

Learning from Videos in Open Online Education

Tim van der Zee

Email: t.van.der.zee@iclon.leidenuniv.nl

Twitter: [@Research_Tim](https://twitter.com/Research_Tim)

Website & Blog: www.timvanderzee.com



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Leiden**

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Start 01/09

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WEEK 1

Video: Introduction

It's not too late—finish up the week and then give your next assessment a try.

7 min

Resume

WEEK 1

Estimated time: 2h 12m



Introduction + Frequentist Statistics

Videos		26 min left
Readings		44 min left
Practice Exercises		32 min left

REQUIRED

GRADE

DUE

-  Quiz
Exam Week 1
30 min

Jan 15

WEEK 2

Estimated time: 3h 32m



Likelihoods & Bayesian Statistics

Videos		50 min left
Readings		1h 12m left
Practice Exercises		1h left

REQUIRED

GRADE

DUE

-  Quiz
Exam Week 2
30 min

Jan 22

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Jan 22

Videos in online education

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- Videos typically are the core content

(Guo, Kim, & Rubin, 2014; Liu et al., 2013)

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Videos in online education

- Videos typically are the core content

(Guo, Kim, & Rubin, 2014; Liu et al., 2013)

- Students plan to watch all of the videos

(Campbell, Gibbs, Najafi, & Severinski, 2014)

- Students spend most of their time watching videos

(Seaton, Bergner, Chuang, Mitros, & Pritchard, 2014)

Learning from videos

1. Video characteristics
2. Student characteristics
3. Context characteristics

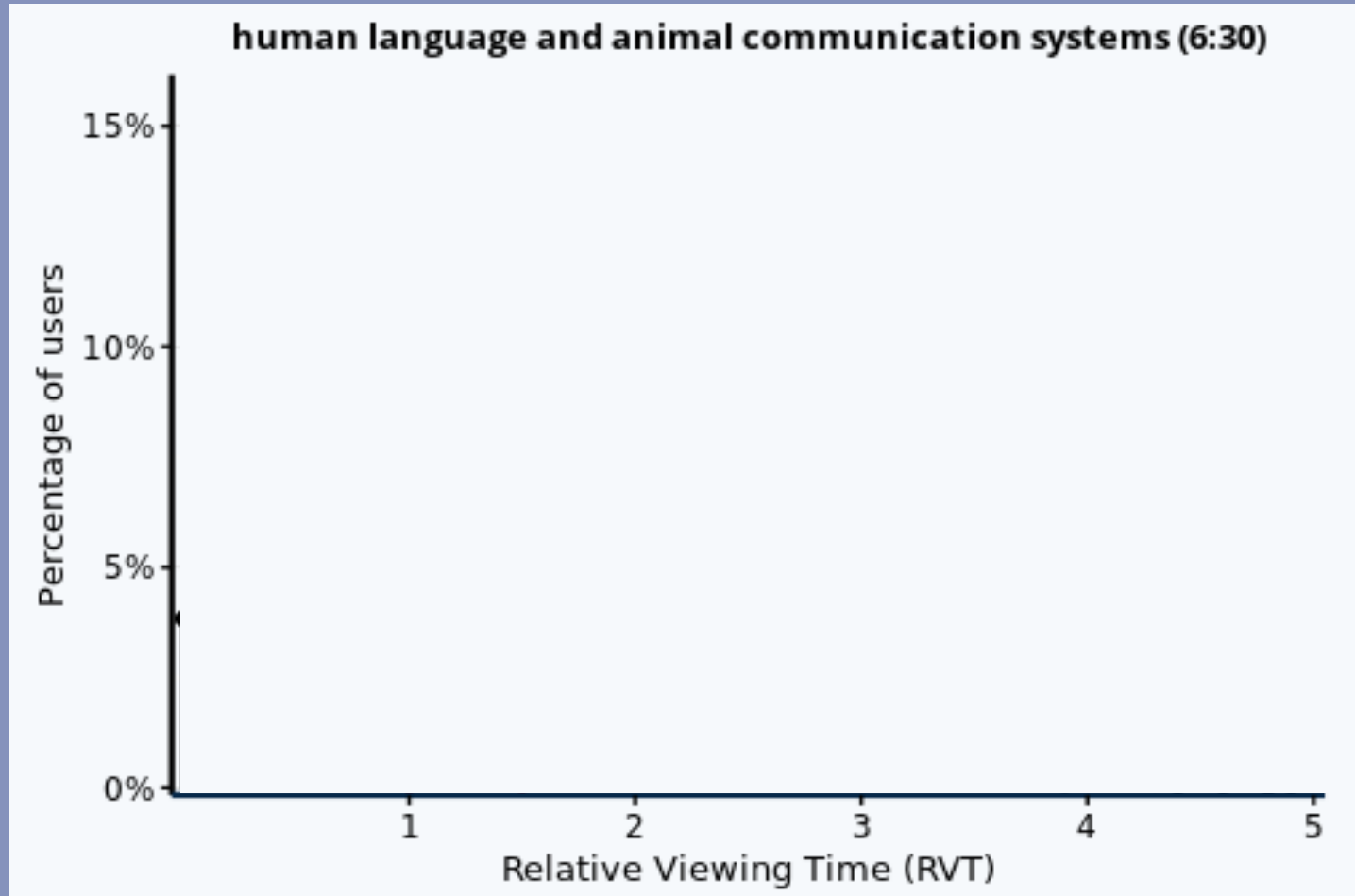
Factors influencing dwelling time

- Video drop-outs are very common.

