LANGUAGE AS A TIME MACHINE

A THEORETICAL ANALYSIS AND IMPLICATIONS FOR READING COMPREHENSION AND HIGHER LEARNING

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STANDARD “NO DATA” DISCLAIMER

• This is a conceptual presentation
• That means no data
• That means no studies
• That means no empirical basis
• It doesn’t necessarily follow that the analysis is wrong, but don’t automatically accept it as complete or correct
• This is an analysis of observations that we’ve all made and events that we’ve all experienced
• This is to stimulate thinking and to potentially help solve a problem
• Hopefully the analysis will provide a framework for empirical investigation
• It’s less important that we are correct about our guesses and more important that we all get closer to what is a more thorough and accurate understanding of the topic
OVERVIEW

- A statement of the problem
- Reading comprehension
- Language for Communication and Language for Education and language for generally enhancing your life (making sense out of the world) (educational language requires “word tricks”). We also use language to make ourselves feel better and entertain ourselves,
- Know Language Know Time, No Language No Time
4 OVERVIEW

• Learning from the past and Predicting the future and the role of root cause analysis (a chain of cause and effect)
• The role of “historical depth and resolution” and judgment (hurricane prediction) (why 2 people with 10 years “experience” may have very different skill sets)
• “Attaching significance” to places/objects/language via language for later recall
• F&%# the moment!
• What should we be doing to counteract/prevent this problem?
5 SHORT ATTENTION SPAN VERSION...

• If you can’t comprehend your day, then you can’t comprehend a story from a book and you will become frustrated and you are not likely to benefit from being exposed to “higher learning.”

• You’re going to suck at predicting the future if you’re no good at postdicting the past!

• You may leave now, but NO CEUs for you!
6 STATEMENT OF THE PROBLEM

• Students who appear to have conversational skills and show good text transcription like a newscaster (text to speech) but comprehension is inadequately assessed (prompted multiple choice questions)

• Individuals who learn transcription but are not properly assessed for comprehension will often begin to have behavior problems as they do not possess the skills necessary to make full use of the information they have been given

• They are NOT likely to develop these skills independently
STATEMENT OF THE PROBLEM

- At some point anything that involves the complex expression of ideas or synthesis or drawing conclusions, comparison and contrast, complex analogies, will leave these kids educationally in the dust.

- Generally speaking, if the skills are lacking to make reading functional (depending on the function needed) then it is less likely that behavior will be maintained by the natural reinforcers for reading (gaining knowledge, entertainment, solving problems, etc.)

- This will require large reinforcers to overcome the resistance and although it may produce compliance with a request to read it will not compensate for a lack of verbal skill development and the child will always require heavy prompting (which is non-functional)
8 STATEMENT OF THE PROBLEM

• We need to have some sort of expectation of the kinds of behaviors the student will be expected to engage in as a consequence of reading a passage!

• Then we need to know how to teach those new verbal skills!

• If this information is lacking then it will be a “teach and pray” sort of education.

• This young lady was already 17 and “reading” on a 1st grade level but not even with the full capacity of a 1st grader.
WHAT IS READING COMPREHENSION?

- Some different examples of types of reading comprehension
- McGreevy (Phone Call, 2018)
- You can say it back: in some manner (long-utterance intraverbal may be all it is, but being able to emit a long-utterance intraverbal very helpful if you need to remember instructions or rap)
- You can now do something: (non-verbal) based on what was said (doesn’t require you to have the skills to say it back per se, but probably limits complex chains)
- You can talk about it: responses involving numerous tacts especially tacting properties of things and then listing those properties to allow them to control subsequent behavior (tell me the overall tone of the story)
WHAT IS READING COMPREHENSION? (FLORIDA)

• The student constructs meaning from a wide range of texts.
• reads text and determines the main idea or essential message, identifies relevant supporting details and facts, and arranges events in chronological order (tacting sequence in time first he did this, then that, then this..);
• identifies the author’s purpose in a simple text; (what behavior is it supposed to create in the reader? i.e., function of writing)
• recognizes when a text is primarily intended to persuade; (again function of passage)
• identifies specific personal preferences relative to fiction and nonfiction reading;
• reads and organizes information (category tact “that’s one of these and belongs here and probably intraverbals as speaker and listener) for a variety of purposes, including making a report, conducting interviews, taking a test, and performing an authentic task; and
• recognizes the difference between fact and opinion presented in a text. (Knows rules about facts and opinions can engage in behavior that will allow rule to be confirmed or denied)
LANGUAGE FOR COMMUNICATION AND LANGUAGE FOR UNDERSTANDING THE WORLD (EDUCATION)

• First we learn language to communicate our own needs (mands) and then to meet the needs of others (answering their questions or engaging in other behaviors). So we are using language to control and be controlled by others, this is the social aspect of language.

