Developing the public intellectual
What are the risks & rewards of public engagement?
1. Self-driving cars will make urban transportation faster, cheaper, and safer.

2. Self-driving cars are still not perfect at telling where other cars and humans are.

3. Deep learning allows the car to teach itself how to figure out what’s around it.

Now what?
Are we satisfied with the outcome?
Unless we communicate strategically, we risk throwing away our shot at impact.
Unless we set explicit goals, we risk throwing away our shot at impact.
Which points you include depends on your goal

**Default**
- Self-driving cars will make urban transportation faster, cheaper, and safer.
- Self-driving cars are still not perfect at telling where other cars and humans are.
- Deep learning allows the car to teach itself how to figure out what’s around it.

**Influence public sentiment**
- Self-driving cars will make urban transportation faster, cheaper, and safer.
- Self-driving technology is already safer than humans.
- Self-driving cars will drastically improve mobility for the elderly and disabled.

**Advocate for public policy**
- Regulatory systems are not ready for self-driving cars.
- We should prepare for massive economic effects of self-driving vehicles.
Which points you include depends on your goal

**Influence public sentiment**
- Self-driving cars will make urban transportation faster, cheaper, and safer.
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**Advocate for public policy**
- Regulatory systems are not ready for self-driving cars.
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**Entertain**
- The software can be confused by silly things like stop signs on school buses.
- The car pulls together information from lasers, radar, and cameras to build a 3D model of the world.
Every time we communicate, we are trying to make a change in our audience.
what you say

are determined by your context

is determined by your goals
What can we find out about the audience?

- What influence do they have?
- What industries are represented?
- How well do these people know each other?
- How does existing public transit support mobility?
- Will there be interest group representatives there?
- What measures have the city/state already passed?
- What professional backgrounds do they come from?
what you say

are determined by your context

is determined by your goals
What are your overarching goals?
You could have many goals

**Advocacy**
- Give context for current events
- Influence public sentiment
- Advocate for policy change
- Show how science affects them

**Recreational learning**
- Inspire awe/wonder
- Entertain / support lifelong learners

**Self-interest**
- Make yourself better-known
- Get your work adopted
- Raise funding
- Invite citizen contributions

**Science education**
- Support formal education
- Make little baby scientists
Determine context & goals

Target your efforts by choosing explicit goals
Research your context and audience
Audience and goals inform each other
1. Determine context & goals
2. Identify the big picture
3. Guide them through the details
4. Practice
2. **Identify** the big picture
Start with the *constellation*
Start with the constellation then point out the stars
Start with the **big picture** then fill in the **details**
Causal relations represent a significant fraction of the intermediate-level semantics of a text. I am defining an annotation scheme for the explicit causal relations in a text, including such metadata as the polarity and the type of causation (motivation, consequence, etc). The triggers in the scheme can be arbitrary constructional realizations of causation, including argument realization structures, discourse relations, and idiomatic constructions.

I am working with annotators to build an annotated newswire corpus using this scheme. I am also building a tagger that will be trained and evaluated on this corpus. The system combines random forests with learned TRegex patterns over dependency parses to identify and classify unseen instances of causal relations.
It’s hard to identify the big picture.
Your audience needs the big picture to follow along
Argentina played another great game last night against Brazil — the last game in Group C. In the first half, Brazil maintained the majority of the possession, but got few clear looks on the goal.

With under 5 minutes to half-time, a long ball was sent towards the Brazilian center back, who misplayed the ball. As the ball skipped behind him, the Argentinian center forward was able to gather it for a 1v1 with the keeper. The result was a 1-0 lead for the Argentina.

In the second half, Brazil struggled to keep possession of the ball. The Argentinian midfielders were able to stop any clear looks, preserving the shutout and advancing their team to the knockout stages.
Focus on the meaning behind the details

“Argentina played the last game in Group C.”

This was the decisive game

“Brazil maintained the majority of the possession…”

Brazil seemed to be in control

“the Argentinian center forward was able to gather it for a 1v1 with the keeper.”

