

# leveraging writing analytics for a more personalized view of student performance



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*SoLAR Webinar: December 11, 2019*

# a few acknowledgments



Danielle McNamara



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Caitlin Mills

# focus of this webinar



## writing analytics



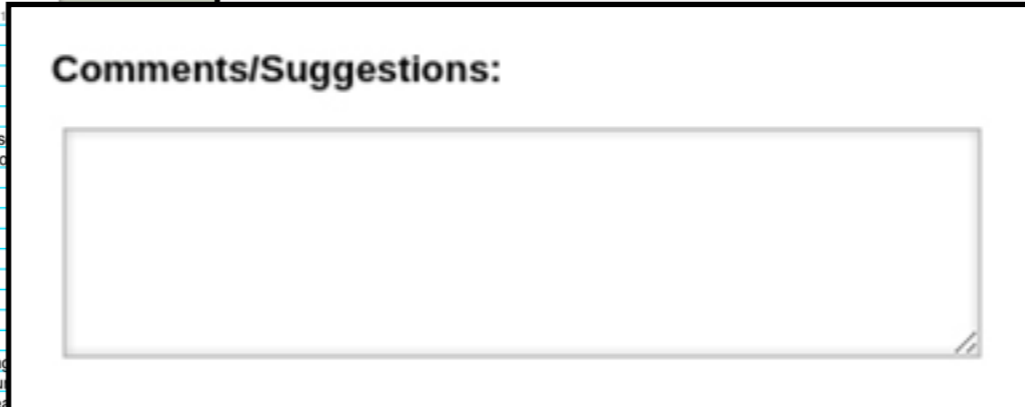
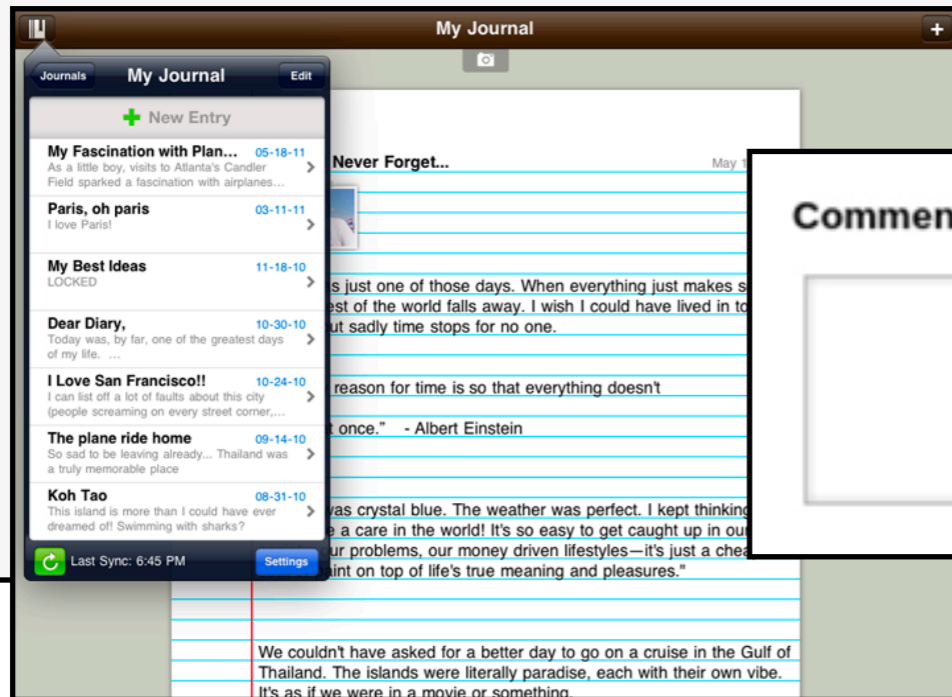
**Measurement and analysis of written texts**  
for the purpose of understanding writing **processes and products**  
in their **educational contexts**



# focus of this webinar

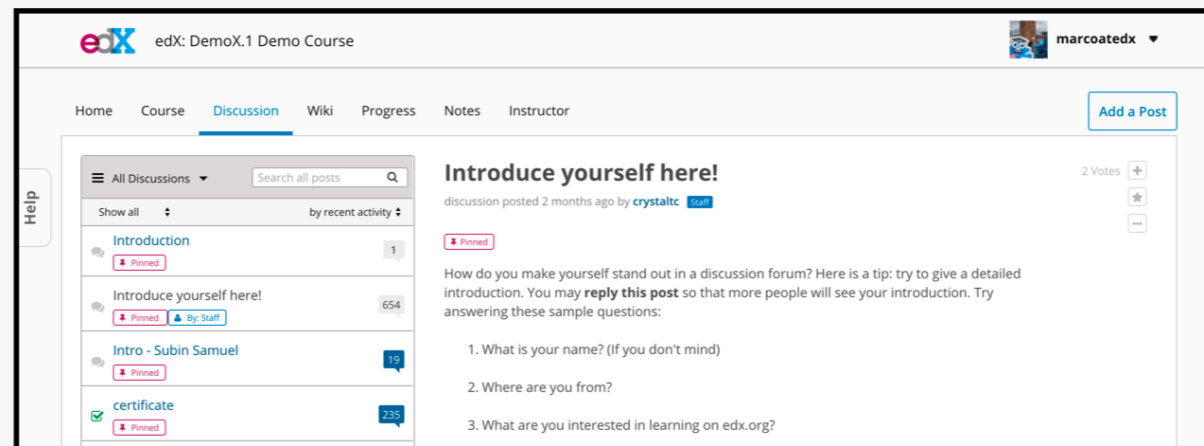


## Measurement and analysis of written texts



written texts?

Circus of Brass and Bone  
Episode 1: Everyone dies.  
The day the ringmaster died, so did civilization.  
We didn't know it at the time, of course. We were miles offshore, sailing back to Boston on a steamship, surrounded by fathoms of seawater.  
We'd been sailing for weeks, returning from our not-so-triumphant Indian tour. There was nothing to do except for rehearse, watch others rehearsing, drink, or gamble over cards. Everything tasted of salt, and the lingering reek of dead fish tainted the entire ship. Short temper spread through the troupe like a plague. I had no friends among them, so I took pleasure at seeing them snarl at each other like fighting dogs.  
The ringmaster seemed especially tense, even after he recovered from a three-day bout of seasickness nastier than any I'd ever had the misfortune of smelling before. When Miss Miller (*The Fabulous Lady Equestrienne Who Defies The Fiery Rings of Death!*) declared her intention to begin her dress rehearsal in the hold without him, since he had promised to begin an hour or more ago and it wasn't good for her horses to wait in their regale for so long after they'd been warmed up, we all thought that the resultant explosion would make a fine show indeed.  
On the ship, "Aether's Bounty," the Atlantic Ocean.  
"If nobody's seen Mr. Loyale," Lacey Miller announced to the group playing poker by the rail, "I'm beginning without him." She turned her back and walked away, her polished riding boots clicking across the deck.  
The ringmaster had said they'd meet at sixth bell! She couldn't let her horses suffer, waiting with their saddles on, simply because he wasn't going to show.  
Mr. Loyale didn't appreciate her skills and the talents of her horses; it would surprise nobody that he disrespected them by showing up late. Why, when she wished to buy a new pair of matched Arabian yearlings to train in, he'd as good as said that equestrian shows had lost their novelty and the figure of the circus lay elsewhere. A hot ball of anger flared up inside her, but she betrayed no sign of it. She kept her back straight and her walk smooth, the skirts of her riding habit swirling around her ankles. She raised her chin slightly, balancing the weight of her heavy blonde chignon and the padding that tipped forward to precisely the right angle and secured there with hairpins.  
Behind her, she heard the flutter of cards being shuffled back into a pack and a low whistle to tell other performers that something worth attention was happening. Ropes rasped above her as the acrobats swung down from the practice area they'd created by anchoring their ropes to the steamstacks. The whistle was repeated along the length of the ship. The monkeys out for their daily promenade began to chatter excitedly as their handler changed their routine, leading them along. A quick patter of bare feet behind her told her that others followed. Let them. She didn't mind an audience, she told herself.  
Knowing nothing of what was to come, we complained of boredom as the ship steamed from Esplanade past the Boston  
Theatrical Society rehearsal, his temper didn't.



SoLAR Retweeted  
**Dragan Gasevic** @dgasevic · Sep 6  
Delighted to announce multiple positions in #LearningAnalytics @MonashInfotech @MonashUni - 1 x assistant/associate prof, 4 x postdocs, 2 x software engineers, 6 x PhD students. Exciting opportunities to work w/@AngusGLChen @RobertoResearch @Neil\_Selwyn @DER\_Monash & many others

MONASH University  
The Faculty of Information Technology at Monash University is proud to be establishing a leading international research group in learning analytics and the education hubs for developing students, researchers, professionals, and leaders in learning analytics. The group is currently rapidly expanding and is proud to offer several positions, including:

- A continuing research and teaching focused Lecturer/Senior Lecturer (Level B/C) position in learning analytics (tenure-track Assistant/Associate professor equivalent). Applications close on 29 September 2019. Details about the position can be found at [http://bit.ly/monash\\_la\\_lecturer](http://bit.ly/monash_la_lecturer)
- Four postdoctoral research fellowships in learning analytics with three-year long appointments and with an option to be renewed for an extra year. Applications close on 29 September 2019. Details about the positions can be found at [http://bit.ly/monash\\_la\\_postdocs](http://bit.ly/monash_la_postdocs)
- Two software developers of learning analytics-based systems with three-year long appointments and renewable for an extra year. Applications close on 29 September 2019. Details about the positions can be found at [http://bit.ly/monash\\_la\\_sw](http://bit.ly/monash_la_sw)
- Six fully-funded PhD studentships in learning analytics. Contact us for details.

Contact: [dragan.gasevic@monash.edu](mailto:dragan.gasevic@monash.edu) or twitter @dgasevic

SoLAR Retweeted  
**LAK20** @lak20frankfurt · Sep 4  
Make sure you mark 1 October on your calendar - deadline for #lak20 full and short research papers, practitioner reports, and workshop/tutorial proposal submissions. Don't forget to check the submission guidelines: [lak20.solaresearch.org/submission-gui...](http://lak20.solaresearch.org/submission-gui...)

SoLAR @SoLARResearch · Sep 1  
Four(!) Research Fellow positions at Monash University Faculty of IT in #LearningAnalytics posted to SoLAR job board. A great opportunity to work with SoLAR's past president @dgasevic. The deadline is 29 Sept so hurry up!



# focus of this webinar



In their **educational contexts**



## Our Courses

Join open courses for free. Experience the fun and excitement of OpenLearning with:



## Create a Course

Teach public or private courses online, engage students like never before and get started for

**assumption:** the language of others (and our own!) can provide important data about **individual differences, performance, learning processes,** and other factors important for **learning**



# focus of this webinar

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how can writing analytics be used to provide better training and feedback in educational contexts?





focus of this webinar

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what might the **properties** of our  
written discourse reveal about  
us & our students?

(how can we *tap into* and  
**leverage** these differences to  
improve educational outcomes?)

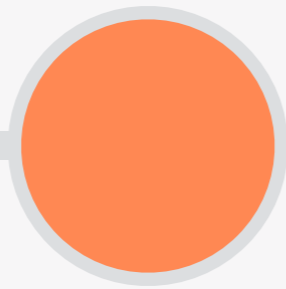
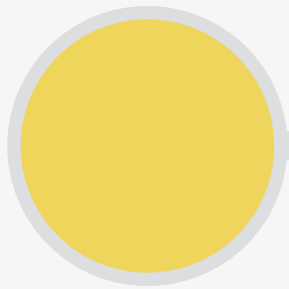
# outline

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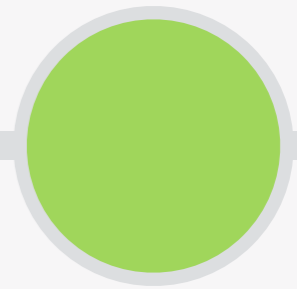
## perspectives

important properties of  
writing



## analytics applications

writing pal



## analytics methodologies

stealth assessment  
writing behaviors

## future research

next steps  
long-term goals



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**perspectives**

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# perspectives

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## important features of writing

that should dictate **theory, analytics & practice:**

1

writing is **multi-dimensional**

2

writing is **dynamic**

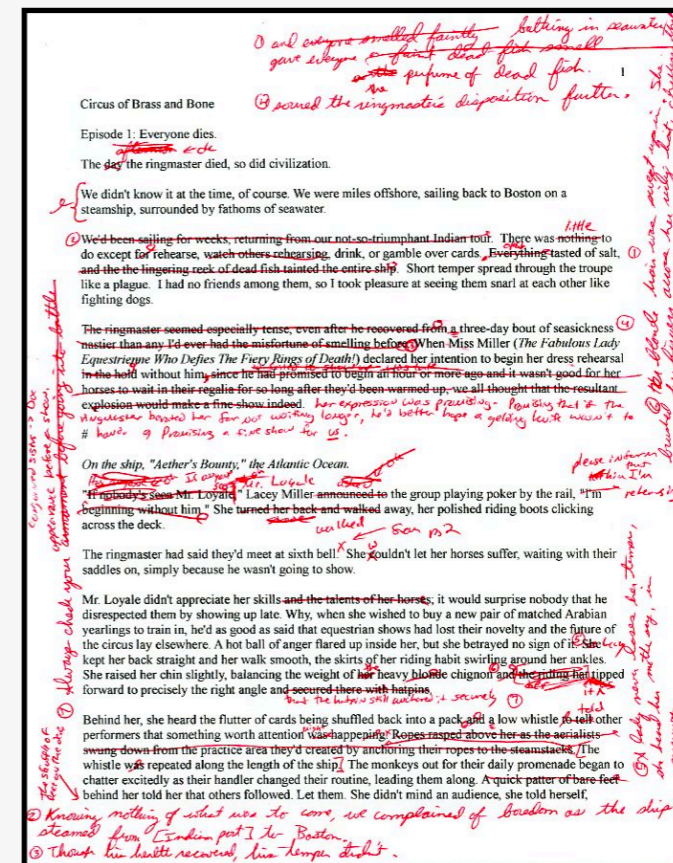
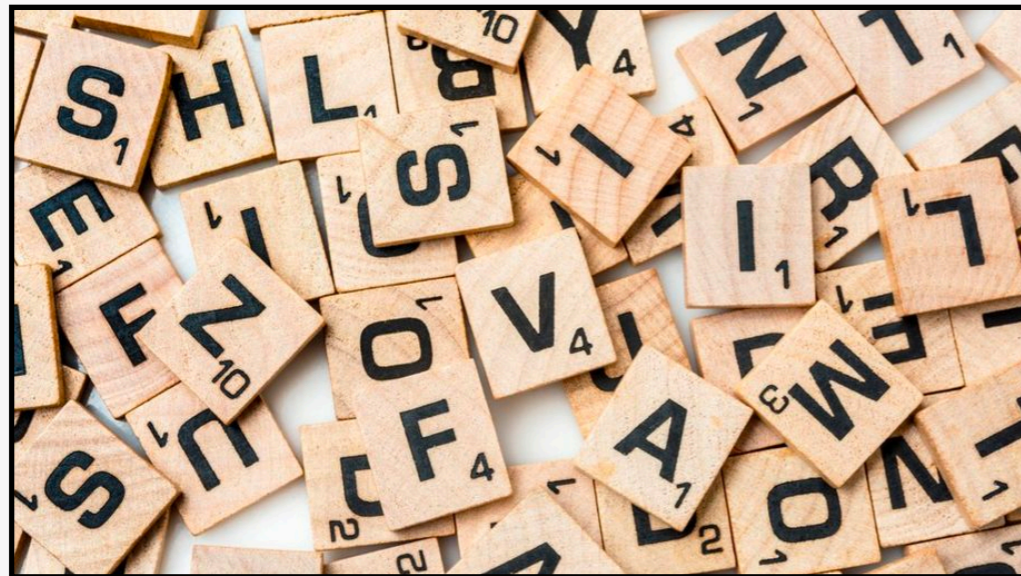
1

