

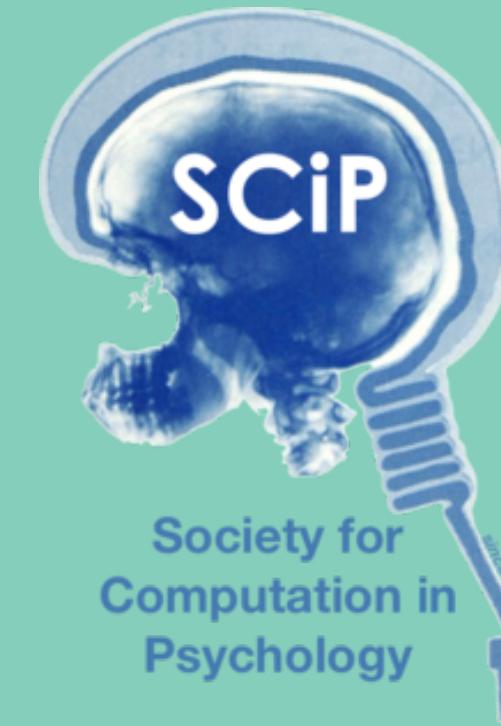
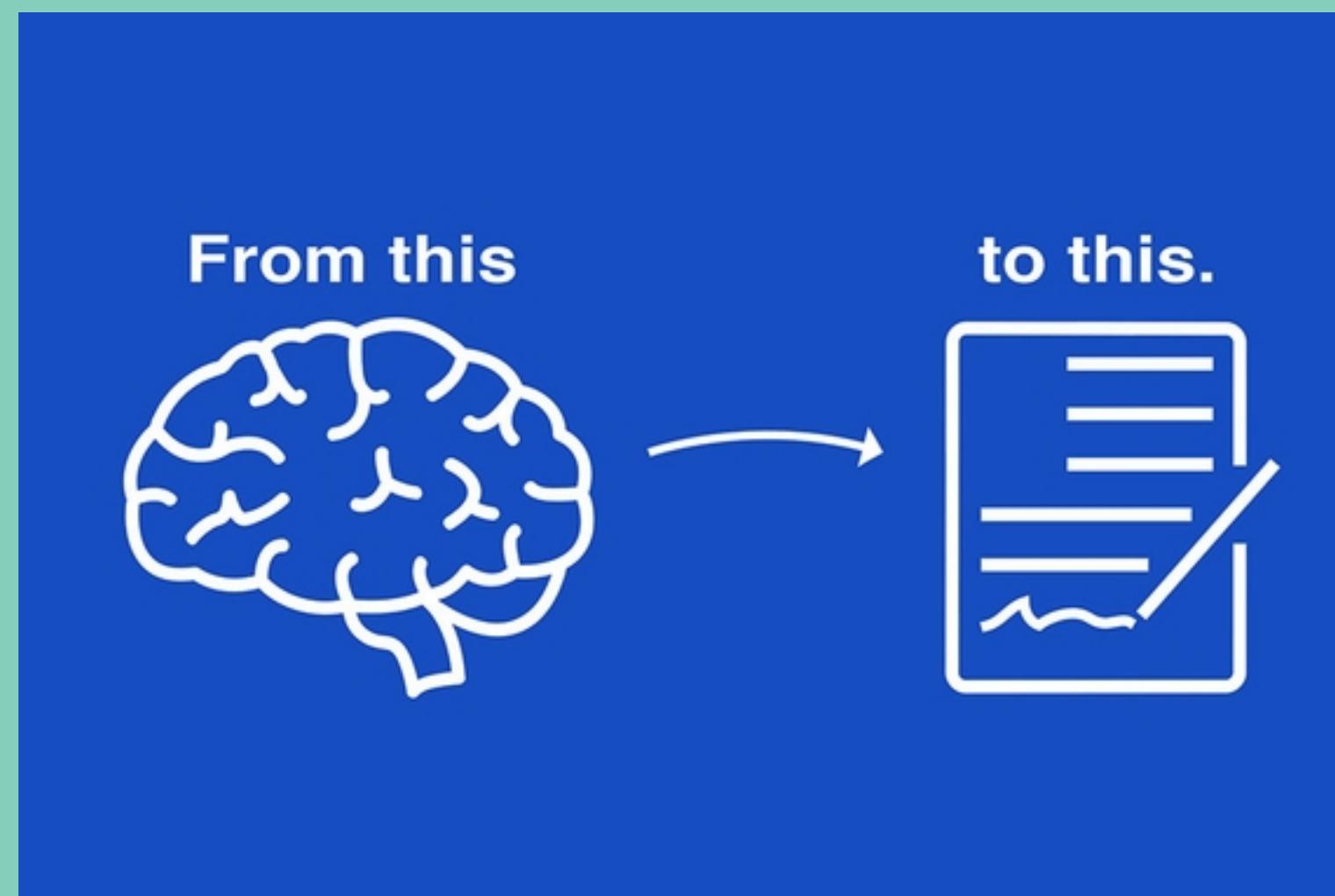
LOL Lab