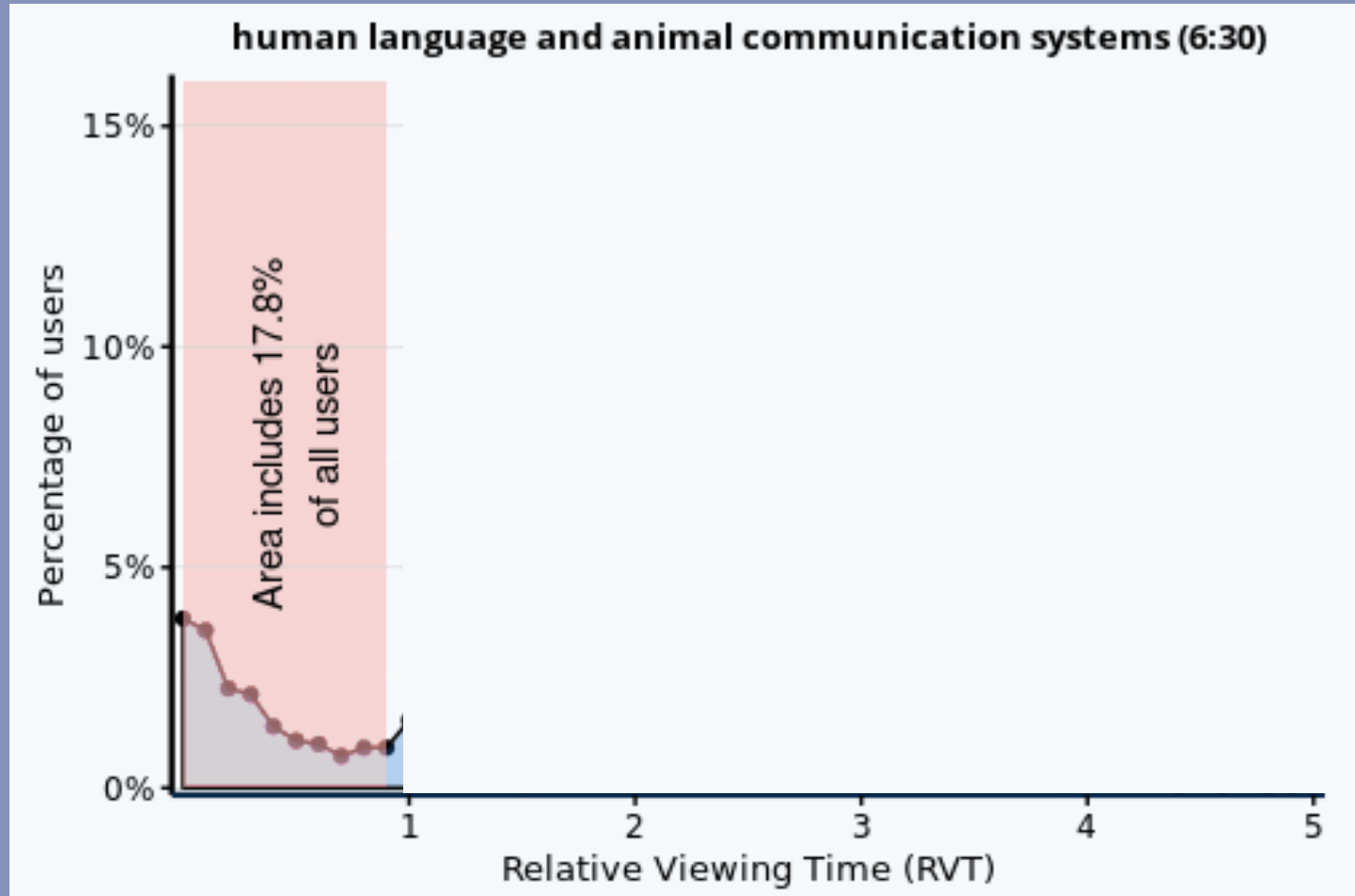
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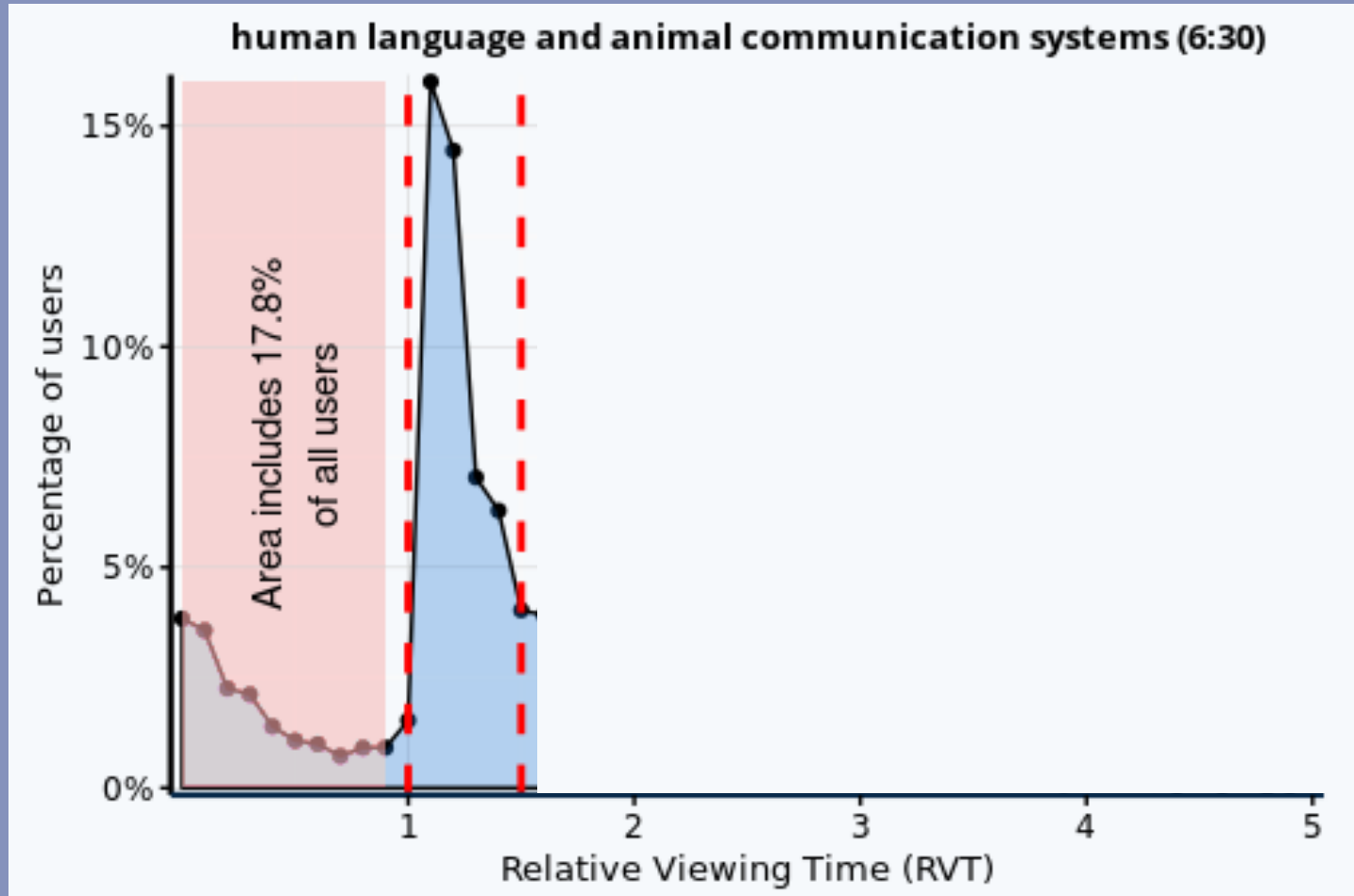
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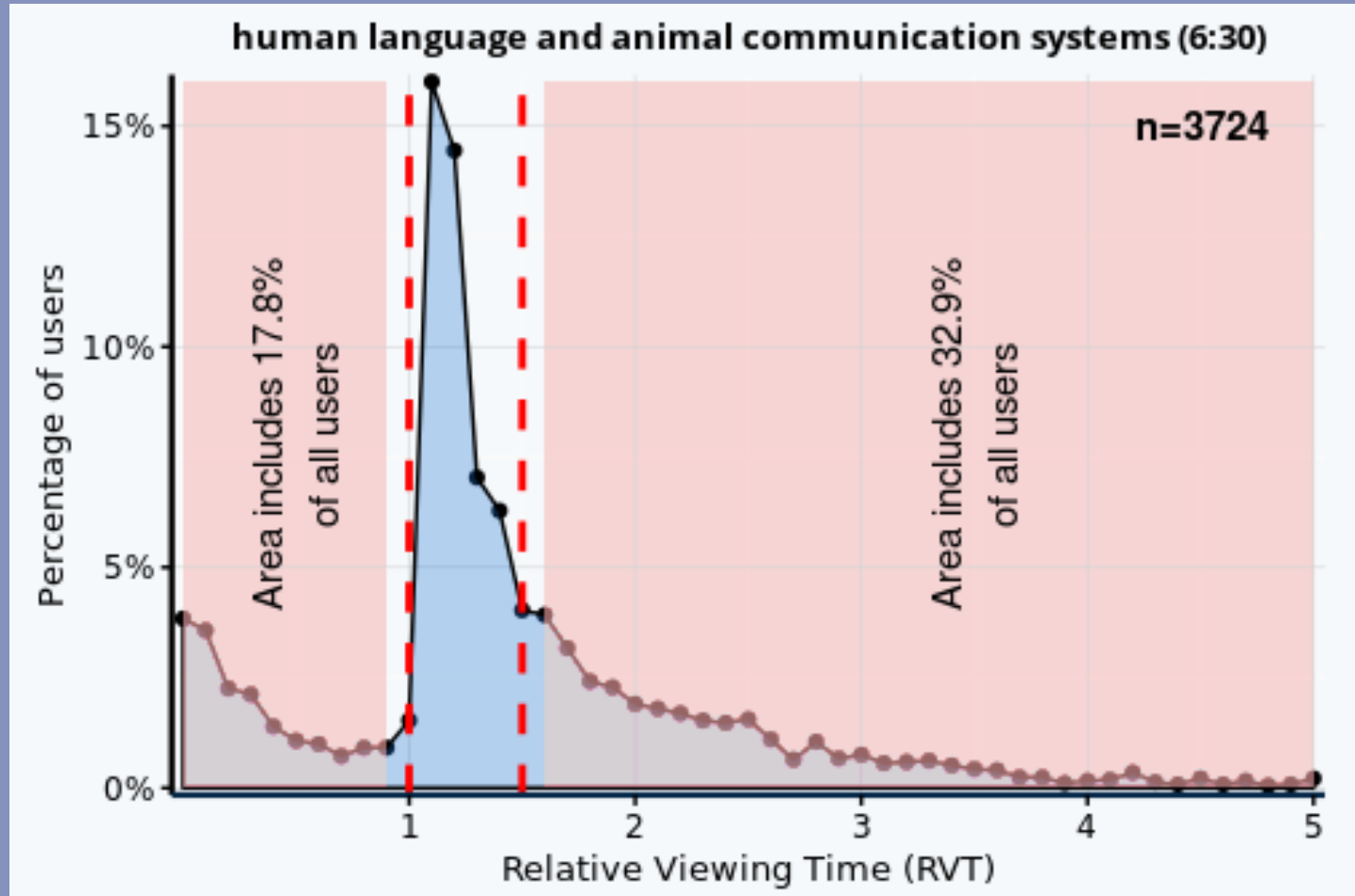
Factors influencing dwelling time