# writing is **multi-dimensional**, constrained by surface and deep levels

(Graesser et al., 2011; Sardinia & Pinto, 2014)

linguistic analyses tend to focus on a single dimension of writing (e.g., words)

attending to the dimensions of writing (and their interactions) can help model its complexities



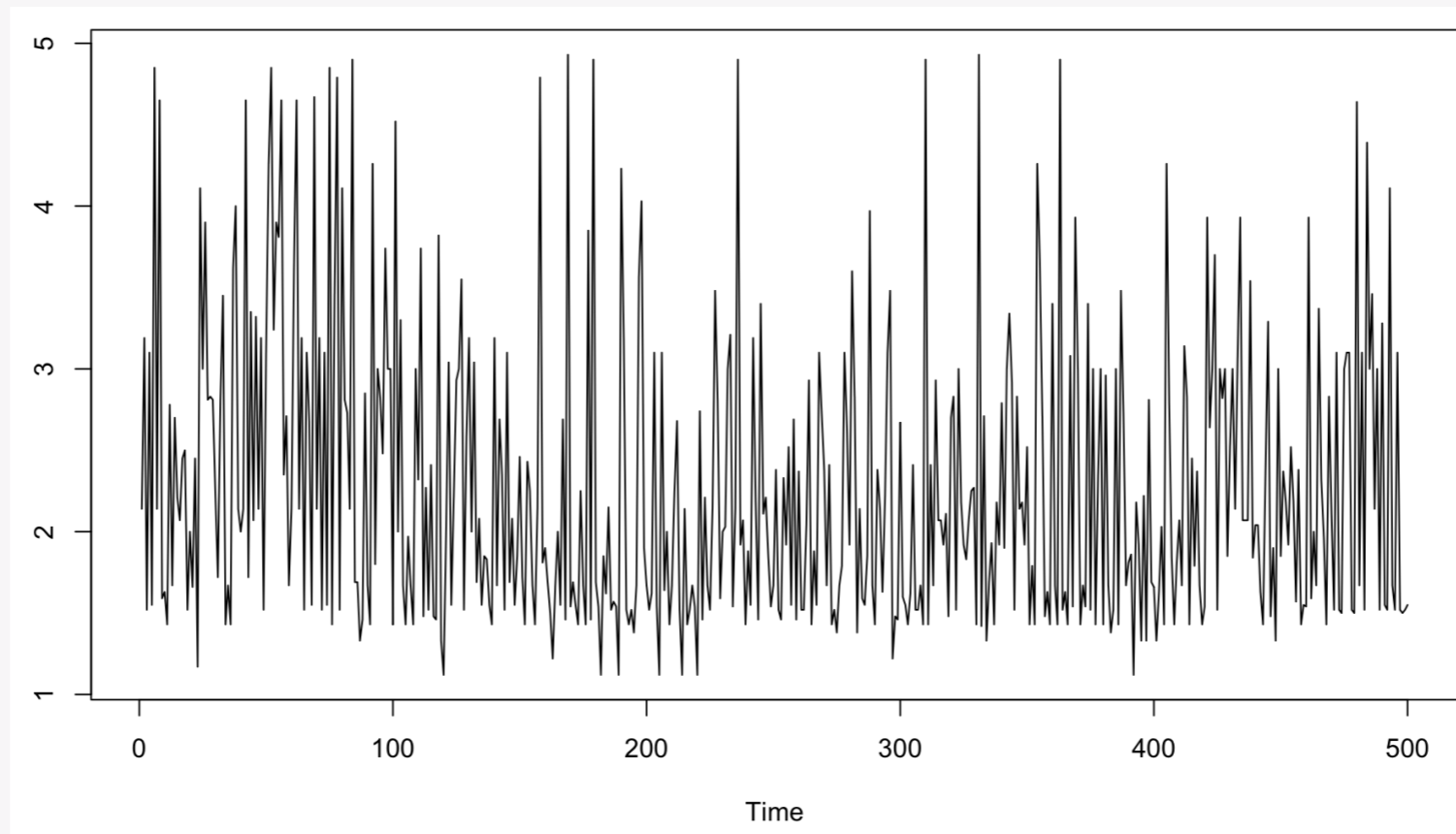
# 2

## writing is **dynamic, recursive, self-organizing, and non-linear**

(Beckner et al., 2009; De Bot, 2008; Ellis, 2011; Van Geert, 2008)

traditional models of statistics  
treat increased variability as  
source of noise

*structure* of variability can  
reveal important information  
about complex processes





**analytic methodologies**

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# dimensionality

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1

writing is **multi-dimensional**

use of Natural Language Processing (NLP) techniques to understand (model) and ultimately improve writing **processes** and **performance**





# dimensionality



## natural language processing

NLP can help analyze language along a number of linguistic dimensions

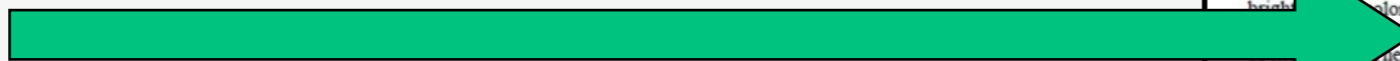
descriptive



lexical



cohesion



semantics



In fifth grade Officer Brown, my D.A.R.E. instructor, asked my class to draw a picture representing the physical characteristics of a typical drug dealer. I drew an evil looking man with snake like eyes. He was wearing dark black clothing, and he was standing on a grungy street corner in front of an abandon warehouse. The purpose of this exercise was to demonstrate that anyone could be a drug dealer. A drug dealer could be a sweet Suburban soccer mom who bakes homemade cookies for her children, or a drug dealer could be that evil looking guy wearing black clothing on the street corner. Officer Brown explained that as a society, we tend to associate negative characteristics with drug dealers because the media depicts drug dealers in this manner. As a result, this negative imagine of drug dealers have been imbedded into our minds at a very young age.

Disney movies have been instrumental in influencing children's views of good versus evil. The movie *The Little Mermaid* has a great emphasis on the characters' physical appearance. For example, in *The Little Mermaid*, Ariel is beautiful and skinny. She has long flowing red hair, big bright blue eyes, perfectly full red lips, and she glows about her. She is very feminine, and her voice is high pitch but pleasing to the ear. The men in *The Little Mermaid* are strapping and handsome. They have big bulging muscles that can aid them in rescuing mermaids if they get into trouble. The men also have a full head of hair that always stays in place. The "good" characters in Disney movies are always portrayed with good characteristics. In fact it is as if they are perfect. On the other hand, the "evil" characters are described as perfectly repulsive. Ursula, a sea witch, in *The Little Mermaid* is an ugly dark looking creature with a long pointy noses, and long fingers. She has monster sharp teeth and a gruff manly voice. Ursula does not possess one positive quality. Like other "evil" characters, Ursula is on the other end of the continuum compared to Ariel.

The environment is also use to depict differences between the "good" and "evil" in Disney movies. For example, in *The Little Mermaid*, Ariel lives in a well-maintained golden castle. The water in the castle is crystal clear. On the floor of the sea, there is green seaweed and bright colored coral. There are also various forms of life swimming around the castle. The fishes, shrimps, crabs, and other animals are bright vibrant colors. Ursula on the other hand, lives in a dark dreary cave. During parts of the movie, the water surrounding the cave is black, and at other times, the water is dark blue. Ursula's cave is unkempt, and it is full of dieing souls and skeletons. The only form of life near the cave is Ursula's assistances, eels. The eels are black with slanted snake like eyes that glow a yellowish-green color. The floor of Ursula's cave is not made of grass. Instead the floor is made of dirt and rocks. The entire atmosphere surrounding the castle represents death.

In the pervious paragraphs it was alluded that the use of color also helps distinguish between "good" and "evil" characters. Scenes involving the "good" characters contained an abundant amount of color. There are mostly bright colors, such as yellows, reds, oranges, purples, and blues. For example Flounder, Ariel's love, is a yellow fish with a mixture of dark and light blue strips. Most of the fish in the sea are a mixture of colors. The fishes are either red with yellow fins, purple with yellow fins, blue with red fins, and blue with yellow fins. Other animals are red and orange. There is also some pink mixed among the animals. The scenes involving the "evil" characters lack color almost entirely. The little color that is use is cold and dark. The most abundant color representing Ursula is black. Ursula herself is a dark purple, and there are some dark blues and greens. There is also the yellowish-green glow that comes out of the eels' eyes.

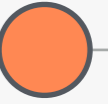
Officer Brown was on to something when he stated that the media influences our opinion. It may not be obvious to children as they watch *The Little Mermaid* or another Disney movie, but that movie is influencing their opinion. The movie gives children a template as to how "good" individuals should look, how they should act, and even what they should possess. Of course, the movies also give children a template for "evil" individuals. The template teaches children that "evil" individuals should look, act a certain way, and possess certain items. It also teaches them that evil people should not possess certain items. For example, in *The Little Mermaid*, Ariel lives in a castle, but Ursula was not even good enough to have a house. Instead she lived in a dark dreary cave. As they grew, children take these images of "good" and "evil" and adopt them as their own beliefs. Louis Althusser coined the term interpellation, the idea that as individuals we tend to accept society's norms as our own. Therefore in the beginning of the paper when I described my picture of a drug dealer in the fifth grade, it could be conjectured that I obtain those images from society, and not from reality. In reality there is no such concept as a "typical" drug dealer. As officer Brown stated, anyone could be a drug dealer.

Bird, Klein, & Loper, 2009;

Crossley, Allen, Kyle, & McNamara, 2014

# dimensionality

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what can **multi-dimensional**  
writing analytics tell us that we  
don't already know?

Some examples...

# dimensionality

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## 1 one example

substantial research in the learning sciences has been devoted to understanding the role of individual differences in performance on discourse comprehension and production tasks

we know that **working memory**, **vocabulary knowledge**, **domain knowledge** are all linked to performance on these tasks (Attali & Powers, 2008; Hoskyn & Swanson, 2003)

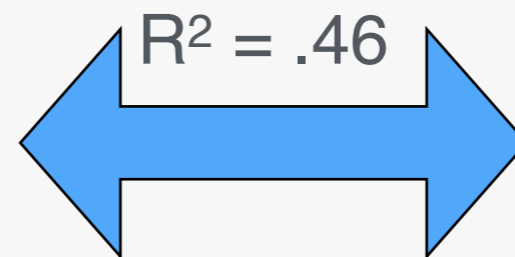
But **how** do they influence these processes?

# dimensionality



## examining vocabulary and writing relations

vocabulary test score



word frequency (-)

logical connectives (+)

words before the  
main verb (+)

higher vocabulary scores related to generation of text with more **complex sentence structures**, **less familiar words**, and **greater** incidence of words that signal **logical connections**

# dimensionality

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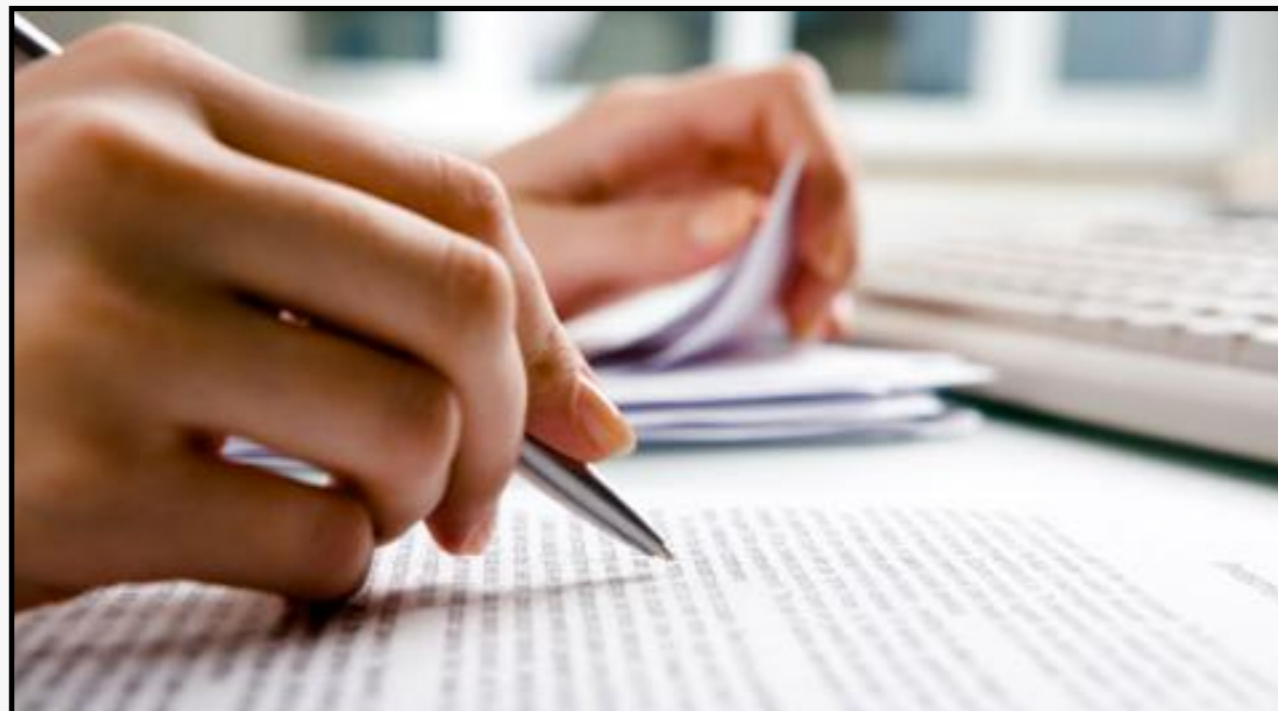


These multidimensional analytics provide insights into the processes underlying writing and can be used to inform **stealth assessments** & deliver **personalized feedback**

**Vocabulary Knowledge**

**Beliefs**

**Domain Knowledge**



# dimensionality

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## 2 second example

students use a variety of **strategies** to develop coherent representations while learning from text

**self-explanation** fosters activation of prior knowledge, prompts inference generation, and promotes increased processing of causally relevant information (particularly for expository texts)

How do the properties of students' **constructed responses** to text relate to their understanding?