• Language needed for higher education, specifically certain reading comprehension, is a bit different, this is more like “meta-language” you use language (thinking or talking) to interact with other bits of language (text on a page). Now we are using language not specifically to control the behavior of others BUT TO CONTROL OUR OWN SUBSEQUENT BEHAVIOR WITH RESPECT TO A SET OF STIMULI

• To answer the question “What was the theme of the story?” is an example of using language (engaging in overt or covert verbal behavior) to allow a new behavior that goes beyond a simple intraverbal response (mediating responses)

• Saying something about an actual item or event you see right now is a very different skill than saying something about an item that is now gone (abstraction)

• That is a different skill from saying something about words “What did you think about that passage?” This is like 2 abstractions. First words are representations of actual things and the words are also in the past…
YOU CAN LEARN A LOT FROM LEGOS

Legos. If you don’t know what to do with them, you can’t say much about them.

Color
Size
Shape
BUT IF YOU KNOW WHAT TO DO WITH THEM YOU CAN SAY SOMETHING ABOUT THE RESULT…
YOU CAN LEARN A LOT FROM LEGOS

• If you know different ways to put them together they may approximate the shape of something else and you can now say something new about the Legos collectively (castle)

• That is, only because of behavior you engaged in, you can now say something different about the Legos.
One HUGE problem in education is that we need children to use language to understand the world and many haven’t even mastered language as a form of communication.

Too many kids can’t build castles! They can only play with individual bricks!

Before moving forward: Intraverbals and Mediating responses, what’s the diff?

“What did you have for breakfast last Tuesday?” the first time it is asked you must engage in mediating responses, if someone asks you AGAIN 30 seconds later, it’s more like an intraverbal. At least in terms of fluency and apparent lack of mediating responses (rap)

Higher education is all about the mediating responses.
• Time is a weird concept
• Really weird
• If you don’t have language or only language for basic communication then you may have a very poor sense of time as your ability to be controlled by abstract concepts is absent or severely hampered
• For these individuals there is no “was” and there is no “will be” there is only right now
• These same individuals most likely don’t “time-orient”
• What time is it? What day is it? Month? Season? Year?
• As a concept we talk about time in a variety of ways
• Catch ya later
• Ain’t nobody got time for that
• I’m looking forward to it
• I remember it like it was yesterday
• Time flies

• Make the time
• Take the time
• Donate time
• Spend time
• Buy time (but you can’t sell it)
• Steal Time
We orient to time, all the time. We ask ourselves what day it is, we take cues from the environment we look at our watches/phones/clocks/television/sun position/current activity.

Time orientation is NOT the norm. It's “fragile” that is you can lose it (drunk, concussion, alzheimers, dementia, amnesia, las vegas casinos with no windows) you can also “misplace” events in time.

Time flies when you’re having fun

4:15 pm on a Friday and time crawls

Why?

We fail to time orient when having a blast and/or otherwise distracted (time flies)

We tend to OVER orient to time when suffering (checking the clock at a much higher frequency, wondering how much time has passed before checking the clock again, realizing Merrill’s presentation is 80 minutes long, etc.)
Typically developing young children must learn to orient to time.

The younger they are, the more stuck in the “now” they are.

Every 3 year old wakes up like they were partying the night before.
• More than likely children learn to go back in time first as it's hard to predict anything (future thinking) if you don’t know what already happened (past thinking)

• Jim Partington used to do the “What was that” once tacting was pretty solid by showing an item and removing it and immediately asking the question

• THIS MAY BE THE START OF WHAT MANY WOULD CALL ABSTRACTION! Words are also a form of abstraction (they represent something else) but this is beginning of time abstraction

• “What was that” refers to something that no can longer directly control your behavior (you can’t use your senses to detect it). The behavior is now multiply controlled by the question and private seeing/hearing/covert verbal behavior.

• It’s easy to see how one would start teaching the concept of time and the past with someone mastering “What was that?” then showing two things in succession and asking “What were those” then “which one did you see first?” “Which one did you see last?” etc.
Once a child has the concept “was” then we can start on “tacting” a series of past events as though watching a movie (private seeing and hearing/speaking, etc.).

This MAY be the beginning of understanding time as a linear event. Events happen in time.

If a child hasn’t mastered listing a sequence of events as they occurred in time (which is not the same as singing the alphabet B did not “occur” after A) they may not be able to do all the more sophisticated time tricks.

