-Eme model was developed to investigate long-term trends and make future projections of the ocean wave climate for an area in the North Atlantic ocean. In Vanem et al. (2012a) the initial model is presented and a revised model with a logarithmic transformation of the data is presented in Vanem et al. (2012b)....

2. However, all previous results pertain to a specific area in the North Atlantic ocean, and in this paper, it will be investigated how the model performs on 11 alternative areas of the world's oceans.

3. Estimated long-term trends and future projections towards the year 2100, obtained by the ... model, will be presented for the following [11] ocean areas:”
Reading for How the Problem Will Be Solved in Our Engineering Article,

“A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control”
In which of the sentences below do we find a description of how the problem will be solved?

1. “Water infusion requires complicated equipment and a considerable amount of water. Water spray nozzles are easily blocked, thereby reducing the dust precipitation range. Dust collection fans have an equipment structure that is complicated. These devices also require substantial wind power, but the environment in underground coal mines constrains the use of such equipment.

2. To overcome the limitations of traditional methods, the authors developed a foam technology to effectively control coal dust levels.

3. Practical application showed that airborne coal dust was efficiently controlled by foam technology; therefore, the proposed technology presents promising application prospects in the coal mining industry.
In which of the sentences below do we find a description of how the problem will be solved?

1. “Water infusion requires complicated equipment and a considerable amount of water. Water spray nozzles are easily blocked, thereby reducing the dust precipitaEon raEo. Dust collecEng fans have an equipment structure that is complicated. These devices also require substanEal wind power, but the environment in underground coal mines constrains the use of such equipment.

2. To overcome the limitaEons of tradiEonal methods, the authors developed a foam technology to effecEvely control coal dust levels.

3. PracEcal applicaEon showed that airborne coal dust was efficiently controlled by foam technology; therefore, the proposed technology presents promising applicaEon prospects in the coal mining industry.
Reading for How the (Newly Defined) Problem Will Be Solved in our sample Psychology article,

“Extreme re-listening: Songs people love ... and continue to love”
1. So how is it that someone like KaEe Arnold-Ratliff (2012) can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? What might account for the difference in her experience from that of listeners contributing to the Hit Parade in the 1960s? Is Arnold-Ratliff’s experience an extreme case or an example of a different phenomenon than Jakobovits examined?

2. One possibility is that, unlike most radio listeners in the 1960s, most listeners today, including Arnold-Ratliff, have access to their favorite songs at all times ... affording them the time to become deeply acquainted with and connected to such songs....

3. The main question we focus on is how listeners can intentionally listen to the same song over and over, without losing interest. To this end, we examine the behaviors and emotional states that accompany extreme re-listening, primarily through self-reports in response to questions in a survey.
In which of the sentences below do we find a description of how the problem will be solved?

1. “So how is it that someone like KaEe Arnold-Ratliff can listen to a song more than 400 times and still not get bored, as she describes in the epigraph? What might account for the difference in her experience from that of listeners contributing to the Hit Parade in the 1960s? Is Arnold-Ratliff’s experience an extreme case or an example of a different phenomenon than Jakobovits examined?”

2. “One possibility is that, unlike most radio listeners in the 1960s, most listeners today, including Arnold-Ratliff, have access to their favorite songs at all times … affording them the time to become deeply acquainted with and connected to such songs.”

3. “The main question we focus on is how listeners can intentionally listen to the same song over and over, without losing interest.”

4. “To this end, we examine the behaviors and emotional states that accompany extreme re-listening, primarily through self-reports in response to questions in a survey.”
Reading for the Solution
How to Read for the Solution

• Look for a sentence in the results section or the conclusion that clearly articulates the solution to the research problem you identified earlier, and which expresses (in the sentence itself or nearby) the value of that solution in terms of the importance of the problem it solves and its filling of the research gap.
Reading for the Solution in our sample psychology article,

“Extreme re-listening: Songs people love ... and continue to love”
In which of the sentences below do we find a clear articulation of the solution to the research problem?

1. “People’s relationships with their favorite songs seem to be individualized and idiosyncratic, in contrast to the mass popularity of hit songs investigated by Jakobovits (1966). In the current study, it is likely that listeners’ initial exposure was more serendipitous (…only about 6% of the 189 unique songs were in the music charts at the end of the study) and their continued exposure was more deliberate, i.e., listeners chose when to expose themselves to the particular song that was their favorite…. This individualized listening experience is an example of what Anderson (2009) calls the ‘long tail,’ i.e., the transition in the digital era from a small no. of hits (determined by industry “taste makers”) to a vast no. of niches (each driven by a small no. of individuals).”