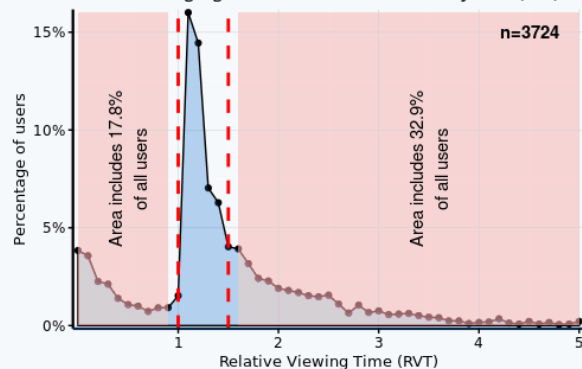
Factors influencing dwelling time



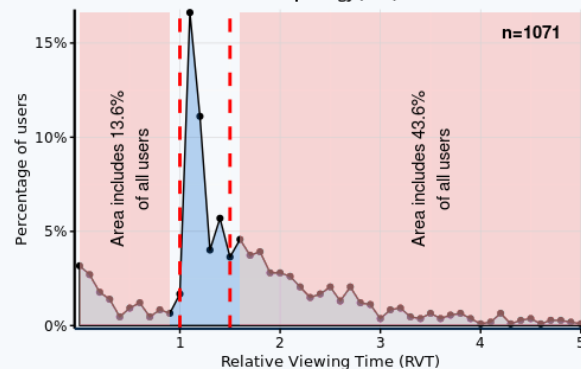
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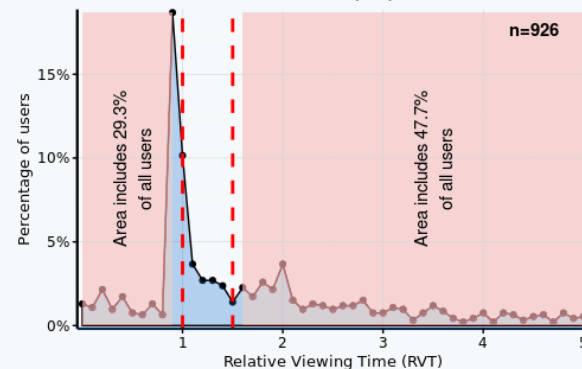
human language and animal communication systems (6:30)



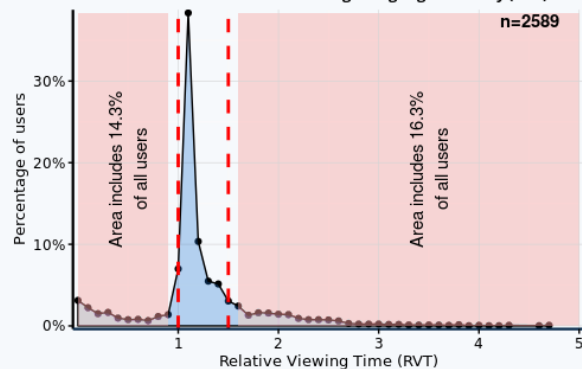
morphology (9:06)



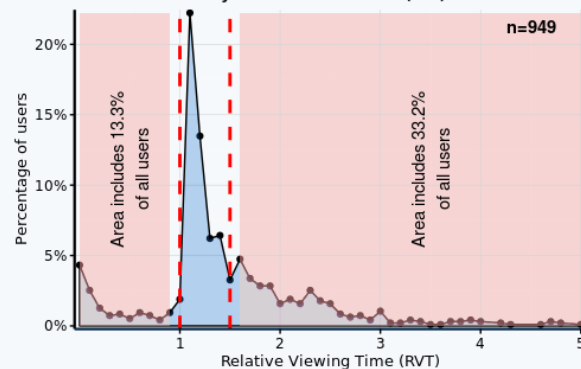
abruzzese (1:08)



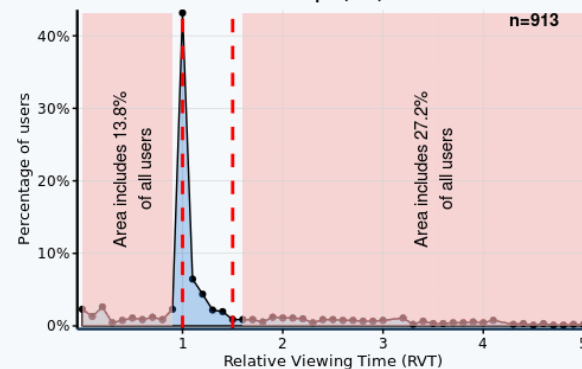
discussion with marten and inge language diversity (9:41)