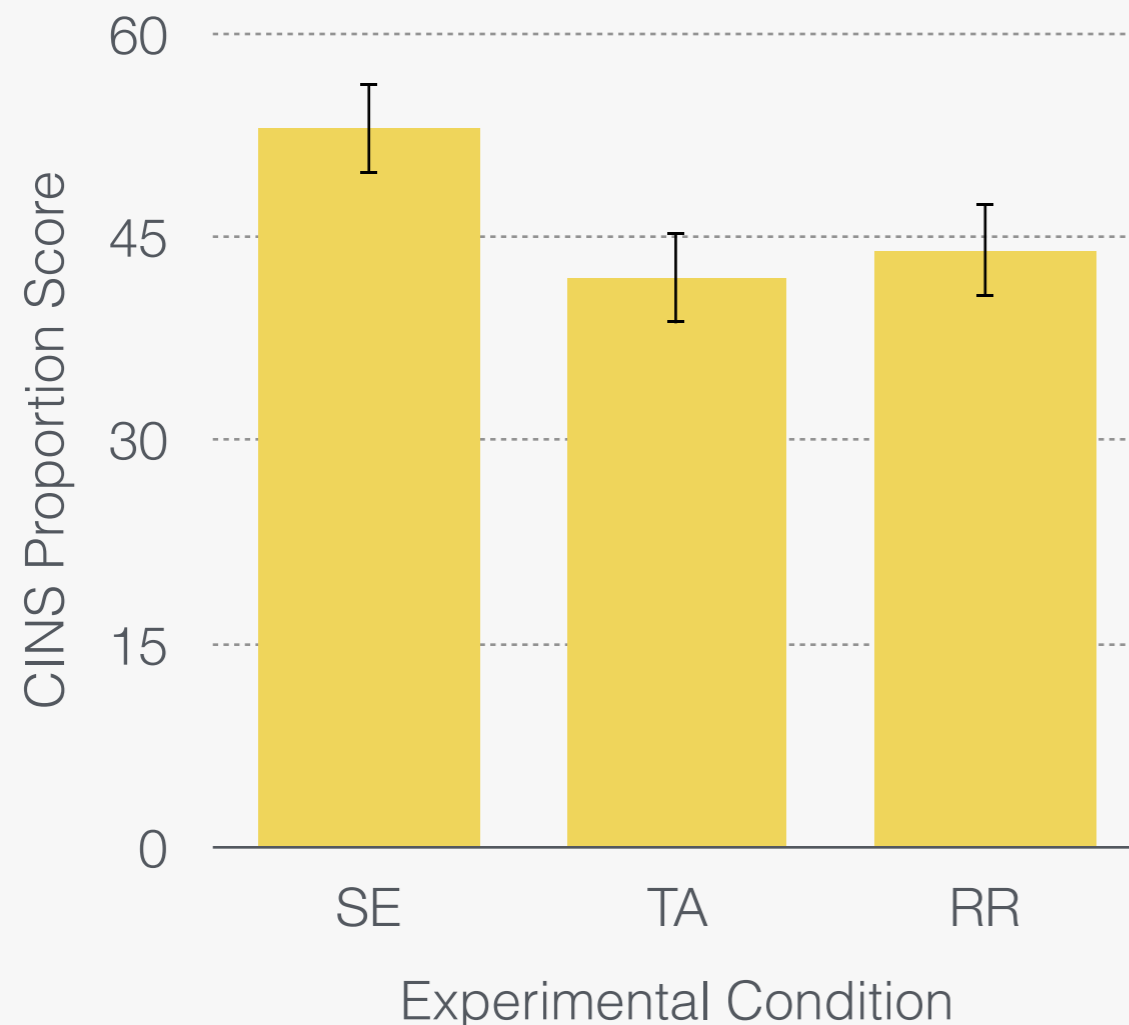
# dimensionality



## previous study

self-explanation v. think-aloud during single text comprehension

**Q:** will self-explanation promote deeper understanding of a complex topic (i.e., natural selection) compared to thinking-aloud or re-reading?



Participants in the self-explanation condition outperformed both the think-aloud and rereading conditions

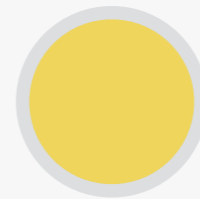
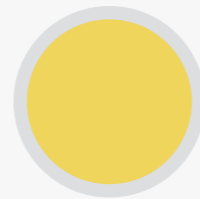
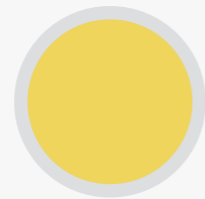
$F = 43.17, p < .001$

# dimensionality

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To understand whether self-explanation instructions prompted participants to generate different forms of connections, we can analyze the **linguistic features** of the responses



The way individuals are making connections across a text can provide important information about successful discourse processing strategies



# dimensionality

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we can examine these different connection types through **cohesion** analyses

## referential cohesion

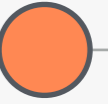
explicit overlap at the noun level across sentences  
e.g., **Jane** went to the store to buy a **sandwich**. The **sandwich** tasted very good to **Jane**.

## semantic cohesion

semantic overlap of concepts across sentences  
e.g., The **dog** caught the frisbee. The **animals** enjoyed playing at the park.

# dimensionality

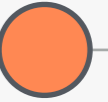
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Do these beneficial self-explanation processes manifest in the **cohesion** of students' responses to the text they are given to read?

# dimensionality

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**Q:** Do these beneficial self-explanation processes manifest in the cohesion of individuals' responses to the text they read?

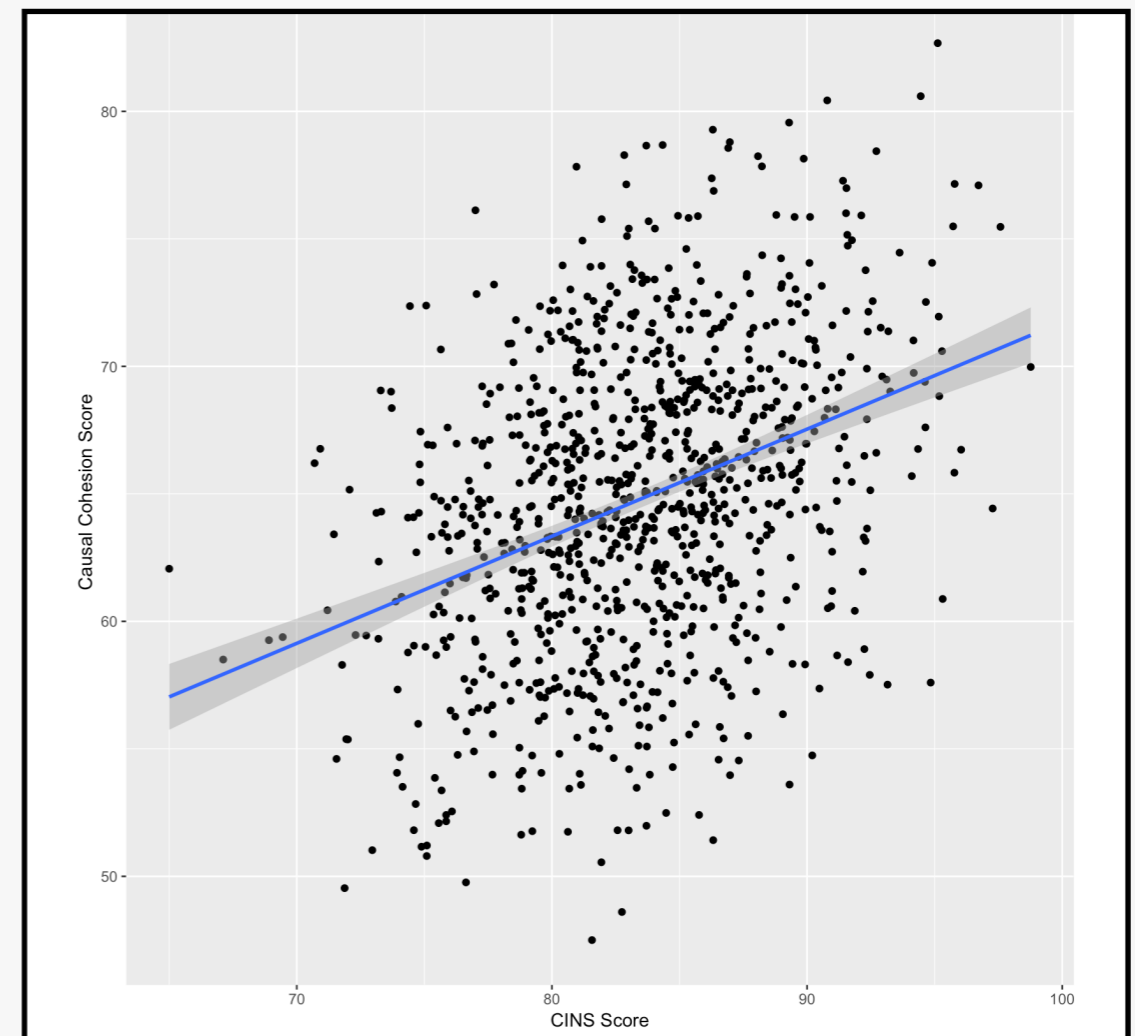
-  Cohesion **was** predictive of condition ( $p < .001$ )
-  Classified **69.1%** of individuals' experimental conditions based on the cohesion of text responses

# dimensionality



**Q:** Do these beneficial self-explanation processes manifest in the **cohesion** of individuals' responses to the text they read?

Cohesion indices significantly correlated with scores on the natural selection knowledge test  
( $r = .36, p < .01$ )



# dimensionality

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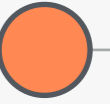


Self-explanation led to increased knowledge of natural selection compared to thinking-aloud or re-reading

**writing analytics** can be used to model comprehension processes and can be leveraged to provide automated feedback to students on their reading behaviors

Further research has replicated these findings and extended it to other contexts, including **multiple document comprehension** and **peer** explanation

# dimensionality



We have identified a number of the vertical protocols that change over time  
students' comprehension processes through their verbal protocols

**cohesion**



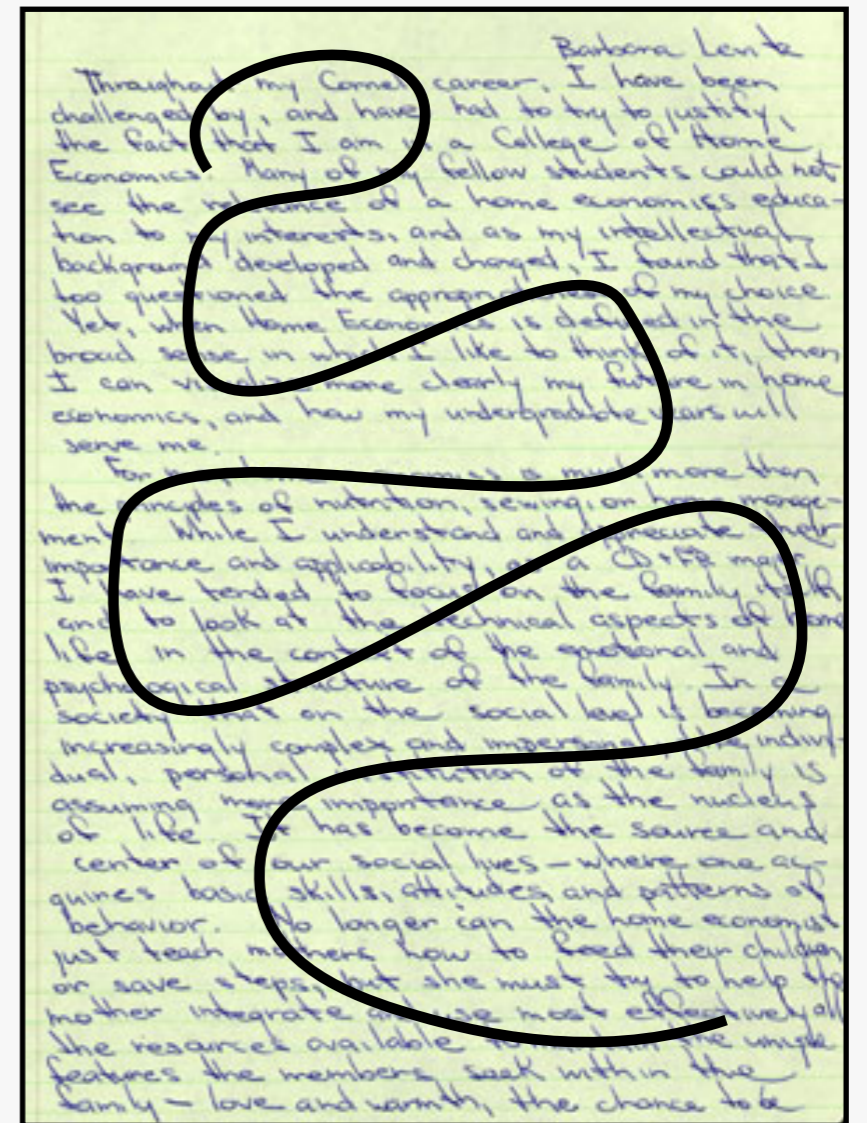
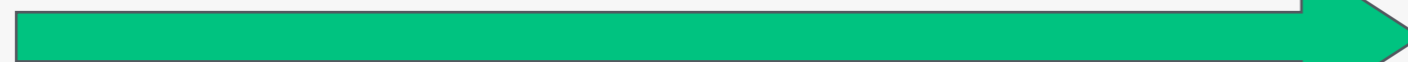
**syntax**