Can the learner recall a series of real events in the correct order? Like a real-world story.

Super Important!
YOU NEED TO BE ABLE TO LIST A SEQUENCE OF PAST EVENTS!

• (Dorothy) The wind began to switch –
• the house to pitch
• and suddenly the hinges started to unhitch.
• Just then the Witch - to satisfy an itch
• went flying on her broomstick, thumbing for a hitch.
YOU NEED TO BE ABLE TO LIST A SEQUENCE OF PAST EVENTS!

• Munchkins (singing now)

• And oh, what happened then was rich.

• The house began to pitch. The kitchen took a slitch.

• It landed on the Wicked Witch, because she’s such a bitch.

• (Cheering)

• Slitch n. (archaic) a combinate form of the words "slide" and "pitch" to denote a sideways motion with an accompanying rotational "roll" and/or "yaw" variance.

• Also slut + bitch mashup (urban dictionary)
YOU NEED TO BE ABLE TO LIST A SEQUENCE OF PAST EVENTS!

- Once the child can sequence past events of a routine it’s a simple matter to “re-orient” the child by asking a different question that capitalizes on the existing remembered sequence of events.
- What happened this morning? “I got up, got dressed, watched tv ate breakfast, left for school.”
- When the child is asked “What will you do tomorrow? He can restate the same list. This does not involve induction or imagination or creativity, it’s just a “static future” which has the same sequence every time. Probably the simplest form of prediction.
YOU NEED TO BE ABLE TO LIST A SEQUENCE OF PAST EVENTS!

- Typically developing children aren’t very good at listing the sequence of events in their day
- This is why 4-year-olds don’t have bad days, they have a bad 5 minutes.
- We, on the other hand, have bad days, bad weeks, bad months and bad lives.
The whole notion of functional relations and causality is extremely important for predicting the future just as it is in behavior analysis and ALL sciences.

Once an individual can recall two events that happened we can begin to teach about causal relationships.

A child sees a boy running, the boy’s shoelaces are untied. The boy trips over them and falls and hurts himself and begins to cry:
CAUSALITY

- Parent: “Why was the boy crying?”
  - Child: “He hurt himself.”
- Parent: “Why did he hurt himself?”
  - Child: “He fell down”
- Parent: “Why did he fall down?”
  - Child: “He tripped”
- Parent: “Why did he trip?”
  - Child: “His shoelaces were not tied.”
PREDICTION

- The next day the parent notices the child’s shoelaces are untied
- Parent: “Uh oh, those shoe laces are untied!”
- Parent: “What might happen if you don’t tie them?”
- Child: “I might trip and fall and get hurt!”
- Parent: “Right! From now on you’re wearing Velcro shoes!”
- None of this is possible without being able to recall a series of events
- Yes, the child could also just be given a rule “Always tie your shoelaces or you’ll get hurt!” but this does not teach how to recall a sequence of events! It also won’t teach how to identify causal relations
A root cause analysis is a method of “looking back” at a causal chain to see how far back one can go in a chain of causal events to find the initial problem that started the chain of events.

If one can only go back only one step in time, then their understanding of causality would be severely limited and prediction would be similarly very limited in range and accuracy.

Individuals who can remember multiple steps in a causal chain and who have practiced identifying causal relationships will be able to better foresee the future.
LOOKING INTO THE FUTURE WITH CAUSAL CHAINS

• Looking into the future is super important!
• Because you'll be going there! (hopefully)
• A child is eating an ice-cream cone and his ice-cream is about to fall off. The parent says, "Be careful! Your ice-cream might fall and land on your new shoes!"
• Parent: "What would happen if your ice-cream falls?"
• Child: "I'll have no ice-cream!"
• Parent: "What else?"
• Child: (silent)
LOOKING INTO THE FUTURE WITH CAUSAL CHAINS

- Adults with long histories and good memories are MUCH better at predicting a future chain of events and will often attempt to do so unprompted (with varying accuracy)
- If my ice-cream falls it could land in my new shoes
- If they get ruined I’ll have to buy new shoes
- Then I won’t have money to pay my electric bill
- Then I won’t be able to charge my electric car
- If I can’t charge my car I can’t go to work
- If I can’t go to work I’ll lose my job
- If I lose my job I’ll lose my health insurance
- If I lose my health insurance I may get sick and die because there is no universal healthcare!
Two broad kinds of judgment:

- Making fine discriminations between things (what belongs in which category)
- Predicting short and long-term repercussions for various events/actions

We’re concerned with the latter, predicting outcomes (multiple/branching/extended chains)

Think of the phrase “I didn’t see that coming!”