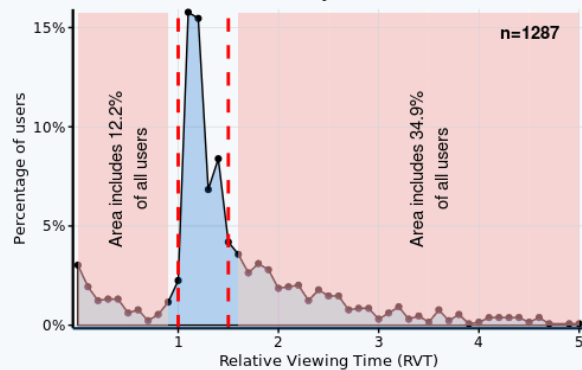
syntax and word order a (8:09)



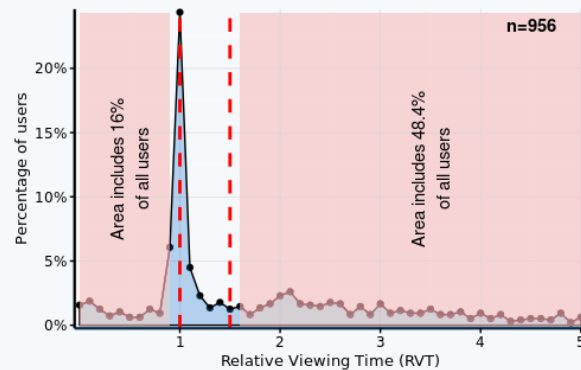
basque (1:08)



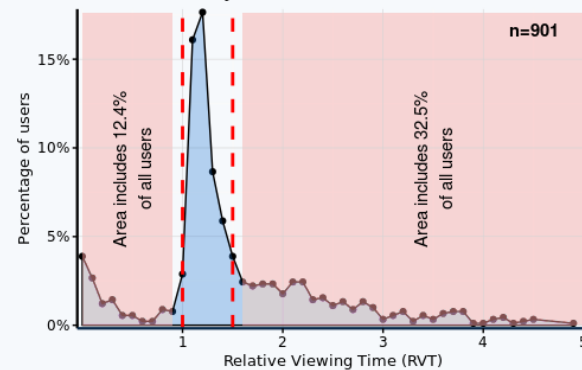
sounds in systems (7:19)



turkish (1:21)



syntax and word order b (5:34)



Factors influencing dwelling time

- Video drop-outs are very common.
 - Drop-outs occur around peaks (e.g., transitions, tutorial steps, questions)
-
1. First view or re-watching
 2. Video length
 3. Learning goal (e.g., knowledge, procedural tutorial)
 4. Production style (e.g., screencast, lecture, talking face)
 5. In-video questions
 6. Information density and complexity

Sense-making

- Question: What does dwelling time mean?

Sense-making

- Question: What does dwelling time mean?

Higher dwelling time means ...

Sense-making

- Question: What does dwelling time mean?

Higher dwelling time means ...

1. ... students are more engaged
2. ... students learn more
3. ... the video quality is higher
4. ... the content quality is higher
5. ... something else?

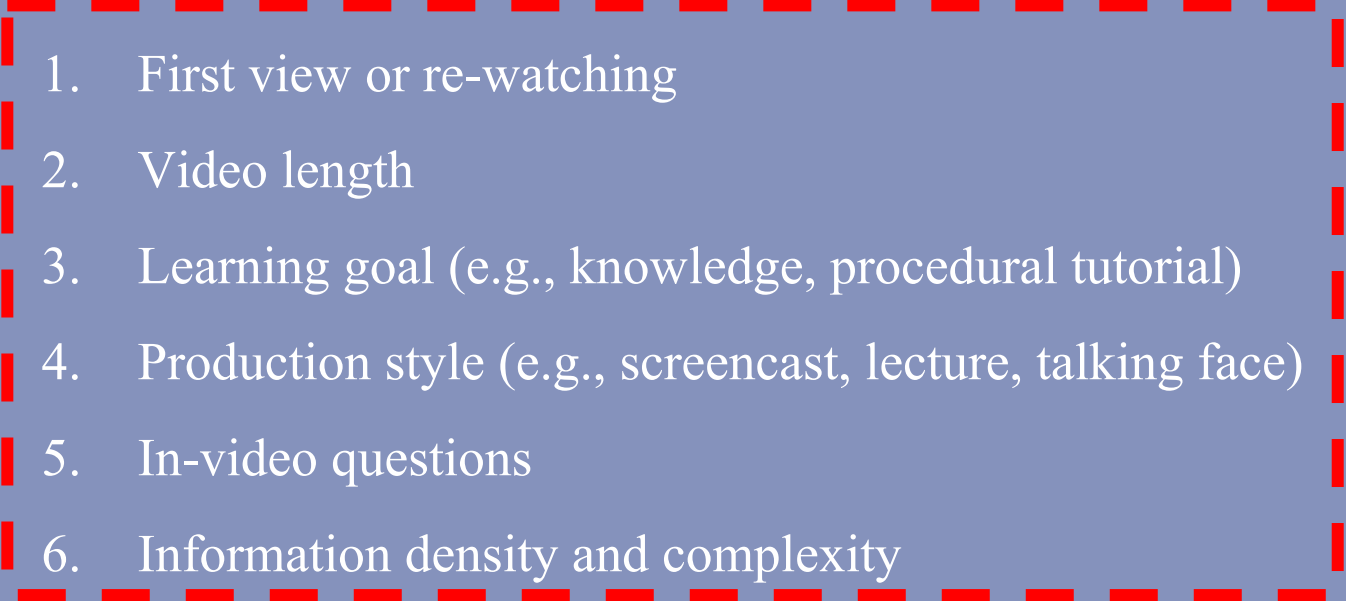
- (A) Students who are more engaged
- (B) Will spend more time watching videos

- (A) Students who are more engaged
- (B) Will spend more time watching videos

Even if A leads to B, observing B
does *not* allow us to conclude A.