**lexical sophistication**



**semantics**



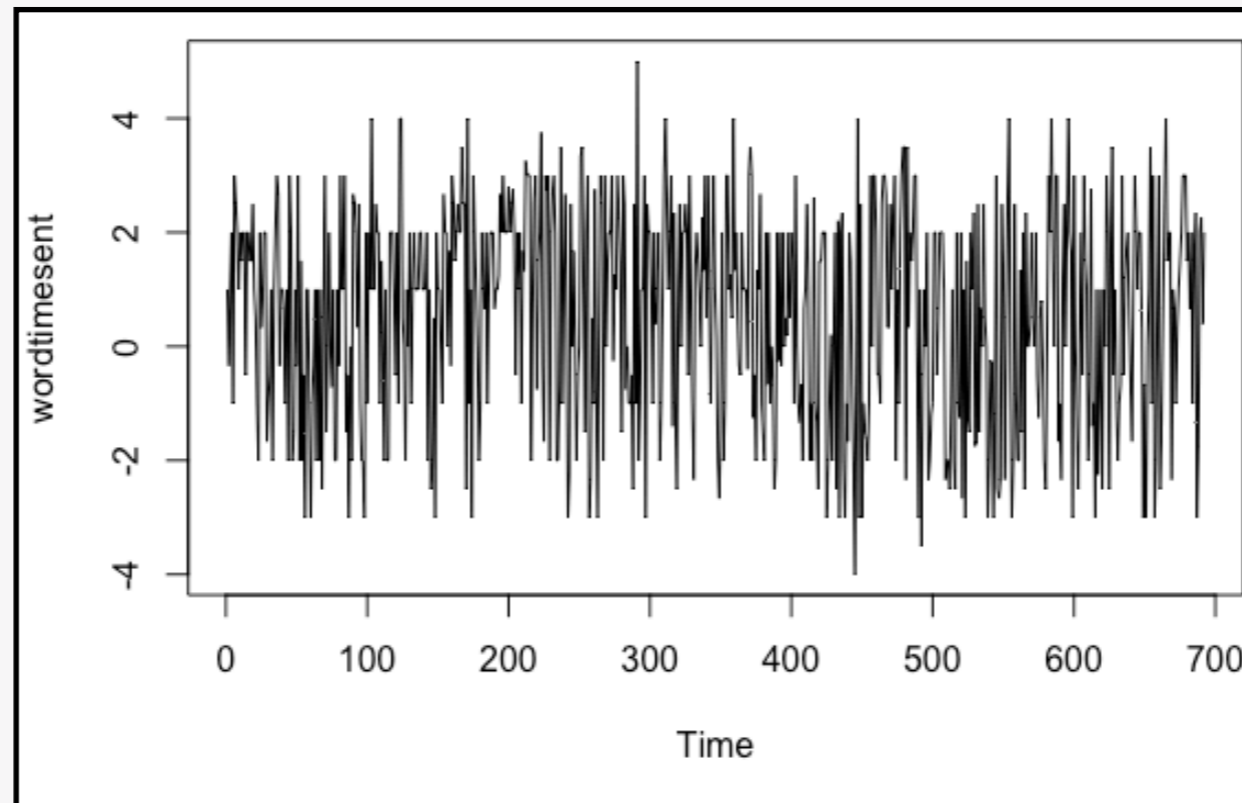
# dynamics



2

writing is **dynamic**

Can use dynamic modeling techniques to analyze the time-varying properties of discourse processes



# dynamics



## 1 one example

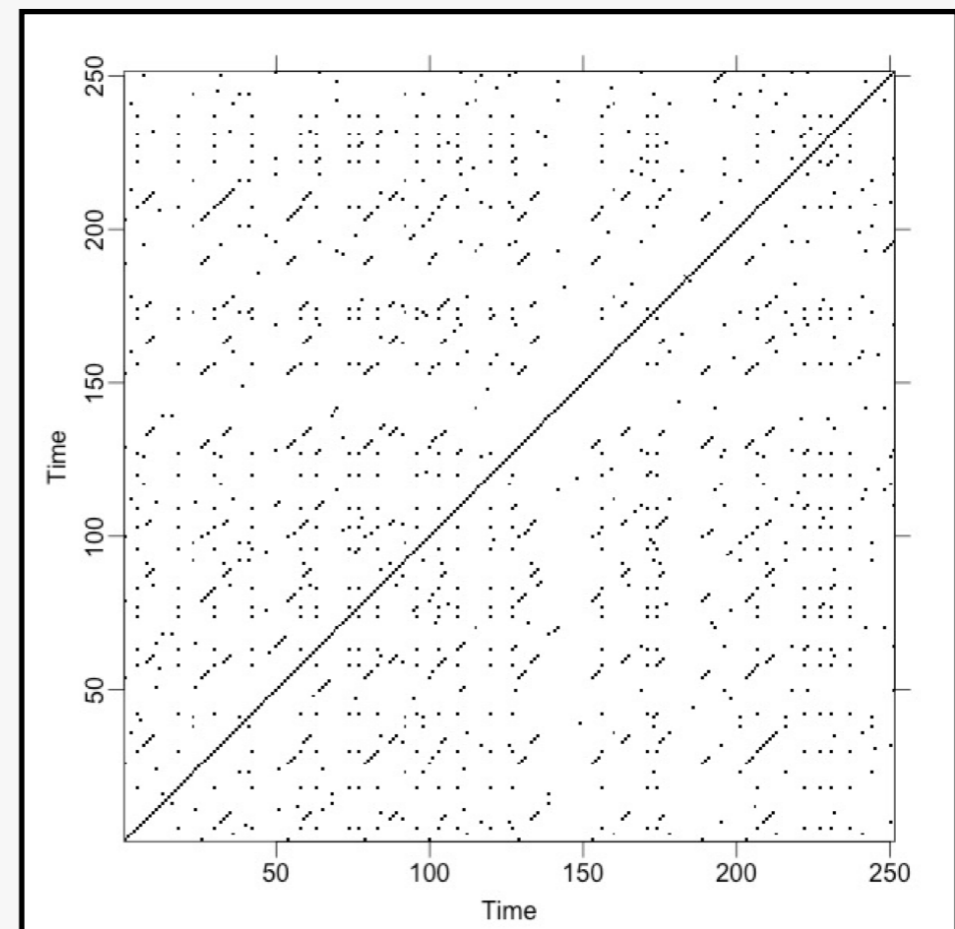
### *Recurrence Quantification Analysis*

Maps time series against itself on x- and y-axes to uncover states and sequences that recur over time

Provides means to **visualize** and **quantify** recurrent patterns in continuous or

So how does it work?

Offers potential to develop deeper understanding of the ways in which comprehension processes unfold over time





# dynamics

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## Conversion

Convert transcripts or texts to sequence of numeric identifiers

“The ice cream man brought ice cream on Friday.”

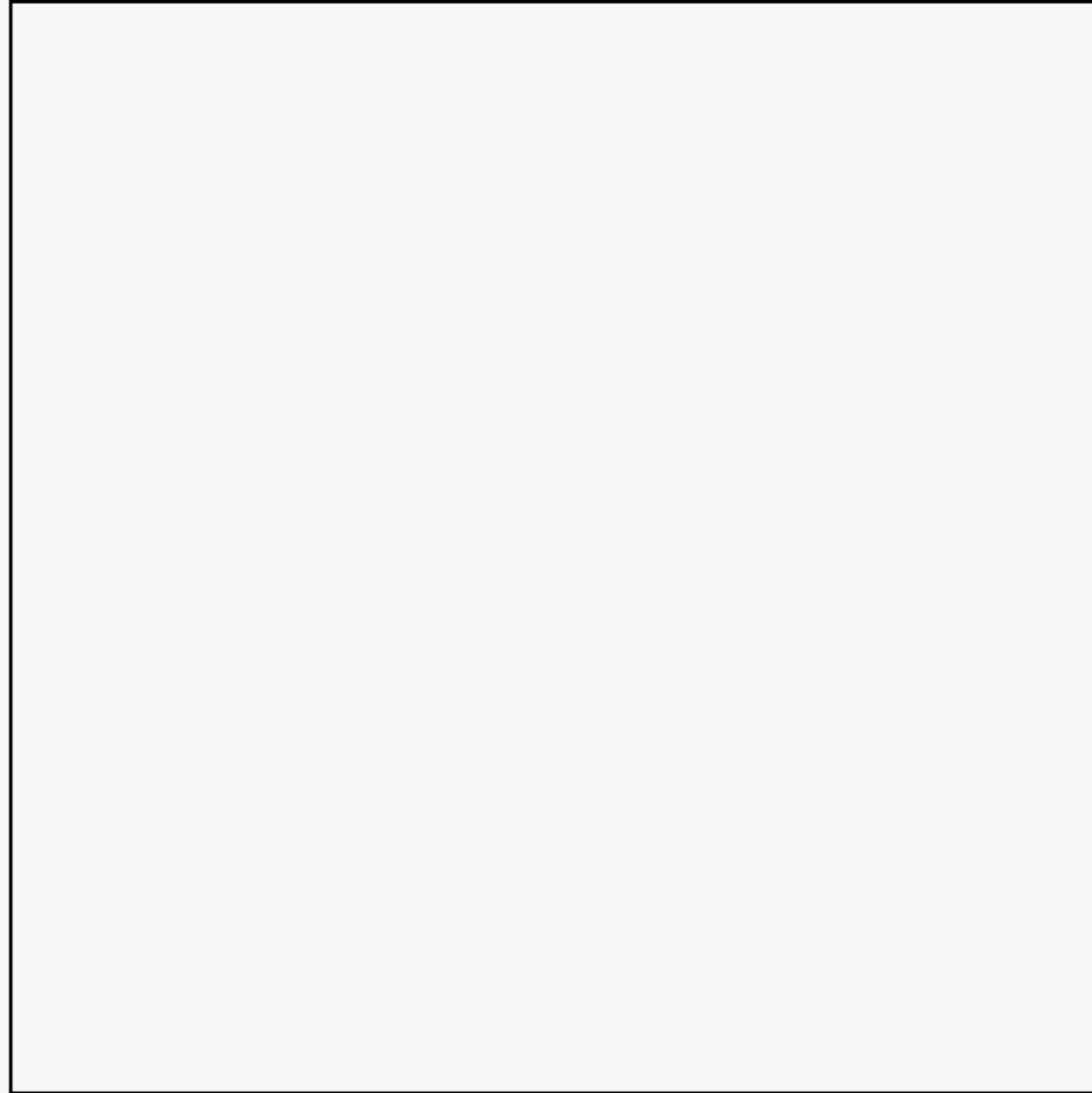
The = **1**; ice = **2**; cream = **3**...

1, 2, 3, 4, 5, 2, 3, 6, 7

**Level of analysis here:** words

“The ice cream man brought ice cream on Friday.”

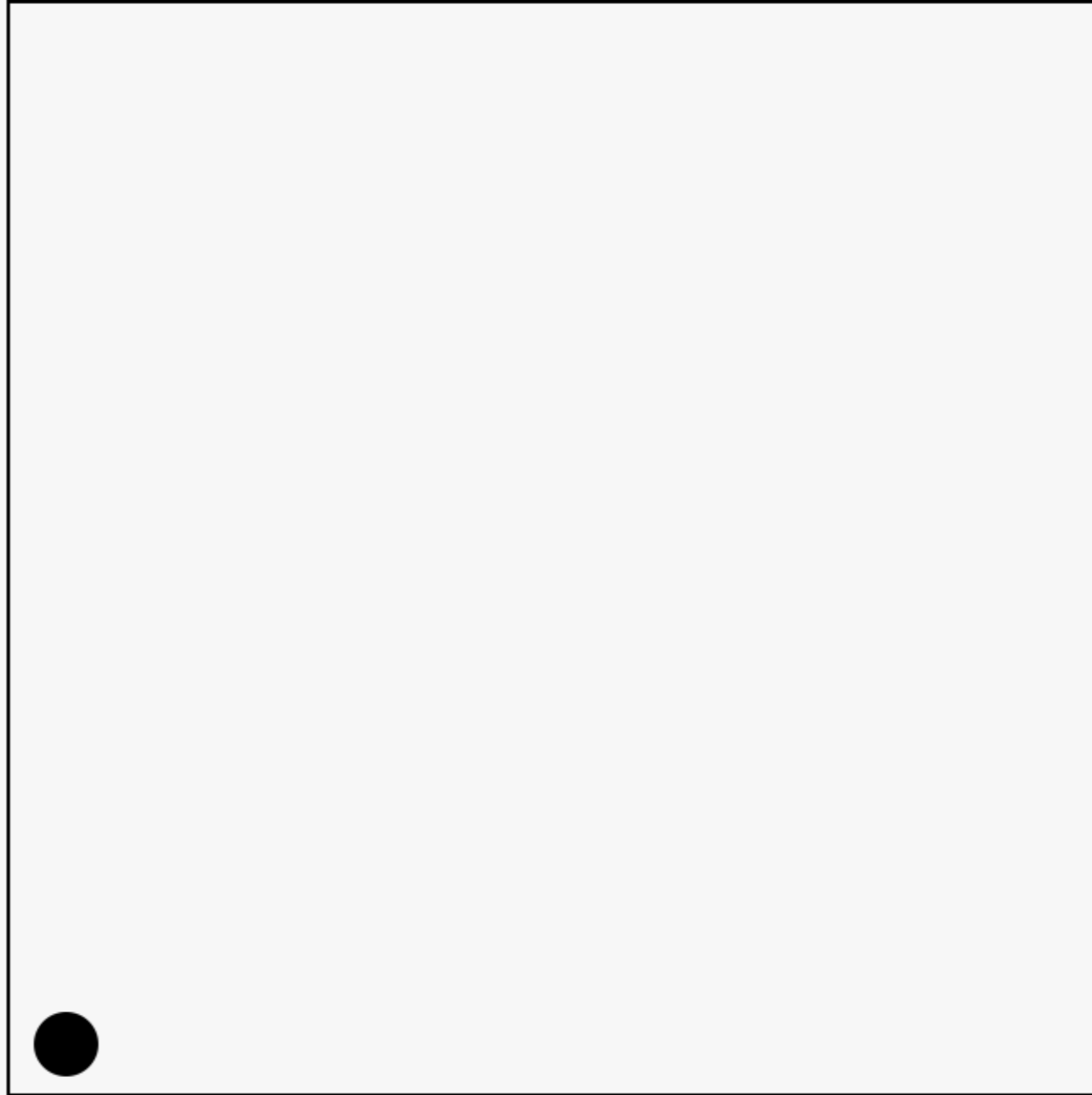
the ice cream truck brought ice cream on friday



the ice cream truck brought ice cream on friday

“The ice cream man brought ice cream on Friday.”