Language Of
Learning Lab

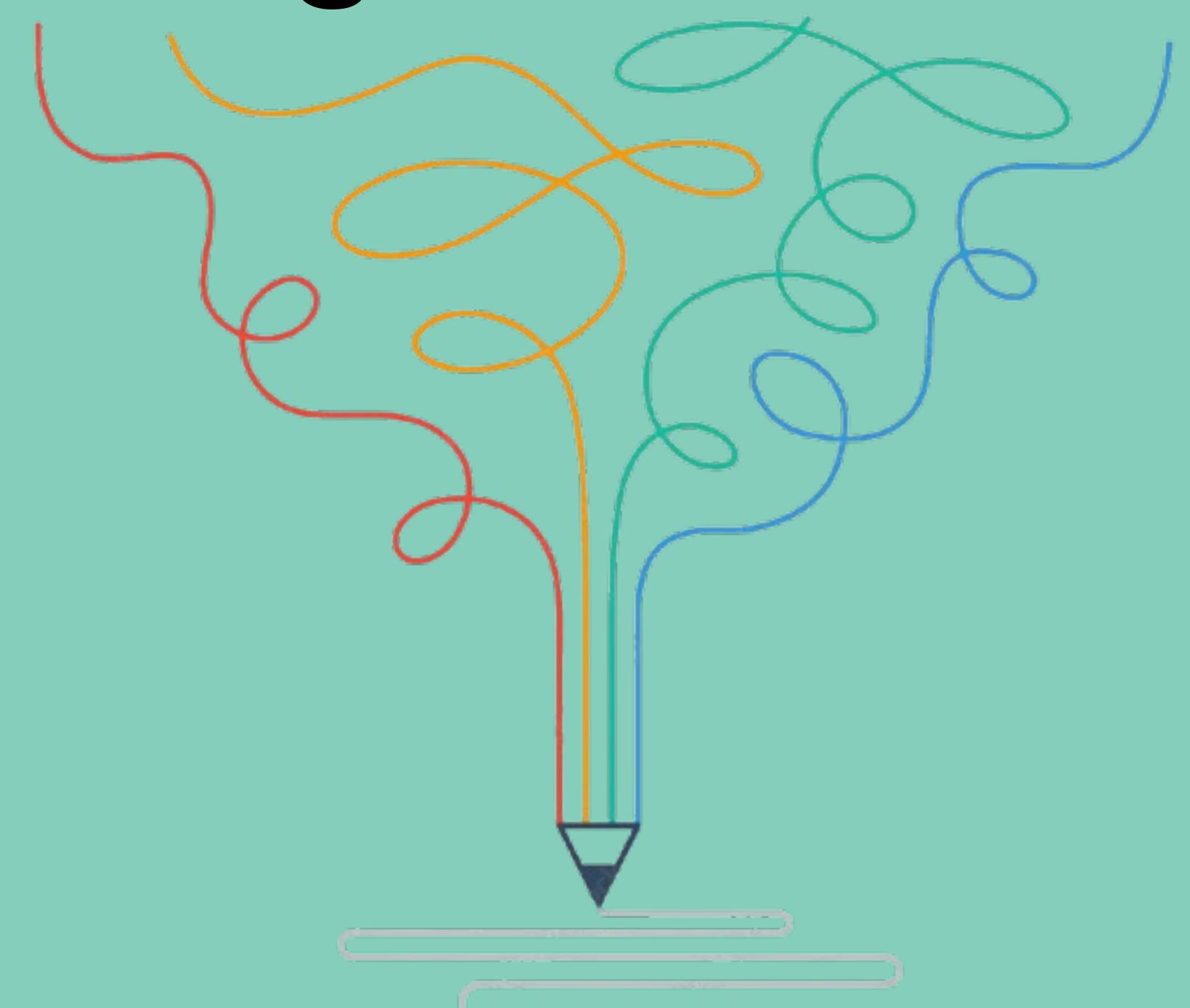
Est. 2019

Disentangling the Influences of Creativity and Verbal Fluency on Writing

Lauren E. Flynn



November 2024



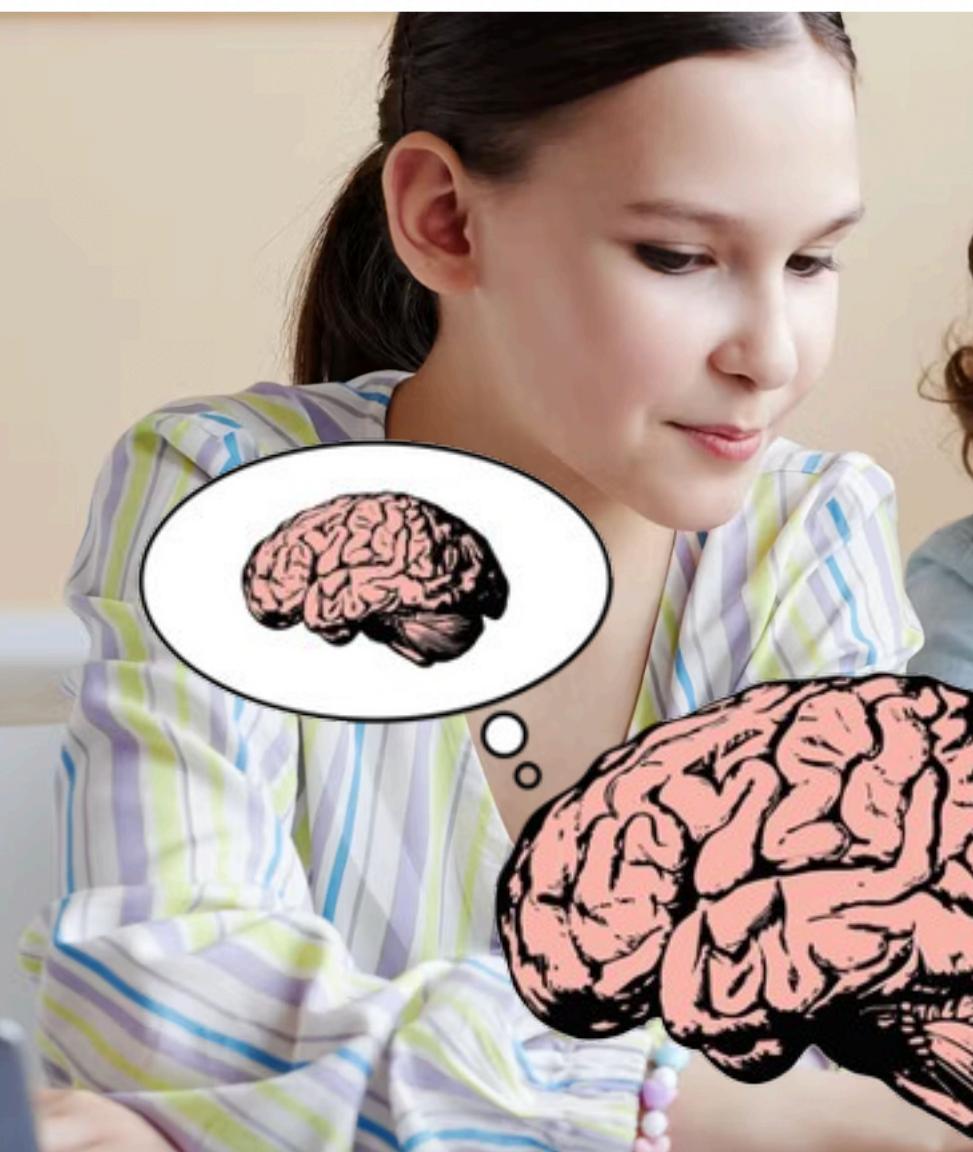
creativity

TEACHING AND LEARNING

Fostering Creativity and Content Creation and Reuse

SPONSORED CONTENT FROM DIGITAL PROMISE

By Olivia Snyder, Tammy Dunbar, Amanda Wortman, Jasmin



21ST CENTURY SKILLS

How Teachers Take a Risky Approach

SPONSORED

By Abbie Misha

Mar 21, 2024



metacognition



open-mindedness

high
value
content

Technology Can Help Students Develop Creativity

ARTIFICIAL INTELLIGENCE

Unlocking the Power of Creativity and AI: Preparing Students for the Future Workforce

