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What cues do people think they use to make metacognitive judgments?

Participants

300 undergraduate students

59.7% female

41.7% White – 29.7% Asian
21.3% Latinx – 5.3% Black – 2.0% Other

Procedure

Read nine short (~56 words) paragraphs on various astronomical phenomena (e.g., black holes, planetary motion, etc.) from McDaniel & Donnelly (1996)[1] each covering one concept.

Predict how they would score on a subsequent comprehension quiz.

Indicate what cues they used to make their meta-comprehension judgment (open, then checkbox).

Finally, complete comprehension quiz of 36 questions (4 questions per concept).

Collecting Cue Usage

OPEN RESPONSE

After reading the nine passages, students were asked to self-report the cues used to estimate their learning.

> WHEN YOU FINISHED READING THE TEXT MATERIAL, HOW DID YOU DECIDE WHETHER YOU HAVE UNDERSTOOD THE PASSAGE? THAT IS, WHEN ASKED TO 'GRADE' YOUR COMPREHENSION OF THAT PASSAGE, WHAT DID YOU BASE YOUR GRADE ON SO YOU CAN SAY, 'I UNDERSTOOD THIS PASSAGE WELL' OR 'I READ IT, BUT I DIDN'T UNDERSTAND IT'?

SELECT CUE(S) FROM LIST

Next, students selected which of eight common cues they reported in the open-ended response to estimate their learning.

Prior Cues	Reading Self-Efficacy	My overall confidence in learning new material from reading.
	Prior Knowledge	My knowledge of the topic(s) from previous coursework or life experience.
	Interest	My interest in the topic(s) of the text.
Shallow Processing	Difficulty/Ease	How difficult or easy the text was to read and understand.
	Effort	The amount of effort I put into trying to learn the materials.
	Surface Recall	My ability to recall information from the text, such as facts or details.
Deep Processing	Mental Imagery	The amount and quality of mental images or examples I came up with to understand the text.
	Explain/Summarize	My ability to remember concepts or summarize/explain what the text was about.

WEIGH SELECTED CUES

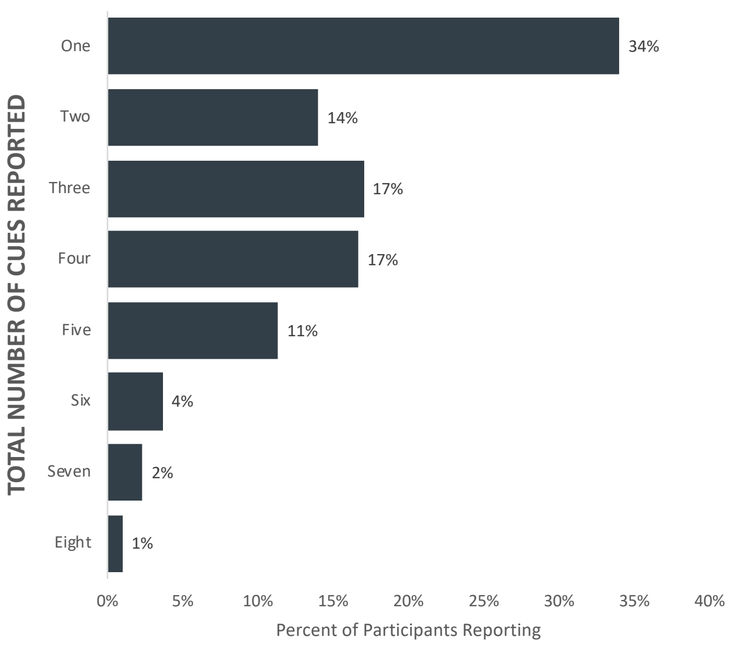
Participant's chosen cues were then shown in a follow-up question for weighting (decision matrix).

RQ1: Do Learners Use Multiple Cues?

Typical research paradigms tend to evaluate how individual cues contribute to metacomprehension[2,3]

Yet judgments of learning are impacted by multiple cues[4, 5].

