Your Book Review: The Educated Mind - by a reader

[*This is one of the finalists in the 2023 book review contest, written by an ACX reader who will remain anonymous until after voting is done. I'll be posting about one of these a week for several months. When you've read them all, I'll ask you to vote for a favorite, so remember which ones you liked*]

"The promise of a new educational theory", writes Kieran Egan, "has the magnetism of a newspaper headline like 'Small Earthquake in Chile: Few Hurt'".

But — could a new kind of school make the world rational?

I discovered the work of Kieran Egan in a dreary academic library. The book I happened to find — *Getting it Wrong from the Beginning* — was an evisceration of progressive schools. As I worked at one at the time, I got a kick out of this.

To be sure, broadsides against progressivist education aren't exactly hard to come by. But Egan's account went to the root, deeper than any critique I had found. Better yet, as I read more, I discovered he was against traditionalist education, too — and that he had constructed a new paradigm that incorporated the best of both.

This was important to me because I was a teacher, and had at that point in my life begun to despair that all the flashy exciting educational theories I was studying were just superficial, all show and no go. I was stuck in a cycle: I'd discover some new educational theory, devour a few books about it, and fall head over heels for it — only to eventually get around to spending some time at a school and talk to some teachers and realize *holy crap this does exactly one thing well and everything else horribly*.

If my life were a movie, these years would be the rom-com montage where the heroine goes on twenty terrible first dates.

I got to look at some approaches in even more detail by teaching or tutoring in schools. Each approach promised to elevate their students' ability to reason and live well in the world, but the adults I saw coming out of their programs seemed not terribly different from people who didn't.

They seemed just about as likely to become climate deniers or climate doomers as the average normie, just as likely to become staunch anti-vaxxers or covid isolationists. They seemed just as likely to be sucked up by the latest moral panics. The strength of their convictions seemed untethered to the strength of the evidence, and they seemed blind to the potential disasters that their convictions, if enacted, might cause.

They seemed just about as rational as the average person of their community — which was to say, quite irrational!

Egan's approach seemed different.

I began to systematically experiment with it — using it to teach science, math, history, world religions, philosophy, to students from elementary school to college. I was astounded by how easy it made it for me to communicate the most important ideas to kids of different ability levels. This, I realized, was what I had gotten into teaching for.

The man

Kieran Egan was born in Ireland, raised in England, and got his PhD in America (at Stanford and Cornell). He lived for the next five decades in British Columbia, where he taught at Simon Fraser University.

As a young man, he became a novice at a Franciscan monastery. By the time he died, he was an atheist, but — he would make clear — a *Catholic* atheist. His output was prodigious — fifteen books on education, one book on building a Zen garden, and, near the end of his life, two books of poetry, and a mystery novel!

He was whimsical and energetic, a Tigger of an educational philosopher. He was devoted to the dream that (as his obituary put it) "schooling could enrich the lives of children, enabling them to reach their full potential".

He traveled the world, sharing his approach to education. He gained a devoted following of teachers and educational thinkers, and (from an outsider's vantage point, at least) seemed perpetually on the edge of breaking

through to a larger audience, and getting his approach in general practice: he won the Grawmeyer Award — perhaps educational theory's highest prize. His books were blurbed by some of education's biggest names (Howard Gardner, Nel Noddings); Michael Pollan even blurbed his Zen gardening book.

He died last year. I think it's a particularly good moment to take a clear look at his theory.

The book

This is a review of his 1997 book, *The Educated Mind: How Cognitive Tools Shape Our Understanding*. It's his opus, the one book in which he most systematically laid out his paradigm. It's not an especially easy read — Egan's theory knits together evolutionary history, anthropology, cultural history, and cognitive psychology, and tells a new big history of humanity to make sense of how education has worked in the past, and how we might make it work now.

But at the root of his paradigm is a novel theory about why schools, as they are now, don't work.

Part 1: Why don't schools work?

A school is a hole we fill with money

I got a master's degree in something like educational theory from a program whose name looked good on paper, and when I was there, one of the things that I could never quite make sense of was my professors' and fellow students' rock-solid assumption that schools are basically doing a good job.

Egan disagrees. He opens his book by laying that out:

> "Education is one of the greatest consumers of public money in the Western world, and it employs a larger workforce than almost any other social agency.
>
> "The goals of the education system – to enhance the competitiveness of nations and the self-fulfillment of citizens – are supposed to justify the immense investment of money and energy.
>
> "School – that business of sitting at a desk among thirty or so others, being talked at, mostly boringly, and doing exercises, tests, and worksheets, mostly boring, for years and years and years – is the instrument designed to deliver these expensive benefits.
>
> "Despite, or because, the vast expenditures of money and energy, finding anyone inside or outside the education system who is content with its performance is difficult."

Q: Oh, can it really be that bad?

Imagine a group of 100 American adults, chosen at random. They've sat through years of science lessons, so you decide to ask them some basic questions. What will they know?

Bryan Caplan, in his book *Against Education*, cites surveys of what Americans know about basic scientific concepts. Here's what they find:

of the hundred adults, 76 know that the center of the Earth is hot (this is good!)

only 54 know that the Earth goes around the Sun

only 50 know that not all radioactivity is man-made

only 29 know that ordinary (as opposed to GMO) tomatoes have genes

Q: Well, those are facts, not understanding — and that's just looking at American adults in general! Surely good schools are doing a better job educating than that?

Caplan cites a famous study by the educational psychologist Howard Gardner:

> "Researchers at Johns Hopkins, M.I.T., and other well-regarded universities have documented that students who receive honor grades in college-level physics courses are frequently unable to solve basic problems and questions encountered in a form slightly different from that on which they have been formally instructed and tested."

Q: Okay, but schools teach reading, writing, and math... right?

Basic literacy and numeracy: yes. Adult-level: no.

If you gave someone two editorials that clashed over interpreting economic evidence, what percent of American adults could compare the editorials? One U.S. Department of Education study that Caplan cites finds: just 13%.

And while 78% could "calculate the cost of a sandwich and a salad, using prices from a menu", only 13% could "calculate an employee's share of health insurance costs for a year, using a table that shows how the employee's monthly cost varies with income and family size".

Q: I'm afraid to ask about reasoning abilities.

Caplan quotes from a study that looked into how well college students were at applying academic learning to everyday life. The authors write:

> "The results were shocking. Of the several hundred students tested... the overwhelming majority of responses received a score of 0. Fewer than 1% obtained the score of 2 that corresponded to a 'good scientific response'."

America isn't so much of an outlier; numbers across the rest of the world are comparable. The 4.7 trillion-dollar question is why.

The usual suspects

Ask around, and you'll find people's mouths overflowing with answers. "Lazy teachers!" cry some; "unaccountable administrators" grumble others. Others blame the idiot bureaucrats who write standards. Some teachers will tell you parents are the problem; others point to the students themselves.

Egan's not having any of it. He thinks all these players are caught in a bigger, stickier web. Egan's villain is an idea — but to understand it, we'll have to zoom out and ask a simple question — what is it, exactly, that we've been asking schools to do? What's the job we've been giving them? If we rifle through history, Egan suggests we'll find three potential answers.

Job 1: Shape kids for society

Before there were schools, there was culture — and culture got individuals to further the goals of the society.

Egan dubs this job "socialization". A school built on the socialization model will mold students to fit into the roles of society. It will shape their sense of what's "normal" to fit their locale — and what's normal in say, a capitalist society will be different from what's normal in a communist society. It'll supply students with useful knowledge and life skills. A teacher in a school built on socialization will, first and foremost, be a role model — someone who can exemplify the virtues of their society.

Job 2: Fill kids' minds with truth

In 387 BC, Plato looked out at his fellow well-socialized, worldly wise citizens of Athens, and yelled "Sheeple!"

Fresh off the death of his mentor Socrates, Plato argued that, however wonderful the benefits of socialization, the adults that it produced were the slaves of convention. So long as people were shaped by socialization, they were doomed to repeat the follies of the past. There was no foundation on which to stand to change society. Plato opened his Academy (*the* Academy, with a capital 'A' — the one that all subsequent academies are named after) to fix that. In his school, people studied subjects like math and astronomy so as to open their minds to the truth.

Egan dubs this job "academics". A school built on the academic model will help students reflect on reality. It will lift up a child's sense of what's good to match the Good, even when this separates them from their fellow citizens. And a teacher in an academic school will, first and foremost, be an expert — someone who can authoritatively say what the Truth is.

Job 3: Cultivate each kid's uniqueness

In 1762, Jean-Jacques Rousseau looked out at his fellow academically-trained European intellectuals, and called them asses loaded with books.

The problem with the academies, Rousseau argued, wasn't that they hadn't educated their students, but that they *had* — and this education had ruined them. They were "crammed with knowledge, but empty of sense" because their schooling had made them strangers to themselves. Rousseau's solution was to focus on each child individually, to not force our knowledge on them but to help them follow what they're naturally interested in. The word "natural" is telling here — just as Newton had opened up the science of matter, so we should uncover the science of childhood. We should work hard to understand what a child's nature is, and plan accordingly.

Egan dubs this job "development". A school built on the developmental model will invite students into learning. And a teacher in this sort of school will be, first and foremost, a facilitator — someone who can create a supportive learning environment for the child to learn at their own pace.

Q: Can you recap those?

We might sum these up by asking what's at the very center of schooling. For a socializer, the answer is "society". For an academicist, the answer is "content". And for a developmentalist, the answer is "the child".

You want a visual? We might think in terms of these three images:

Kieran Egan laughs at your educational reforms

Okay, of those three jobs, which should we give to schools? You probably have your favorite — I certainly did! But Egan wants you to know they're all crap. None of them, by themselves, can give us the kinds of schools we want.

Q: I kind of like Rousseau! What's the problem with pure development?

Like I said before, my bookshelves overflow with authors who want to knock down Rousseau (and the people who followed in his wake — John Dewey in particular). Egan will have none of it: before the developmental approach, many schools were terrible places where children were beaten for getting math problems wrong. "Rousseau and Dewey," he writes, "have enriched our conception of education in important ways. We will not make educational progress by trying to cut away their contribution".

But, he continues, there's no way a purely developmental approach could possibly work! Rousseau imagined human nature to be selfless and kind; this ideal state could only survive if it was kept away from the evils of society — the titular child in his book *Emile* was kept away from human society, unable even to read, until age twelve.

Of course, schools don't go this far — they can't — but I can attest from personal experience that even fairly serious attempts to raise children in an accepting community of peers often crash and burn when faced with actual human nature. Kids reared in the most developmentally appropriate schools can be nasty, bored, and lazy at about the same rate as their mainstream peers.

Q: In my heart, I'm an academicist. What's the problem with it?

I think Egan was an academicist in his heart, too. His book drips with classical references — so much so that it can make some sections difficult to read. But, he points out, those purely-academic schools really were hellscapes. And their brutality wasn't something that was just tacked on, it flowed from their understanding of knowledge: enlightenment will come when the right information enters a child's head, regardless of how it gets in there (or whether the child wants it in there).

And again, Egan feels obliged to point out that we've tried this approach for thousands of years, and it hasn't worked. In fact, Plato's original vision so obviously doesn't work that people hawking academic schools have modified their pitch: no longer is the goal for students to understand the Truth, but to cultivate inquiring, skeptical minds who are perpetually dissatisfied with old answers. Can we imagine taxpayers paying for this?

Q: Fine, fine. I'm not a fan of socialization, but I'll ask the question — what's wrong with it?

The funny thing is that of the three, this is the only one that has shown its ability to work for a long stretch of time! (As

~~John~~
Calvin pointed out, as animals, we're pretty pathetic. Socialization allowed our ancestors to become something more than individuals so that they could survive; we owe this job our gratitude.