SPONSORED CONTENT FROM DOBE FOR EDUCATION

By Abbie Misha Mar 21, 2024

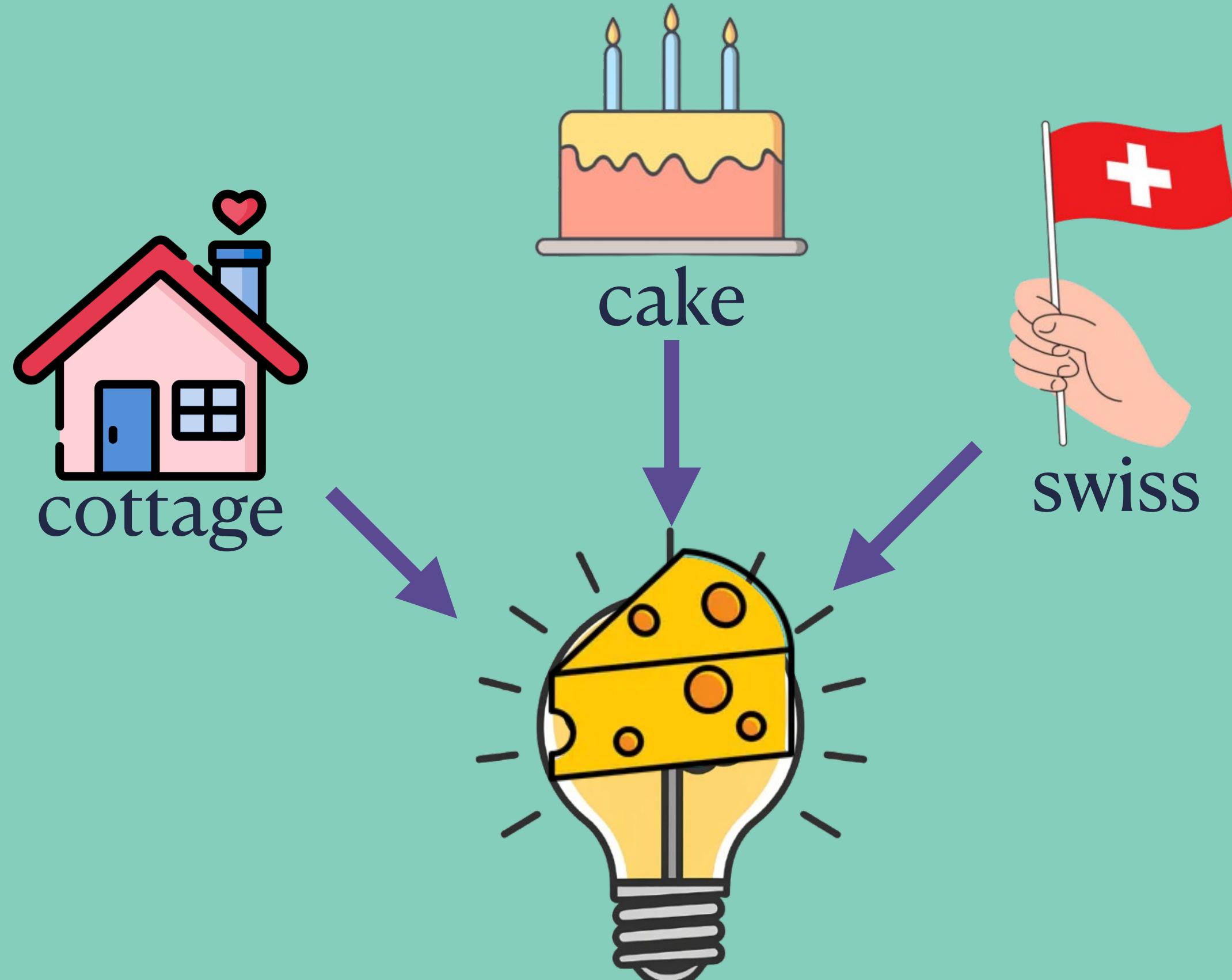


flexibility/
adaptability

creativity

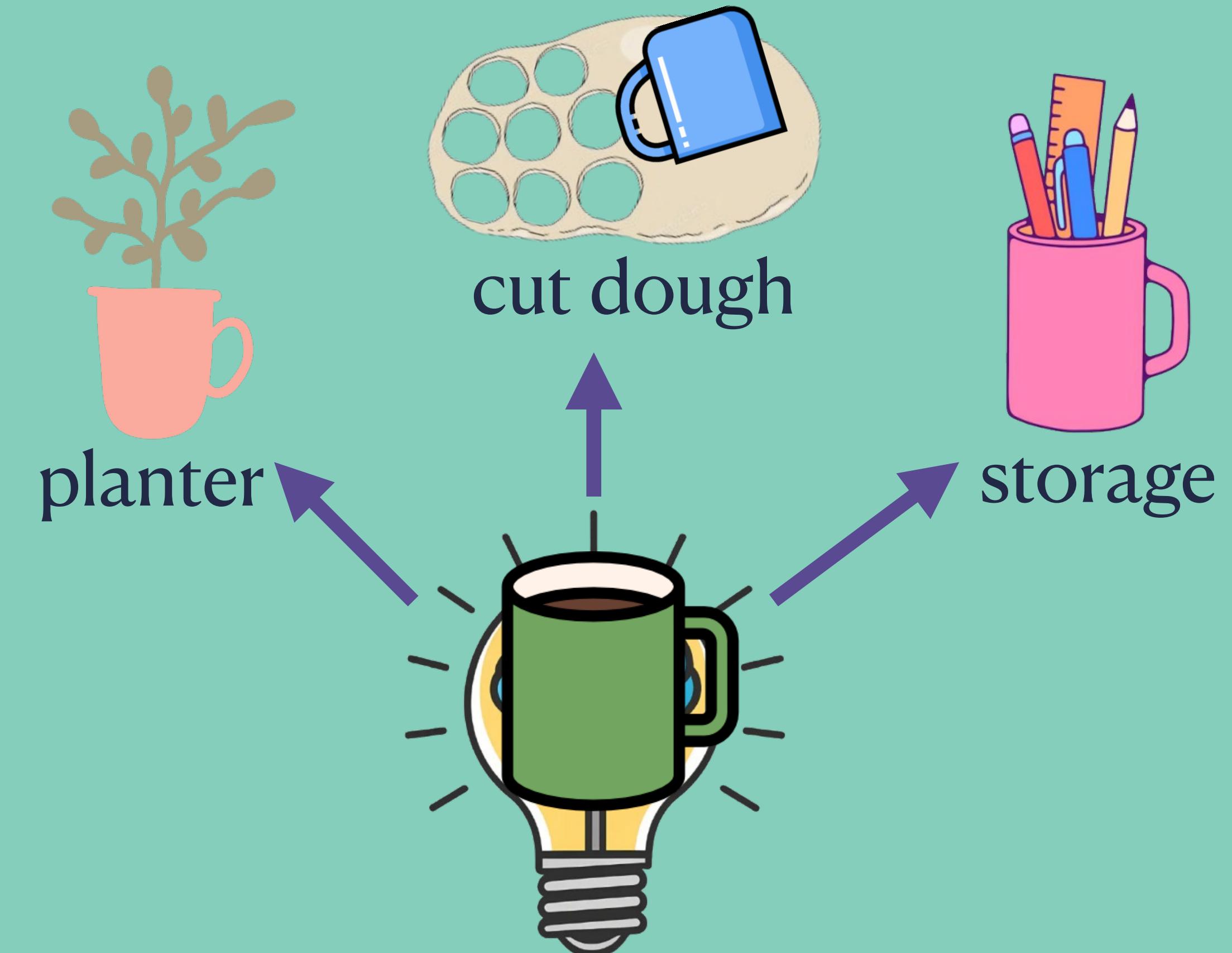
creativity in the lab

convergent thinking



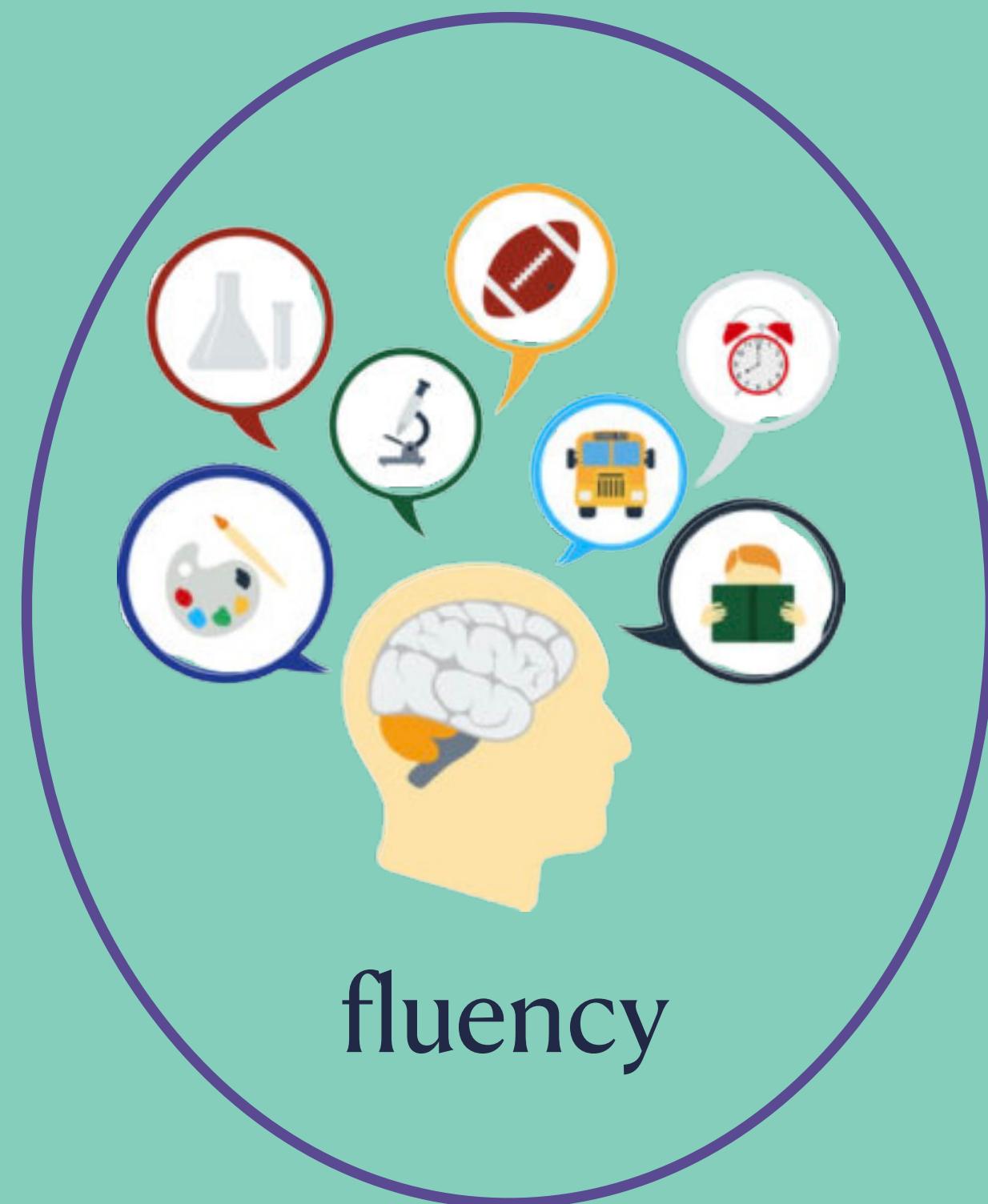
Remote Associates Task

divergent thinking