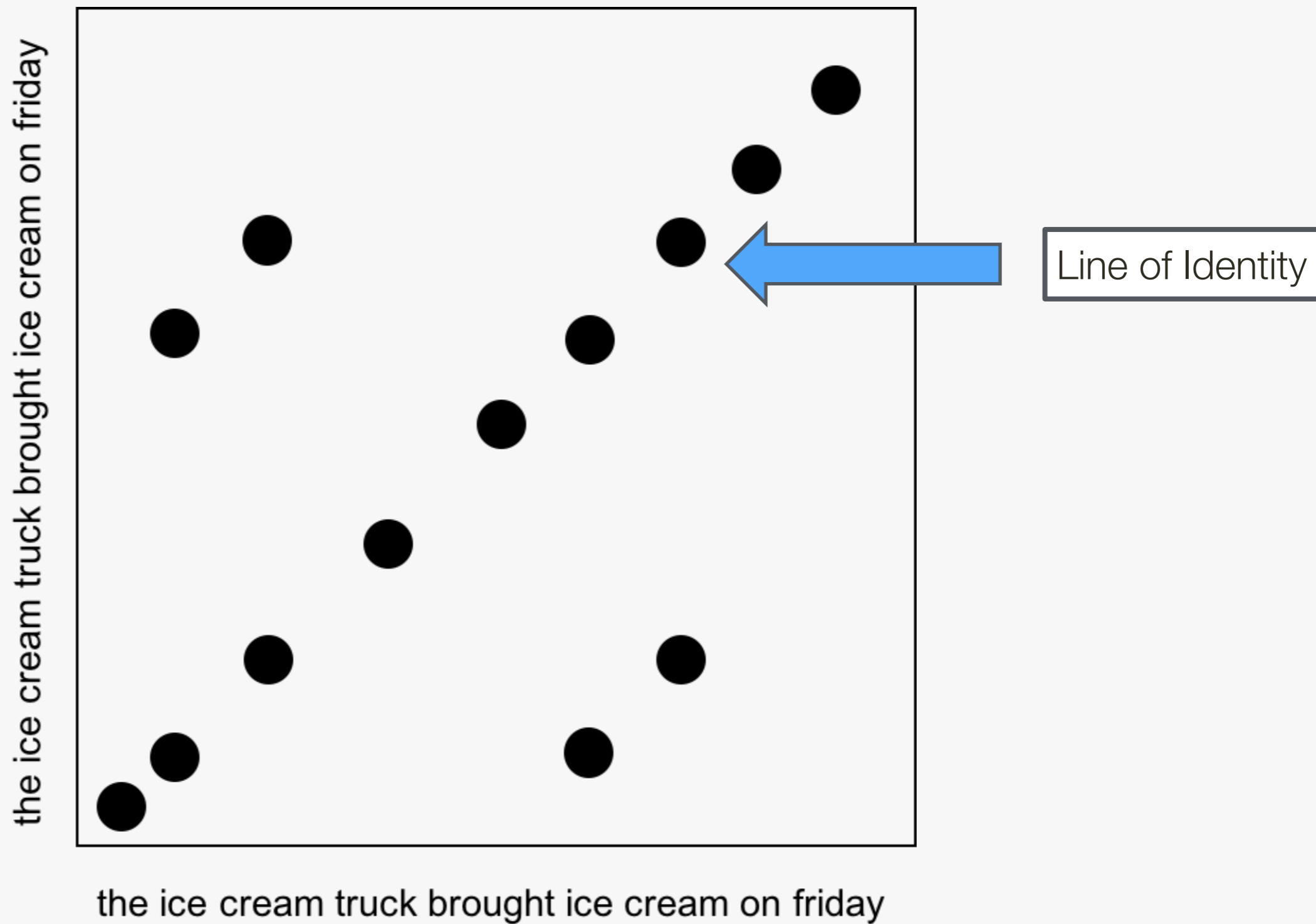
the ice cream truck brought ice cream on friday



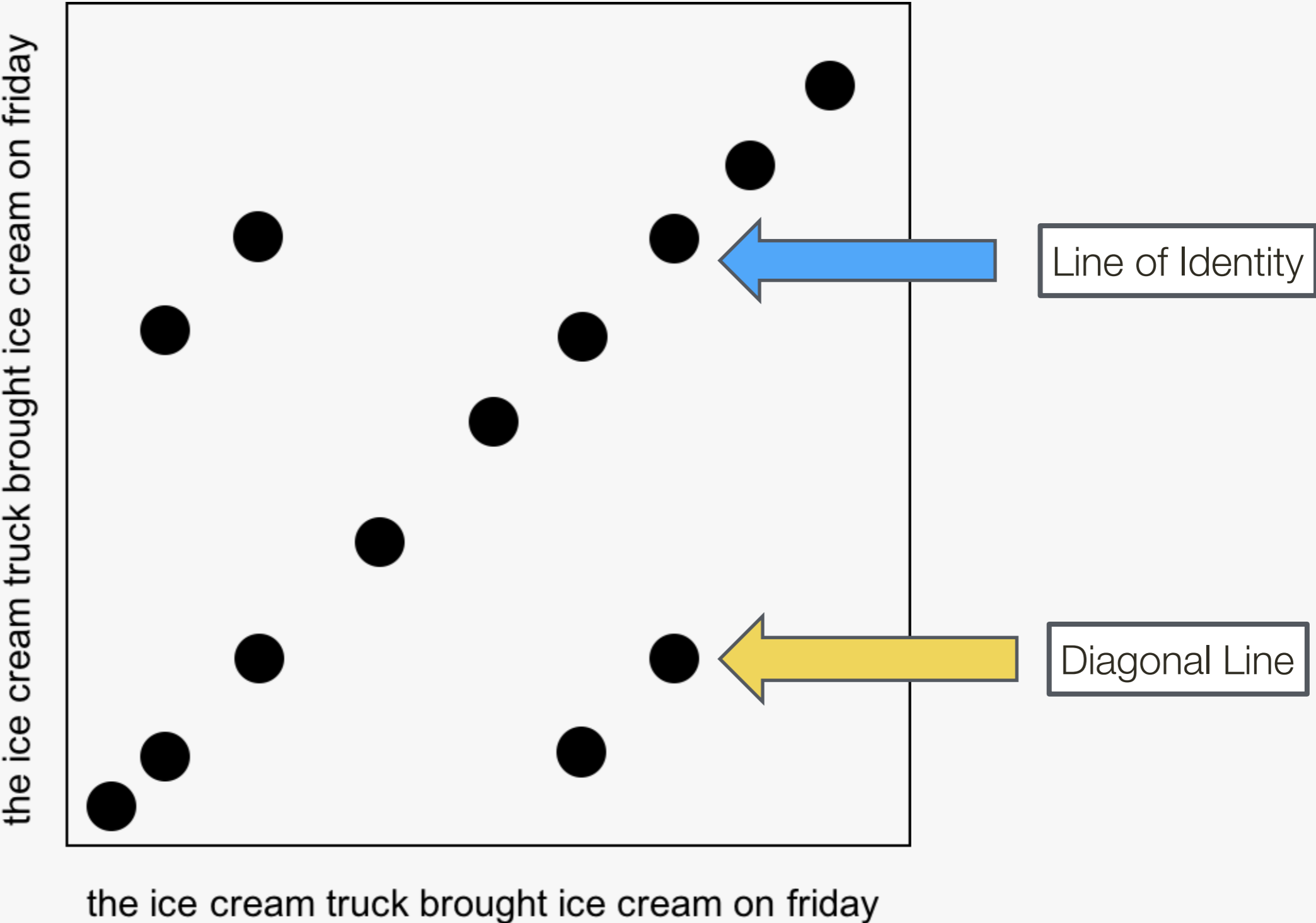
the ice cream truck brought ice cream on friday



“The ice cream man brought ice cream on Friday.”



“The ice cream man brought ice cream on Friday.”