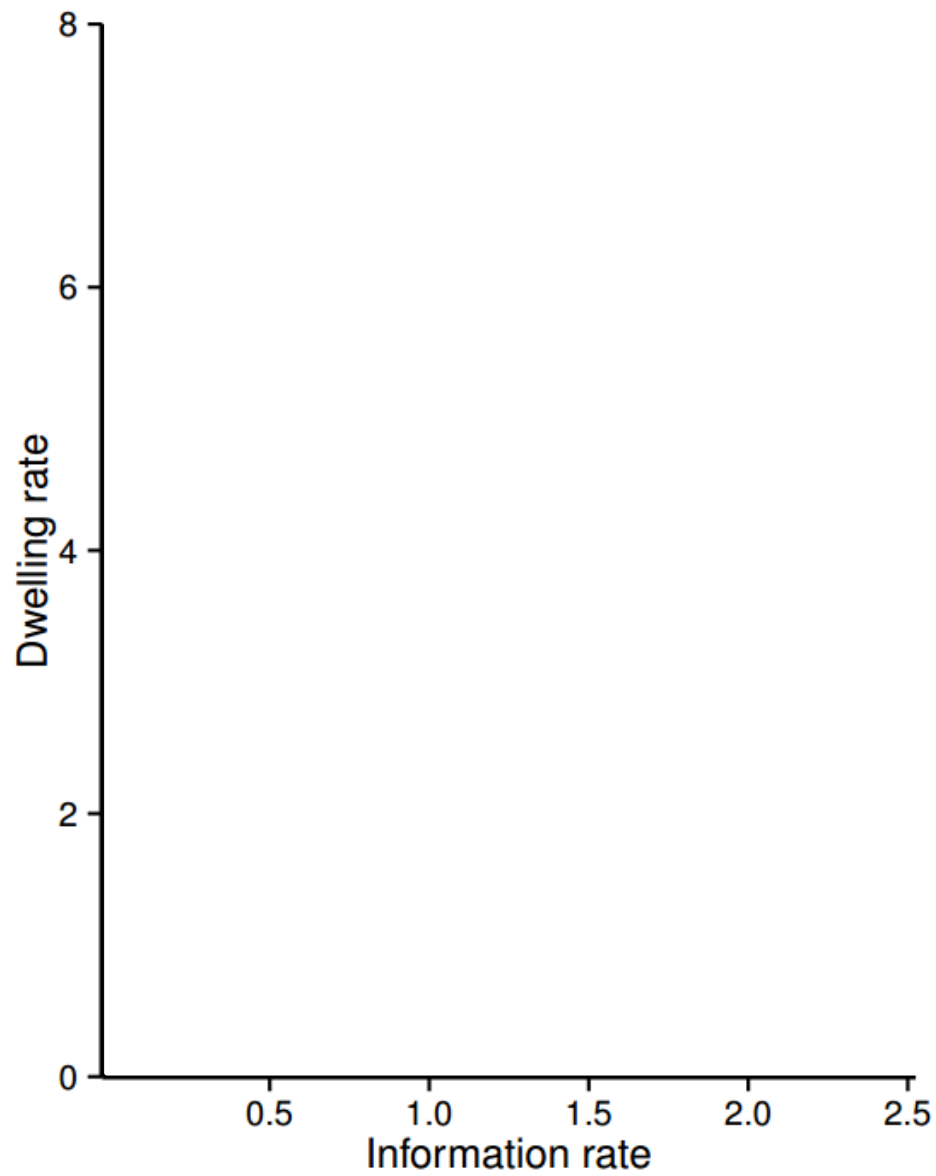
Factors influencing dwelling time

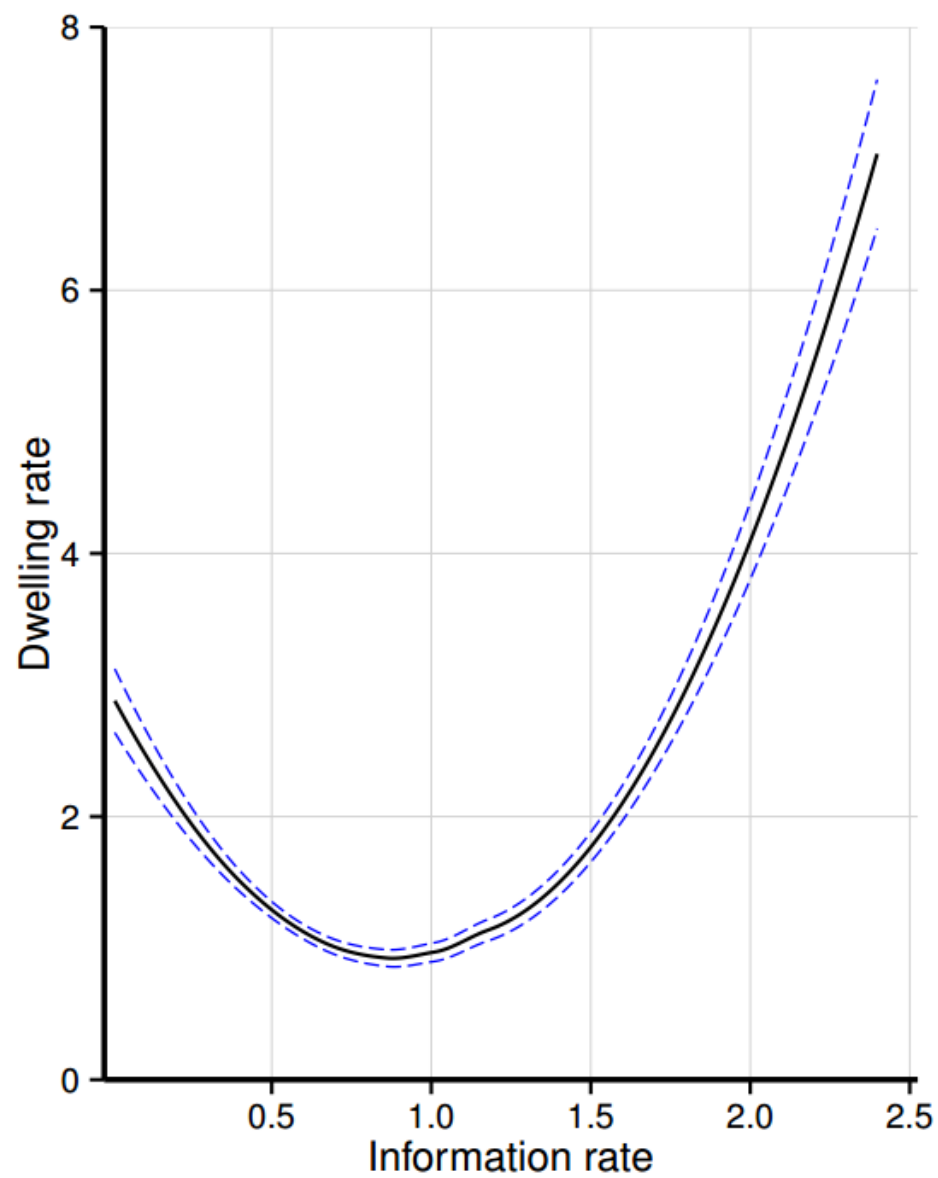
- Notes:
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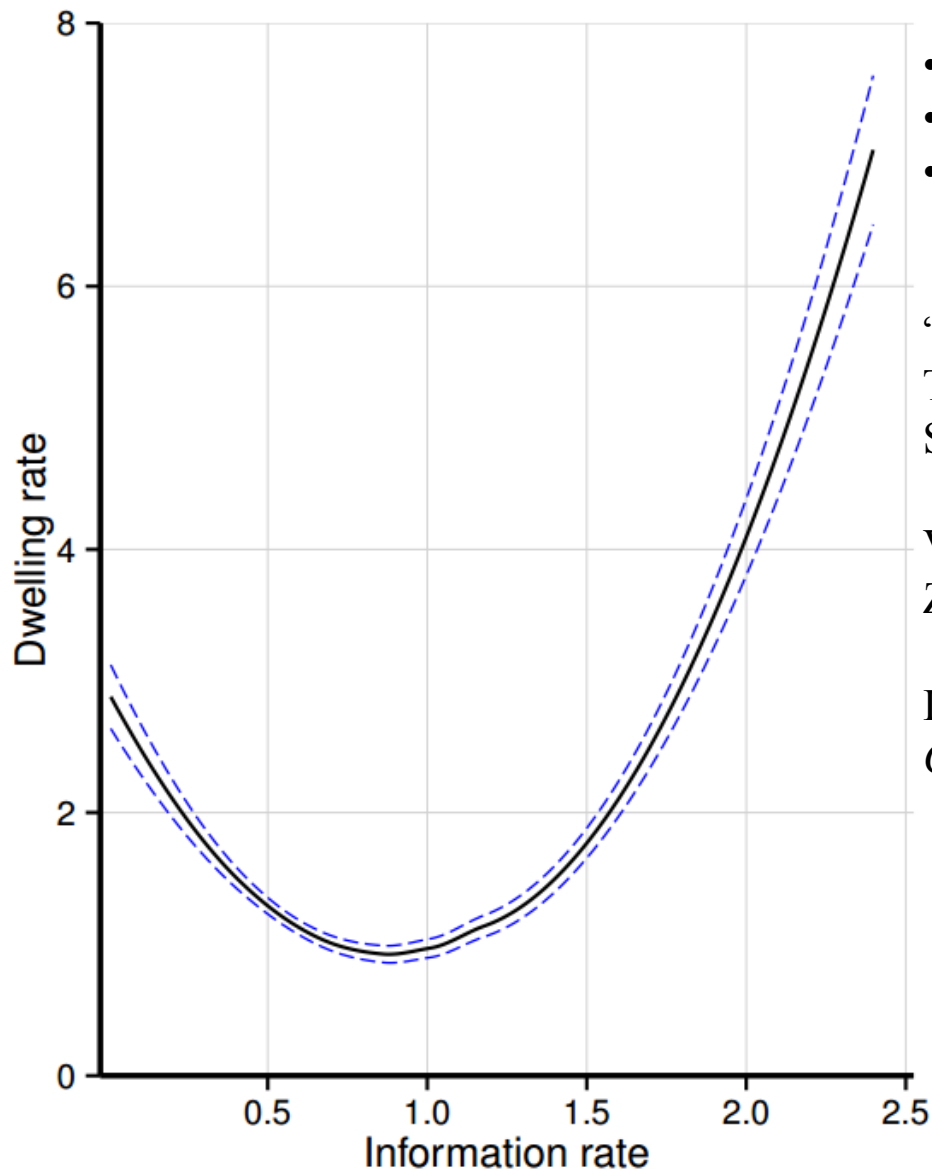
- 
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Factors influencing dwelling time