That said, it would be impossible for schooling today to seek only to socialize. That would require that members of a society share values, and fundamentally agree that their society is good. It also requires that a society not be changing, so the values and skills that are taught to children today will be the ones that will be useful to them in thirty years. Obviously, modern Western society is none of those things. Pure socialization might work for the Amish, or for Catholic trad communities, but not for us. And, frankly, we should feel okay about this. (Do you know where you could get a pure socialization education in the 20th century West, Egan asks? The Hitler Youth!) There really are good reasons to be wary of any education that decrees that its society is uniformly good.

Which combination is best?

Okay, you say, it's clear that none of these jobs is good on its own — the solution (obviously!) is to smoosh them together. If we do that wisely, the good parts of each will make up for the deficiencies of the others.

This sounds eminently reasonable — but Egan would like to have a word with you.

Q: What's the problem in combining socialization with academics?

Wouldn't this be a beautiful combination? Socialization would cohere the school together, and then they could leverage those good feelings to, say, read Aristotle. I've seen this work in schools (like conservative Christian academies) founded on a set of specific beliefs. But when intellectual diversity enters in, it becomes harder.

You, perhaps, say that socialization could unite people around their differences — schools could support a society made up entirely of critics! Yes, a society of critics would be interesting, and so would a herd of cats: neither works in practice. Imagine students reading their Ibram X. Kendi books in the morning, then pledging allegiance to the American flag after lunch.

Q: What's the problem in combining academics with development?

Again, this seems like a beautiful vision: we can invite children into discovering the big ideas. Alas, it crashes into the reef of reality quite quickly: what do we do when kids don't *want* to learn about the big ideas? This combination works wonderfully for kids who naturally want to be academics, but — and this is a crucial point that geeky education types too often sweep under the rug — *lots of kids don't naturally want to be academics*.

Okay, you say, ignore the "liberatory" element of the developmentalist program, and focus on the "uncovering the nature of the individual child" part: academics can tell us *what* the students should be learning, and development can tell us *how* they should learn it. Egan has a thought experiment for you.

Imagine that you get the funding to fully pursue this combined goal — you set up a hundred different types of schools in the nearest big city. There's a specific school for every possible permutation of learner — a school for big-picture kinesthetic learners who score as INFJ on the Myers–Briggs, a school for detail-oriented auditory learners who score ENFP, a school for marine-biology-loving hyperactive learners who lost their personality test results… you get the idea.

You build the schools, you work out the bus schedule, and then, on the first day, all the students learn exactly the same content.

Because that's what it means for a school to be an academy — it teaches "the best that's been thought or said".

Q: What's the problem in combining development with socialization?

What's wrong with telling kids to become their authentic selves, even as you squeeze them into the roles most beneficial to society?

Imagine two rural schools merging together, due to declining local population. Now imagine that one of them is a hippie free school, and the other is a military academy. (*That's* a reality TV show I'd watch.)

It's possible, I suppose, to imagine this working for kids who naturally want to be, say, plumbers, or paleontologists, or presidents — and who happen to go to a school that prepares its students to fill that one role. But the odds of matching students to schools just perfectly seems small.

But enough thought experiments — we can state this in a visual form: behold, the SAD triangle. It's bright around the edges, but muddled where they mix:

One of the things I love about Egan is that he looks at educational ideas historically. (Most histories of education start around the turn of the 20th century; I remember being excited when I found one that began in the 1600s. Egan begins in prehistory.) And what we're reminded of, when we see these historically, is that these jobs were meant to supplant each other. Put together, they sabotage each other.

What are we asking of schools?

Of the three possible jobs, which are we asking mainstream schools to perform? Egan answers: *all three*.

To confirm this, stretch your memory back to your student days, and see if you can put some of the most basic elements in any of these three categories. We're so immersed in these that they seem obvious, "natural" aspects of schooling, but of course they're nothing of the sort.

Did you spend your time with other children of the same age? Was your work graded according to a standard? Were you forced to play team sports, or to pledge your allegiance to your nation-state?

All of these, Egan says, bear the fingerprints of the goal of socialization. Progressive reformers in in the 1960s saw these as the markings of a dark conspiracy, but socialization has more warm-feely aspects: counselors to help students cope with the strains of modern society, field trips to the local fire station and historical monuments, and everything "practical" — life skills, sex ed, emotional regulation, and so on.

Did you learn anything that wasn't obviously useful? Did you read *Hamlet*, say, or master the Pythagorean theorem, or learn that the planets orbit the Sun (and not the other way around)? That's the fingerprints of the academic goal.

Finally, did you hear teachers show concern about "age-appropriate" content, or see signs that your school valued individualized learning? Does it seem right to you that learning should be "active" rather than "passive", or that it's better for someone to discover something than to be told it?

Did your kindergarten have tiny, child-sized chairs?

All these, Egan says, are the fruit of developmentalism.

The first time I read the book, I wondered at all this. What Egan was saying was indeed lining up with my memories. But perhaps, I thought, he was playing loose with the categories; I was still skeptical that schools *really* were trying to balance all three goals.

So I decided to check his idea from a different perspective and look up the mission statements of school districts I was familiar with. Here's the one from the town I currently live in:

"Skills" and "become involved members of a global community" seem to connote socialization, "challenge" and "knowledge" seem to connote academics, and "empower" and "reach their full potential" seem to connote development.

But I wasn't sure if I was just seeing faces in clouds, so I looked up the mission statement for my hometown:

"Succeeding" seems like socialization, "learning" seems like a nod to academics, and "growing" seems like code for development. But again, I was worried that I engaging in motivated reasoning, so I looked up the largest district I've lived in, a city of about a million people:

[redacted] Public Schools, the largest K-12 school system in [redacted] state, has a deep commitment to every student's journey—to ensure that each student will graduate ready for college, career and life.

Wow. That seems pretty clear.

So, to sum up: Egan says that there are three potential jobs we can give to schools. Alone, each of these jobs is terrible; together, they're worse. And what we've done is given schools all three jobs.

A sad triangle, indeed.

What about alternative schools?

I was curious to see whether this “sad triangle” could help us understand other philosophies of education, and why they work (or don’t). Where would, say, unschooling, and classical education, and vocational ed, and Montessori go?

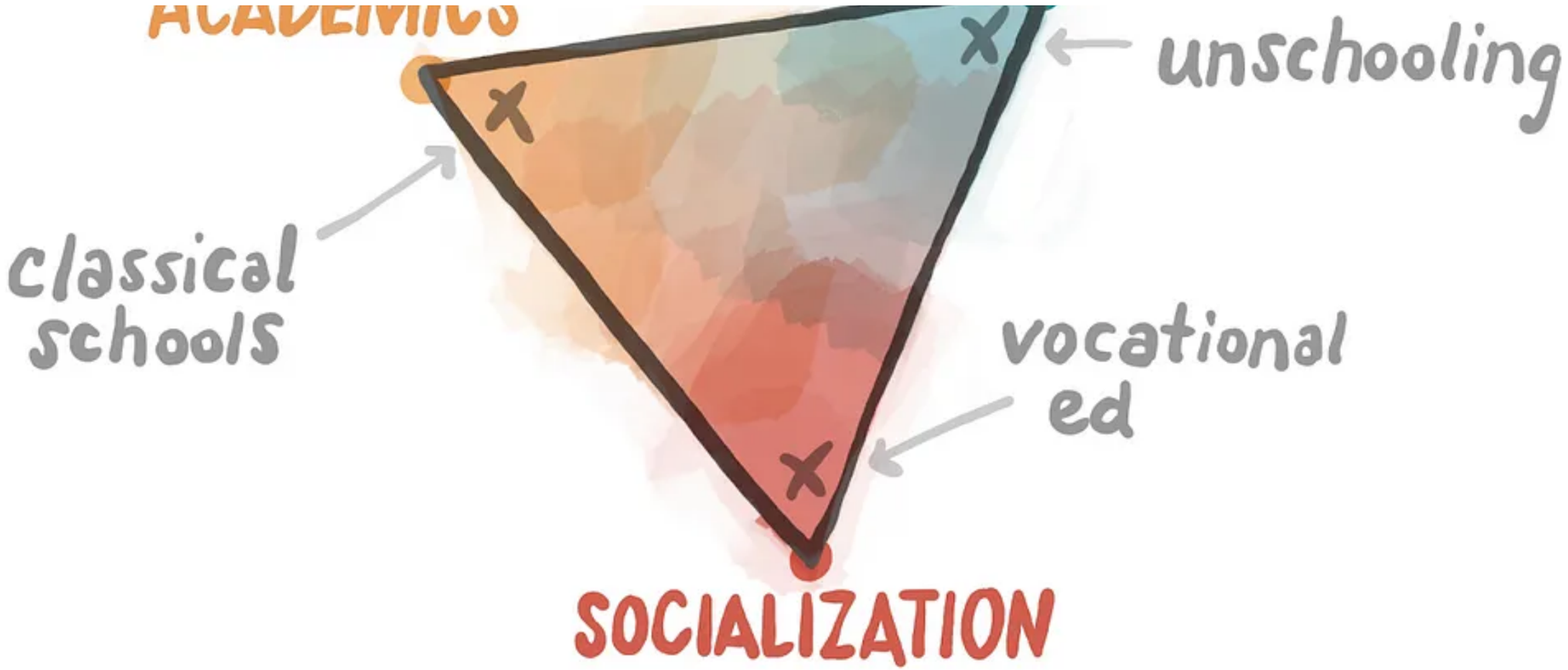
The first three seem obvious. Radical unschooling is in the upper-right, classical schools (with its focus on feeding kids “the best that’s been thought or said”) is in the upper-left, and vocational ed is in the bottom corner.

What can that tell us? Intriguingly, each of those approaches can claim to have done some impressive stuff. I’ve worked with radical unschoolers, and while their skills have often been lopsided (not learning math is an acknowledged issue in the community), they’ve all at least exhibited a zeal for learning the topics they’ve been interested in. (Video games, frequently.)

And I remember a massive study in the early 2000s that asked which kinds of schools actually improved student test scores controlling for the effects of socioeconomics. What it found was that only two types of schools stood out: Catholic schools that were operated by a religious order (e.g. the Jesuits — not local parish schools), and vocational schools.

Q: Oh, that’s terrible evidence. One of those was just personal anecdotes! And what about selection effects? And what about…?

I wouldn’t disagree — and, as Freddie deBoer points out, most educational research is bunk. I’ll take this to be only weak confirmation of Egan’s theory that combining jobs undercuts education.



Are we hosed?

If Egan's critique is correct, we're in a bad situation. Educational radicals yell from their dark corners to abandon the middle and come join them; a century of educational reforms have amounted to little more than wobbling around, first in one direction, then another.

At the moment, the conversation about schools in the United States, at least, seems to have hit an all-time pessimistic blech. Freddie deBoer speaks for a lot of people when he says "Even the most optimistic reading of the research literature suggests that almost nothing moves the needle in academic outcomes. Almost nothing we try works."

I'm not quite that pessimistic — the word "almost" is doing some work, there. There are some reforms that seem to work at the margin: raising teacher pay, making it easier to become a teacher, reducing air pollution, free school lunches, and more. Actually applying what the science of reading has been telling us for a few decades seems a big one.

And perhaps you have your own pet reform proposal. Sure — add it to the heap! What Egan suggests, though, is that so long as we're bopping around this triangle of jobs, we won't be able to get the schools that we want.

The dream

There's a moment at the end of my favorite Bollywood movie that's become stuck in my head. The protagonists have made the arduous journey to a beachside rural school. In the sun outside, flocks of children are experimenting with art and playing with inventions; inside, the walls are covered with books and the tables are covered with models. The kids are learning joyously and deeply.