Argentina took a risk that paid off
The big picture is a compelling story.
This was the decisive game in qualifying rounds, a tense encounter between Argentina and Brazil. For the first half of the game, Brazil seemed to be running the show. But halfway through, an Argentinian player took a bold risk that paid off, and his team pulled into the lead. The Argentinians then kept up their own defenses, and ultimately won the game!
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Elements of a compelling story

Clear stakes
Difficult obstacles
Exciting solution
Outcome
obstacles resolved
Identify the big picture

Focus on the meaning behind the details

Research can be a story
Research can fit into a storytelling template

Clear stakes

Difficult obstacles

Exciting solution

Outcome

obstacles resolved
Research can fit into a storytelling template

<table>
<thead>
<tr>
<th>Clear stakes</th>
<th>Problem you’re trying to solve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult obstacles</td>
<td>Why it’s difficult</td>
</tr>
<tr>
<td>Exciting solution</td>
<td>Your approach</td>
</tr>
<tr>
<td>Outcome</td>
<td>Results (so far)</td>
</tr>
<tr>
<td>obstacles resolved</td>
<td></td>
</tr>
</tbody>
</table>
It would take you 20 years to read the articles we publish online every day. The only way we’ll be able to harness this information overload is if our computers can help us extract the key information — but even state-of-the-art software can interpret only the simplest English statements. As a first step toward more sophisticated interpretation, I’m building a system to extract one of the most common and useful types of information: statements about cause and effect (e.g., “smoking leads to cancer”). To teach the system what such expressions look like, I am first building a collection of documents in which humans have manually flagged and analyzed cause-and-effect language. From these documents, the system will learn to extract different kinds of cause-and-effect language, ultimately allowing us to see at a glance the key arguments being made.
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Identify the big picture

Focus on the meaning behind the details

Research can be a story

Start with what’s at stake
Start with what’s at stake

What’s the problem?
Why do you care?
[Goal], but [obstacle]
Negative space
Start with what’s at stake

[Goal], but [obstacle]

is a series of parallel sentences to connect your work into a big picture problem

We want [Goal], but [obstacle]. Solving the obstacle becomes the new goal

We want to [solve obstacle], but [more detailed obstacle].
People didn’t know how to feed a growing population.
We couldn’t grow enough food because plants need nitrogen.
There’s plenty of nitrogen in the air, but not in a usable form.
It’s not usable because nitrogen clings tightly to itself.
But Haber figured out how to move nitrogen to ammonia.
That discovery allowed the world to have 7 billion people.
Killing cancer cells usually hurts the surrounding tissue. Specifically targeting cancer cells is hard because cancer cells disguise their immune receptors. Previous attempts to inject new T-cells have failed because they are too short-lived. Here we report a new method to add persistent T-cells. This resulted in delayed development of leukemia tumors.

Porter 2011, NEJM

Repeat until you reach your exciting solution
Finally, connect the results to resolving the original obstacle
Where you start in this chain depends on the audience
Start with what’s at stake

What’s the problem?
Why do you care?
[Goal], but [obstacle]
Negative space
Calibrate based on your context

Your team
Colleagues
Funding agencies
8th grade
US Senate
My mom

What

So What
2% paint
98% propellant
Identify the big picture

Focus on the meaning behind the details

Research can be a story

Start with what’s at stake
3. Guide them through the details
What works?
What doesn’t work?

Zemedia: https://www.youtube.com/watch?v=wLFztjQDdzI
Art of the Problem: https://www.youtube.com/watch?v=3QnD2c4Xovk
Guide them through the details

Build from familiar to unfamiliar
Use audience-appropriate language
No information without motivation
Signpost your structure
Determine context & goals

Target your efforts by choosing explicit goals
Research your context and audience
Context and goals inform each other

Sketch the big picture
Guide them through the details
Determine context & goals

Sketch the big picture
Focus on the meaning behind the details
Research can be a story
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Determine context & goals
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Signpost your structure
1. Determine context & goals
2. Sketch the big picture
3. Guide them through the details
4. Practice
This content was developed by Public Communication for Researchers

Jesse Dunietz  Ardon Shorr  Adona Iosif  Kelly Matula

pcr-exec@lists.andrew.cmu.edu
http://www.cmu.edu/student-org/pcr
Developing the public intellectual