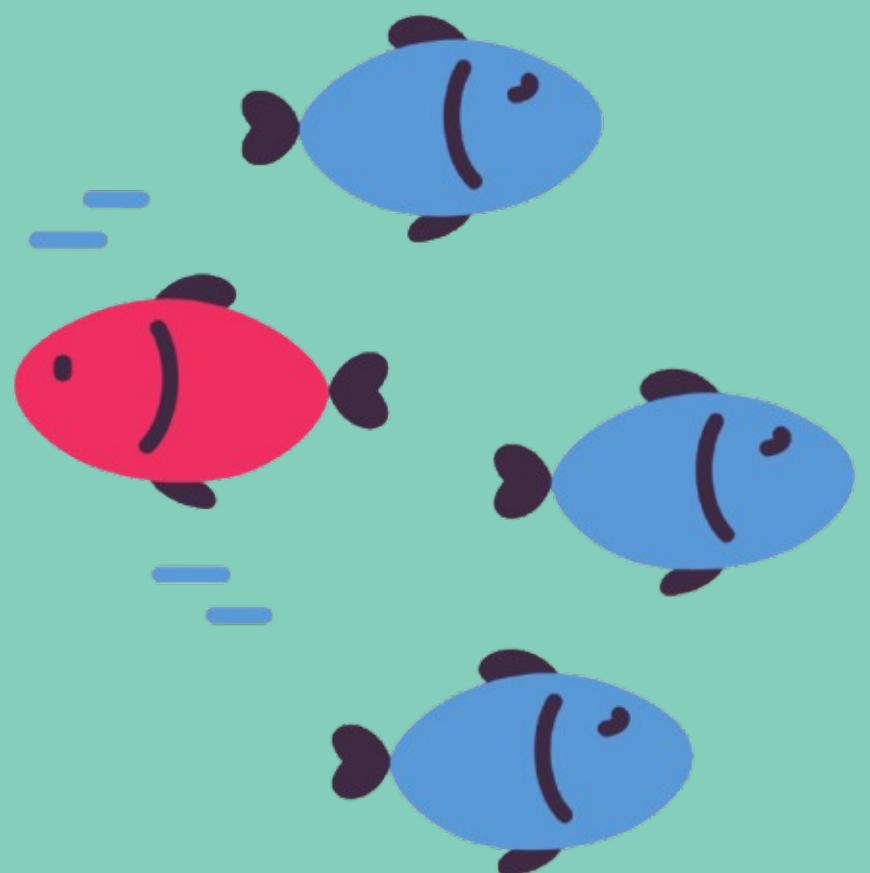


Alternate Uses Task

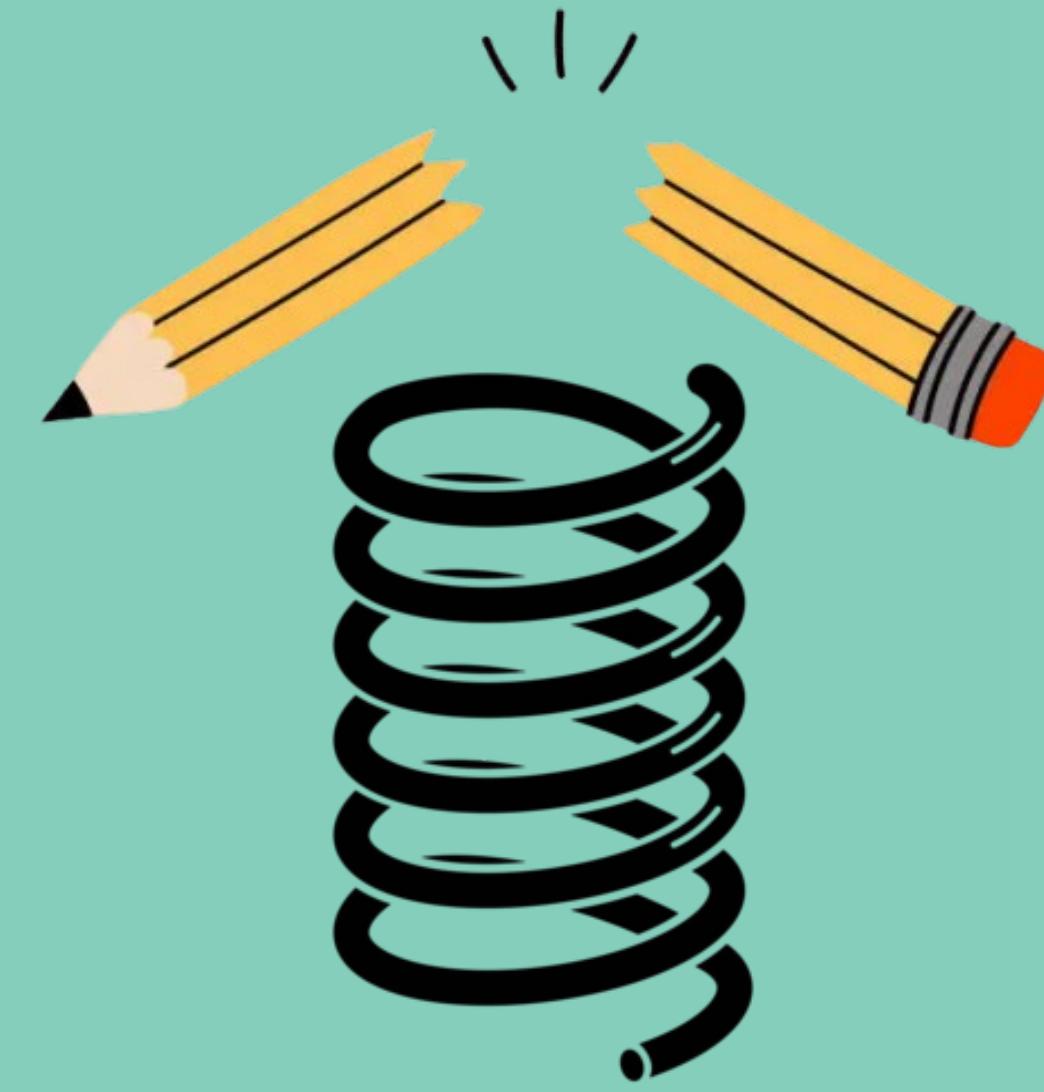
dimensions of creativity



originality



flexibility



elaboration

fluencies



verbal fluency

how many ideas one has

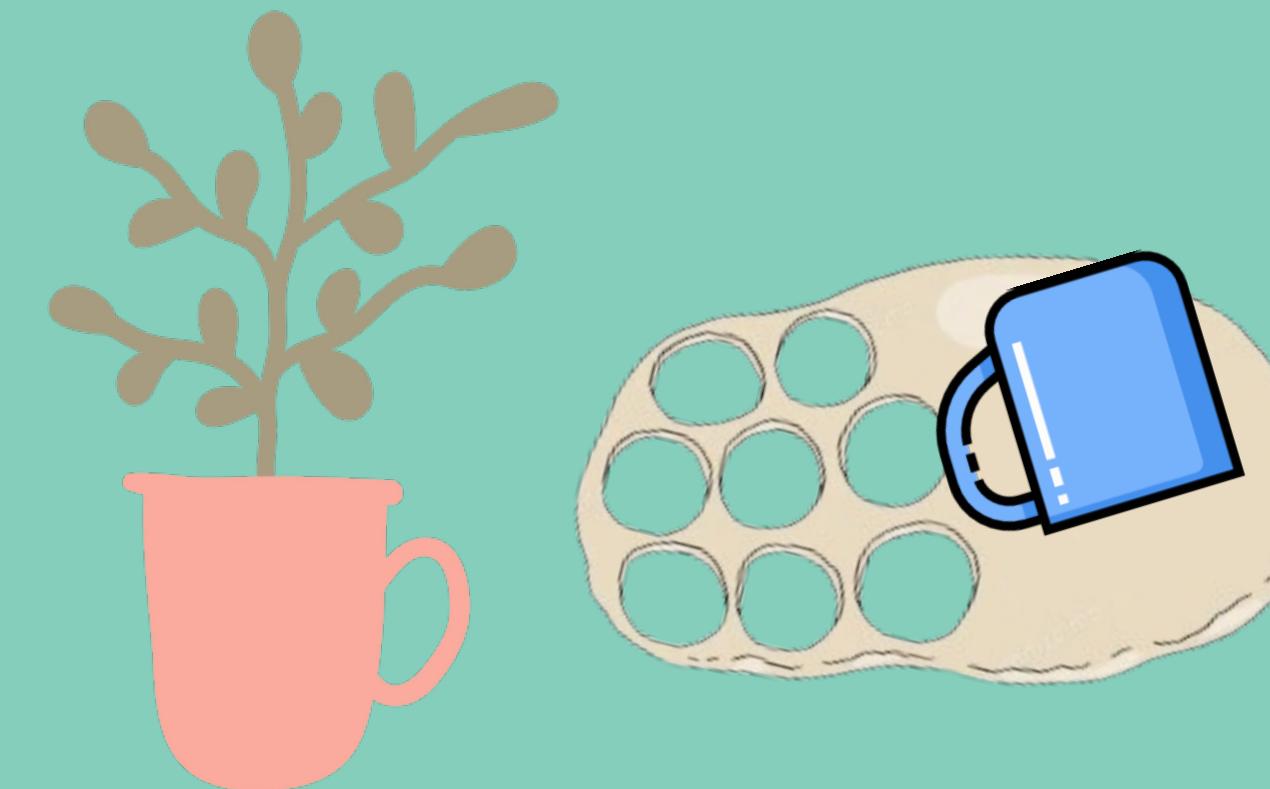


creative fluency

Name as many animals as
you can:



Name as many CREATIVE
uses as you can:



creativity in the real world

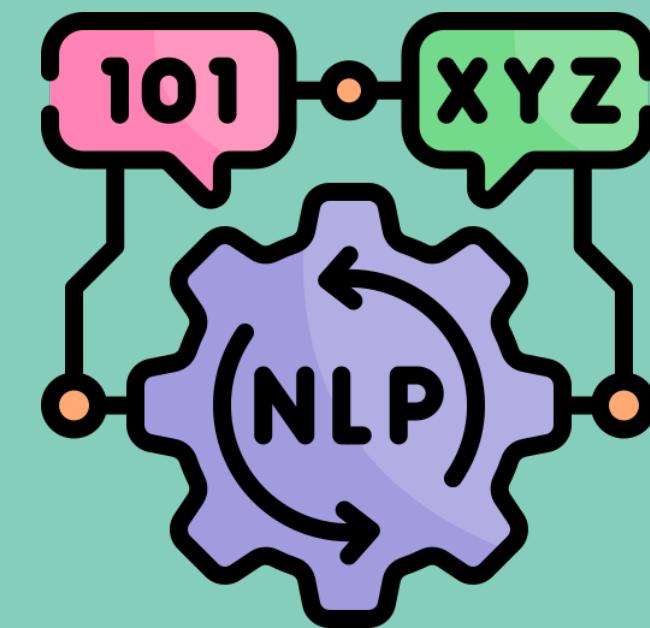
how do creative fluency scores map to real world activities?



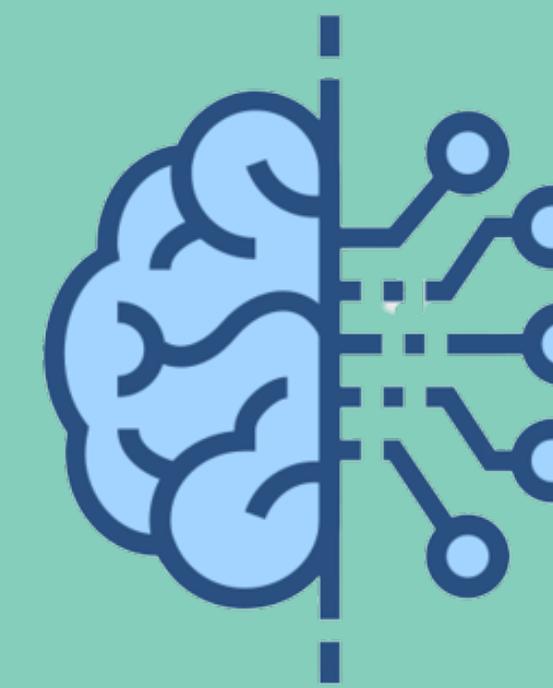
current study



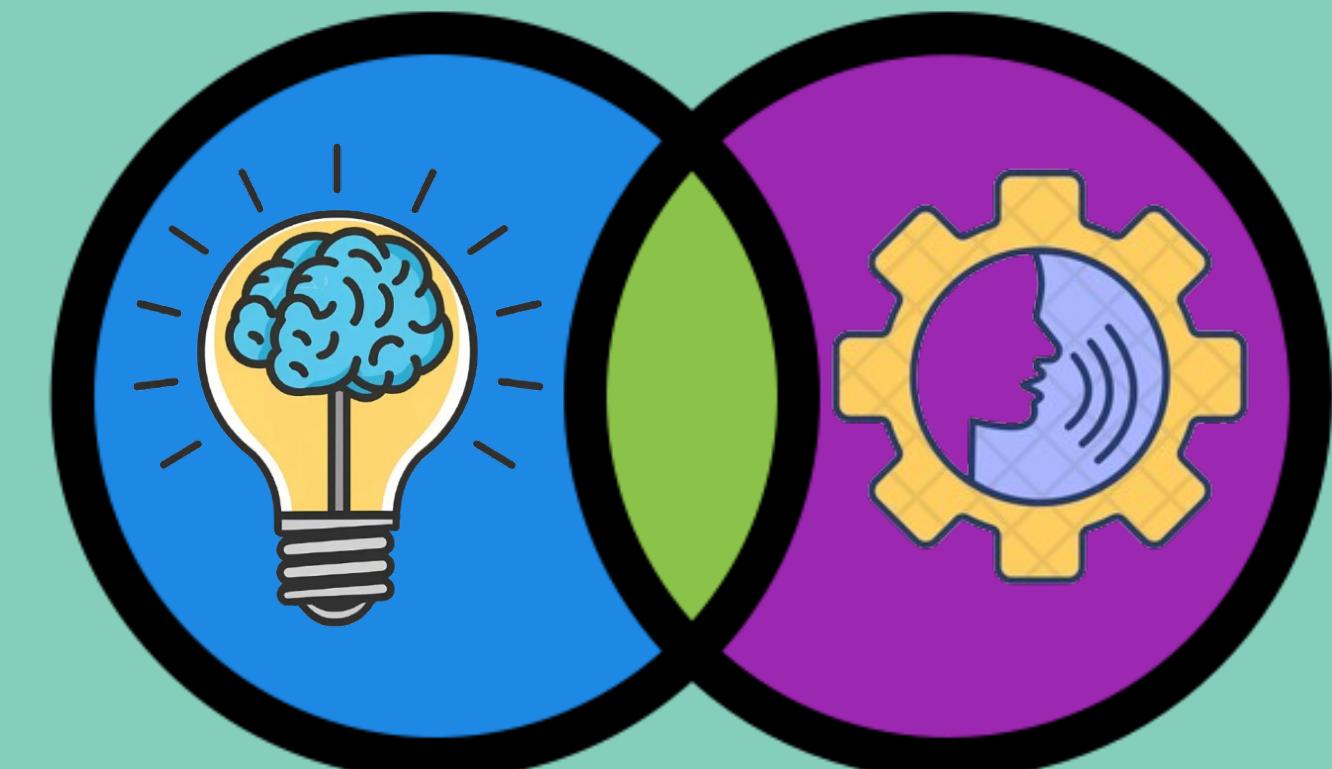
examines how creative and verbal fluencies
manifest within writing