In the real world, such places do exist — they're just exclusive, pulling their students from among the families who are already the most gifted and curious. They don't make kids this way; they scoop up the kids who are already this way. But in the movie, we're supposed to believe these are normal children — normal, except they've been transformed by a school.

Egan's wild idea is that it's possible to make schools like this. He thought that we didn't have to wait for the communists to make people equal or for the transhumanists to make people smarter. All he thought it required was giving schools a different job — not socialization or academics or development, but something that brings pieces of them together in a new way. But in order to understand that job, we have to come to a cleaner, bigger, and truer understanding of what "education" is.

The road ahead: a special Q-and-A

Q: This is the proverbial thousand-dollar-bill-lying-on-the-sidewalk: if this is possible, someone should have done it now. Is Egan going to give sufficient evidence for me to believe this?

Maybe! I'll address this in a special section at the end, after sketching out what his theory looks like.

Q: If his theory is even plausibly true, then why haven't I heard of Egan before?

His books can be hard to read — he was an intellectual's intellectual; he had difficulty writing a page without a reference to William Wordsworth, Friedrich Nietzsche, Sigmund Freud, Ludwig Wittgenstein, Claude Levi-Strauss, Richard Rorty, Noam Chomsky, or Steven Pinker.

And his paradigm is wonky and multidimensional; he rejiggers common categories, and tells you everything all at once.

But worst of all, when his paradigm is stated plainly, it sounds *stupid*.

Q: Oh! What… is his paradigm?

I'm going to jigsaw his book, and hold back his big idea for its own section. First, I'm going to list out some simple observations of students at different ages, and imagine what schooling could look like, if it were built on these principles. (First I'll do this for elementary school, then middle school, then high school.)

Then I'll explain how his theory ties all of this together… by clarifying our definition of what education actually is.

Q: I'm not from America; could you be clear on what you mean by those divisions of schooling?

Egan's framework has three main stages, but they don't divide neatly into "elementary, middle, and high school". (The precise age ranges he talks about, if you're interested, are 2–8, 8–15, and 15 and older.) Regardless, I'm going to use those terms — he sometimes did — because it gives me something specific to imagine. Don't sweat 'em.

Part 2: A new kind of elementary school

What's the matter with elementary schools?

Egan suggests that Plato and Rousseau, for all their differences, might have the same reaction if they visited a modern elementary school: they'd call it "trivial".

I'll admit, here, that I have tremendously fond memories of my elementary school years — committed teachers, good friends, and interesting activities. But I suspect my memory has edited out the most typical work I did. Either that, or elementary schools have taken a drastic plunge in quality from the 1980s. My wife and I homeschool now, but before the pandemic, we sent our kids to our local public school, and whenever we volunteered in the classroom, we were horrified. They spent their days practicing reading on shallow texts, or half-mindlessly practicing basic arithmetic. Occasionally they'd bring us home a sign of learning about something from the real world — usually something as intellectually and emotionally compelling as the importance of tooth brushing. And at parent–teacher conferences every year, we'd be sat down on tiny chairs and informed that, while our children were quite bright, they were struggling to pay attention in class. No sh**, I wanted to reply. The school seemed hermetically sealed; almost nothing that felt meaningful from the outside

world could get in.

Though they might agree about little else, Egan thinks that Plato and Rousseau would look at the dull worksheets and insipid “hands-on activities” and call modern elementary schools trivial. He agrees, and thinks that fixing this is the first step to building a new kind of school.

Why so trivial?

Ironically, Egan thinks it's all the fault of Plato and Rousseau. Hidden in the ways that both the academicists and developmentalist think about education is an assumption: that children’s reasoning is basically the same as adult reasoning, but lesser.

Q: This isn’t some romantic, children-are-the-real geniuses theory, is it?

Egan actually does think that there’s an intensity to how children perceive the world that we lose — but no, it’s not. He’s building on mainstream cognitive science — just aspects of it that are currently more-or-less ignored in school. The upshot, though, is that he thinks that educational researchers (be they of academic or developmentalist persuasions) see kids as smaller, stupider versions of adults.

Q: But that’s the opposite of what my local developmentalist school says!

It was the opposite of what the developmentalist school that I worked at said, too. But at teacher meetings, I’d frequently hear people ask what was “developmentally appropriate” for a child. I’ll grant that there are perfectly reasonable times to ask this: “Honey, is it developmentally appropriate for our 10-year-old to watch ‘Cocaine Bear’?” is just one of many examples. But “is it developmentally appropriate for our class to learn about world religions?” or “is it developmentally appropriate for our school library to have a book mentioning homosexuality?” probably aren’t some of them. (The latter example was not one that I heard at my progressivist school, but Egan points out that this sort of language is often used by conservative activists.)

This notion of “developmentally appropriate” took on a scientific sheen with the work of Jean Piaget, the famous Swiss psychologist. Before age 12, he “proved”, children aren’t able to form hypotheses, draw conclusions, or think abstractly. This, his followers thought, should transform schools — and so they did! To math, they added in “manipulatives” — physical cubes and rods and such — to help students see math. To the history curriculum, they — well, they ended it. Why waste time, they asked, lecturing students about history that they couldn’t possibly understand? In its place they put the “expanding horizons” model of social studies. One version goes as follows:

In kindergarten, students learn about themselves
In first grade, they learn about their families
In second grade, they learn about their neighborhood
In third grade, they learn about their city
In fourth grade, they learn about their state
In fifth grade, they learn about their nation
In sixth grade they learn about the world

We can admit that there’s an elegance to this model. (I can picture how clever the theorist who first came up with it must have felt!) The downstream effects of it, however, seem horrible. Doesn’t keeping kids ignorant of the rest of the world seem provincial? Doesn’t reinforcing their self-centeredness seem infantilizing? Perhaps we could stomach it if it was founded on some unshakable findings of child psychology — but does it really strike you as likely that kids are incapable of understanding anything that happened long ago or far away? How, Egan asks, can we explain the $50 billion success of a movie franchise aimed at children that literally begins “A long time ago, in a galaxy far, far away?”

Q: Because… Jedis aren’t history?

The point is, kids obviously have the mental abilities to understand — and in fact care a lot about — things far outside their own experience, and we've built elementary schools on a long-dominant model of educational psychology that swears they can't. This is actually a great example of a general principle. Let's call it "the Star Wars test": can our model make sense of the most obvious facts of students? When we find that the answer is "no", we should at least consider radically revising what we're doing in school.

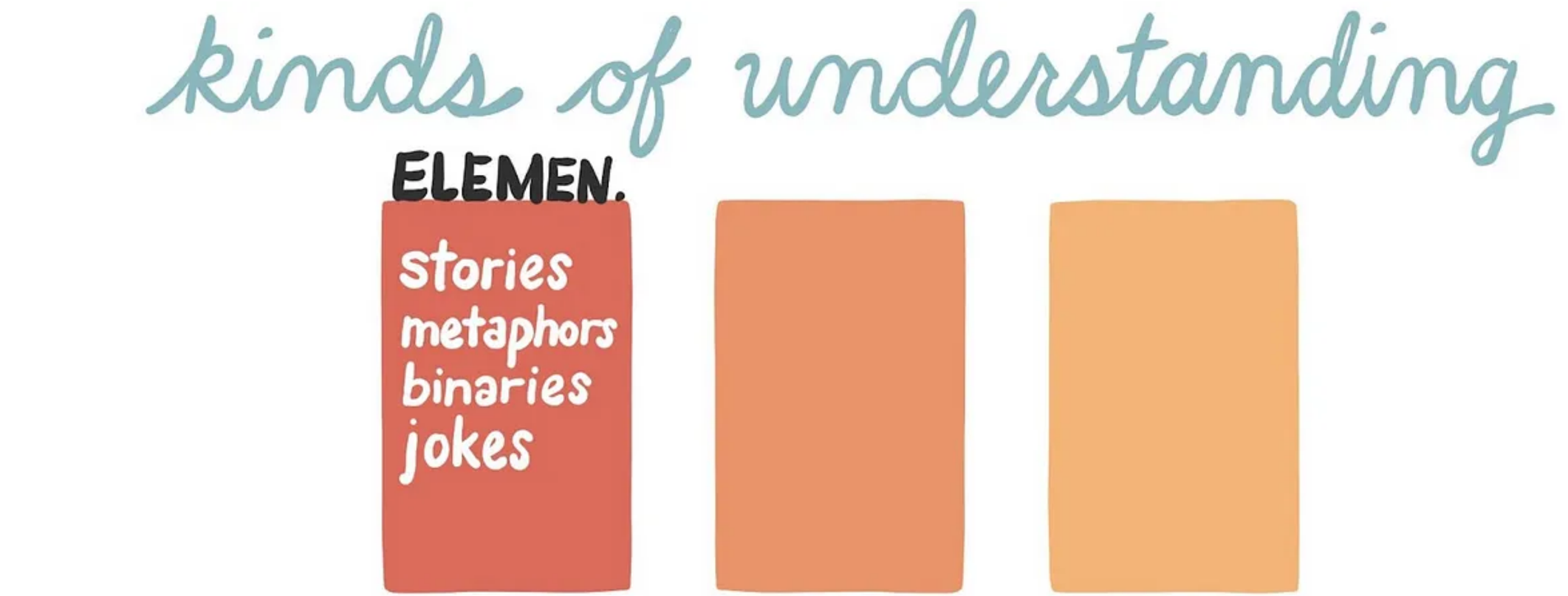
What are elementary schoolers good at? (or: kids are smarter than students)

Someone — I can't now find who — once observed that children seem to lose IQ points the moment they step into a classroom. Egan agrees, and suggests that we think of ourselves as primatologists to kids, Jane Goodalls who investigate children "out in the wild" to see the sorts of things they gravitate to, and do fairly well at.

If we do this, what do we see?

Kids tell ***jokes***, for one. They get ***mental images*** stuck in their heads, for another. They engage in ***role-playing***, get lost in ***reverie***, and beat out ***rhythms*** when they're bored. They make ample use of ***metaphors***, tell ***stories***, and insist on seeing the world in terms of ***abstract binaries*** (e.g. stupid/smart, cowardice/courage, slavery/freedom, and so on).

These, Egan holds, are the cognitive strengths that children use to understand the world. They're the things that kids are often about as good at as adults — or much better than. They're going to be the tools Egan wants us to use to rebuild the entire elementary curriculum, and in fact he spends most of his second chapter geeking out about how we might define these, how they operate in the mind, where they first pop up in history and anthropology, and even how they might have developed in our evolutionary past. I'm going to skip all of that, and get to the curriculum.



From trivial to rich: the trick

What could an intellectually rich elementary school curriculum look like, if we built it on kids' cognitive strengths? He gives us one suggestion to help us do this: ask where each discipline came from in the first place. What was math before it was math, for example — or science before it was science?

Q: How on Earth could that help?

That'll become clear later, when we finally uncover what Egan thinks "education" actually is, and see what job he wants us to give schools. For now, take it as a tantalizing hint… or, y'know, just ignore it.

Elementary literature & language

What was literature before it was literature? Before people invented writing, they had rich oral traditions: they told simple stories, recited poems, and shared proverbs. Egan suggests that these bits of oral tradition should form the backbone of the elementary literature curriculum.

Q: What sorts of stories?

As many as we can, and from as many diverse cultures as possible! Folktales are wonderful, as are myths. Think the Aboriginal story of "The Rainbow Serpent", episodes from the Sumerian "Epic of Gilgamesh", the Egyptian story of Osiris & Isis, the Greek story of Orpheus & Eurydice, the Chinese Legend of the White Snake, the Japanese Tale of Amaterasu and Susanoo, the Ashanti tales of Anansi, the Aztec myth of Quetzalcoatl, the English legend of King Arthur, the Maori myth of Maui and the Sun, the Roman story of Romulus and Remus, selections from the Indian Mahabharata, the Anglo-Saxon epic of Beowulf, the Inca legend of the Sun and Moon, the Iroquois Myth of the Flying Head (a real thing! look it up!), and the Ojibwe story of Turtle Island.