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 6. Information density and complexity







- 104 videos from 5 MOOCs
- 1.5 million watching episodes
- 22.44% explained variance

“Explaining Student Behavior at Scale:
The Influence of Video Complexity on
Student Dwelling Time.”

Van der Sluis, F., Ginn, J., & Van der
Zee, T. (2016).

*In Proceedings of the Third (2016) ACM
Conference on Learning@ Scale*

Video characteristics

- Transcript complexity

Video characteristics

- Transcript complexity
- Instructional design complexity

Video characteristics

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- Instructional design complexity
- Consistent with human cognitive architecture

Video characteristics

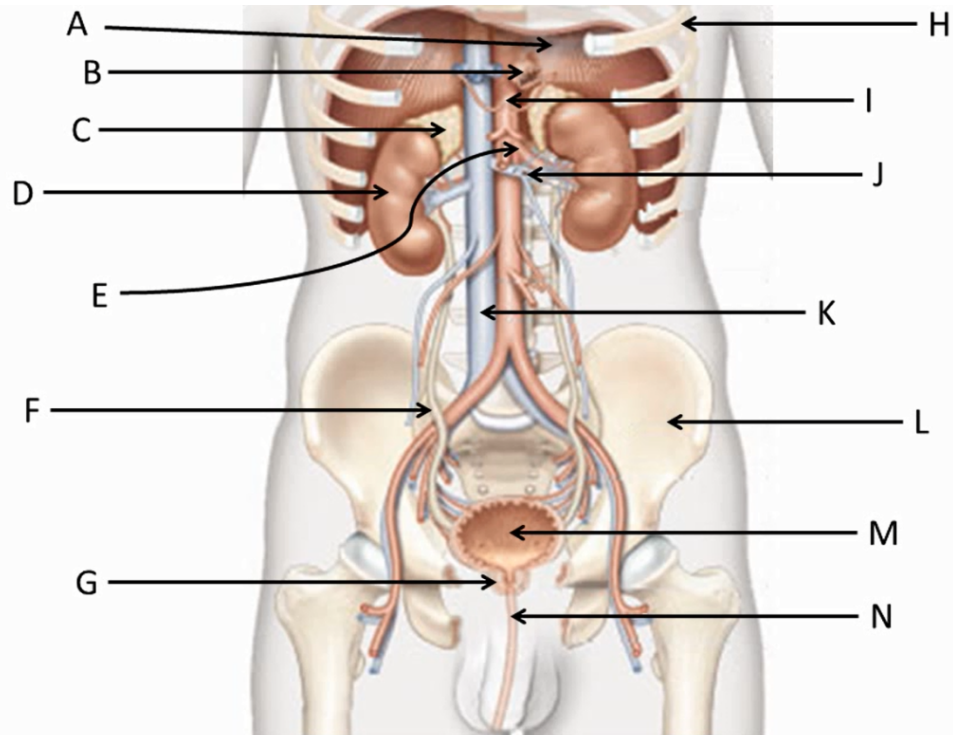
- Transcript complexity
- Instructional design complexity
- Consistent with human cognitive architecture
 - Limited resources (attention)

Video characteristics

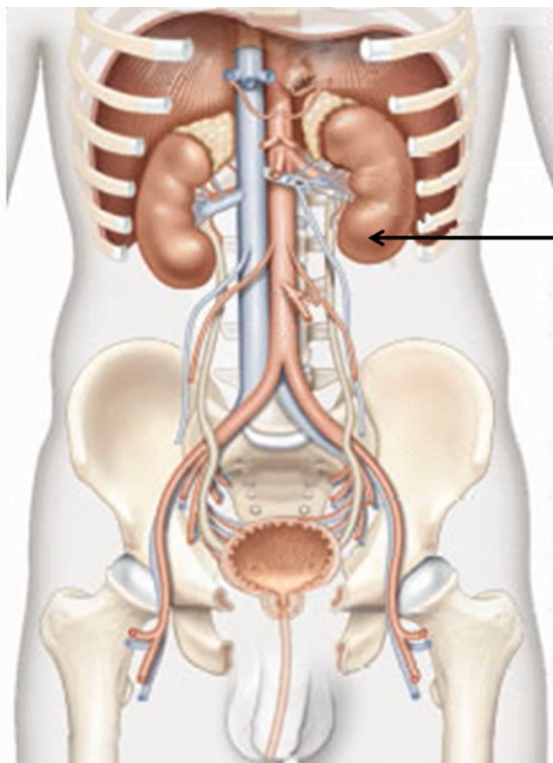
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 - Limited resources (attention)
 - Interference (during initial processing, and recalling)

