Once Upon a Time

Interactive Learning for Storytelling with Small Language Models


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Motivation

Why are children so good at learning language?

Is next-word prediction at fault?

Once	upon	a	time	,	?

Idea: Interactive feedback!

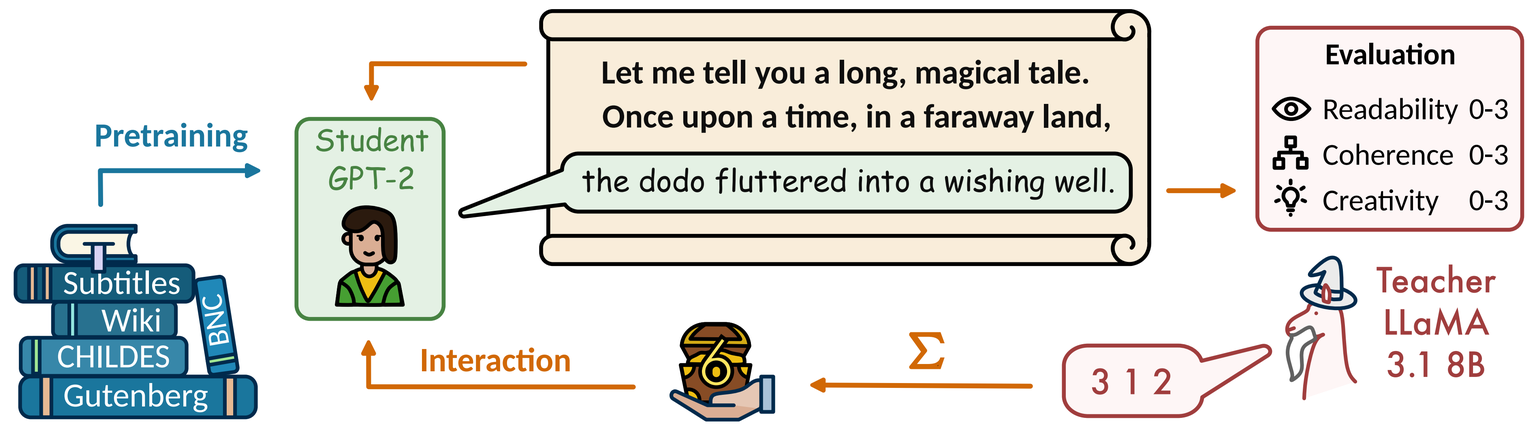
Task: Storytelling

We train a student model to generate stories, rated by a teacher model.

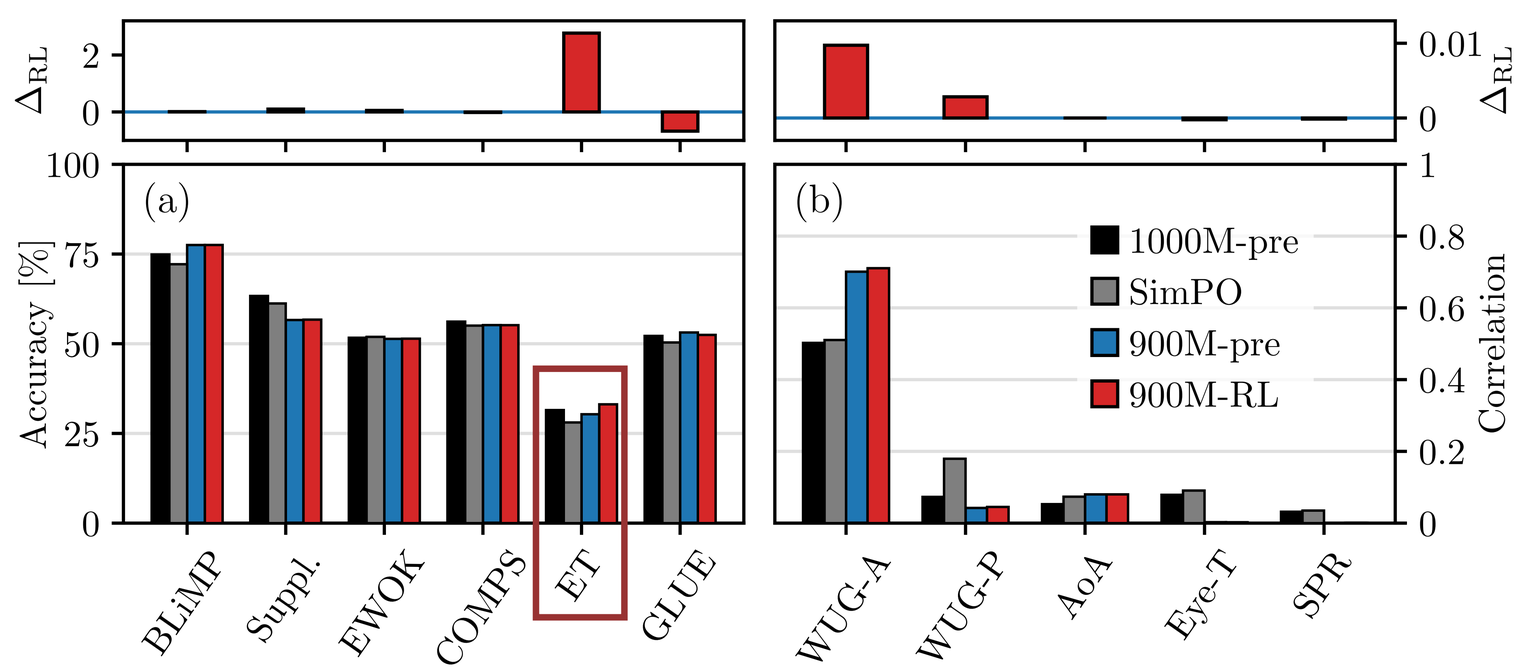
We find that this interaction is highly data efficient:

1 M words of input in interactive learning ≙ 410 M words of next-word prediction.

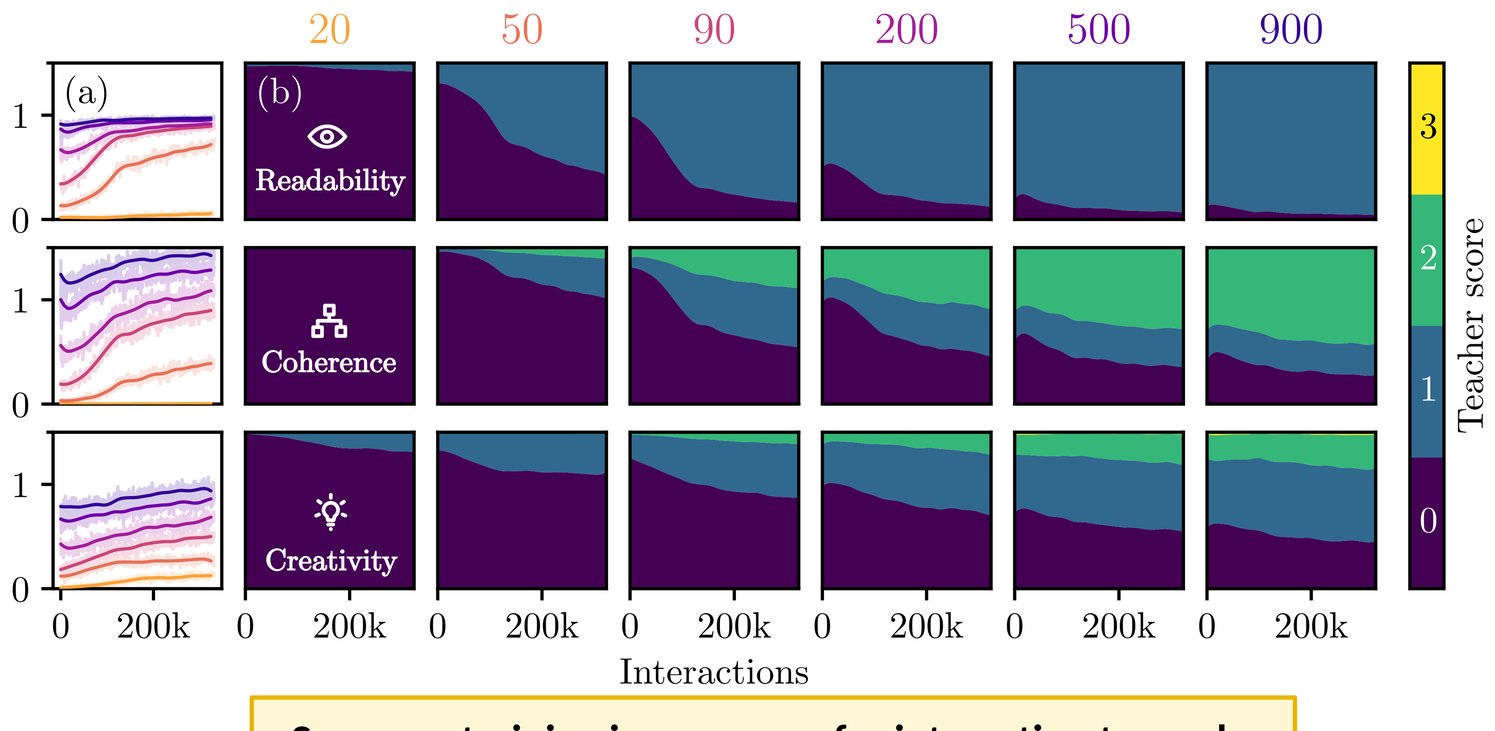
Setup

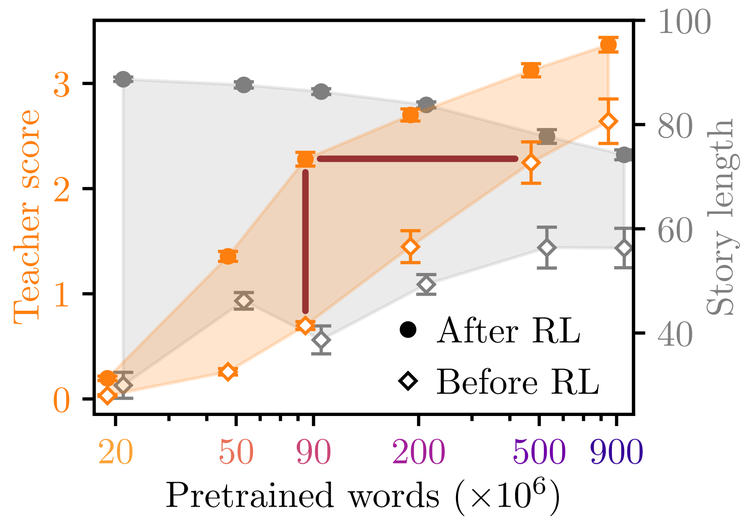


Results



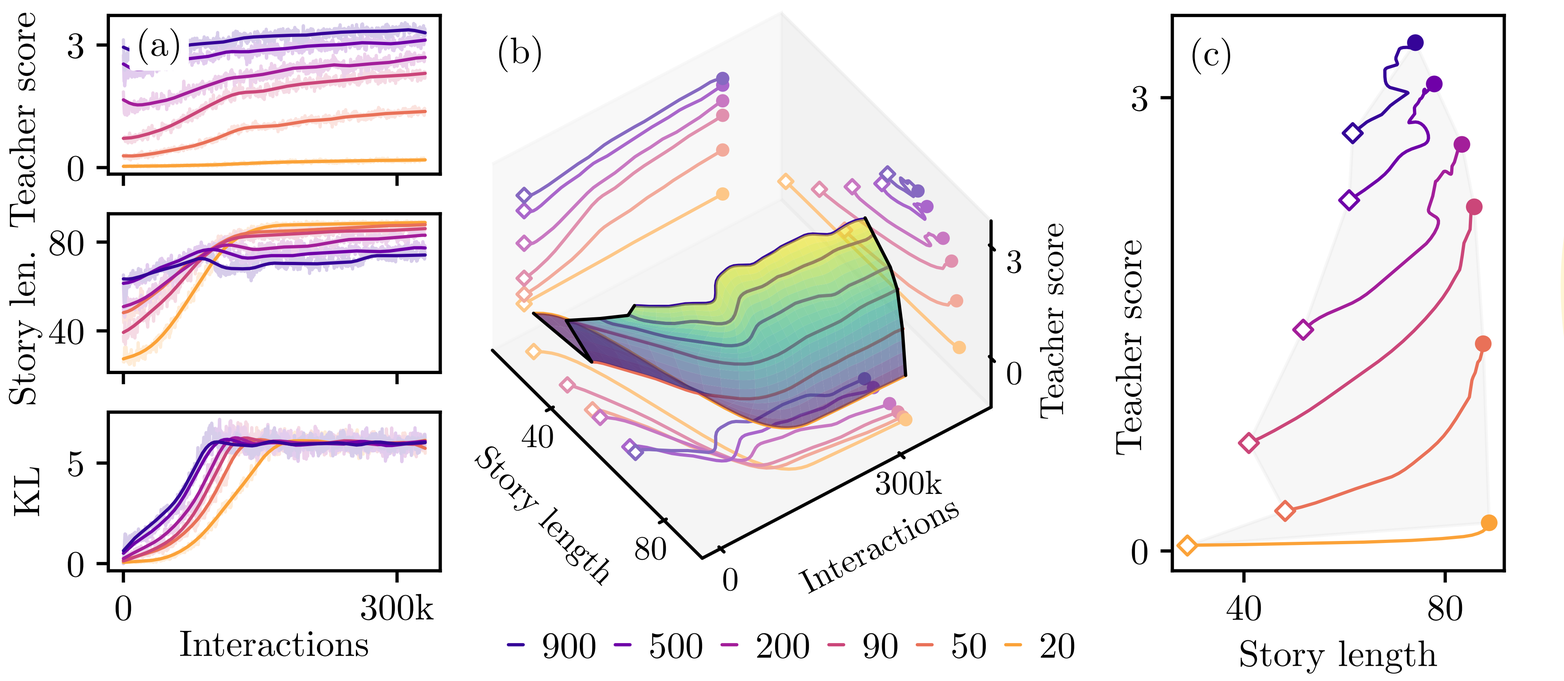
Surface fluency mostly unchanged, but entity tracking improves.





1 M words RL ~ 400 M words pretraining.

Some pretraining is necessary for interaction to work.



So what?

Interactive feedback is data efficient.

Narrative improves, surface-level fluency is unchanged.

Mind the pretraining gap!

Outlook: Validate teacher heuristic.