Q: That was a lot of examples. Are you going to keep giving so many? I've got a [*mumble mumble mumble*] to get to.

Sorry about that. Sometimes, though, I feel that a limitation of reading Educated Mind is that, in trying to keep his book to a manageable size, Egan skimped on examples in some places that it matters. It's easy to read his occasional example and assume he intends that it hold some central place in the curriculum — when all he wants to do is display how rich and diverse the curriculum could be. (Also: good God, I didn't even include an example from Norse mythology!) So from now on, just assume that every category could be filled with oodles of examples.

Q: What sorts of poems?

Lots of poems, first of all. We shouldn't steer toward "fancy" poems — rather, we should find poems that appeal to kids immediately — think Shel Silverstein, Mother Goose, Dr. Seuss, Jack Prelutsky, Edward Lear, or Ogden Nash… that sort of thing. In a biting essay, Egan suggests these poets like these appeal to kids precisely because they leverage kids' cognitive strengths: "we should find, and encourage saying and singing and shouting aloud verse with strong narrative forms, thumping rhymes and rhythms, the most vivid images, fun with metaphors, and a rollicking story."

Q: Why proverbs?

Proverbs stick in your mind almost effortlessly. ("All's fair in love and war!" "When in Rome, do as the Romans do!" "You can't judge a book by its cover!") They're also useful; they capture general truths. Kids can apply them to all sorts of situations, but also discuss them — to what extent are they wise or foolish? (I remember my surprise when I realized that they couldn't all be true — because you can't follow "look before you leap" and "he who hesitates is lost" at the same time! I'm embarrassed to say that I think I only realized this when I was in college.)

Elementary science

What was science before it was science? Egan suggests: being immersed in the natural world. We might, he writes, encourage elementary students to "adopt" some feature of the natural world — a patch of grass, a cat, a branch, a stream — and simply observe it at length. To do this, we can use the cognitive strength of reverie.

Q: Oh, do you mean like kids sometimes do in science class nowadays — describe a thing to a partner, make notes, draw it, and label its parts?

No, the exact opposite! That's all about squeezing the experience into words and forms that we understand. What we want "is less an attempt to know about nature as to know it in some participatory way, to know it as something we are an intimate part of, not set off from".

Q: That sounds a little... "woo" to me.

It did to me, too... until I remembered my childhood climbing tree. I didn't much like to go outside as a child, but I had this one tree that I'd climb up and read for hours and hours. If I close my eyes I can bring to mind the precise texture of its bark, the roughness of its broken-off branches, the coolness of its leaves, the always-surprising solidness of its trunk... I'm bigger now, but I think if I were back in my parent's yard, I could still navigate its limbs with my eyes closed. I have, at this point in my life, read a fair number of books about trees, but I'd be surprised if all of them together more than equaled the amount I learned from that tree — *my* tree.

Elementary math

What was math before it was math? Egan suggests: counting and logic. We might, then, use rhythms, metaphors, stories, and jokes to help kids become fond of these.

Q: Counting is pretty... basic. Could it really be improved?

Beware of "the curse of knowledge": Steven Pinker's phrase for forgetting that something was once difficult! Egan suggests we should spend time helping kids count wonderfully. We can start early with counting rhymes. ("One, two, buckle my shoe! Three, four, out the door! Five, six...") But we can also help kids use their fingers as metaphors. There are some pretty cool ways of using your hands as an abacus — and did you know that you can count up to 1,023 using just your fingers on both hands, and a knowledge of binary?

Q: Logic — I'm intrigued! Aristotelian, or Boolean?

Neither, for the time being — Piaget was presumably onto something when he found that young children couldn't reason abstractly, but he was looking at logic in a vacuum. When we put logic into the context of stories, we find that kids can deal with logic just fine. There's an entire worldwide network of educators, in fact, called Philosophy for Children, who have written whole books about how to do this, and Egan loves it all. Sometimes they read stories and ask simple questions: "What is friendship?" or "What does it mean to be brave?" They also pose ethical questions: "Is it ever right to spill a secret?" And they pose paradoxes: "Can you step in the same river twice?"

Q: You mentioned "jokes" a moment ago. Care to elaborate?

Egan thinks that, to help kids get good at math, you should tell kids jokes.

Q: That's... new.

I think so, too — but he backs it up pretty well. To be funny, jokes (or at least most kid jokes) rely on a leap in logic:

> Why can't you trust an atom?
> *They make up everything.*
>
> Knock-knock.
> *Who's there?*
> Boo.
> *Boo-hoo?*
> Don't cry, it's just a joke!

To understand the joke, kids have to follow the logic — spotting patterns, making connections, and tracking what their audience expects a word to mean. That's a lot of cognitive lifting. And Egan goes further, suggesting that we grit our teeth and create methods to help kids invent their own jokes, no matter how horrible they'll be at first. (The things we do for learning…)

Q: Wait wait wait! What about addition facts, and multiplication tables, and fractions?

Egan emphasizes that his methods are designed to be add-ons to the standard math curriculum. In general, he's a don't-blow-up-the-system sort of guy, and if something seems especially weird, you should probably assume it's an add-on to the regular curriculum rather than a replacement, even if I forget to say so.

Elementary arts

What was art before it was art? Egan suggests we pop our heads into Paleolithic caves for our inspiration. Whatever the specific meaning of all those charcoal elk and aurochs and mammoths (communication with the spirit world? art for art's sake? a way to impress babes?), Egan thinks it obvious that they were also an attempt to capture an intense experience that would be difficult to express in words alone. What did it feel like to be near an aurochs, or a saber-toothed tiger?

"The arts help us," Egan writes, "to hear and see afresh, to force our perceptions and sensations to experience again the immediacy and vividness of the world".

If we follow this, then, we don't want to help kids build "art skills" so they can draw like an adult — rather, we want to help them amass a repository of diverse aesthetic feelings that they'll want to express. We should provide them with a riot of experiences.

Q: That couldn't be more opaque. Examples, please!

Egan writes that we should have children learn to whistle, sing, and click their tongue; we should help them emulate the ways a skunk or a hawk or a stick bug might move through a space. We should expose them to scores of different temperatures and materials. In music, we should help them love Beethoven, yes, but also the Beatles; Tchaikovsky, yes, but also Tuvan throat singers, and also John Cage, whale song, and bird song.

Q: That's a lot of experiences, but what would they be doing?

An interesting aspect of Egan's view of education is that he doesn't seem to think we should push kids right to the "doing" phase. He wants to help kids cultivate an affective relationship with the world.

In any case, he writes that as students get more experienced, we should prompt them to move from merely enjoying these experiences to trying to systematically shape similar experiences. And drawing, painting, and playing music could easily be folded into other parts of the curriculum.

Elementary social studies

What was social studies before it was social studies? *Well.*

Remember how, just a moment ago, I wrote that you could assume that you should probably assume that Kieran isn't in favor of junking the curriculum as it currently stands? He suggests we very carefully pick up the elementary social studies curriculum, place it into a trash can, and set the whole mess on fire. He isn't worried about much of importance being lost. (Remember that the "expanding horizons" model is, to him, the original sin of 20th century educational reform, and he repeatedly quotes student surveys showing that "social studies" regularly wins the title of "most boring subject".)

In its place, he suggests we put history — which, he hints, we should think of as the centerpiece of the elementary curriculum.

So the real question is what was history before it was history? His answer, surprisingly, is myth.

Q: Egan wants us to teach myths as if they were history?

Not at all. What he suggests, though, is that we look at how myths operate as narratives — so we can design an intellectually vivid history curriculum. And myths really are special: each is built on at least one binary (like weak vs. strong, or lies vs. truth, or so on), and uses that to tell the story of the big picture of the world. They're so powerful that people can understand it, remember it, and love it — even if that thing never happened.

We should take that power, Egan says, and apply it to things that really did happen.

Q: So what history does he think kids should learn in elementary school?

The great struggles of humanity from across the whole. Flippin'. World.

We're still talking about young children, so these should be done as simple stories. The goal isn't to make them history PhD's, so we needn't even try to put them in any sort of order. Egan suggests that, in first grade, we pick a single binary like "freedom against oppression" and tell kids a welter of stories, again from as many cultures as possible, and as many times in history as possible.

Q: Can you give examples?

Oh, all right — in first grade we can tell kids the stories of the war of the Greek city-states against the Persian empire, and the slave uprising of Spartacus against the Romans. We can tell them about the plight of Jews in medieval Europe, and of the unsuccessful Sepoy Rebellion in India against the British. We can tell the stories of the American, French, and Haitian Revolutions, and about the Chinese Taiping Rebellion against the Qing Dynasty. We can tell them the story of the escaped slave Harriet Tubman returning to the South to rescue her kinsmen, the story of six-year-old Ruby Bridges facing threats to integrate her elementary school, and the story of how the Mau-Mau uprising led to modern-day Kenya. We can tell the stories of Mexican-American union organizer Cesar Chavez and of Malala Yousafzai surviving an assassination attempt to advocate for female literacy. The world does not lack for stories of oppression and liberation that can capture the attention of a six-year-old.

Q: That's... huh. What stories might they hear in second and third grade?

Egan gives examples, but I won't list them here. He suggests we use a similar approach for each, except that we swap out the binary each year. He thinks "the struggle for security against danger" would work well for year two, and "the struggle for knowledge against ignorance" would work well for year three. (That year could have a lot of overlap with the science curriculum.)

Q: Anything else, for history?

Yes — they should get a sense of Big History. They should get some simple stories about the ice age, the Cenozoic, the age of dinosaurs, the Paleozoic, the origins of our solar system, and the Big Bang. (Because if the ancient Norse can tell their story of the beginning of the universe, by gum, we can tell ours, too.)

To sum up

Egan argues that the problem of early schooling is that it's trivial — and it's trivial because the dominant theories of educational psychology see children as lesser versions of adults. What else would we teach them, except dumbed-down versions of what adults learn? But children have certain cognitive strengths that schools aren't making systematic use of. If we rebuild elementary schools on those strengths, we could turn schooling upside down. We could stop seeing the curriculum as a bag of information to impart, and start seeing it as a set of great stories to tell — and invite kids into. Kids could experience (both intellectually and emotionally) the great struggles of humanity and see that they can join in them. Students could experience the story of education as the beginning of a very real adventure.

Egan's elementary school: some skeptical questions

Q: I'm not sure I'm understanding what you mean by "mental images". Care to explain?

It's an interesting fact of human cognition that just a few words can whip up a complex mental experience. Egan doesn't just mean what we might call "visual imagery" — the ability to hold, say, the image of a bespectacled, spat-wearing duck in your mind without seeing a photograph. He's also including what psychologists call auditory imagery, olfactory imagery, gustatory imagery, and tactile imagery.

Q: How could all of that be helpful in schools?

Humanity has a built-in VR system, and we're not using it! Egan invites us to pretend we're teaching a class about the humble earthworm. We might list off facts — "earthworms are so many centimeters long, move through soil by means of their something-or-other muscles…" but he suggests we can evoke images, say, "of what it would be like to slither and push through the soil, hesitantly exploring in one direction then another, looking for easier passages, contracting and expanding our sequence of muscles segment by segment, and sensing moisture, scents, grubs, or whatever". Those facts are now felt by the student; the knowledge has become part of them. And just a few words can spark a complex mental experience, one going beyond literal images to include imagined sounds, smells, tastes, and more. These experiences can feel real and stick with us. (That these mental images are so easy to evoke, and so meaningfully felt, feels something like the proverbial hundred dollar bill on the ground.)

Q: How could metaphors be helpful?