Video characteristics

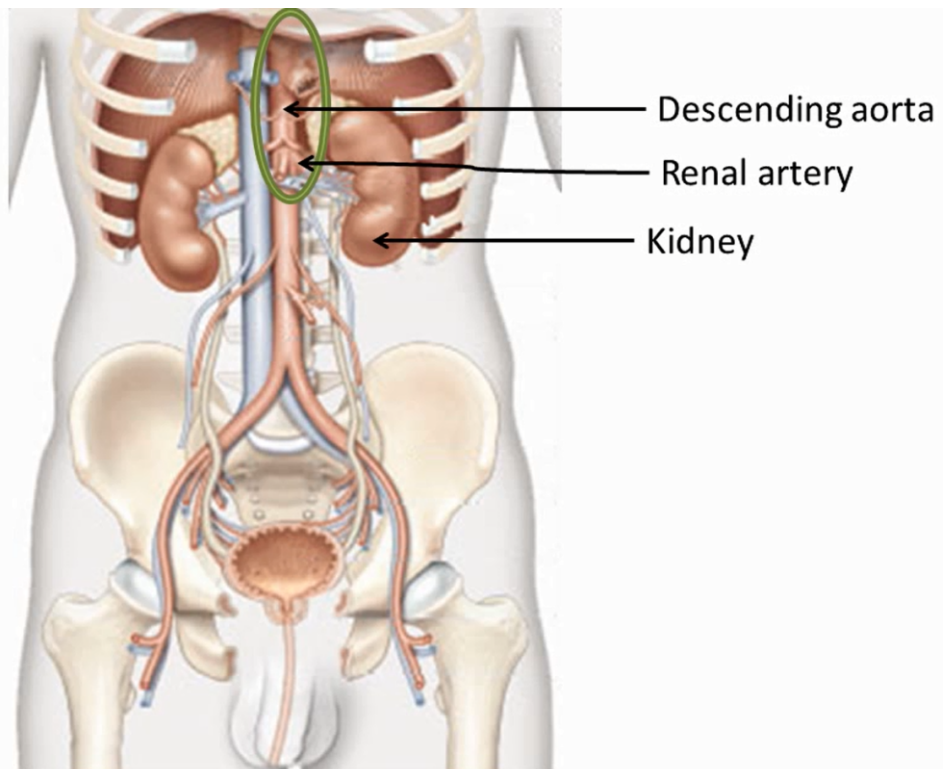
- Transcript complexity
- Instructional design complexity
- Consistent with human cognitive architecture
 - Limited resources (attention)
 - Interference (during initial processing, and recalling)
 - Task demands & benefits

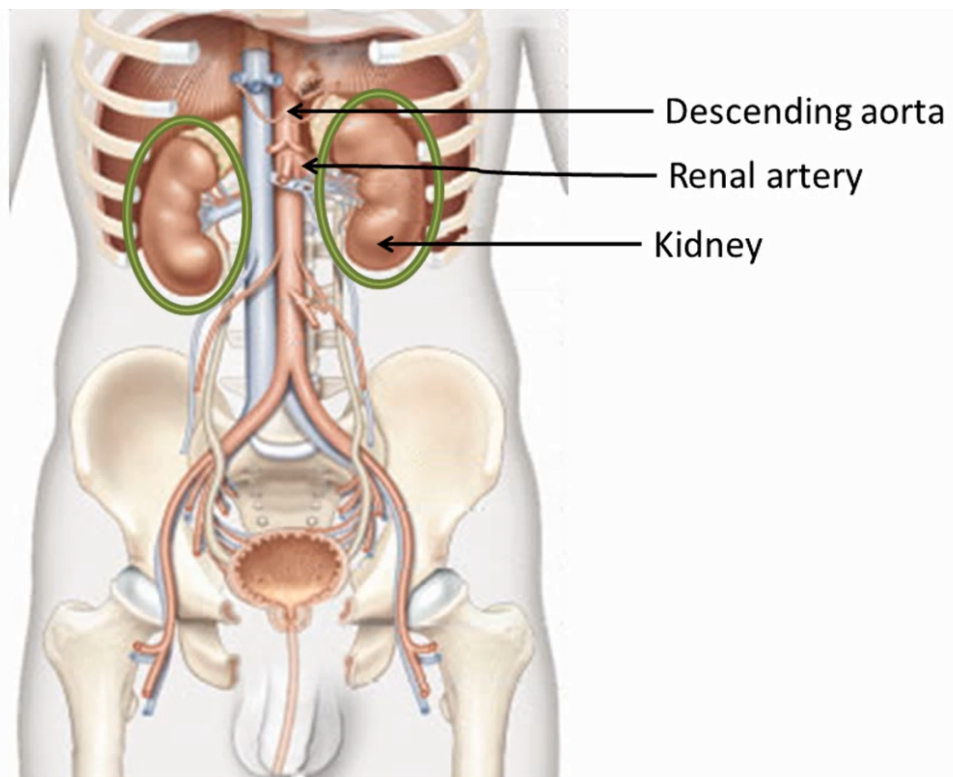


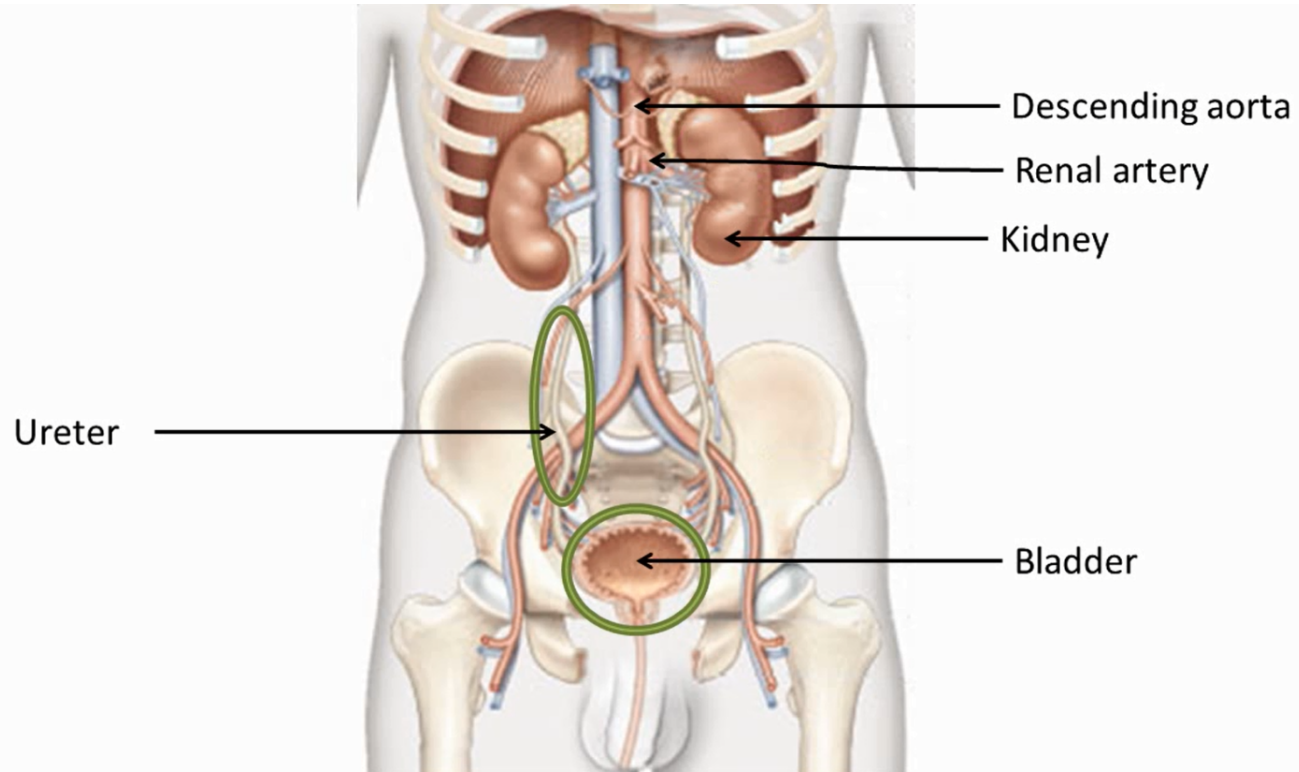
- A) Diaphragm
- B) Esophagus
- C) Adrenal gland
- D) Kidney
- E) Renal artery
- F) Ureter
- G) Prostate gland
- H) Rib cage
- I) Descending aorta
- J) Renal vein
- K) Inferior vena cava
- L) Pelvis
- M) Bladder
- N) Urethra