dynamics



# Recurrence Quantification Analysis

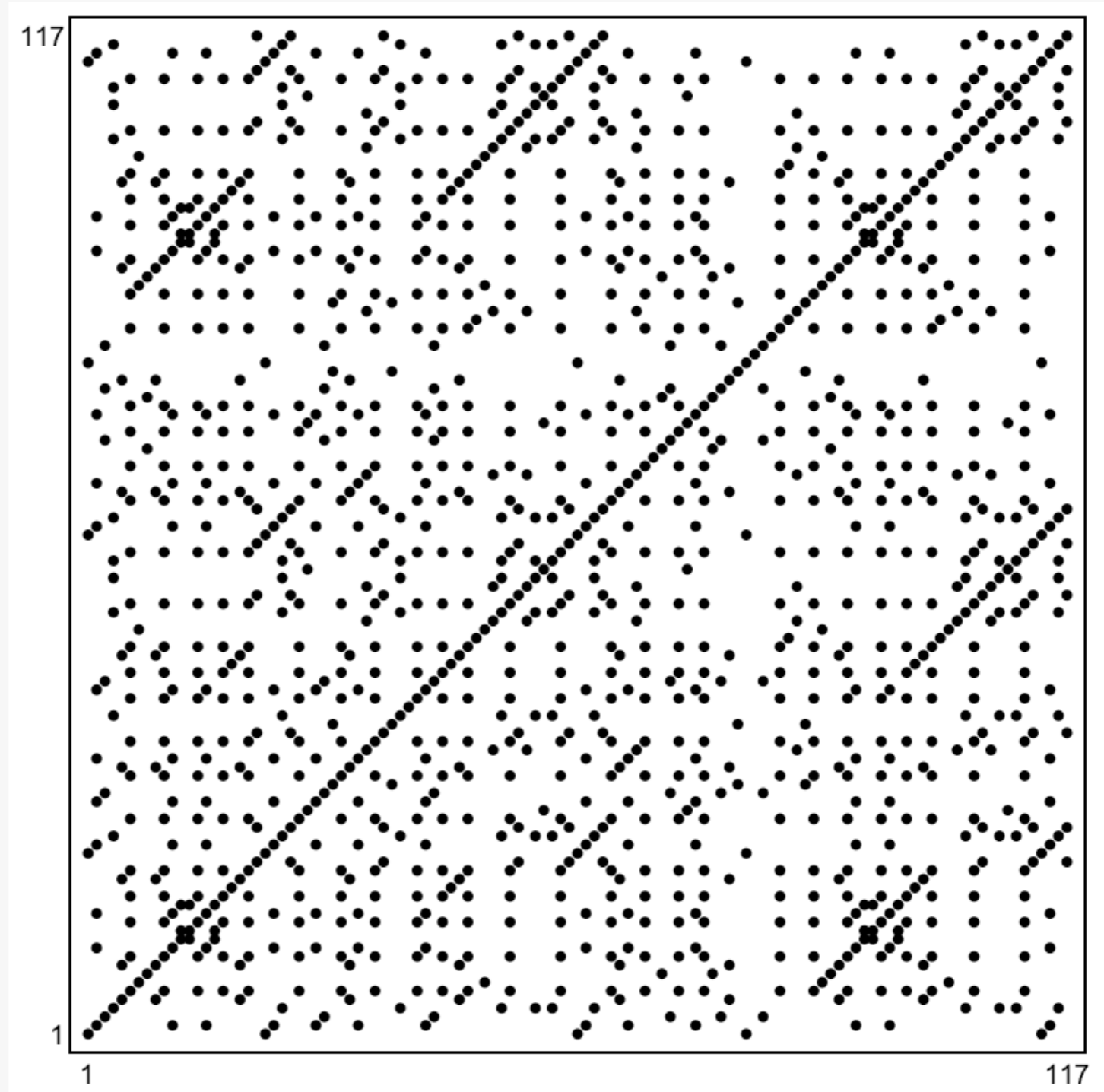
Entropy

Determinism

Maximum Line Length

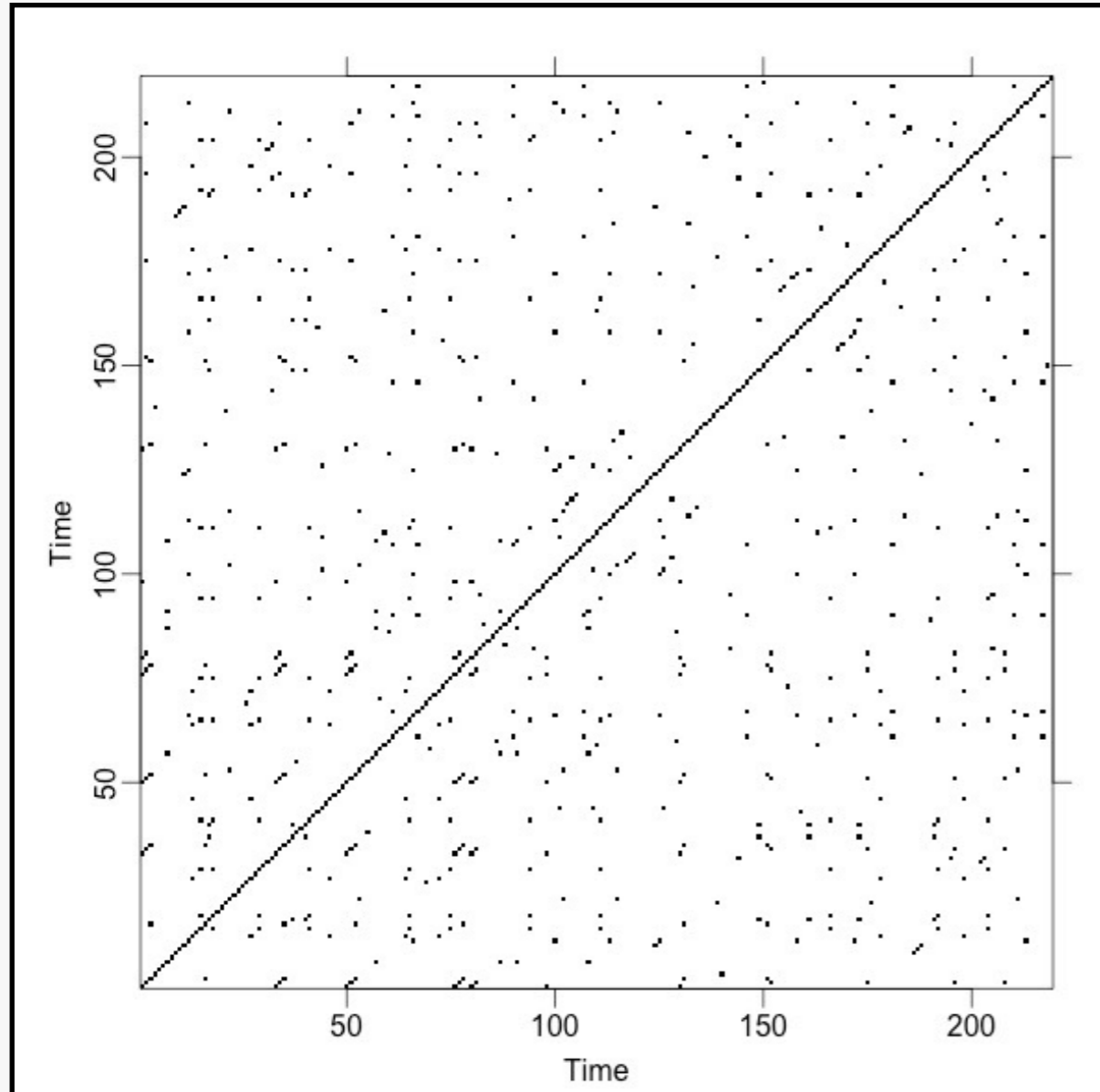
Average Line Length

Recurrence Rate

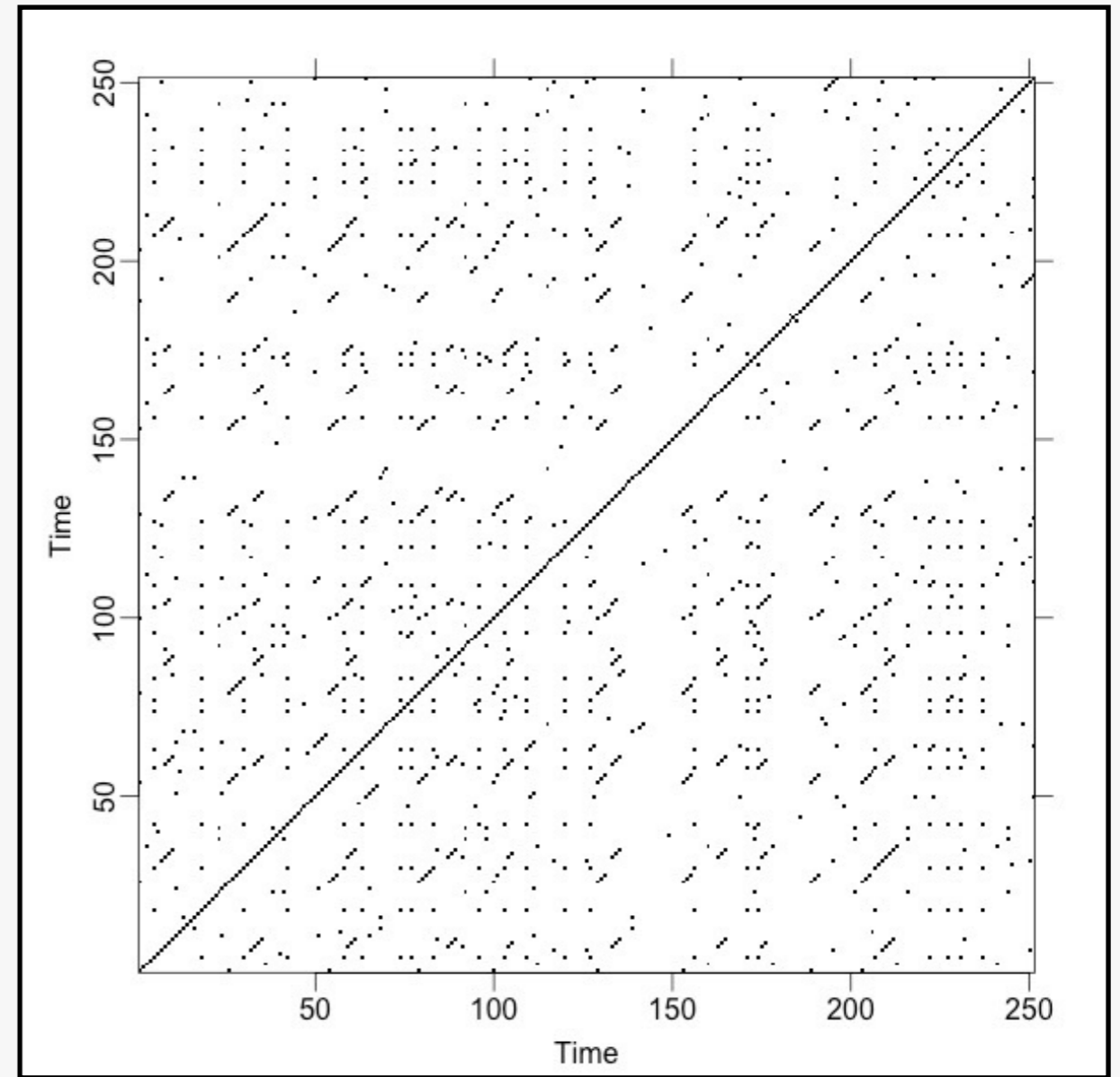


# previous study

Low Comprehension Score



High Comprehension Score



RQA metrics account for 38% of variance in individuals' deep comprehension of text material



# dynamics



Dynamical methodologies such as **recurrence quantification analysis** allow us to model the time-sensitive properties of writing

**Categorical Data**  
e.g., words, topics

**Continuous Data**  
e.g., keystrokes, dyads,  
physiological data



# dynamics

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## 2 second example

individuals engage in complex behaviors while producing writing (e.g., editing behaviors, production, etc)

**keystroke** analyses can provide important information about how writing is produced over time — rather than solely focusing on the final product

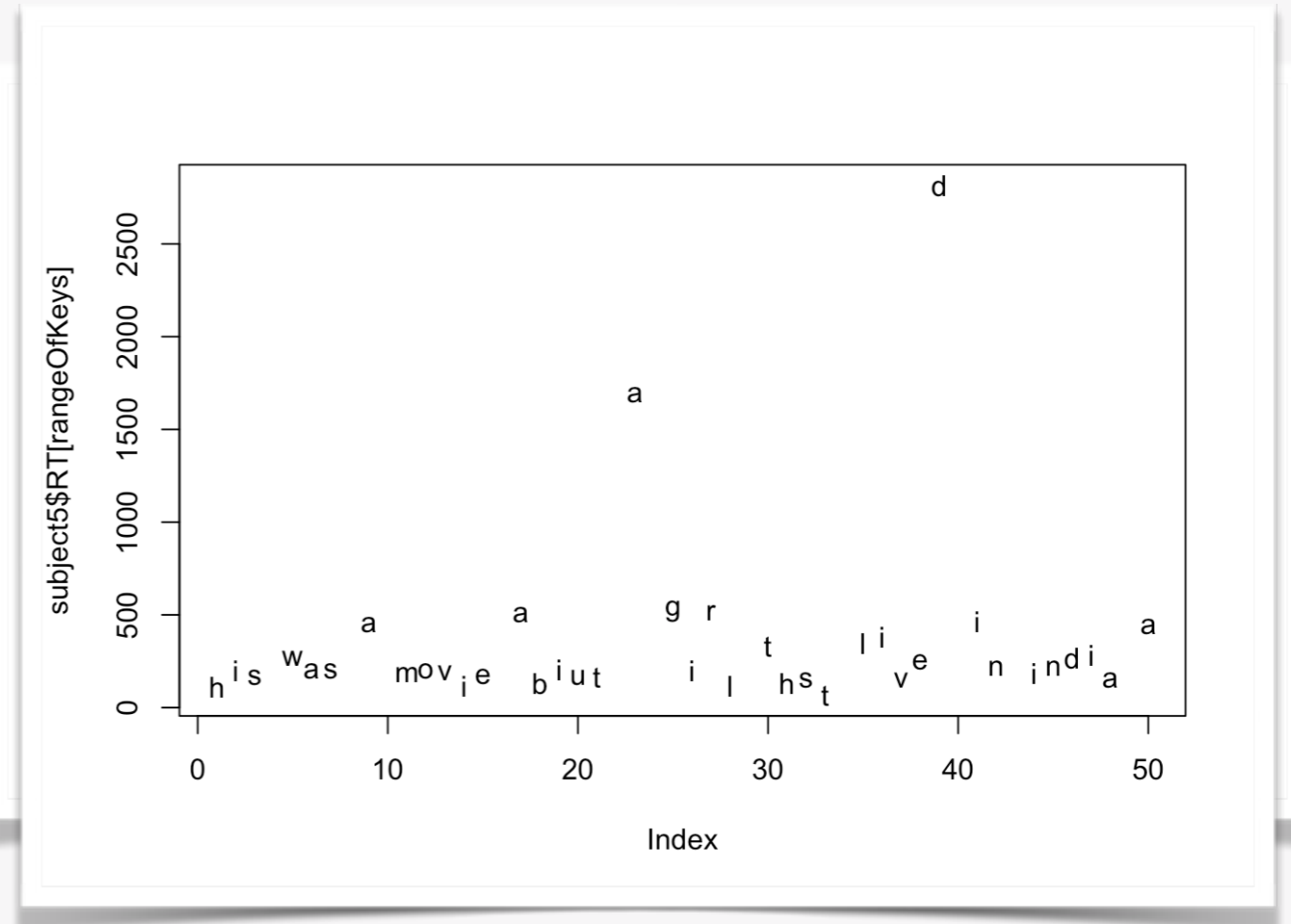
How do individuals' **typing** behaviors relate to the quality of their writing?

# dynamics



## Keystroke Dynamics

Do word-level keystroke dynamics of typing reveal important properties of the text that production processes?



**Patterns of keystroke behaviors** account for 43% of variance in essay scores

# dynamics

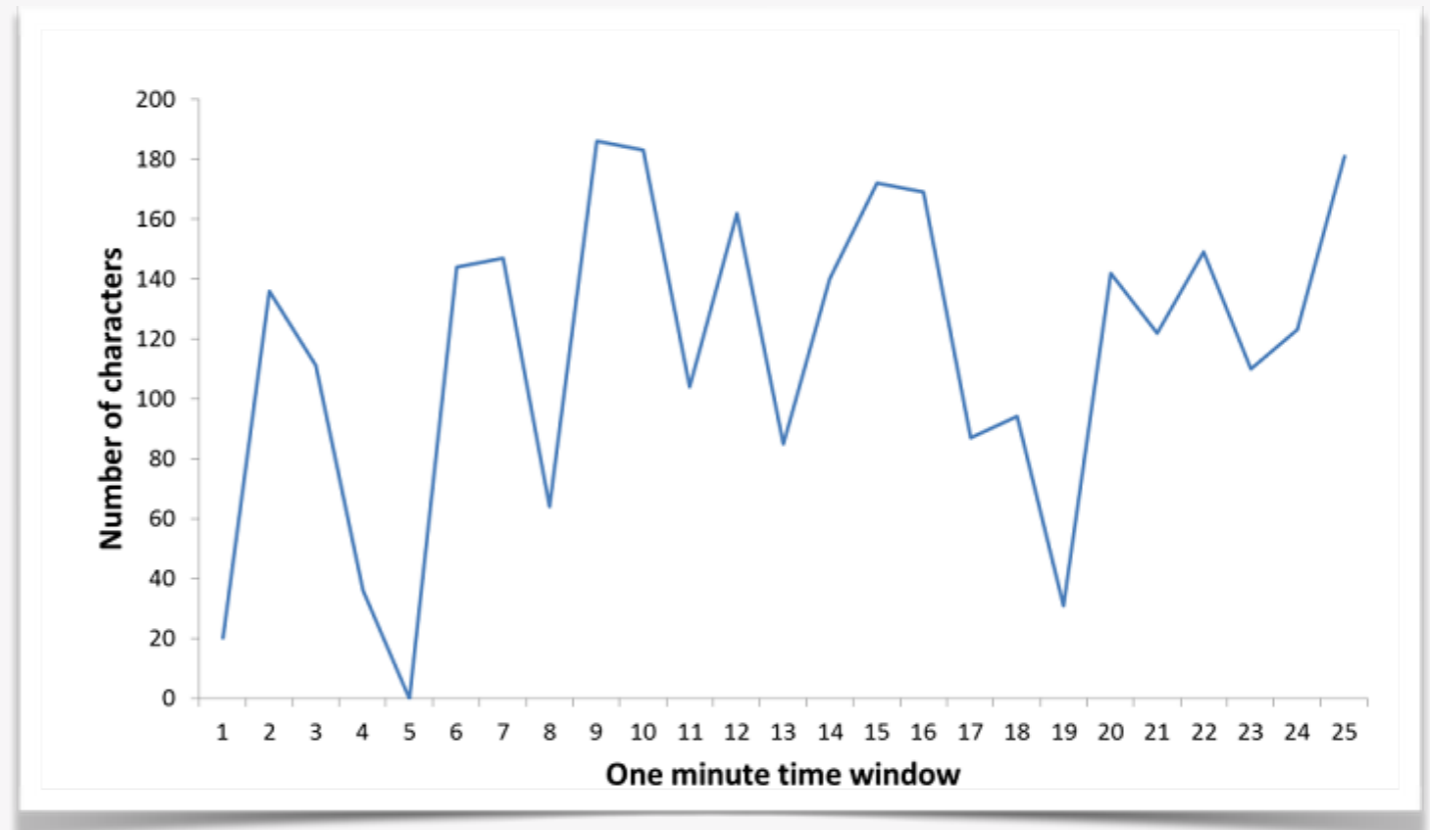


## More Keystroke Dynamics

Recent research has used keystroke behaviors to predict **clusters** of writers based on linguistic properties of essays