4-year-olds see NOTHING coming because they have almost no history (can’t time travel to the past)

For some individuals, this never improves…
JUDGMENT

• Good judgment is not simply developed based on how far back one remembers in a sequence of events, but also an understanding of causal relations between those events and having experience with similar chains of events with different (better) outcomes

• That is, “experience” alone, in terms of “years of doing something” doesn’t yield good judgment

• If the experience is mostly making errors, and not even realizing they are errors then this particular kind of experience is actually a bad thing

• “An expert is someone who has made every error that could be made in a field of study” (Niels Bohr, Physicist)
JUDGMENT

• Judgment relies on
• # of Samples (requiring good memory, how many samples can you remember)
• Resolution (how many details of each sample can you remember)
• This is why you want a hand surgeon who has performed 3000 carpal tunnel surgeries, not 30.
• Hurricane forecasts rely on a rich sample of events to allow better prediction
• If the resolution is poor however, then the individual may not develop good judgment
EVERY “BIT” OF INFORMATION HELPS US CREATE A MORE DETAILED MEMORY

How do we remember all the bits???
ATTACHING SIGNIFICANCE! (IT’S SOMETHING YOU DO)

• Some may call this “processing”
• I like to call it “behaving”
• There are memorable events because of their uniqueness or rarity which don’t require us to “do” anything
• Then there are those events that we may only remember if we “do something” with them
• That “do something” is typically talking about them in ways that increase the probability of recall (we also do private seeing/hearing as in when we imagine things)
HOW DO YOU REMEMBER WHERE YOU PARKED?

• Most of us look for a marker (parking lot row number/letter)
• Then we make a rule
• When parking at airport:
  • What level?
  • Facing which direction?
  • How many spaces from which end (south or north end of garage)

What if you just park your car in a hurry and don’t engage in certain behaviors that increase the probability of recall?

Crap!
There are a few reasons you might find yourself reading a passage of text and at the end have no idea what you read:

1. You were not engaging in the proper behavior with respect to the words you read. This means you were not thinking about the words in a way that is required for comprehension. For example, you might not have been visualizing what the words describe as we do with story books.

2. Sometimes this is because you weren’t engaging in the proper behavior with respect to the words you read. This means you were not thinking about the words in a way that is required for comprehension. For example, you might not have been visualizing what the words describe as we do with story books.

3. You may in fact read each word, but you were thinking other things while doing so or simply NOT saying something about the words or visualizing what the words describe as we do with story books.
ATTACHING SIGNIFICANCE

- We increase the probability of recalling any event, by doing something with respect to the event.
- Any behavior we engage in that is controlled by the event and (probably) multiple MOs, can help.
- We might make a comment about what we saw/heard or ask ourselves questions (as speaker and listener) “That’s an odd place for a bench, I wonder why it’s there?”
- We might “flash” the image in our heads multiple times.
- These strategies for increasing recall probability can be formal or informal.
- When formal they are referred to as “mnemonic devices” (behavior).
ATTACHING SIGNIFICANCE
WHAT ABOUT ATTACHING SIGNIFICANCE AND READING COMPREHENSION?

• For difficult texts it is often necessary to “interact with” each sentence or paraphrase.
• Note anything unusual about it or unique.
• Ask questions about it.
• Say what it’s similar to.
• Separate the text into parts that are understood and parts that aren’t.
• Re-reading the parts that aren’t understood and talking about them more as both speaker and listener.
• Visualize (private seeing) things in the text that have physical, observable properties (It was a beautiful day as the sun rose casting a morning shadow over the valley).
WHAT ABOUT SIGNIFICANCE AND READING COMPREHENSION?

• If you don’t attach significance to what you read (talking to yourself about what you are reading as you read it, and visualizing) then you are not likely to remember things very well.

• If you can’t remember things very well it is more difficult to fully comprehend what you’re reading.
WHAT CAN YOU SAY ABOUT IT?

• At the root of comprehension, I think, is the ability not just to talk about something but to talk about it many ways.

• If you can talk about something in different ways, tacting different properties of the object, identifying it by feature/function/class, etc. Then you “understand” it better than someone else.

• A literature professor can say MANY more things about a short passage of text than the average person as they can dissect the passage according to the kind of voice used, the type of writing, the perspective of the author, the tone of the passage, the underlying message the author is trying to convey (that is not clearly stated), etc…

• The novice might say “I liked the book, it was a real page turner” but they can’t say much more.