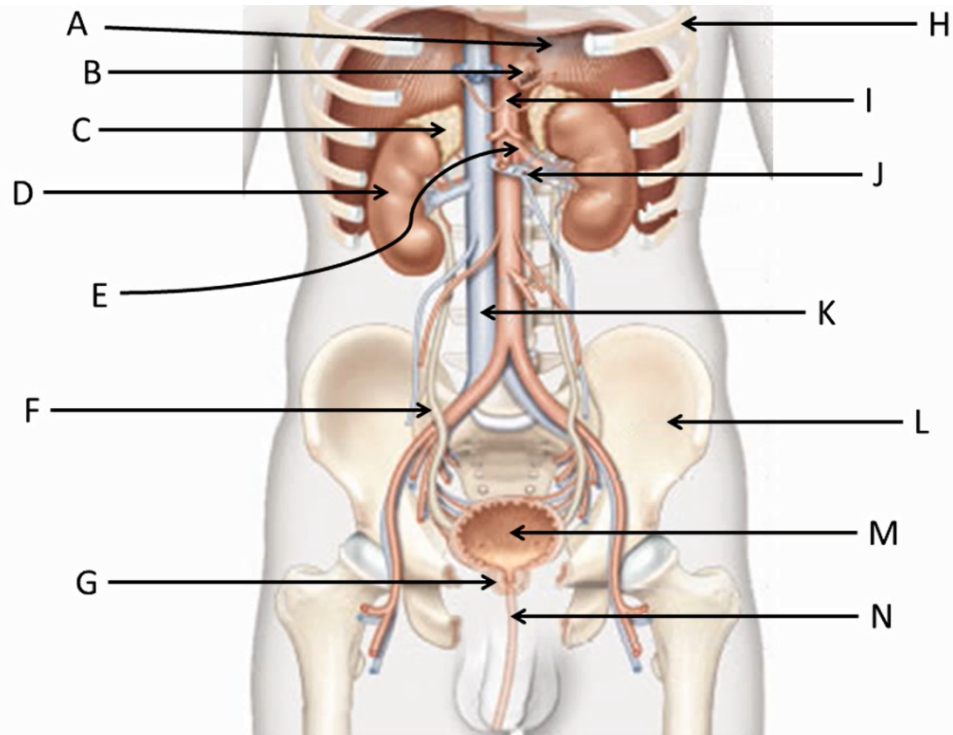


← Kidney









- A) Diaphragm
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Instructional design guidelines

1. Reduce irrelevant information

Instructional design guidelines

1. Reduce irrelevant information
2. Segment complex information

Instructional design guidelines

1. Reduce irrelevant information
2. Segment complex information
3. Use attentional cues

Instructional design guidelines

1. Reduce irrelevant information
2. Segment complex information
3. Use attentional cues
4. Reduce split-attention effects

Learning from videos

1. Video characteristics
 - Information complexity
 - Visual complexity
2. Student characteristics?

Student characteristics

1. From all over the world

Student characteristics

1. From all over the world
2. But: Western countries overrepresented

Student characteristics

1. From all over the world
2. But: Western countries overrepresented
3. Language barrier might play a substantial role?

(Nesterko et al., 2013)

Student characteristics

1. From all over the world
2. But: Western countries overrepresented
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Availability vs Accessibility

To Sub or not to Sub

To Sub or not to Sub

- Practical solution & official guideline
(Web Content Accessibility Guidelines)

To Sub or not to Sub

- Practical solution & official guideline
(Web Content Accessibility Guidelines)
- Second language learning
(Baltova, 1999; Chung, 1999; Markham, 1999;
Winke, Gass, & Sydorenko, 2013)

To Sub or not to Sub

- Practical solution & official guideline

(Web Content Accessibility Guidelines)

- Second language learning

(Baltova, 1999; Chung, 1999; Markham, 1999;
Winke, Gass, & Sydorenko, 2013)

- Content learning

(Kalyuga et al., 1999; Mayer, Heiser, & Lonn, 2001;
Harskamp, Mayer, & Suhre, 2007; Mayer & Moreno, 1998, 1999)

Results

- Visual complexity
- Subtitles
- Language proficiency

Results

- Visual complexity: -0.62 ($d = 0.31$)
- Subtitles
- Language proficiency

Results

- Visual complexity: -0.62 ($d = 0.31$)
- Subtitles: 0.04 ($d = 0.02$)
- Language proficiency

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- Language proficiency: -0.55 ($d = 0.27$)

van der Zee, T., Admiraal, W., Paas, F., Saab, N., & Giesbers, B. (2017).

Effects of subtitles, complexity, and language proficiency on learning from online education videos. *Journal of Media Psychology*.

Learning from videos

1. Video characteristics
 - Information complexity
 - Visual complexity
2. Student characteristics
 - Language proficiency

Learning from videos

1. Video characteristics
 - Information complexity
 - Visual complexity
2. Student characteristics
 - Language proficiency
3. Context characteristics?

Context characteristics

Context characteristics

- Videos are passive

Context characteristics

- Videos are passive
- So add active learning?

Context characteristics

- Videos are passive
- So add active learning?
- Goal-orientated practice

**“To learn a thing,
you have to repeatedly do the thing.”**

Context characteristics

- Videos are passive
- So add active learning?
- Retrieval practice!
 1. Write a summary
 2. Read a summary
 3. Control

Context characteristics

- Videos are passive
- So add active learning?
- Retrieval practice! But now in the videos

Context characteristics

- Videos are passive
 - So add active learning?
-
- Retrieval practice! But now in the videos
- Pilots results:
1. Students like in-video questions

Context characteristics

- Videos are passive
 - So add active learning?
-
- Retrieval practice! But now in the videos
- Pilots results:
1. Students like in-video questions
 2. Answering in-video questions enhances performance

Context characteristics

- Videos are passive
 - So add active learning?
-
- Retrieval practice! But now in the videos
- Pilots results:
1. Students like in-video questions
 2. Answering in-video questions enhances performance
 3. Active students are active students

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Twitter: [@Research_Tim](https://twitter.com/Research_Tim)

Website & Blog: www.timvanderzee.com



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