Salience and Predictability: attention, accessibility and surprisal

Vera Demberg and Alessandra Zarcone

Universität des Saarlandes
- WS 2015/2016 -

October 23, 2015
Outline

1 Salience and Predictability

2 Administrative remarks

3 How to give a good talk
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2 Administrative remarks

3 How to give a good talk
Surprisal Theory [Hale, 2001, Levy, 2008]
information-theoretic notions to account for behavioral correlates of cognitive load (RTs, eye gaze, N400)
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Information-theoretic notions to account for behavioral correlates of cognitive load (RTs, eye gaze, N400)

\[ \text{Effort}(w) \propto \text{Surprisal}(w) = -\log_2 P(w|\text{context}) \]

- Cognitive effort proportional to amount of information
- Highly predictable input conveys little information
- We predict upcoming input, react to unexpected stimuli
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Information-theoretic notions to account for behavioral correlates of cognitive load (RTs, eye gaze, N400)

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But do we focus on all stimuli in the same way?
Our perceptual experience is "an embarrassment of riches"
Our brain has to filter out the relevant information
Attention guides us, easing the processing burden

[Wolfe and Horowitz, 2004]
What is salience?

Salience is the degree to which a perceptual stimulus (e.g. visual, auditory) is likely to attract attention [Awh et al., 2012] determined by the intrinsic properties of the stimulus and/or its relation with context/background.

Do we need a separate notion of salience in an information-theoretic account of comprehension?
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Do we need a separate notion of salience in an information-theoretic account of comprehension?
Salience and Predictability

Salience accounts
▶ current accessibility of mental representations
▶ attention, goal, task, situation model

Predictions:
▶ attention-evoking stimuli → high accessibility
▶ high accessibility → low cognitive load

Predictability accounts
▶ comprehender's expectations about what will follow next
▶ transitional probability, information content of input

Predictions:
▶ high predictability → low information
▶ low predictability → high cognitive load

Research questions:
▶ Can salience effects be reduced to surprisal effects?
▶ Can we distinguish between the predictions of the two accounts?
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1. A 20-30 min **presentation**, strict time limit
   (30 min if you are the only person presenting on that day);
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Attendance: You can miss ONE meeting without giving an explanation; if you miss more, you have to hand in a critical review for the discussed paper(s).

Grading: We will weigh all parts equally.
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Presenting a paper

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- Before deciding, please don’t just read the title, but read the abstract and take a detailed look at the paper!!!
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- Please send us an email with your 2-3 preferred papers you’d like to work on by FRIDAY next week (Oct 30)
- We will do an assignment of papers and weeks by next Monday (Nov 2nd) and let you know by email
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- You are welcome to suggest other papers than the ones listed (please send us your suggestions by email)
(1) Presenting a paper

You need to:

▶ present the paper accurately
▶ choose what parts of the paper to focus on
▶ analyse the paper critically and relate it to the seminar topics
▶ prepare discussion topics

You can make an appointment with us for feedback on slides at least one week prior to the presentation date:

vera at coli.uni-saarland.de
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(2-3) Summary, questions and discussion

- The **speaker** is expected to prepare discussion topics.
- The **class** is expected to email a summary and two questions by **Thursday evening** before the course.
- Each presentation will be paired with a **discussion chair**, who should bring up two problematic aspects of the paper.
(4) Peer feedback

Why peer feedback?

If you provide feedback:

▶ you make you more observant of the others' talks
▶ you learn more from the others' talks

If you get feedback:

▶ you get detailed feedback on your talk
▶ you learn what aspects are important

In the peer feedback process you are expected to

▶ give thoughtful and constructive comments
▶ highlight positive and negative aspects of the presentation

Both speakers and reviewers should keep in mind how to give a good talk.
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How to give a good talk

1. Content
2. Structure and use of your time
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2. Structure and use of your time
3. Style of audio-visual aids (slides)
4. Style of language
How to give a good talk

1. Content
2. Structure and use of your time
3. Style of audio-visual aids (slides)
4. Style of language
5. On stage: speaking style and body language
6. Discussion
(1) Content

- Be sure you understand the material
- Highlight the important points
- Give a good overview of the topic

Motivation: why is the problem you are solving important?