Identified **four clusters** of source-based writers

Academic/Argumentative  
Descriptive  
Story Tellers  
Summarizers



**Basic Keystroke behaviors** classify participants into clusters with 78% accuracy



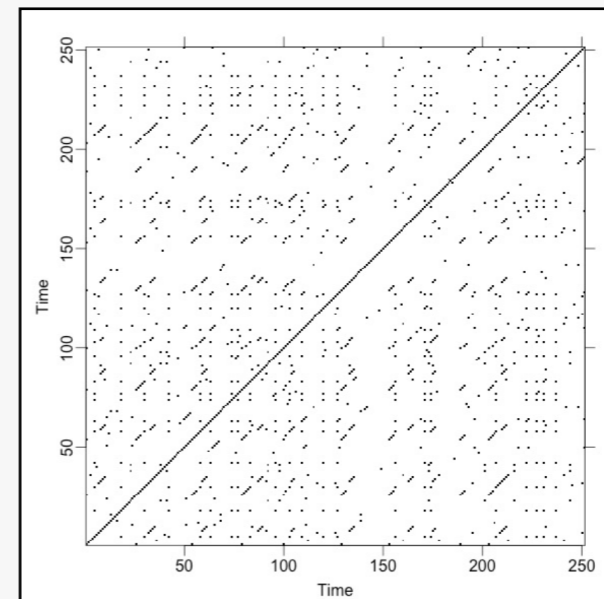
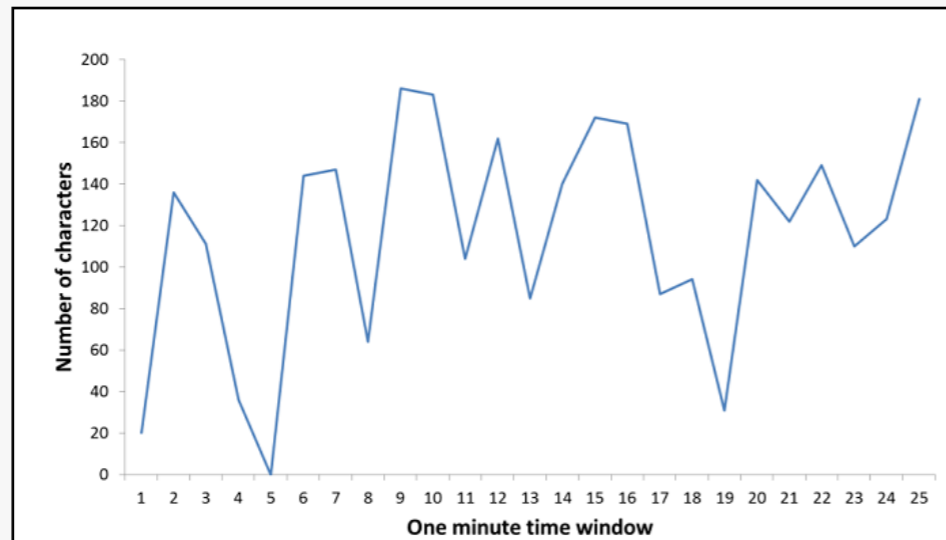
**analytics applications**

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# applications



**Multi-dimensional** and **dynamic** writing analytics can provide new insights into the psychological processes involved in discourse processing



Research on discourse processes can be leveraged to develop **educational** interventions and technologies



# applications



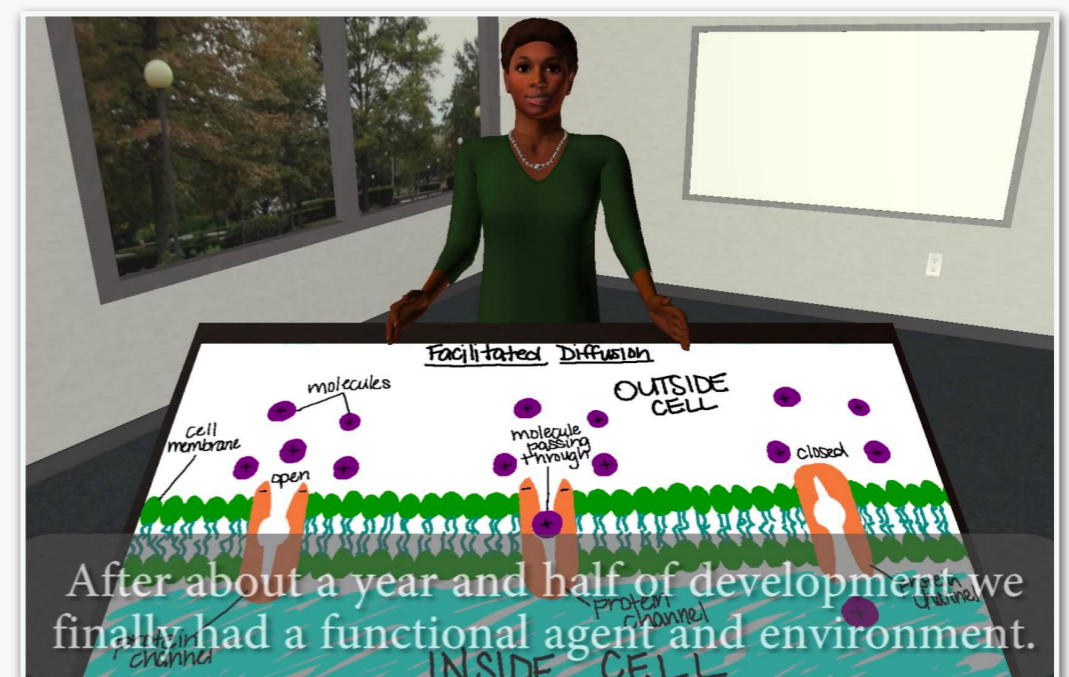
## Expert Human Tutors

Provide interactive and adaptive scaffolding to support effective learning

## Intelligent Tutoring Systems

Mimic (or improve upon) human tutoring tactics to support learning

Can be as effective as human tutors



# applications



Immediate, corrective feedback, scaffolding, and strategies



Adaptive and Individualized

- inner and outer loops
- knowledge tracing, student tracing
- respond to student responses



Well-defined Learning Domains

- grounded in clear procedures
- rely on simple, repeated assessments



# applications



# applications



## Writing Pal: Intelligent Tutoring System designed to support adolescent writing proficiency via strategy instruction, educational games, and automated summative and formative feedback

The collage includes several educational cards and interface elements:

- Importance of Thesis Statements:**
  - your essay will be harder to understand without a clear thesis
  - your essay will be unconvincing without a clear thesis
  - readers must be able to easily identify your "main idea" or "central claim"
  - thesis provides the... organizes or guide
- Grabbing the Reader's Attention:**
  - connect with your reader in different ways:
    - intellectually (facts and thoughts)
    - emotionally (feelings and moods)
- ESSAY LAUNCHER:** A game interface with a "5 Ships" prompt: "Prompt: Is it true that the more things change the more they stay the same? Recently, a cousin I hadn't seen in many years became my friend on Facebook. Her hair was longer and she had contacts instead of glasses, but her updates showed that she had the same quirky sense of humor and music tastes. Although she looked different, she was the same person inside. As people age, they may get taller, more muscled, wrinkled, or put on weight, but these are superficial changes. Peoples' personalities and temperaments often stay the same throughout their whole lives." It features a "Technique Control" wheel with "History Review" and "Ask a Question" options.
- Fix It:** A game interface with a "GOLDEN CIRCUITS EARNED" counter. It includes a prompt: "Prompt: Is it true that the more things change the more they stay the same?" and a question: "Does this paragraph correctly use the TAG strategy?" Below are four feedback items:
  - This introduction needs a thesis statement.
  - This introduction needs to preview the arguments
  - This introduction needs an attention-grabbing tec
  - This introduction correctly uses the TAG strategy.

**ESSAY WRITING FEEDBACK REPORT:**

POOR WEAK FAIR **OKAY** GOOD GREAT

LENGTH: Acceptable  
RELEVANCE: Acceptable  
STRUCTURE: Acceptable

This essay continues to show weaknesses in the body of the essay. It may be helpful to review your previous drafts and the feedback you received about body building. The feedback below describes some additional issues you should consider when revising your essay.

**REVISION**

Skilled writers revise their essays to make them more clear and understandable. Moving information around is a revision technique that can improve the structure and flow of an essay.

- Reread your essay to make sure that it follows a logical flow
- Try changing the order of sentences or paragraphs to fix organizational problems
- Remember that you can move small or large sections of your writing, whichever works best for your essay

**REVISION**

Revision is a crucial process for writers of all levels. One strategy for revising essays is to add important information that the reader might need to know.

- Check to see if your essay is missing any important components, such as thesis statements or topic sentences
- Make sure each claim is supported by enough evidence and examples
- Add details to your evidence to make your essay more persuasive!

# applications

## Essays and Feedback

Choices-12c: 9:55

SHOW PROMPT SCRATCH PAD

**B I U** ABC [list of icons]

Psychology encompasses many specializations. Some of these areas that have been extremely influential by today's clinical practitioners are cognitive and behavioral psychology. Although these practices used together they still represent different ways of looking at the psychological person. Behaviorism was the dominant paradigm in the United States during the first half of the 20th century. Behaviorism psychologists primarily were concerned with observable behavior rather than internal processes that are subjective and therefore the data are more biased and validity issues. Behaviorism argued their way was superior to other methods because unlike previous studies behaviorism used operational definitions in order to obtain objective results of behavior.

PRINT SAVE SAVE/EXIT EXIT WITHOUT SAVE

### ESSAY WRITING FEEDBACK REPORT

POOR WEAK FAIR OKAY **GOOD** GREAT

LENGTH: Acceptable  
RELEVANCE: Acceptable  
STRUCTURE: Acceptable

#### CONCLUSION BUILDING

Persuasive essays contain conclusion paragraphs that summarize the main points in the essay. Providing a concluding phrase in the conclusion paragraph signals your reader that your essay is coming to an end.

- Concluding phrases are a great way to begin your conclusion paragraph and to introduce your restated thesis
- Concluding phrases should clearly tell your reader that your essay is coming to a close
- Some examples of concluding phrases are: "In conclusion," "In summary," or "As we have seen"

#### INTRODUCTION BUILDING

High scoring essays contain both thesis statements and argument previews in their introduction paragraphs. These components introduce the reader to the main idea and help them understand the "big picture" of the essay.

- A clear thesis statement combined with an argument preview will help guide the structure and coherence of an essay
- Example: "I think that writing a thesis statement along with an argument preview is useful to readers."
- The combination of these two strategies is important, because it shows your reader where you are going, relates your ideas directly to the prompt, and gives an outline of the structure for your essay.

#### CONCLUSION BUILDING

An effective conclusion ties together all of the ideas presented in the body paragraphs of the essay. One way to improve your essay is to make sure that

More Feedback on this Issue Feedback on a Different Issue Save Feedback and Exit

# applications

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## Method

**Goal:** Examine efficacy of W-Pal to improve the writing skills and monitoring accuracy of its users

High school students (n = 86) participated in summer workshop program

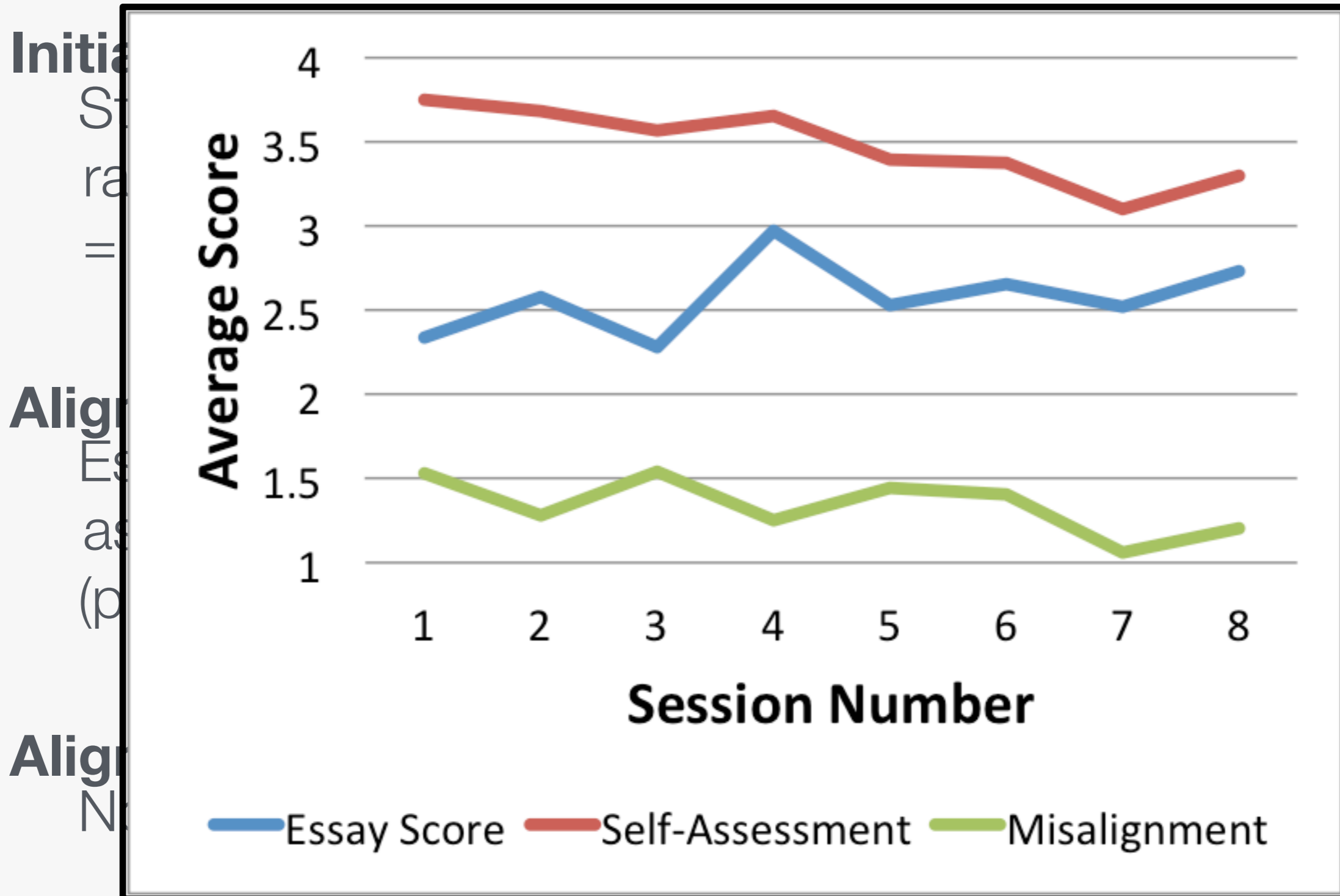
**Writing Pal** essay practice with automated feedback

- write and revise 16 essays
- typical of current writing tools (e.g., Criterion)

Learning with complete **Writing Pal** system

- write and revise fewer (8) essays
- strategy instruction and game-based practice

# applications



# applications

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## **findings**

students able to learn from W-Pal  
writing performance  
monitoring accuracy

strategy instruction and practice led to equivalent gains  
compared to heavier doses of deliberate writing  
practice with feedback

computer-based writing instruction can promote better  
monitoring accuracy— an important element of transfer



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**future**

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# future

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How can computational linguistic analyses be used to provide better training and feedback in the classroom?