It really is interesting that so much of the "constructivist" turn in psychology — that is, the notion that children don't absorb knowledge, but construct it — has continued to focus on logics-mathematical reasoning, when there's been mounting evidence for decades that metaphors are more central. It's not just that we use metaphors to better understand things we already know, we also use them to grasp new knowledge. What's more, psychologists have devised tests to measure the skill at metaphor-making, and have given them to people of different ages. What they found was that eleven-year-olds make more metaphors (and higher quality metaphors) than do undergraduates — and that four-year-olds have both groups beat. Again, hundred dollar bills on the sidewalk.

Q: Your talk of "binaries" has me worried — binaries like good/evil and male/female are the source of so many of our most pernicious stereotypes! Isn't the purpose of education to get us *beyond* stuff like this?

Yes, it is! Education is supposed to complicate our understanding — but that means we've gotta start somewhere, and binaries provide us a natural starting place.

As an uncontroversial example, think about temperature. We all begin as babies by perceiving two temperatures — hot and cold. Later, we add on intermediate categories — warm and cool. (Note that the human body is the assumed mid-point to temperature. Binaries often work like this; "big" and "small" mean "bigger or smaller than me", "nasty" and "kind" mean "nastier or kinder than I am, except when my brother is really asking for it", and so on.)

A good story (and an Egan-inspired elementary curriculum is, in a sense, nothing but good stories) will go further, and transform the binary. *Toy Story* is grounded in the binary of abandonment/belonging: at the beginning, the toy cowboy Woody belongs to his owner, and has his affection. Then a rival comes who threatens his belonging. In trying to get back to belonging, Woody is entirely lost — and to save the day, he has to

come to a deeper understanding of what belonging means.

Now, all lessons can't be Pixar movies. But the good stories (especially in literature and history) will challenge and subvert the binaries they begin with.

Q: I see the pattern of Egan drawing from "as many cultures as possible". Why so many? Is this a political correctness thing?

If it helps to think of it as such, then, sure! I don't think Egan would have had a problem with that. But his ultimate reason for including so much diversity goes deeper. For Egan, including such world-wide diversity isn't optional, and the answer to why is bound up in his definition of education. (Keep reading.) His answer also insists that we, whenever possible, also include stories from the Bible and Homeric epics (the Iliad and Odyssey).

Q: Mmm, stories from the Bible aren't going to fly in my local school!

So be it! Egan doesn't spend much time obsessing over the practicalities of...

His interest is in describing what an ideal education might look like, if it were possible. Every lesson, every classroom, and every school is necessarily a compromise.

Q: You make a big deal of poems. But isn't poetry dead?

An interesting contrast can be made to classical education, which also has kids read a lot of poems — they see knowing great poems as one of the marks of an educated person; again, for an academicist, it's the information that transforms. Egan begs to disagree. Poems are important because they're a wonderful way to train their cognitive strengths, like rhythm (poems are language fueling by thumping). We want to help kids learn to use this tool better, and a great way to do that is to help them recite poems that they've learned by heart.

Q: "Learn by heart" — is that code for "memorize"?!

It is! Egan is actually quite big on memorization — he points out that all the knowledge in the world can do nothing for a person once they've forgotten it. He didn't, however, appreciate the academicist focus on memorizing without understanding (or at least enjoyment).

Q: I'm still worried about the science curriculum, as you're describing it. Can you allay my fears?

Honestly, while I feel there's something profoundly right to how Egan is describing early experiences of nature, I feel the same way. Note that there's more science coming in the social studies curriculum. But if that's still not enough, one could bring down aspects of the middle school science stage.

Q: Anything else that Egan suggests we do in elementary school literature and language?

He suggests that we help kids learn a second language! This is so obviously true (why do American schools typically wait until kids lose the ability to naturally absorb languages to start teaching languages?) he doesn't belabor it, though.

Q: You had mentioned that Egan's vision seems more internal-focused. Should we be worried about that?

While I strongly suspect that his curriculum would make kids more creative in any way you'd like to measure it, Egan wasn't particularly interested in "creativity" — he was more about helping kids find the world interesting.

I get the sense that he thinks kids will do things with minimal prompting once they're loaded up with complex internal experiences.

Q: I think I'm beginning to understand Egan — is he basically saying "make learning fun"?

"Fun", applied to education, is a dangerous word. Egan worries about the dangers of an emotionally unserious curriculum producing emotionally stunted adults. That doesn't mean we need to tell students only "serious" stories — only that we treat the world honestly. "Disney-esque sentimentality is the exact emotional equivalent to intellectual contempt".

Q: But aren't some of these stories too dark for children who have themselves experienced oppression and disaster?

Egan argues that these stories may be especially helpful to them — they can help them understand their struggles better, and give voice to them.

Q: At the very start of this, you promised us "rationality"... but I'm not seeing rationality here! All this talk of "adventure" almost seems to go the opposite direction. What gives?

Wait for it. But for a hint right now — Egan is fond of citing his fellow educational theorist Jerome Bruner, who claimed "any subject can be taught effectively in some intellectually honest form to any child at any stage of development". Bruner was criticized for that; his critics charged that he was ignoring learning differences and socio-economic realities. Egan thinks he was profoundly right.

Part 3: A new kind of middle school

What's the matter with middle school?

What was middle school like for you?

In math, I recall a jumble of barely-related topics. In literature, I remember reading great literature — Frankenstein, Romeo and Juliet — only in their dumbed-down summary formats. In social studies, I remember teachers proclaiming on the first day of class that unlike all of our previous history classes, this class wouldn't be about names and dates... and then going on to memorize names and dates. And in science, I remember being forced to dissect a frog only to discover that frogs are — you guessed it — made of slimy frog parts.

Your mileage may vary, but for a lot of us, middle school feels like getting booted out of the (in retrospect) Eden of elementary school, and like marking time before the serious studying of high school. It feels meaningless. In my favorite of his books, Egan calls so much middle school curricula "human deserts", noting "we have created a system in which the importance of human emotions for meaning seems barely noticed".

Why so meaningless?

If our dominant approaches to educational psychology fundamentally misinterpret younger children, Egan suggests, they basically throw up their hands when faced with pre-teens and teenagers. Mainstream schools begin to introduce vocational training to help lighten the load, and Maria Montessori famously suggests that adolescents should be sent to go run a farm. Egan is sympathetic to those responses, but points out that they don't do much to lighten the load that the academic curriculum often becomes at this age.

This feeling of meaninglessness, he argues, is utterly tragic — it comes just when a hunger for meaning blossoms in adolescents! We can see that hunger for meaning in their lives outside the classroom, where their interests ramp up into veritable obsessions.

What are adolescents obsessed with?

What might we see, if we become Jane Goodalls of early adolescence?

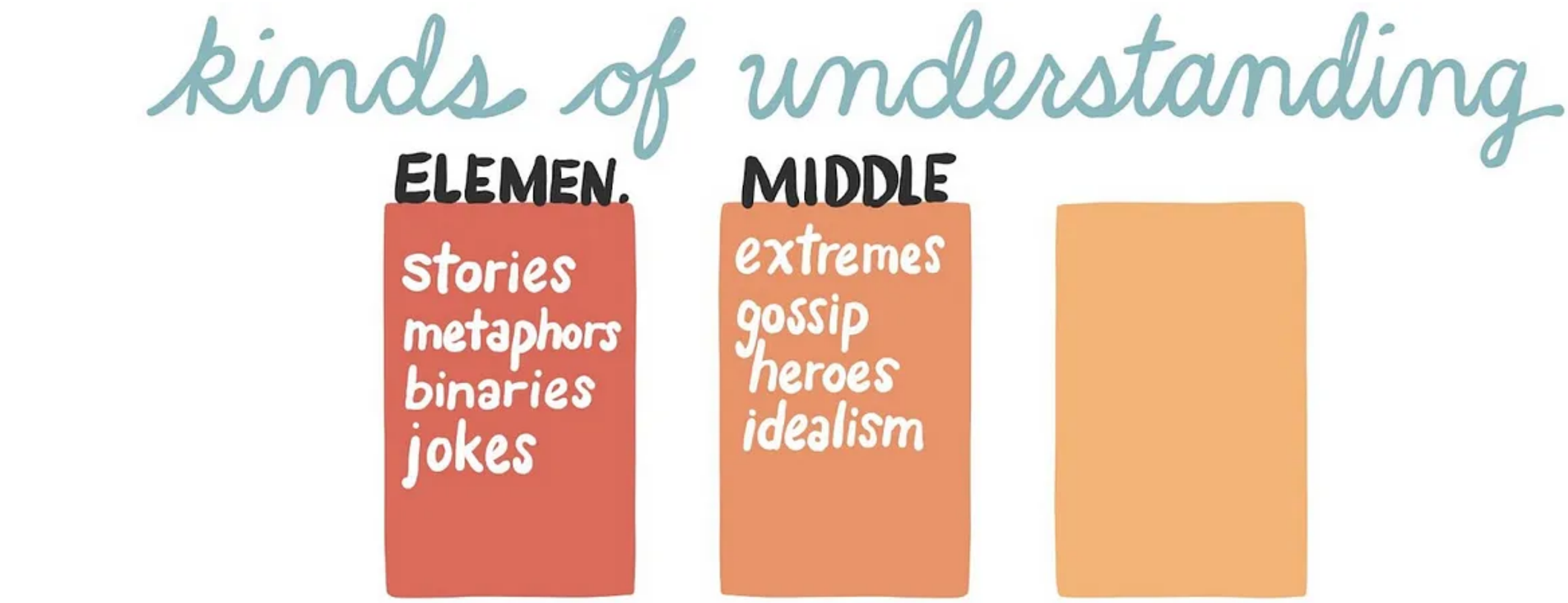
First, teens are obsessed with ***gossip***. The motivations of others — why did he do that? and what was he THINKING? — are hypothesized and talked to death.

Second, that they're pulled toward ***idealism***. Many feel a dissatisfaction with the world as it is, and feel a romantic urge to make it a better place. They're often lured into simplistic beliefs that promise to help them do that.

Third, they love ***extremes***: they want to find limits, and test them. Obviously, this can show up as risky behavior, but we can also see it in their love for the bizarre — note adolescents' fascination in things like aliens, cryptids, and ghosts. (Egan loves pointing out that *The Guinness Book of World Records* is a perennial bestseller among kids at this age. How else would they find out who had the world's longest fingernails?)

Fourth, they gravitate toward ***heroes*** — people who push the edges of those limits. By celebrating heroes, they can vicariously share in their transcendence. Look for the posts hanging up in a teenager's bedroom to guess what boundaries they feel most hemmed in by: athletes push against physical limits; a death metal guitarist might push against authority and conventional morality. An activist or entrepreneur might push against our dulled morality or our sense of what's possible.

Finally, we might spot teens taking up ***hobbies*** and making ***collections***. Hobbies can be a way to identify yourself as part of a group against the rest of the world ("I'm the sort of person who goes bird-watching!"), and collections can be a way to climb the status ladder inside the community. Egan points out that a collection can also be a way to feel like you have control over what you're discovering is a very big and complex world of detailed information ("I've spotted every one of the fifty most common birds of Texas — even the black-capped vireo!")



Egan's insight is that these obsessions give teenagers a sense of meaning, and that we can use them as tools to make middle schools that overflow with meaning.

From meaningless to meaning-soaked

Again, Egan sketches out a new kind of curriculum subject-by-subject. Before, his trick was to ask where the subject first evolved out of; now, it's to ask who first discovered or created the specific content we're teaching.

"All knowledge", he writes, "is human knowledge. Everything we know is knowable through the lives of its inventors, discoverers, or users, and we can have access to that knowledge through the hopes, fears, or intentions that drove them".