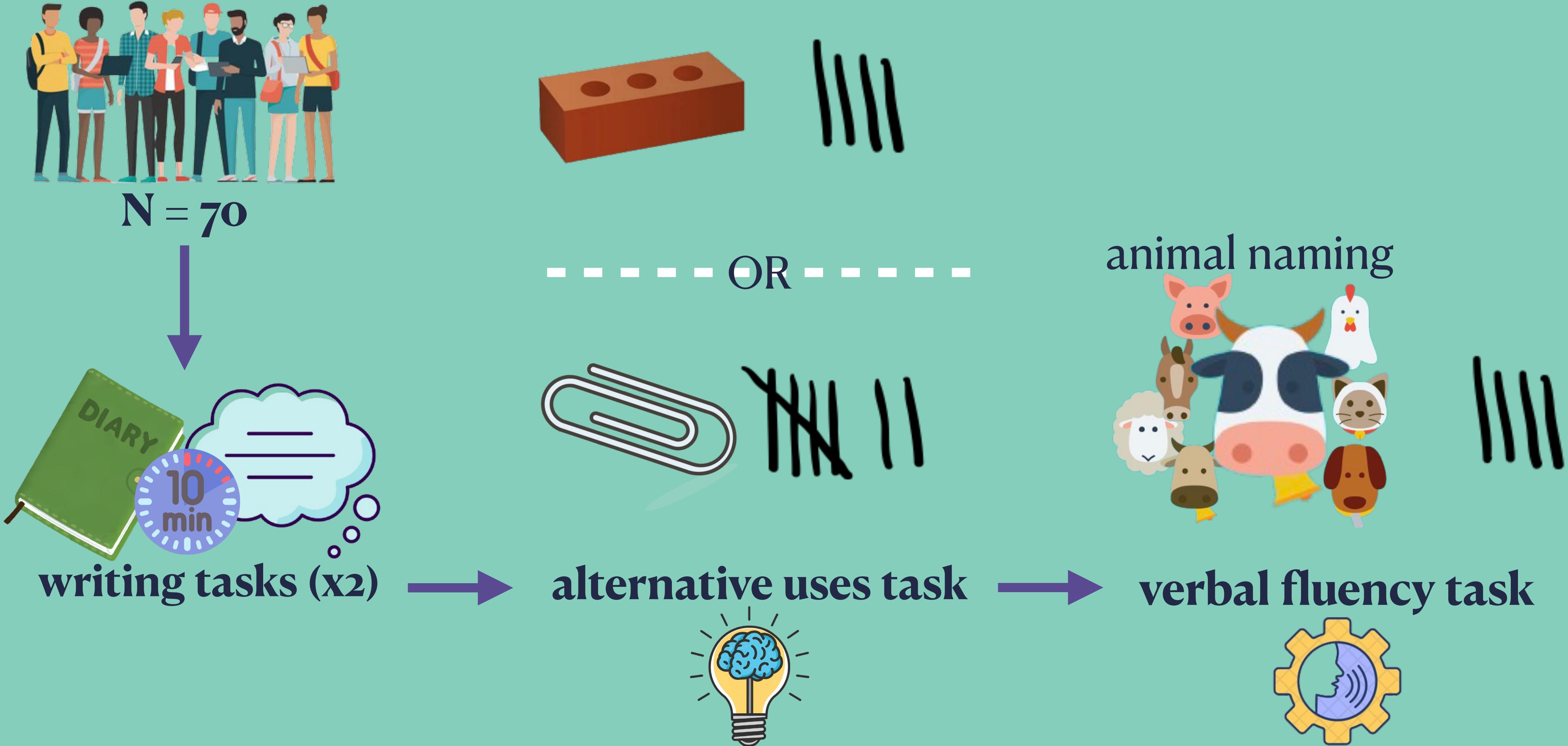
using NLP and machine-learning



and distinguishes the effects between them



procedure



computational methods

descriptive

word length
sentence length

lexical

content word concreteness
content word frequency

diversity

content word type-token ratio

cohesion

explicit content word overlap
semantic overlap

syntactic

noun phrase complexity

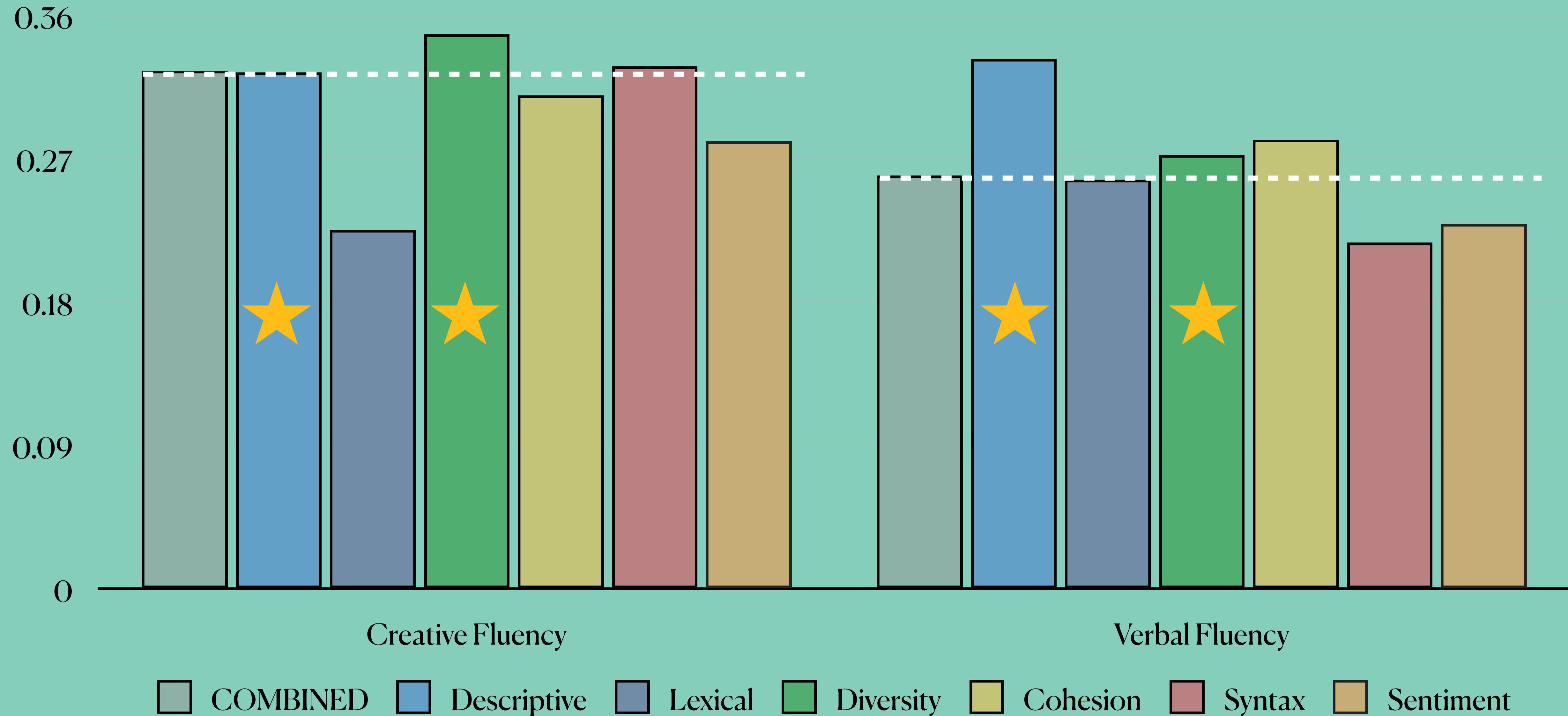
sentiment

positive valence
self-referential words

machine learning
Today was a wild ride. I woke up early, grabbed a bagel from a little shop in Lower Times Square, and couldn't stop staring at all the bright billboards. The energy here is unreal—so many people, so much noise. I took the subway to Brooklyn about, and the train was packed. As a little 10 k-fold cross-validation from the bridge. The skyline looked like something out of a movie—tall buildings everywhere in distance. I wandered through the streets, stopping at food trucks for lunch in Central Park. The middle of all the madness. By sunset, I was exhausted, but I couldn't resist staying for the lights on the Empire State Building. New York feels like it never sleeps, and I'm already planning my next trip here.

results

results: best r-squares



results: best linguistic predictors



creative fluency

- synonym paragraph verb overlap
- explicit content word paragraph overlap
- content word type-token ratio
- semantic paragraph overlap
- # sentences
- sentence length variability
- synonym paragraph noun overlap
- clause complexity
- content word polysemy
- noun phrase variety



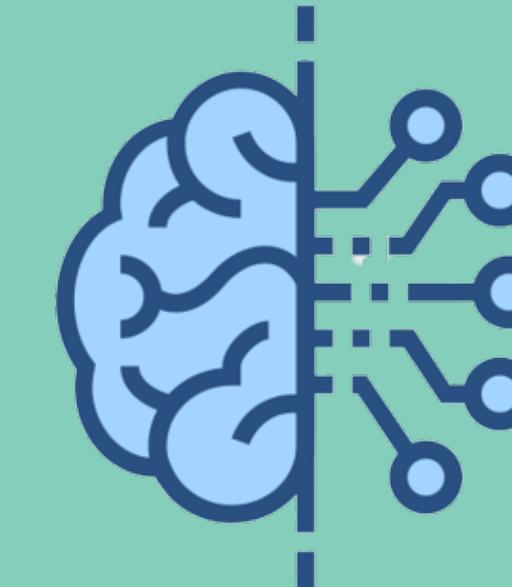
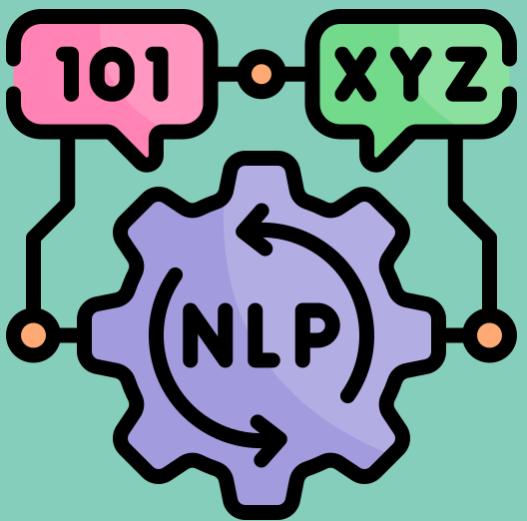
verbal fluency