2. “Niche listening may enable listeners to develop the kind of personally meaningful relationships with particular songs that allows their affection for those songs to persist across very large amounts of exposure.”
“People’s relationships with their favorite songs seem to be individualized and idiosyncratic, in contrast to the mass popularity of hit songs investigated by Jakobovits (1966). In the current study, it is likely that listeners’ initial exposure was more serendipitous (only about 6% of the 189 unique songs were in the music charts at the end of the study) and their continued exposure was more deliberate, i.e., listeners chose when to expose themselves to the particular song that was their favorite. This individualized listening experience is an example of what Anderson (2009) calls the ‘long tail,’ i.e., the transition in the digital era from a small no. of hits (determined by industry “taste makers”) to a vast no. of niches (each driven by a small no. of individuals). Niche listening may enable listeners to develop the kind of personally meaningful relationships with particular songs that allows their affection for those songs to persist across very large amounts of exposure.”
Reading for the (Efficacy of the) Solution to the Research Problem in Our Engineering Article, “A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control”
In which of the sentences below do we find a clear articulation of the solution to the research problem?

1. This was the first time that dust control foam technology was applied in an underground coal mine.
2. In return-airway of the workface, three measuring points were set near the fully mechanized coal mining machine. A digital conimeter was used to measure the dust in air when using the foam and spray technology.
3. Figures 12 and 13 show the contrast-Eve histogram of the dust control efficiency levels for total dust and respirable dust, respectively, after the adoption of foam and spray technology.
4. The efficiency levels of foam technology for total dust and respirable dust were 2.11 and 1.72 times, respectively, that achieved with water spraying. The application of the dust control foam technology effectively reduced dust concentration at the mechanized workface. Indicating promising implications for the health and safety of the miners.
In which of the sentences below do we find a clear explanation of the solution to the research problem?

1. This was the first time that dust control foam technology was applied in an underground coal mine.  
2. In return-airway of the workface, three measuring points were set near the fully mechanized coal mining machine. [A] digital conimeter was used to measure the dust in air when using the foam and spray technology....  
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Reading for the Solution in Our Oceanography Article,

“Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
1. “According to the results obtained ... most of the investigated areas, except perhaps two, are expected to experience a trend towards rougher ocean wave climate towards 2100 ....

2. Qualitatively, the fact that the ocean wave climate is expected to be rougher is in agreement with many previous studies on future wave climate changes, but there is great uncertainty as to how large future changes will be.

3. Nevertheless, it is believed that the results presented herein, especially future trends in the wave climate pertaining to several ocean areas around the globe ... is an important contribution ... in this important area, with important implications for maritime and coastal safety.”
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Reading for the Solution's Limitations

a.k.a. Research Limitations
How to Read for the Solution’s Limitations

• Usually found in the Results or Analysis section

• It’s a statement that acknowledges some weakness in an aspect of the research—essentially, an anEception of readers’ possible objections to the validity of its conclusions. An anEception, in other words, of its own “research gap.”

• Like all anEceptions of readers’ possible objections, it is a rhetorical device meant to make an argument more persuasive.
Reading for the Solution’s Limitations in Our Oceanography Article,

“Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
In which of the sentences below do we find an acknowledgment of the solution's limitations?

1. “The model presented in this paper, uses the stochastic relationship between level of CO2 in the atmosphere and significant wave height.

2. It is acknowledged that this is a simplification, and that there are several mechanisms in between that has [sic] not been modelled directly. For example, ocean waves are generated by winds (Janssen and Viterbo 1996), which are again results of air pressure gradients.

3. A more refined model could include several levels of explanatory variables, including wind fields and fields of sea level pressures as well as other meteorological variables. This has not been tried out to date, and remain possible alternatives for model extension [sic].
In which of the sentences below do we find an acknowledgment of the solution’s limitations?

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Reading for the Solution’s Limitations in Our Engineering Article,

“A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control”
No limitations are acknowledged in our sample Engineering article.

It is difficult to say whether this absence is common in Engineering research articles, but it may reflect the relatively greater control engineers have over research parameters.
Reading for the Solution's Limitations in our sample psychology article, "Extreme re-listening: Songs people love ... and continue to love"
In which of the sentences (or phrases) below do we find an acknowledgment of the solution's limitations?

1. “Pop songs are generally easy to listen to for the first time, and as Frith (2007) says, pop music “is designed to appeal to everyone” (p. 169), but we propose that unless they reveal new features and layers and take on new meaning with repeated listening, listeners will eventually lose interest consistent with the Hit Parade trajectory observed by Jakobovits (1966).

2. Consider the experience of this listener in the current study: “The song Ette is, Royals, by Lorde. As soon as I heard it, I liked it. At the first time the song had a more alternative feel to it. But now, I hear it all the time on the radio and it does not have the appeal it did when I first heard it.”

3. The evolution of listeners’ emotional reaction to songs they love deserves additional research, likely conducted longitudinally rather than through the cross-sectional approach used in the current study.
In which of the sentences (or phrases) below do we find an acknowledgment the solution’s limitations?