Middle school math

Who first discovered the concepts students learn in math? The answer, of course, is a wide diversity of curious men and women living across the world over the last few thousand years. Egan says: bring those people into how we teach math.

If we used gossip and heroes to help students find it meaningful, what kind of math would result? When we teach the Pythagorean theorem, we should give a sense of who Pythagoras was — a cult-founder who worshiped numbers to find God, whose followers (according to a piece of ancient gossip) murdered one of their members who discovered irrational numbers!

Q: Well, sure, that works for Pythagoras, but he's a known nut job; surely most math doesn't come from such interesting roots?

When we teach the Cartesian coordinate system, students should meet Rene Descartes, the Calvinist French polymath who saw the possibility that math could decipher the world, if only we could unite algebra and geometry… and invented the xy-plane to do exactly that. When we teach scientific notation, we should call our students' attention to the importance of the number zero, and tell them the story of the Pope who tried to introduce Arabic numerals to Christian Europe and may have been assassinated because of it. When we teach algebra, we should ask students why "algebra" is Arabic for "the fixing of bones", and tell the story of what Muhammad ibn Musa al-Khwarizmi was up to.

We could do this all day. Literally everything students learn in school was first invented or discovered by some interesting person who was struggling to accomplish something hard. To learn is to connect with those people, whether we know it or not. Egan says: help kids know it. Math has been dehumanized: re-humanize it.

Q: So the math curriculum needs to become a history of math curriculum, and math teachers need to become history teachers?

No, the content needn't change. But with surprisingly little work, we can bring in the gossipy stories of heroes, and their obsessions can spread to students.

Middle school science

Who first discovered the things students learn about in science?

If you're thinking "scientists", you're only partially right. Most of the big-picture ideas that we now think of as "science" were discovered before the word "scientist" was invented, or the discipline was professionalized. Frequently, they were hatched by true amateurs, working in their free time, hungry to unlock the secrets of nature. We can use gossip and heroes to spread their obsessions to students just as we taught math, but Egan points out two twists.

The first is that the content itself can take on heroic qualities: everything is impressive, when you look at it in a certain light. In an interview, Egan once said:

"My book is an attempt to show that, indeed, everything in the world is wonderful, but that schools are designed almost to disguise this slightly shameful fact. We represent the world to children as mostly known and rather dull. The opposite is the case: we are surrounded by mystery, and what we know is fascinating".

What would even the most boring subjects look like, if we emphasized their heroic qualities? Well:

What's a tooth? Bone, wrapped in rock, surrounding tiny cells that your body feeds with blood.

What's a bar of chocolate? A crystal of jellyfish-shaped fat molecules stacked together; when you put it in your mouth you shake them apart into a writhing confusion.

What's the air around you? The bottom of a 10-mile-deep ocean; when you put your tongue over a soda straw and your Pepsi stops leaking out, it's not because a "vacuum" is "sucking" it up, but because that ocean is squeezing it into your face.

Again, we could do this all day! And in middle school science, we can. Everything in the world is wonderful; we can help students see this again and again.

The second twist is that science is a subject rich in extremes. Here Egan introduces a concept that we'll see crop up again: "15-minute segments". To help us fit as much wonder as possible into a school day, he suggests we supplement the usual school subjects with a few quick lessons. To infuse science with extremes, he suggests we add on three: "human & natural records", "extremes of animals & plants", and "cosmology".

Middle school history

Who first made the things students learn about in history? Why, the historical characters themselves! Since we've given kids a grounding in history in elementary school, now we can build on that, going through many of the same events as before, but in more depth, and more vividly.

We'll leverage the interest with other people's inner lives to tell stories focusing on the perspectives of the people who made history — zooming in, when possible, on scandalous details. We'll leverage the tool of idealism to choose historical characters who chafed against their surroundings, and understand what they were trying to accomplish. What was their vision of the world? What did they hope for, and what did they fear?

Q: Isn't the "great man" approach to history out of fashion?

Egan's approach doesn't say that "great men" made history — it's just leveraging gossip to help kids see history as something meaningful that can expand their own possibilities. "Early adolescence is commonly a time of intense and vivid emotional life, and also a time of deepest boredom and depression… [We] can give shape to the intermediate curriculum and offer the students a world that is rich, complex, varied, and as intense and vivid as their own emotional lives".

We also should add on another "15-minute segment" just to pump in as many biographies as possible, and from people who don't always fit into the normal history curriculum. Call it "Brief Lives", and throw in anyone who's struggled to push some limit — Mary Wollstonecraft, Jesse Owen, Dietrich Bonhoeffer, one of the students' great-aunts, whoever.

As students get older, this can transition to "People and Their Ideas". Here, we'd focus less on the details of the person's life, and use it as a backdrop to showing how meaningful some of history's most important ideas could be. Think Aristotle and syllogisms, Edward Said and orientalism, Confucius and propriety, Cornel West and race, Buddha on the four noble truths, Muhammad and the five pillars, Karl Marx and communism, Adam Smith and the invisible hand, Thomas Hobbes and the state of nature, John Locke and natural rights, Jeremy Bentham and utilitarianism, Thomas Aquinas on the sacraments, Martin Luther on faith, Voltaire on the freedom of speech… you get the idea.

Q: Can you really get a profound understanding of utilitarianism in 15 minutes?

Yes! The point of this segment isn't to develop a systematic understanding of any one idea, it's to introduce students to the exciting possibilities of human thought. (As a bonus, this might make them less likely to fall for the first ideology that they encounter later in life.)

Diversity is important for this — as it is with culture. Throughout this, we should also be trying to expose students to as much cultural diversity as possible, because in high school, we'll be trying to make sense of our society, and it's impossible to do that unless we have something to compare it against.

Middle school literature & language

You might think that this subject would be easy — that middle school literature is already filled with "strong and clear narratives", that it deals with "transcendent human qualities such as courage, love, and persistence", that it focuses on "extremes of human experience", that it examines "something strange and exotic".

You'd be right! Egan's pretty happy with a bog-standard middle school literature curriculum, done well. In this part of the book, his spends most of his limited space suggesting three rather odd activities which could also be useful — especially for increasing students' awareness of language, so they can use it better.

The first is etymology — not, however, memorizing lists of roots, but in being told the entertaining backstories of specific words. Take the word "berserk", for example — we now use it to mean something relatively mild ("if my mom catches me coming home late, she'll go berserk"), but it comes from an old Norse word meaning "a raging warrior of superhuman strength". And that's because *ber* meant "bear" and *serk* meant "shirt": soldiers of the bear cult would don the skin of a bear to, in their minds, transform into one — howling, foaming at the mouth, and gnawing the rims of their shields.

(Most adults walk through life with little understanding that the words falling out of their mouths are entities, with their own back-stories. Communication is, at the very least, more *interesting* when we become aware of this.)

The second is to add on another language to learn — not, this time, to become fluent in it, but just to become aware of how very different human languages can be. (For native English speakers, Sanskrit might work well, or Cantonese, or perhaps even ancient Egyptian. Again, the point isn't for this language to be useful — it's to explore diversity.)

The final one is to study humor — not just jokes anymore, but comedy at its finest. Egan cites (at length!) Monty Python as a group of people who were particularly brilliant in their use of the English language. Examining their skits can lead us into not just an appreciation of semantics (the study of how meaning is made from smaller pieces, like etymology) but also pragmatics (the study of how meaning is made in social situations).

Pretty heady stuff, for a conversation about a dead parrot.

Part 4: A new kind of high school

I'll confess — I loved parts of high school... and among nerdy folks, I suspect I'm not alone. For some of us, this was a golden time. Even at my local public high school, I had access to academically thrilling classes — especially, in my last two years, advanced literature and history. I felt like I was finally understanding the ideas that mattered.

In any case, Egan is quick to acknowledge that, at this level, the sort of education he advocates really is being practiced in some places. What he can add is an understanding of what makes it wonderful, how to make it even more wonderful, and how to make it wonderful for many, many more people.

What's the matter with high school?

Far too often, even when high school classes are intellectual, they're dry. For the majority of students, all this academic stuff is experienced as utterly lifeless, a mass of dead information to be squeezed inside one's head for a test and then left to evaporate. Egan mocks the curriculum wars that seem to be a permanent feature of the teaching life; quoting the sociologist Pierre Bourdieu, he says "while the academic left and right bicker over whether the curriculum is too traditional or too radical, they fail to recognize that most students absorb so little of academic culture that the bickering is largely irrelevant".

Why so dry?

Egan suggests three reasons to explain this.

First, because high school academic classes are too often masses of small details with no sign of the big picture. Second, because they're typically slavishly disciplinary, and aren't able to address the questions that span the disciplines. Third, because they're often designed to bring students through what everyone is sure of, and hide away any controversies. In all of these, Egan suggests that what's called "academics" in high school is too often a dim imitation of what real academics are actually practicing.

There's a fourth reason, though, and it's probably the biggest of all — by the time they get to high school, most students haven't actually learned that much! An academic approach is designed to connect small details into the big picture; for people who arrive in high school (and college) classes without having already collected much in their heads, academics are going to taste dry.

(An implication of this for anyone trying to improve schools is that we might not want to start with high schools. If your goal is to create a new kind of academic learning, first start at elementary school — or barring

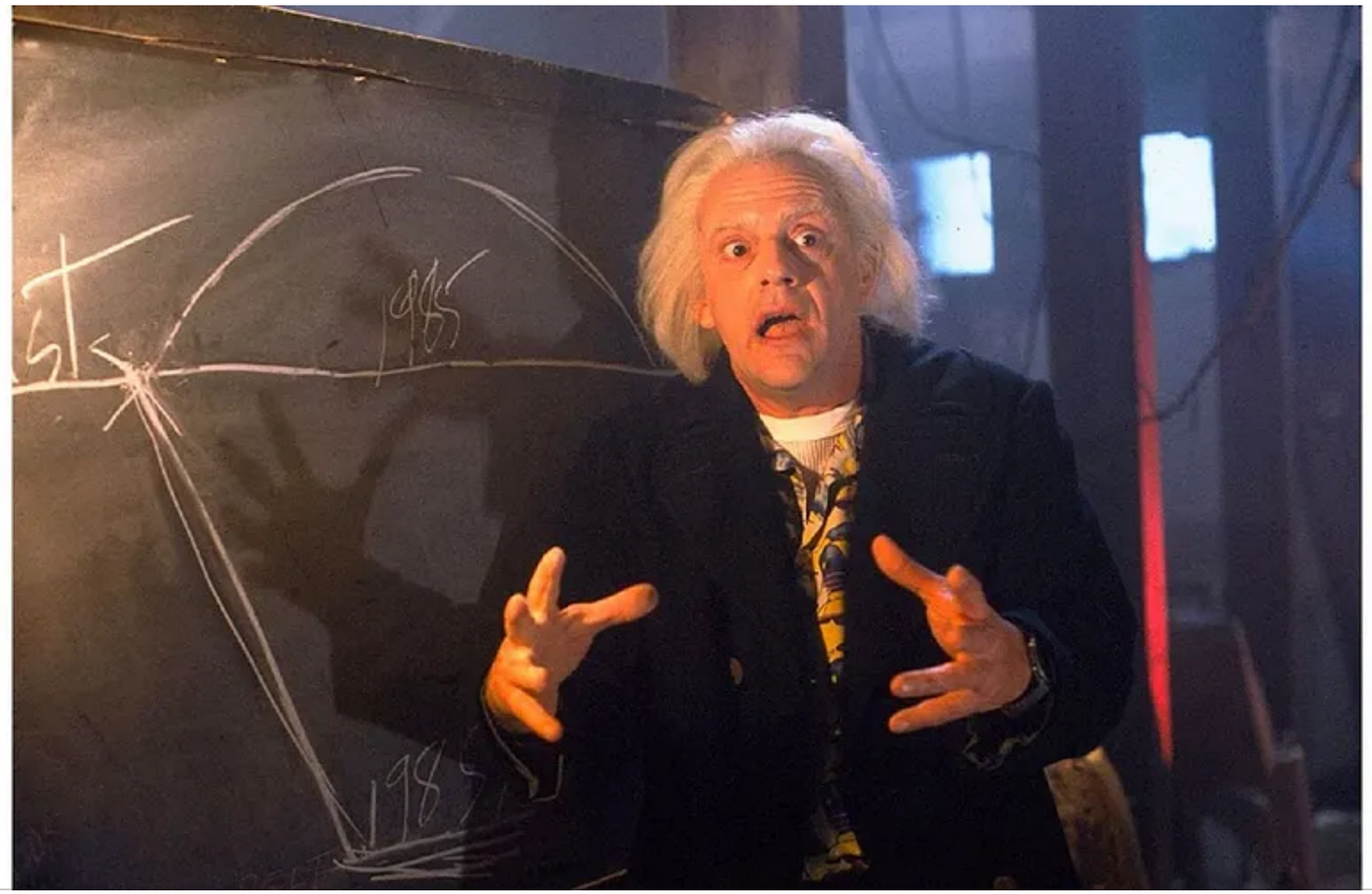
that, middle school.)