- content word type-token ratio
- synonym paragraph verb overlap
- sentence length variability
- personal pronouns
- neutral valence
- semantic paragraph overlap
- synonym sentence verb overlap
- % academic language
- contextual distinctiveness
- # sentences

discussion

summary

leveraged multidimensional linguistic features
using NLP and ML



■ Descriptive ■ Lexical ■ Diversity ■ Cohesion ■ Syntax ■ Sentiment

to predict individuals' creative and verbal fluency scores



and examine how creativity manifests within the real-world context of writing



study significance

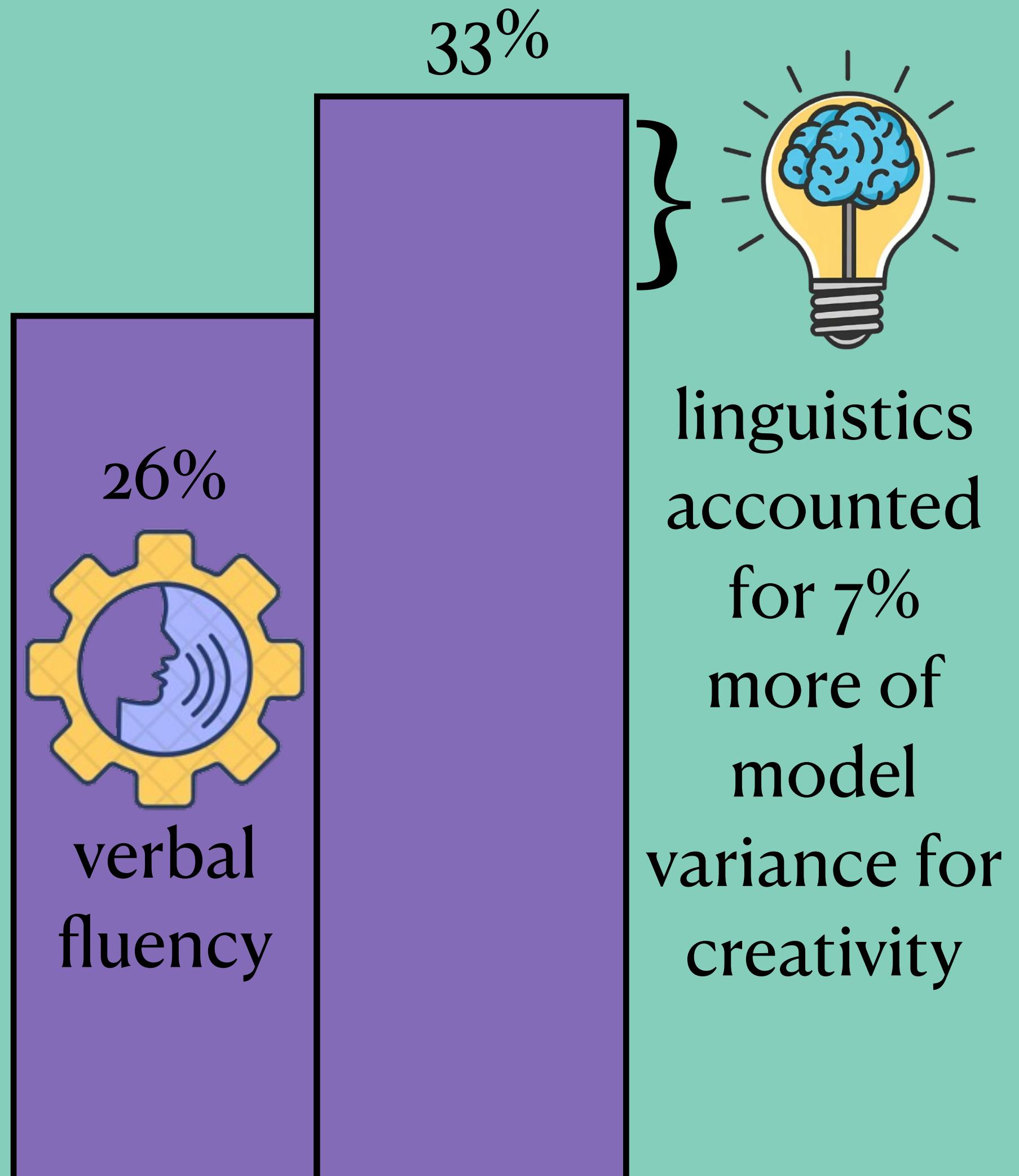
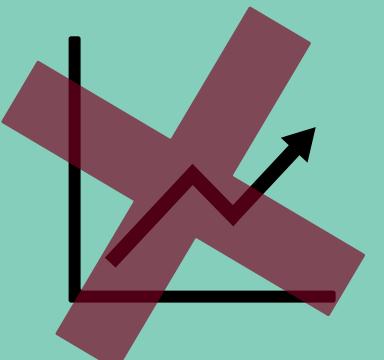
- verbal fluency predicted best by descriptive length-based linguistic indices

E.g., This is a really, really, really, really, long sentence.

- whereas, creative fluency predicted best by linguistic diversity indices

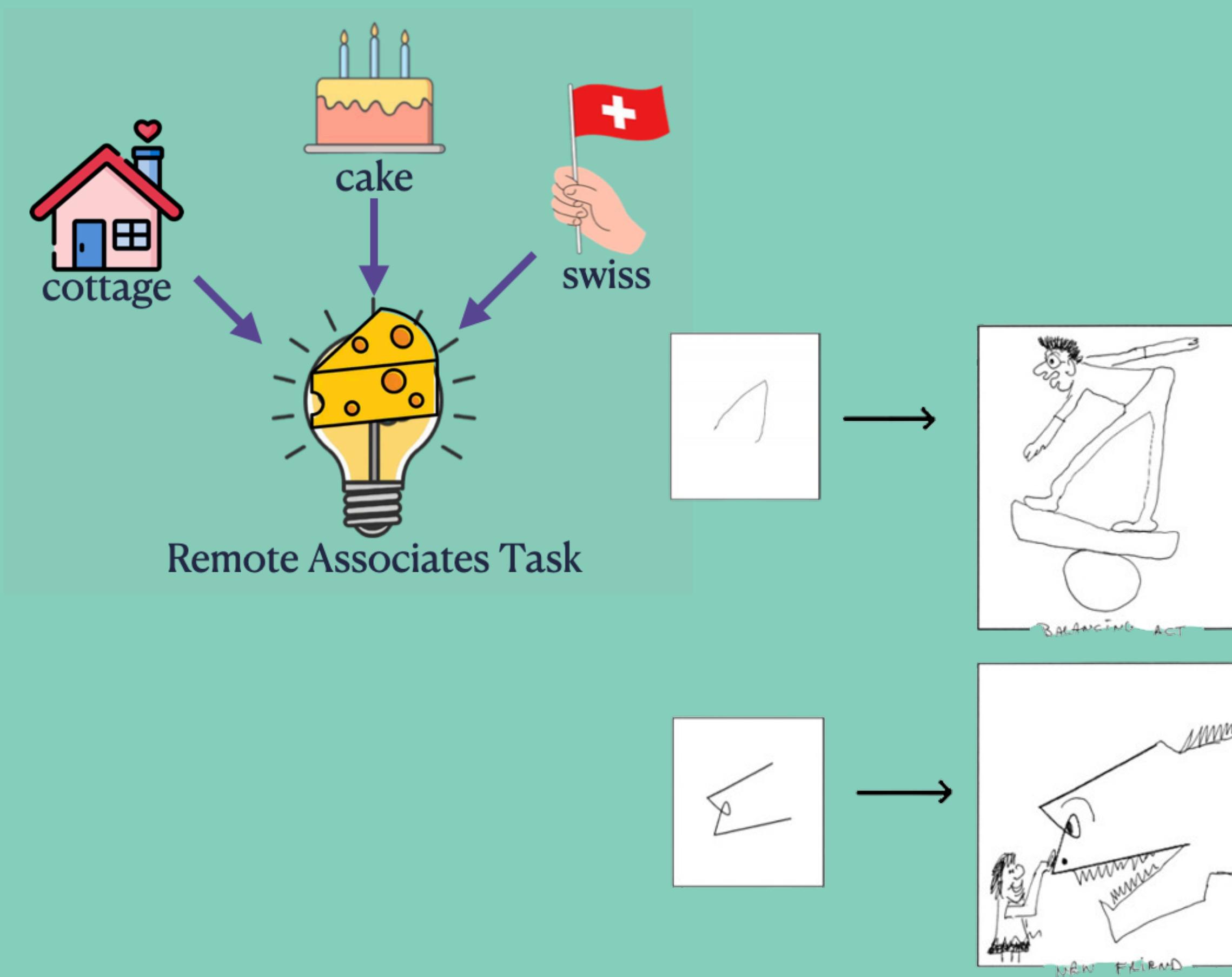
- this is first step to mapping how creativity manifests within real-world activities