1. “Pop songs are generally easy to listen to for the first time, and as Frith (2007) says, pop music “is designed to appeal to everyone” (p. 169), but we propose that unless they reveal new features and layers and take on new meaning with repeated listening, listeners will eventually lose interest consistent with the Hit Parade trajectory observed by Jakobovits (1966).

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Reading for Suggestions for Further Research
How (and Why) to Read for SuggesEons for Further Research

• The suggesEons for further research o_en follow immediately on acknowledgment of the soluEon’s (i.e., the research’s) limitaEons.

• If you’re in a discipline where you get to choose (and therefore have to find) your research problem, suggesEons for further research are a good place to look.
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2. Consider the experience of this listener in the current study: “The song Etle is, Royals, by Lorde. As soon as I heard it, I liked it. At the time the song had a more alternative feel to it. But now, I hear it all the time on the radio and does not have the appeal it did when I first heard it.”

3. The evolution of listeners’ emotional reaction to songs they love deserves additional research, likely conducted longitudinally rather than through the cross-sectional approach used in the current study.
Another suggestion for further research

1. “Kivey (1990) argues that a song can create feelings in listeners that are simultaneously mournful (negaEve) and moving (posiEve). Some listeners in the current study arEculated this kind of experience, e.g., “It makes me feel emoEonal, with mixed feelings, beauty and biMersweet at the same Eme.” And other listeners seem to directly experience different feelings on different listening occasions: “The song makes me happy someEmes, but sad other Emes.”

2. It’s possible that some listeners experience mixed emoEons directly from the musical sEmulus while for others the different emoEons have disEnct origins. Our data – open responses, provided retrospectively – cannot definiEvely address this.

3. Follow-up research with real-Eme measures may shed light on this issue.
Another suggestion for further research

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Reading for Suggestions for Further Research in Our Engineering Article,

“A New Method for Reducing the Prevalence of Pneumoconiosis Among Coal Miners: Foam Technology for Dust Control ”
No suggestions for further research are offered in our sample Engineering article.

Given the frequent connection between acknowledged research limitations and suggestions for further research, this absence is perhaps not surprising.
Reading for Suggestions for Further Research in Our Oceanography Article,

“Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans”
In which of the sentences below do we find a suggestion for further research?

1. "The model presented in this paper, uses the stochastic relationship between level of CO2 in the atmosphere and significant wave height.

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<tr>
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<td>A New Method for ... Among Coal Miners: Foam Technology for Dust Control. Xing W. Ren et al.</td>
<td>Popularity of mechanized coal production has led to hazardous levels of coal dust in mines</td>
<td>High number of Chinese coal miners die of pneumoconiosis annually.</td>
<td>Water spraying, water infusion, dust collection using fans</td>
<td>Spray nozzles easily blocked, infusion requires a lot of water, fans require complicated equipment</td>
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<td>Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans. Vanem, Natvig, et al.</td>
<td>How will climate change affect future ocean-wave climate?</td>
<td>MariEme safety. Ships and other coastal structures may not be designed to withstand future ocean-wave climate.</td>
<td>A Bayesian hierarchical space-Eme model projected ocean wave climate in an area of the North Atlantic Ocean</td>
<td>Previous results pertain only to the one area in the North Atlantic Ocean.</td>
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<td>Extreme re-listening: Songs people love... and continue to love. Conrad, Corey, et al.</td>
<td>Unexplained phenomenon: “extreme re-listening enjoyable despite lack of surprise (implied) Study of human psychological phenomena inherently worthwhile</td>
<td>Jakobovits (1966) studied repeat listening to ‘Hit Parade’. Found increasing enjoyment, then decline due to ‘semantic senseEaEon.’</td>
<td>Jakobovits’ theory can’t explain continued enjoyment in ‘extreme re-listening’. He predicts the opposite effect.</td>
<td>Examine behaviors and emo-Enal states that accompany extreme re-listening thru self-reports in response to</td>
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<td>No limitations acknowledged.</td>
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<td>Modelling the Effect of Climate Change on the Wave Climate of the World’s Oceans. Vanem, Natvig, et al.</td>
<td>9 of 11 investigated ocean areas will experience rougher wave climate as a result of climate change</td>
<td>Model’s stochastic relationship between CO2 and wave height is simplified. Other mechanisms in between</td>
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<td>“niche listening” in digital era allows for personal relationship</td>
<td>Cross-sectional approach can’t capture the evolution of listeners’ emotional reactions</td>
<td>The evolution of listeners’ emotional reactions to songs</td>
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Questions?
Thanks for Joining Us!
Works Cited

Conrad, F., Corey, J., Goldstein, S., Ostrow, J. & Sadowsky, M. Extreme re-listening: Songs people love ... and continue to love. Psychology of Music 47.2, 158-172 (2019).