What motivates mad scientists?

When we wanted to re-conceive the elementary and middle school curriculums, we looked at what students were already good at — kids' cognitive strengths and adolescents' obsessions. For this level it might be easier to look — for reasons that will become clear when we finally unveil Egan's crazy-sounding definition of education — at the sorts of things that bring intellectuals joy.

Q: Which intellectuals?

Take your pick. Galileo, Einstein, Smith, Marx, Goodall, Chomsky, Curie… all the people who took to the life of the mind like fish to water. But that's a lot to hold in my mind at once, so I'm just going to think about Doc Brown from *Back to the Future:*

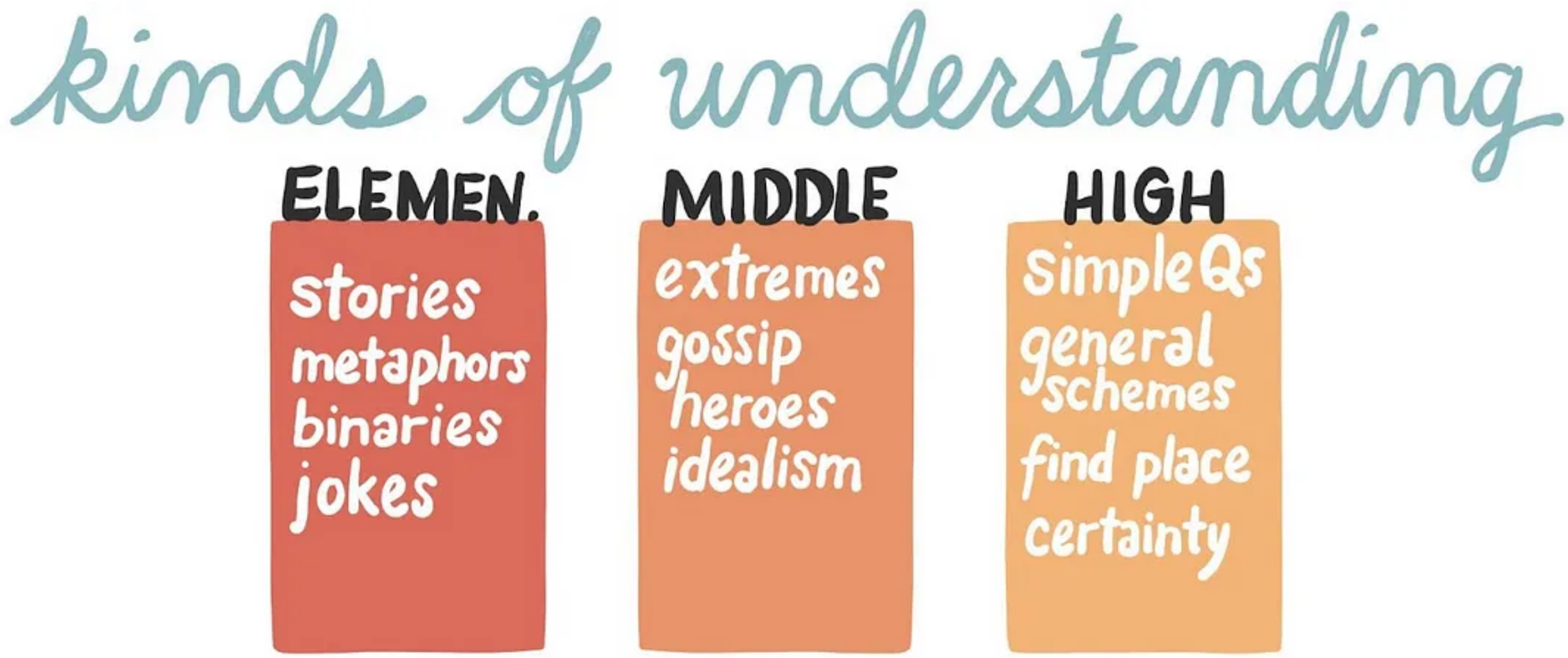


He was high on intellectualism
I've never been there, but the brochure looks nice

Let's call these people "mad scientists". And let's pretend we once again took up our job of being primatologists, and snooped on these folks "in the wild" ("in the lab"? this is beginning to get recursive…)… what would we find motivating them?

Asking simple questions, for one. (What is space? What is society? What is a human? What is language?) Building general schemes (big theories) that hold lots of evidence together. Finding their place in the cosmos. And (perhaps above all) seeking certainty.

Once again, Egan suggests we use these as tools to remake the curriculum.



From dry to daring

What could a high school curriculum look like, if it were rebuilt on these tools? Once again, Egan has a trick. This time, it's to ask what fights have driven the development of each of these fields forward — and how we can help students enter them.

First, a mini-segment!

Intellectuals invented the academic disciplines to better pursue the life of the mind, but the disciplines can get in the way. Some of the most important intellectual discoveries that could help students are too big to fit into any of the disciplines. We need a place to introduce them plainly. Egan proposes another mini-segment — again, just 15 minutes a day, a few times a week — called "Metaknowledge".

Q: Isn't that already in the International Baccalaureate program?

Yes, he acknowledges that he's borrowing from that! This segment would introduce ideas that would enrich student thinking across the disciplines: game theory, cognitive biases, systems thinking, Bayesian reasoning,

epistemology, ethics, logic, cultural evolution, and so on.

High school literature

How can we help students enter the big fights of literature? Intellectuals of a literary bent — professors, critics, poets, novelists — delight in arguing over literature like rabbis arguing over the Talmud. Take, just for one example, the debates over Shakespeare's character of Ophelia. Does she love Hamlet, or is she a victim of his emotional abuse? Is she truly insane, or is she acting? Is she passive, or is she pulling the strings? Oceans of ink have been spilled arguing over questions like these; our students can, perhaps, spill a few ounces more.

The usefulness of arguing literature, for Egan, isn't that it's oh-so important for educated adults to know a lot about Ophelia. (This, again, was where the academicists went wrong — in thinking that being educated was about getting the best knowledge in your head.) Rather, arguing over literature is a training arena for the all-important intellectual move of this kind of understanding: building general schemes out of evidence, and struggling with anomalies.

One person, for example, might hold that Ophelia is insane, and cite all sorts of obvious evidence — her father just was murdered by her lover, she rants nonsense while (bizarrely) handing out flowers to friends… But then he's challenged when he reads a scholar pointing out that, to people in Elizabethan England, types of flowers have symbolic meanings.

How does he deal with that? He could ignore it, claiming it an over-reading of Shakespeare. (Sometimes a flower is just a flower!) Or he could address it, complicating his own scheme.

This intellectual work is best done with other people, who are incentivized to challenge your understanding of something, and go back and forth, building competing models and calling attention to anomalies. This process — the "dialectic" — pops up again and again in the academic disciplines. It's the center of how understanding works, at this stage.

And the nice thing about practicing it on literature is that, more so than in history or science, the evidence is shared knowledge — it's right in front of everyone, written out.

But there are other ways literature class can be helpful to the general life of the mind.

Egan also suggests that we'll want to specially include literature that helps students understand complex ideas. Camus, Orwell, Borges, Calvino might be particularly helpful here… and I imagine that genres like science fiction and magical realism might be particularly useful, too. (Note, though, that once again none of this requires a radical remaking of the curriculum, or of the canon of texts that we traditionally assign to high schoolers.)

Q: Oh yes, the canon — what does Egan have to say about the canon wars?

When he wrote *Educated Mind* in the nineties, the long-brewing canon war was approaching its inevitable apocalyptic climax. On one side of this Plain of Megiddo were the pro-canon traditionalists, arguing that we should keep assigning the texts that had been argued over for centuries. Facing them were the anti-canon reformers, arguing the standard texts over-represented the perspective of dead white men.

Onto the middle of the plain rides Egan on a white horse, who bellows above the din: "I'VE GOT A BUSLOAD OF HIGH SCHOOLERS WHO WANTS TO JOIN IN, EVERYONE OKAY WITH THAT?"

To do so, he says, we need to give students the arguments from both sides. So, for example, bell hooks, Edward Said, and China Achebe should be on the syllabus, as should Allan Bloom, Mortimer Adler, and Diane Ravitch. And of course they should actually *read* the texts cherished by both sides, too, so they can argue better.

High school history

How could entering the big fights help us reinvent high school history?

First, we might look for dueling histories. It's time for students to get into historiography and understand that history isn't just what happened, it's something we make. We might help kids read chapters from Howard Zinn's socialist history of America alongside the corresponding chapters from Paul Johnson's conservative history of America.

How could big questions help? We want to help students see how various people have disagreed over some of the big questions of what human history is, at its most basic. We can have them compare Steven Pinker's theory of civilization's progress (*Better Angels of our Nature*) with Yuvah Noah Harari's theory of civilization's woes (*Sapiens*). We could have them compare so-and-so's account of human history as an ever-expanding unlatching of energy sources with Robert Wright's account of human history as unlatching more and more positive-sum games (*Nonzero*).

What role could the lure of certainty play?

To help them grow their skills at finding anomalies, we might help them work through pseudo-histories and conspiracy theories.

Q: Conspiracy theories! Oh, come now, you're playing with fire.

Well, the world is on fire. Our students will spend the rest of their lives encountering terrible-but-beguiling arguments about how the world works; if we don't prepare them for those, what have we been doing?

So we should introduce arguments that the Moon landing was a hoax, that the Illuminati founded America, that aliens built the pyramids, and so on. At no point can we demean students for falling for any of these theories — the job of a teacher at this stage, Egan writes, is to support students in their reasoning even when their beliefs are offensive and stupid, gradually offering anomalies. There's no way out of bad theories except through them.

By the time students graduate, we want them to have wrestled with terrible ideas and — for a while — lost. They need to experience what it's like to change their minds about something they felt strongly about. They need to viscerally realize, in Feynman's famous phrase, "The first principle is that you must not fool yourself and you are the easiest person to fool."

High school natural science

How could entering the big fights reinvent high school science?

At present, so much of the high school science curriculum — especially "honors" classes — is oriented toward helping amass details. (The same is true of 100-level university classes, which famously "survey" the field to prepare for more advanced studies. I always thought this was stupid — of the huge lecture hall of students in my Geology 100 class, how many went on to take even a second course?) The meaty debates that propel science forward are held back. Egan complains: "The more general and speculative theories in any discipline are treated like an unconventional and disreputable relation who, even though the children find her exciting and entertaining, must be kept hidden from view, her very existence denied as long as possible". This is a stupid approach — students with an adventurous bent are convinced that science isn't for them.