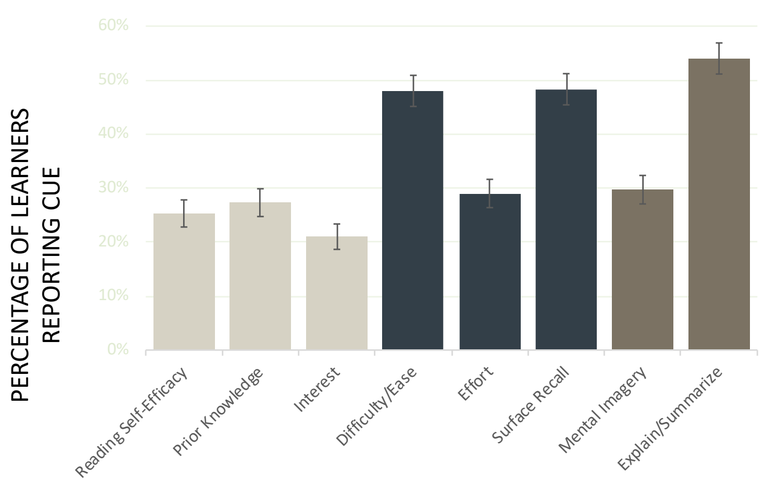
When given the opportunity, found two-thirds of participants reported using multiple cues to estimate their comprehension.



RQ2: What Cues Do Learners Report Using?

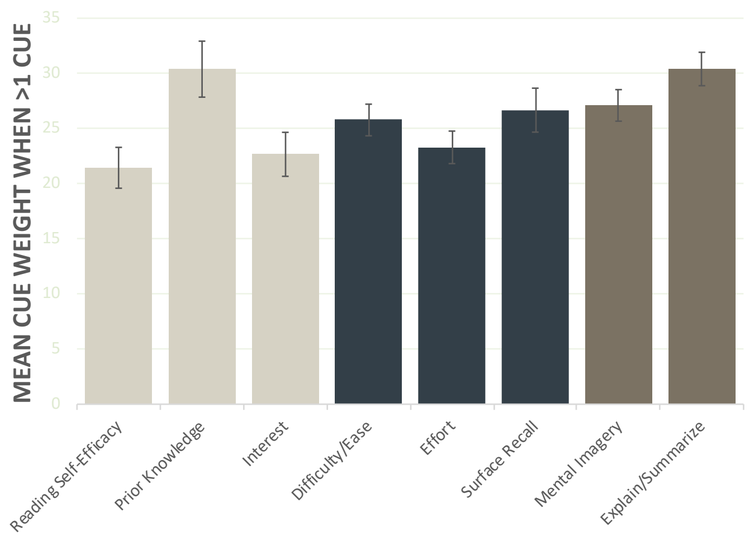
Prior research suggests that some cues are reported more commonly by learners[6], but little is known otherwise.

In our sample, readers report using a variety of types of cues—factors they bring in with them, shallow cues based on fluency, as well as deeper cues based on semantic processing.



RQ3: How do Learners Weight Cues?

Research analyzing single cues may produce misleading conclusions about metacomprehension, if in reality most readers integrate multiple cues.



Individuals differed, however, on how they weighted these multiple cues.

RQ4: How Do Reported Cues Relate to Predictions and Performance?

Linear multiple regression analyses, predicting metacomprehension judgments and final comprehension test performance from reported cues:

Predictor (Cues)	Metacomprehension b	Metacomprehension b [95% CI]	Learning b	Learning b [95% CI]
(Intercept)	0.51**	[0.46, 0.56]	0.48**	[0.45, 0.52]
Reading Self-Efficacy	0.10**	[0.04, 0.16]	-0.01	[-0.06, 0.03]
Prior Knowledge	0.08**	[0.02, 0.13]	0.06**	[0.02, 0.11]
Interest	-0.05	[-0.11, 0.02]	-0.04	[-0.09, 0.02]
Difficulty / Ease	-0.05	[-0.10, 0.01]	-0.01	[-0.05, 0.04]
Effort	-0.11**	[-0.16, -0.05]	-0.04	[-0.09, 0.01]
Surface Recall	-0.05	[-0.10, 0.00]	-0.02	[-0.06, 0.02]
Mental Imagery	0.07*	[0.01, 0.13]	0.09**	[0.05, 0.14]
Explain/Summarize	0.05	[-0.00, 0.11]	0.09**	[0.04, 0.13]

Takeaways

- People can and do use multiple cues in making their metacomprehension judgments
- Only certain cues, however, are related to actual learning
- *Limitations*: People may not have accurate insight into what is affecting their judgments
- *Future directions*: How do individual and situational characteristics bias cue use?

References

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