- nonlinear algorithms tended to perform best

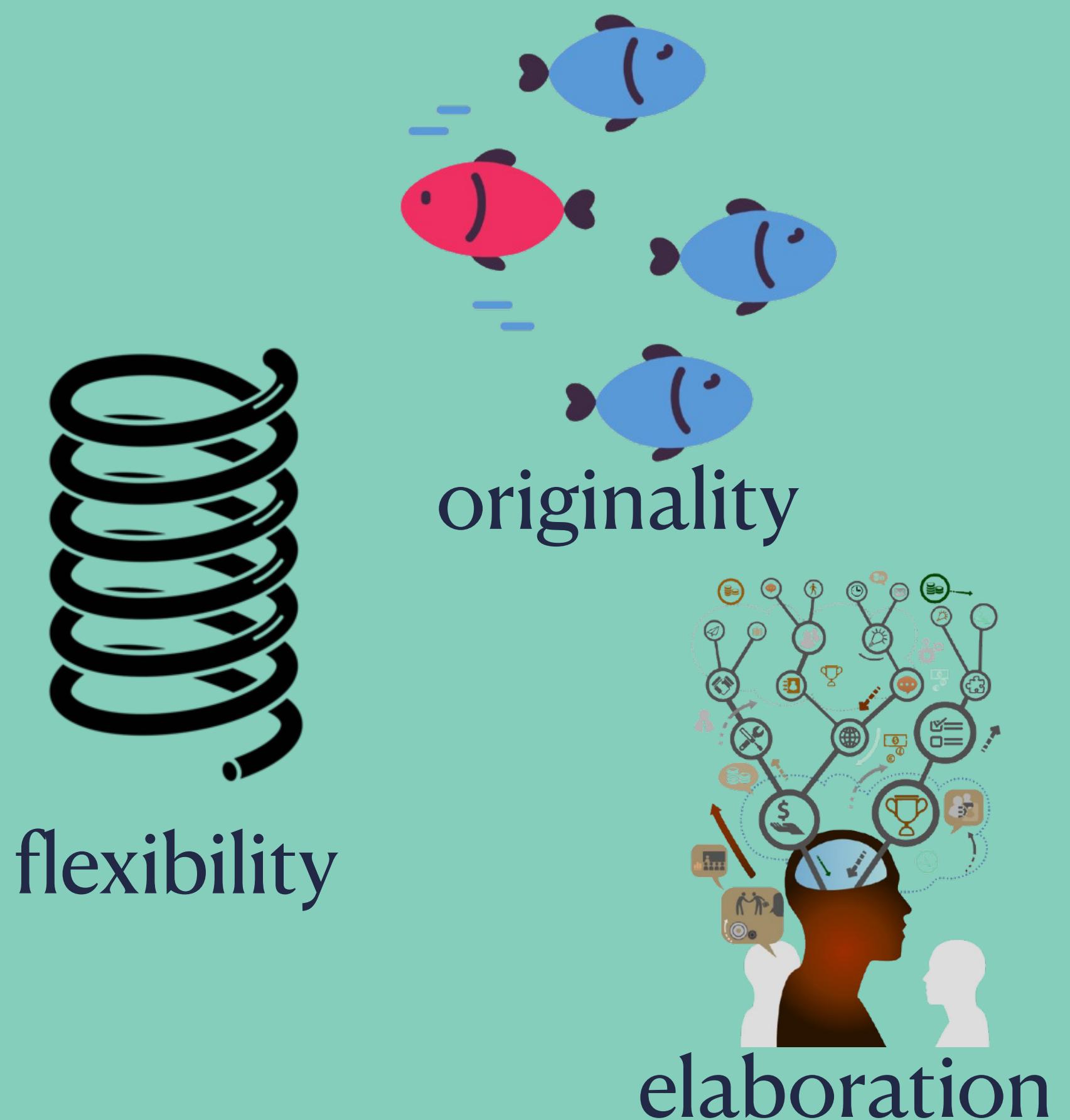


limitations

we only looked at one of many different creativity tasks



examine other dimensions of creativity other than fluency



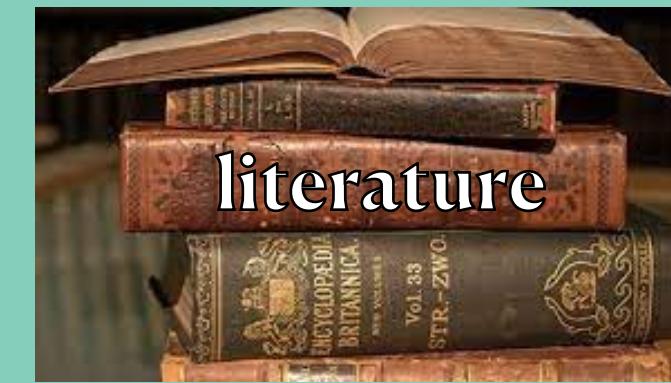
future work



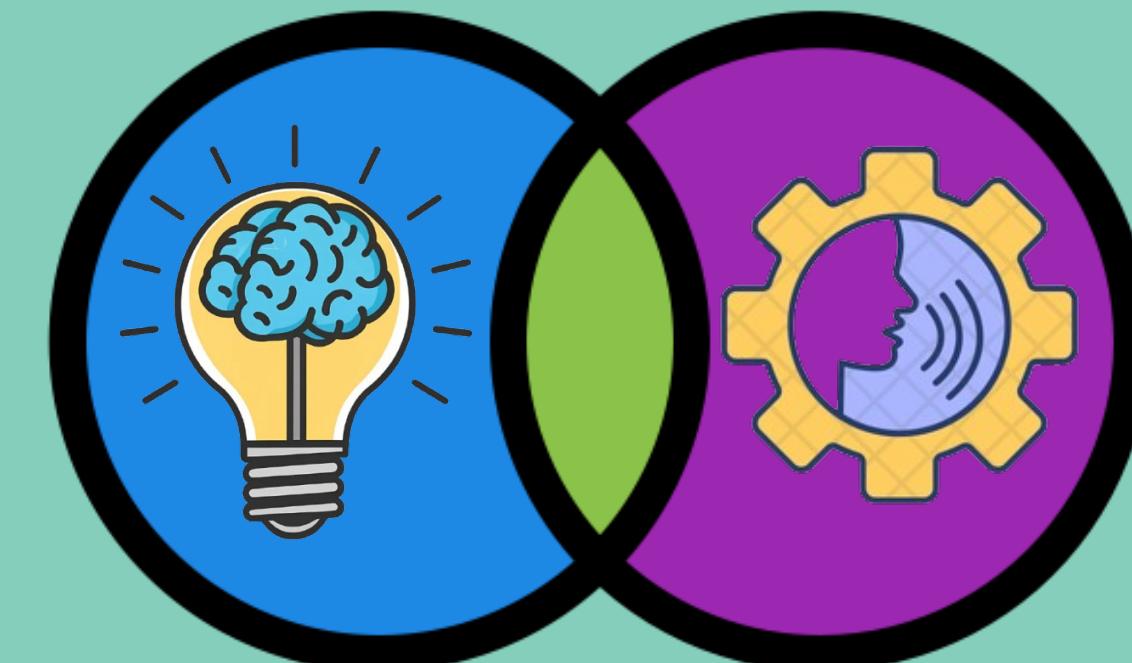
de-aggregate writing task NLP to begin examining
possible task effects



expand scope to other genres of text



still need to further tease apart how much variance is
actually shared between fluencies and how much variance
is unique to verbal fluency



questions?

email: flynn598@umn.edu