• The book critic could write a 10 page paper about the book and talk about different aspects of the writing.
• Being in the moment is the DEFAULT
• Being in the moment can be useful…
• Unless the moment sucks!
• Then your ass better be able to time travel!
• People with no/poor concept of time can’t look forward to anything
• They cannot fondly remember pleasant events
What if the individual is ALWAYS in the moment?

How well will “do this, get that later” contingencies work with this individual?

That someone can RECITE a contingency completely (I do 3 worksheets then I get computer time at the end of the day) or even answer a question (what do you have to do get computer time?) doesn’t mean that they are time orienting and/or thinking and talking about the future.

Does the individual ever say “I’m really excited about _____ that’s going to happen tomorrow!”
Similarly, what if the individual is “in the moment” and doesn’t think about the consequences of their actions?

What if they don’t remember the consequences of previous actions?

If someone doesn’t time orient properly and is only in the moment, then only immediate environmental changes will control behavior.

It doesn’t mean someone won’t avoid a stimulus that has been historically paired with an aversive event and it doesn’t mean someone won’t approach a stimulus that has been paired with reinforcement.

The individual may not however “envision bad things happening” just before misbehaving. To do this you have to remember what did happen and fear what might happen (remembering and predicting).
Laraine Winston, M.S., BCBA wrote a short paper titled “Basic Time Travel For Athletes” (larainewinston@outlook.com if you want a copy).

In it she discusses how we must move from being in the moment to being in the future and back again.

The recommendation is to NOT live in the future with respect to any current level of minor discomfort. We don’t want to anticipate worse pain when it hasn’t happened yet. Just remind yourself everything is ok now, and stay in the NOW.

The time for time travel to the future is when the pain is much higher. This is when you visualize yourself running across the finish line into the waiting arms of family and friends.
WHAT DO WE DO ABOUT THIS PROBLEM?

• Kent Johnson stuff: Think out loud (so we can correct incorrect statements)
• Proper comprehension assessment (this means UNPROMPTED assessment) preferably spoken, not a multiple choice test
• Teaching individuals to comprehend sequences of events in their day and then learning to comment on those sequences (how can you comprehend a story if you can’t comprehend your day?) (What did we do 5 minutes ago? What did we do this morning? What did we do yesterday? Also tacting their own behavior and objects and actions of others throughout their day)
• Asking the question to parents and educators, “What kind of comprehension will this child need, and what kinds of comprehension will be possible given the child’s current ability to time travel?”
WHAT DO WE DO ABOUT THIS PROBLEM?

• If children are going to be expected to do more than give a “text sourced” answer (what was the name of the lead character’s brother?”) then they must be able to synthesize information.

• This means using rules to place things into categories and then listing similarities and differences to answer questions like “What kind of a person was the lead character?” This information can only obtained by doing “word math” as it isn’t directly stated in the text.

• We might refer to some of these skills as inductive and deductive reasoning.

• Deductive involves simple rule application without being creative (If you have Malaria and don’t yet have a fever, you will have one as all patients with Malaria develop fever).
WHAT DO WE DO ABOUT THIS PROBLEM?

- **Inductive** involves drawing conclusions based on incomplete evidence and ruling in/ruling out causes. The patient has a fever but that’s all the information we have and we can’t say it’s Malaria as a number of things can cause fever, so we must look for other pieces of evidence and when there is enough evidence we are more likely to say “You have the flu, not malaria” even though we are not yet 100% certain.

- **Deductive** is more like simple rule following, Inductive may require “time travel” especially in a question that asks the learner anything about “what might happen” or “what might have happened differently” as this is asking to the person to infer a different future.

- What behaviors are you doing? Making multiple conditional discriminations (that may be compound discriminations) and rule following to a great extent.

- When you “use” inductive reasoning to place something in a category then you can “switch back” to deductive like rule following. Now that I have enough evidence to say that X is a ________, I know that all _____ are dangerous!
WHAT DO WE DO ABOUT THIS PROBLEM?

• One of the fundamental problems with a variety of learners with unsophisticated verbal repertoires is that they are being asked to attempt work that requires a sophisticated verbal repertoire and the individual is destined to have difficulty which will increase the motivation to escape and result in failure to attain goals.

• **We must learn to recognize incomplete verbal repertoires for what they are and use this information to carefully decide which goals would be attainable.**

• Incomplete in the sense of “using words to operate on other words”

• Time-orienting should also be assessed and language/skills related to it (today, yesterday, in a little while).

• Can the individual say how long it takes to do various routine tasks? Where does the understanding break down? (how long does it take to brush your teeth? Watch a tv show? Walk to the store?)

• If deficits can be detected they might be corrected and the individual may be able to master the skills we are teaching instead of pretending that the individual can do something they are simply incapable of.