- Make the audience “feel the pain”
- Get them engaged (why should they care?)
- Make them think

I can’t believe this hasn’t been done before!

Common mistake:

- Too many technical details, not enough motivation
(1) Content

Clarity

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(2) Structure and use of your time

Structure: what story are you telling?
▶ who's the main character?
▶ where are the problems (the bad guys)?
▶ where are the solutions (the heroes)?
▶ how do the different parts relate to one another?
▶ what's the take-home message?

Common mistakes:
▶ not structuring the talk
▶ presenting too much stuff
▶ poor time management

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(3) Style of language

The slides should help the audience, not distract them

▶ be coherent with your color scheme
▶ make sensible use of boldface
▶ not too much text, not too little
▶ wise use of examples, images, tables and graphs
▶ be sure the font is not too small

Common mistakes:
▶ too many words
▶ too many bullet-point lists
▶ full sentences
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I used to hate writing assignments, but now I enjoy them.

I realized that the purpose of writing is to inflate weak ideas, obscure poor reasoning, and inhibit clarity.

With a little practice, writing can be an intimidating and impenetrable fog! Want to see my book report?

"The dynamics of interbeing and monological imperatives in Dick and Jane: A study in psychic transrelational gender modes."

Academia, here I come!
(5) On stage: speaking style and body language

- be confident
- keep a consistent pace
- use your voice to highlight important points
- make sure everyone can hear you
- don’t turn your back to the audience or obscure the screen
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<td>even if s/he gives lousy talks</td>
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- bringing up interesting issues
- actively leading discussion
- prepare interesting questions
- set the scope and topic of discussion
- encourage arguments, not opinions
Timeline

week 1  assignment of topics and discussion chairs
        send us your preferred papers by Oct 30th
week 2  no seminar
week 3  reading group
        topic: Surprise, Itti & Baldi (2009)
week 4  presentation
week 5  presentation
        topic: Attentional deployment
week 6  presentation
        topic: Acquisition / learning
week 7+ more topic-related presentations by students
Don’t forget

**as soon as possible** register to the mailing list:
http://ml.coli.uni-saarland.de/cgi-bin/mailman/listinfo/salience

by **Oct 30** send us our paper suggestions

by every **Thursday evening** read the assigned paper(s) and send us a summary and two questions the discussion chair should prepare
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Before your presentation

2-3 weeks before start reading the paper, check if you haven’t understood
something, prepare your slides (it takes time!)

one week before you can get feedback on the slides
(send the slides before the meeting)
practice your presentation
Seminar BINGO!

To play, simply print out this bingo sheet and attend a departmental seminar.

Mark over each square that occurs throughout the course of the lecture.

The first one to form a straight line (or all four corners) must yell out BINGO!! to win!

<table>
<thead>
<tr>
<th>Speaker bashes previous work</th>
<th>Repeated use of &quot;um...&quot;</th>
<th>Speaker sucks up to host professor</th>
<th>Host Professor falls asleep</th>
<th>Speaker wastes 5 minutes explaining outline</th>
</tr>
</thead>
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<tr>
<td>Laptop malfunction</td>
<td>Work ties in to Cancer/HIV or War on Terror</td>
<td>&quot;... et al.&quot;</td>
<td>You're the only one in your lab that bothered to show up</td>
<td>Blatant typo</td>
</tr>
<tr>
<td>Entire slide filled with equations</td>
<td>&quot;The data clearly shows...&quot;</td>
<td>FREE Speaker runs out of time</td>
<td>Use of Powerpoint template with blue background</td>
<td>References Advisor (past or present)</td>
</tr>
<tr>
<td>There's a Grad Student wearing same clothes as yesterday</td>
<td>Bitter Post-doc asks question</td>
<td>&quot;That's an interesting question&quot;</td>
<td>&quot;Beyond the scope of this work&quot;</td>
<td>Master's student bobs head fighting sleep</td>
</tr>
<tr>
<td>Speaker forgets to thank collaborators</td>
<td>Cell phone goes off</td>
<td>You've no idea what's going on</td>
<td>&quot;Future work will...&quot;</td>
<td>Results conveniently show improvement</td>
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Jorge Cham © 2007

www.phdcomics.com