# future

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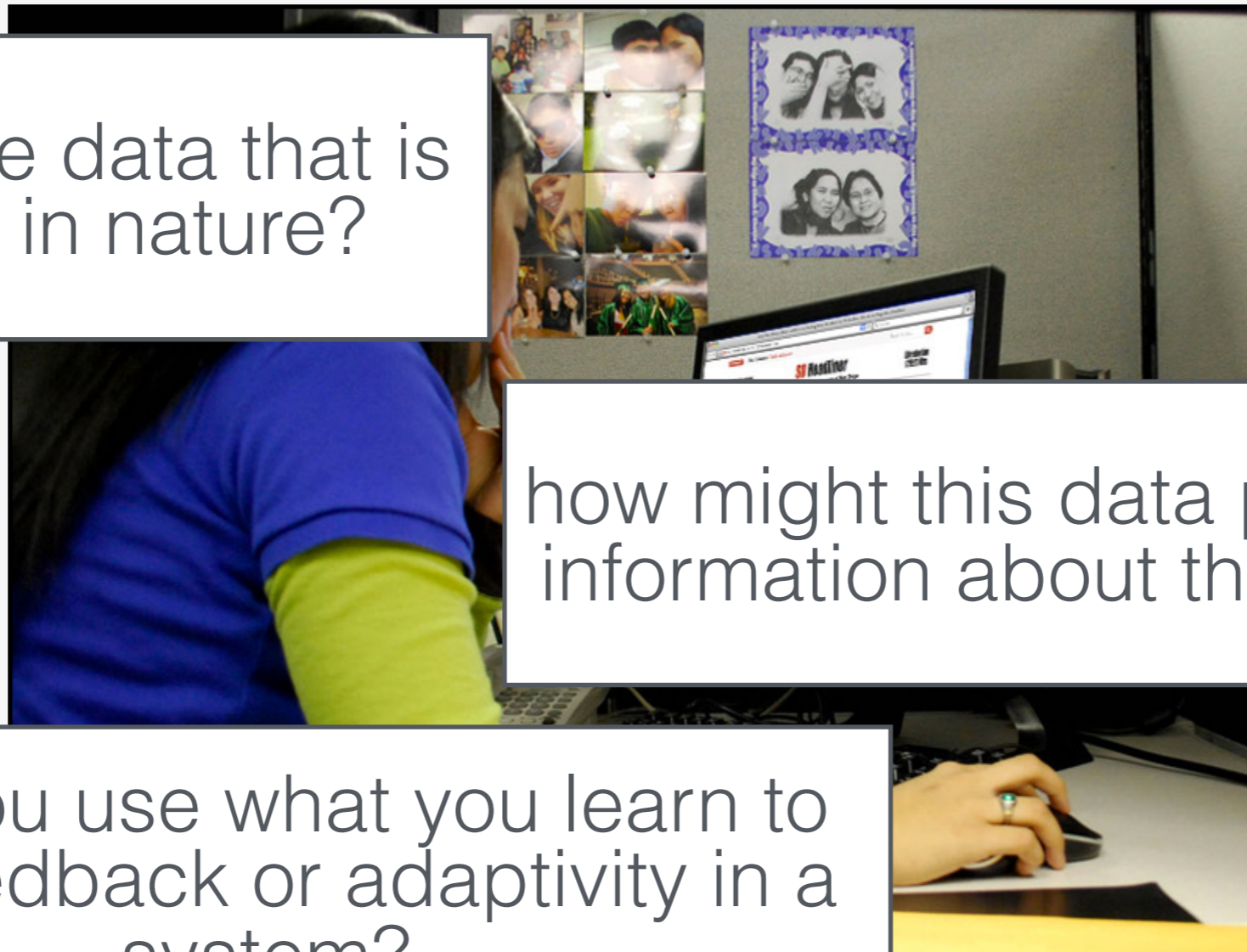


how can you apply writing analytics to your own research?

do you have data that is linguistic in nature?

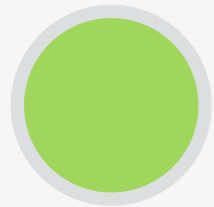
how might this data provide new information about the students?

could you use what you learn to drive feedback or adaptivity in a system?



# future

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## **Consider your data sources**

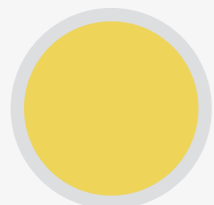
(short statements, essays, etc.)

(individual differences, performance metrics)



## **Formulate your research question**

what do you want to learn about the learning process from this data?



## **Develop an analysis plan based on your data type and research question**

what techniques or tools do you want to use to analyze the language in your data?


There are a variety of tools and packages available to help you answer your questions

# future



There are a variety of tools and packages available to help you answer your questions

SUITE OF AUTOMATIC LINGUISTIC ANALYSIS (SALAT)



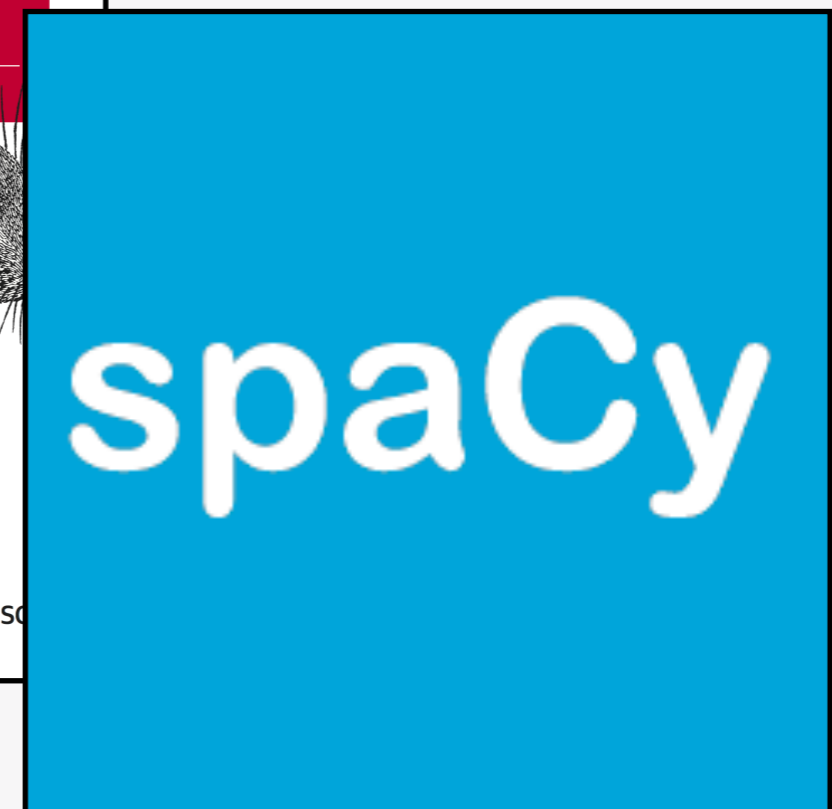
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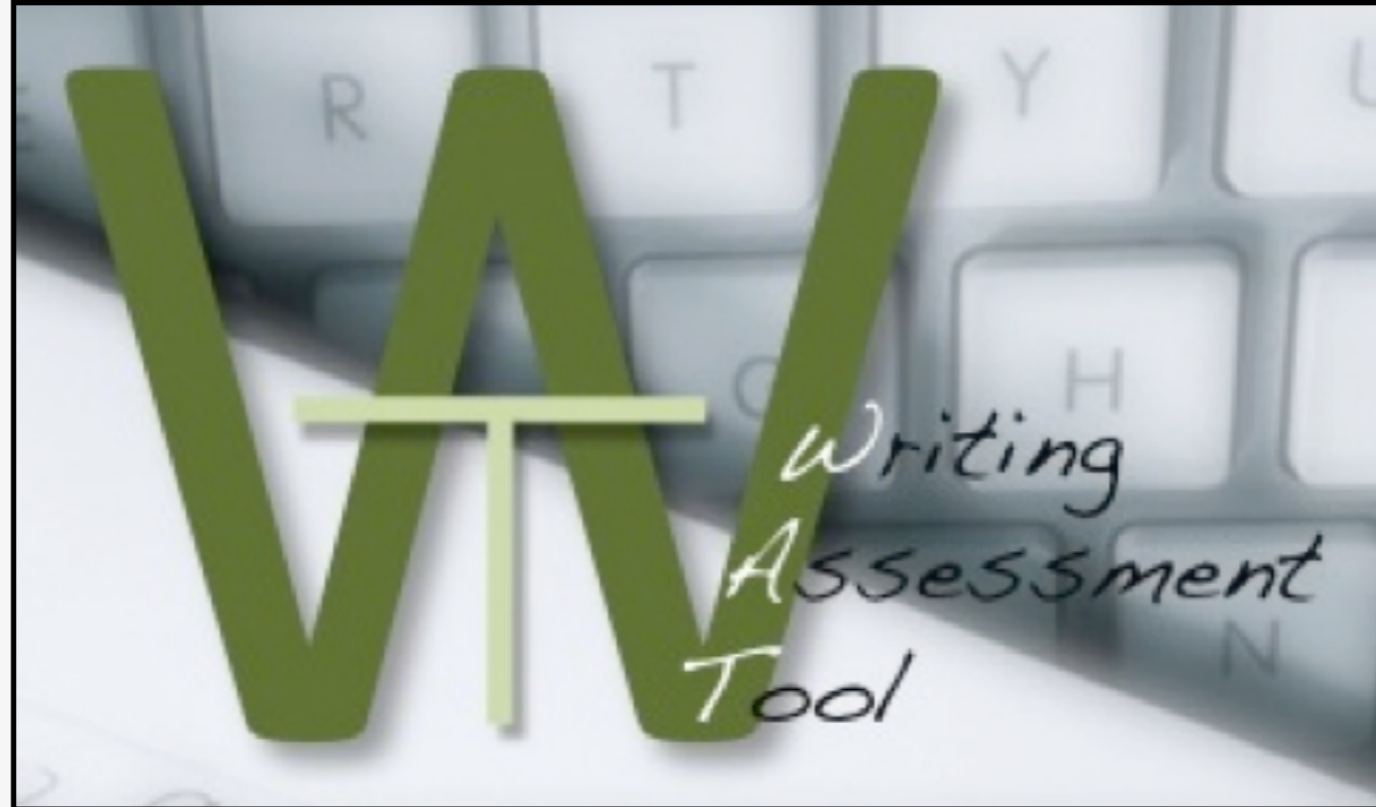
future

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## The Development of the Writing Assessment Tool

Provides **students**, **teachers**, and **researchers** access to automated writing analytics for summarization, persuasive essays, and source-based writing assignments

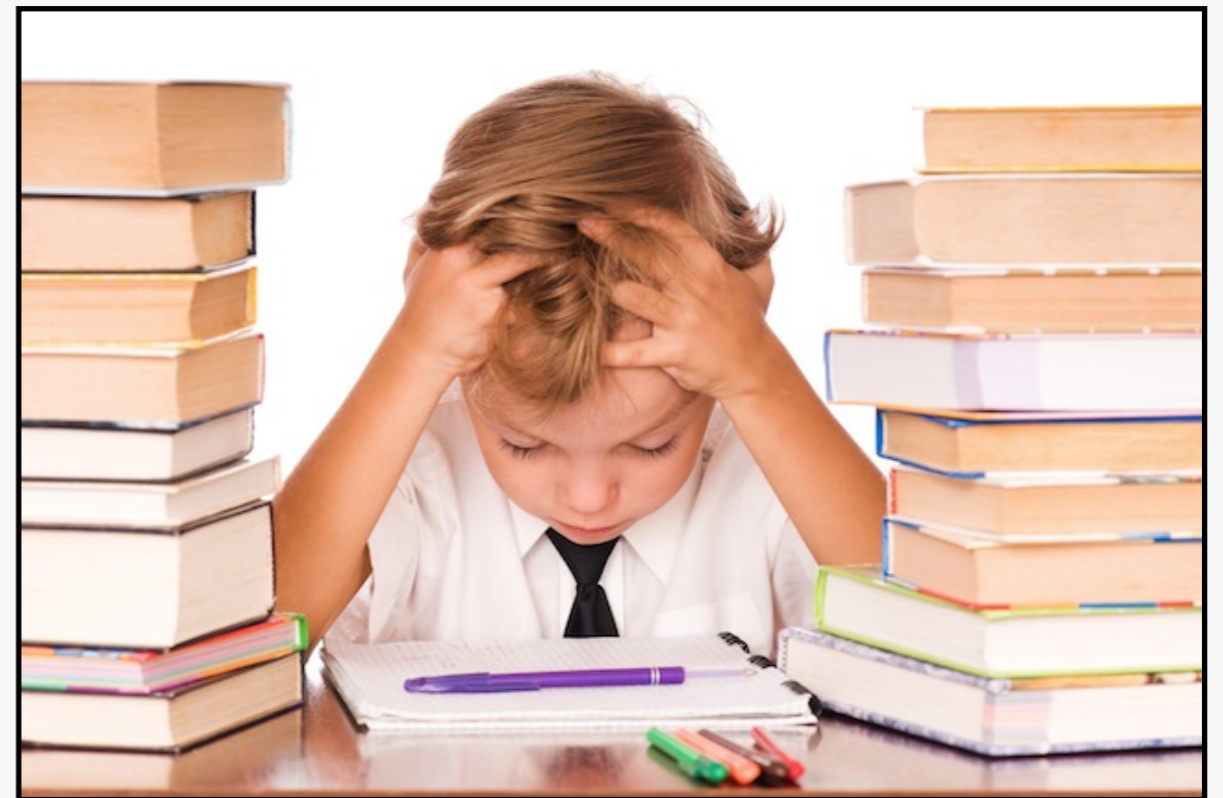


# future

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development of writing analytics points to potential areas for **improving** processing and production of discourse



# thank you



Danielle McNamara



Scott Crossley



Katie McCarthy



Aaron Likens



Simon Buckingham Shum



Simon Knight



Sarah Creer



Puren Oncel



Caitlin Mills

# questions?



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University of New Hampshire



Laura.Allen@unh.edu



**p.s.** I am currently recruiting graduate students for Fall 2020

# additional information

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**[Link to Linguistic Analysis Tools](#)**



**To sign up to test WAT**

Email me @ [Laura.Allen@unh.edu](mailto:Laura.Allen@unh.edu)