Egan proposes, simply, that we flip this, and organize high school science classes around the big debates. We shouldn't be ashamed at how, well, adolescent this might look: "the dramatic, speculative, and contentious theories will be up-front in the early years of the [high school] curriculum". What might those be? Egan doesn't give a list, but we can spitball some:

instead of explaining what "matter" is from the top down, a physics class could problematize "matter" by following the debates over the nature of dark matter and dark energy, and by becoming familiarized with the various interpretations of quantum mechanics

instead of holding back the origin of life, a chemistry class could treat it as a central debate, and investigate molecules and cellular processes to follow the scholarly conversation

instead of giving the usual short definition of natural selection, a biology class could dip into the recent professional debates that have motivated specialists — things like selfish gene theory, multi-level section, punctuated equilibrium vs. gradualism

If these are too high-level, teachers could dip into the historical debates that resulted in our now-dominant theories — showing, for example, the evidence that led to our understanding of the atom, and how people like J. J. Thompson, Ernest Rutherford, and Niels Bohr argued over it.

High school social science

But wait, there's more! If, in elementary and middle school, history is the most important subject in Egan's paradigm, then in high school, science takes that role. Science is so important that we should double it, and make social science (especially psychology and sociology) part of the core curriculum.

How should we teach it? He suggests that the tools of "simple questions" and "finding one's place in the cosmos" can play a big role.

At present, Egan writes, it's common for an instructor's perspective to focus the curriculum in ways that aren't ideal for cultivating students' understanding. Say two people run Psychology 101 courses — a cognitivist and a behaviorist. How might their curriculums differ? The cognitivist might focus on helping students understand memory and attention, investigating optical illusions and goal-setting; the behaviorist might emphasize the differences between classical conditioning and operant conditioning. Egan argues that something important is being lost in both classes — students aren't being invited into the fight that the instructors might have with each other.

Q: How might that look?

A high school social science course can lean into these disagreements by asking simple questions. For psychology, Egan suggests, one of these might be "what is the mind?" The course might begin by introducing a handful of scholarly perspectives — a cognitivist might respond "a computer", a biopsychologist might say "a car engine", a Freudian might say "an iceberg", and a behaviorist might say "a team a trained seals". Then the course might continue by looking at famous studies in psychology, and students can argue about which of these paradigms the studies might be giving evidence for, or against.

Q: How about sociology?

Egan suggests one simple question might be "what's society"? And a functionalist might compare it to a body, a Marxist might compare it to a battlefield, a symbolic interactionist might compare it to a theater. Again, students can read famous studies and argue about which of these paradigms are supported (or not) by the evidence.

Questions & answers

Q: You had said, back in the elementary curriculum, that we need to bring in as much cultural diversity as possible. Why?

The high school curriculum is about coming to understand the simple patterns that sit beneath the complex surface. Gertrude Stein said it well: "I like a thing simple but it must be simple through complication. Everything must come into your scheme, otherwise you cannot achieve real simplicity."

If we don't shower kids with cultural diversity, they'll never understand what humans really are. (Nor, ironically, will they ever come to understand their own culture.)

Q: Does Egan say anything about foreign languages, for high school?

He drops the thread here, but one assumes that, after having learned a second language and dipped one's toes into other languages, some of the cool ideas in linguistics could be introduced here. How do these languages connect to each other historically? What features, if any, do all languages have in common? To what extent is the Sapir-Whorf Hypothesis correct?)

Q: Can we really find teachers who can teach this?

I suspect, actually, that we keep getting them — they come in with romantic notions of discussing ideas with interested students. The trouble is that they leave the profession when they discover how much teaching amounts to babysitting.

Imagine if we could multiply the number of students hungry to discuss ideas. If we could do that, I don't think we'd have too much of a problem finding teachers.

Q: Aha! I slogged through this much, and I've finally found the section on how we train kids to be rational... right?

Don't be so sure! Keep reading.

Part 5: What education is

Finally, the moment of the unveiling! Egan says that to educate is

to guide students
through humanity's five great revolutions
as they learn to speak and write,
so they can imitate
each new kind of understanding
(while keeping alive the old ones)

Q: *What?*

Yeah, okay, let's unpack that.

Each of these kinds of understanding existed before any of us were born. They're the products of specific cultures struggling to survive and thrive.

Q: Where did they each come from?

The kind of understanding we laid out for high school was first hammered out by Plato and Aristotle, went dormant in Europe, and was further developed by Arab & Jewish scholars before blossoming again in the Renaissance and Enlightenment. Nowadays it's carried on by scholars in more-or-less every university department. Egan needed a name that would encompass all of that, and he picked "Philosophic".

How about the kind of understanding we laid out for elementary school? At first glance, it seems to bear some similarities to indigenous knowledge — and those similarities point to something important.

Robin Kimmerer, professor of biology, member of the Potawatomi tribe, and author of the bestselling Braiding Sweetgrass, pointed out that what Egan dubs "Philosophic" understanding is limited:

> "There's no replacement for learning from the land herself. You learn to exercise all of your facilities, not just your intellect, your mental powers to know how the world is, but how to feel how the world is, to sense it, to develop a relationship with it. We know that we learn so much better when we're engaging our memories, when we're engaging stories, when we're engaging our aesthetic senses, and I'm sorry but that doesn't happen much in a textbook. So to me, the place to learn to become a biologist, to learn to become a naturalist, is on the land."

But this isn't unique to the Potawatomi, or to Native Americans — you can find these "cognitive strengths" showing up in the Maori of New Zealand, the !Kung San of Botswana, the Yanomami of Brazil... in fact, anthropologists have found these "cognitive strengths" in every society they've researched: all but one of them show up in Donald Brown's list of human universals. Like clothing and fire, these ways of encoding information were part of humanity's original toolkit, equipping each person with the collected knowledge of their tribe so they could survive in environments that found them tasty.

Q: Are you saying that indigenous knowledge is "childish"?

No — no more than you'd say that Stephen Hawking's thinking was "high school-ish". The tools are shared, but each indigenous knowledge system is the culmination of millennia of evolution.

But the question does call our attention to something odd — why should it be that there's any connection between children and indigenous knowledge? To answer that, we need to ask a bigger question: where did

Philosophic come from in the first place?

The birth of an understanding

Greece was a backwater on the periphery of the Persian Empire — but in a historical instant it was transformed into an intellectual and cultural powerhouse: philosophers like Plato, and Aristotle revolutionized Western thought; mathematicians like Pythagoras and Euclid revolutionized math; playwrights like Aeschylus and Sophocles revolutionized drama.

What the *heck*? This is one of the simple questions that's lured in generations of classical historians.

Egan points to an intriguing fact: not long before, writing was introduced to Greece.

Q: Why would *writing* make such a difference?

When we write down a thought, we give it an existence separate from our own. We free up our working memories. Our ideas stop being things we see the world through, and become objects of contemplation in their own right. (How often have I had a world-shaking idea, only to write it down and realize it's moronic?) But Egan suspects there's more — and he points to the famous research of the psychologist Alexander Luria, who trekked into the hinterlands of the Soviet Union in the 1930s, and asked a simple question:

> "In the far north, where there is snow, all bears are white. Novaya Zemlya is in the far north. What color are the bears there?"

The answer, of course, is white — it's a simple syllogism. But here are some of the answers Luria reported hearing:

> "I've never been in the north and never seen bears."
>
> "If you want an answer to that question, you should ask people who have been there and have seen them."
>
> "There are different kinds of bears. If one is born red, he'll stay that way."
>
> "Your words can be answered only by someone who was there, and if a person wasn't there, he can't say anything on the basis of your words."

Only one person got it correct: "From your words it means that bears there are white." And that person was the village priest, who could read.

Literacy seems to be special — seems to open up the human capacity for decontextualized, abstract, logical thinking even when we're not reading or writing.

Q: So is that what caused the "Greek miracle" — the advent of writing?

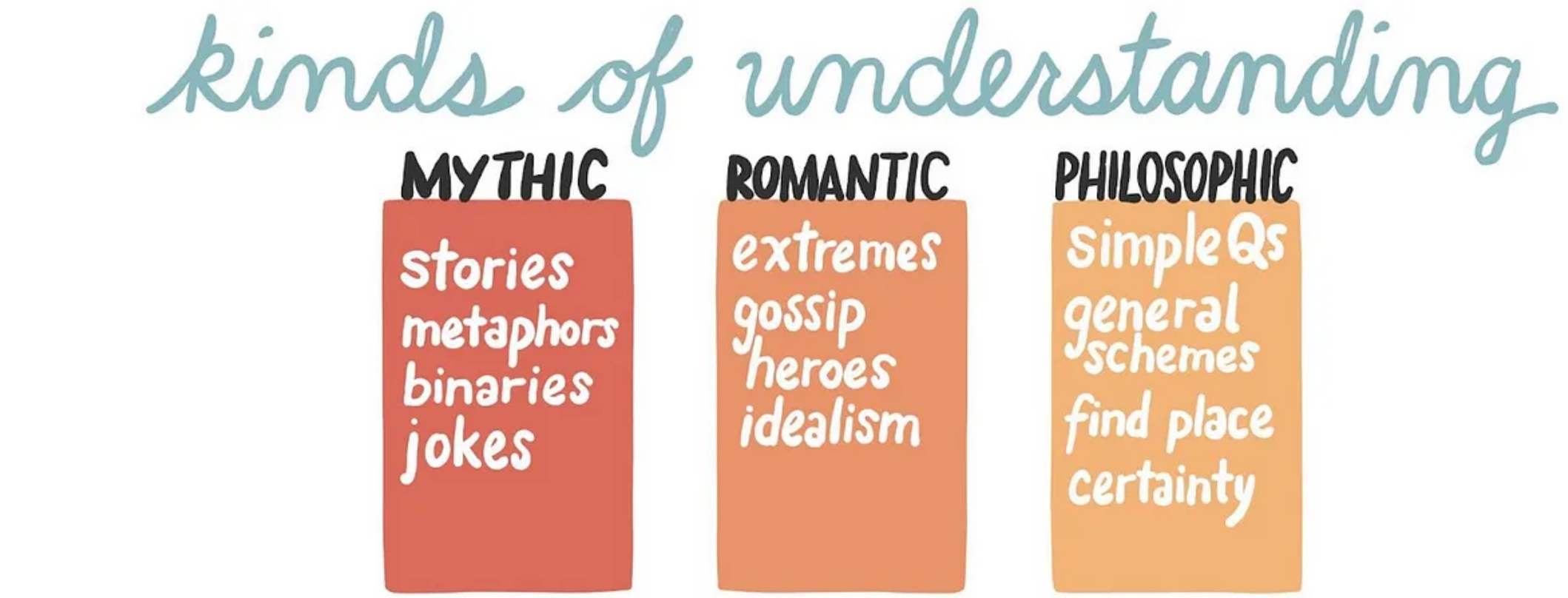
If the ability to write was all that it took, then we'd expect every literate person to be a near-genius. We might expect that the secret sauce is in the quick transition from the oral tradition to writing, but there have been many other groups who've learned to write with nary a trace of intellectual revolution.

There's something missing… and Egan thinks we find it in the emotion-laden, unsystematic, wonder-struck kind of writing that he says spread through Greece in the early years of the Greek Miracle. This looks for all the world like a mash-up of Mythic and Philosophic understanding. It's best exemplified, Egan writes, in The Histories, by Herodotus — a sort of "Guinness Book of Ancient World Records. But you don't need to take Egan's word for it — here's the historian (and vampire novelist) Tom Holland, being interviewed by Tyler Cowen:

> "what I loved was the infinite curiosity that he has about everything. His writings are called *Historia*, which in Greek basically means researches, inquiries. It doesn't mean history in the sense that we have.… He's writing about wild animals, he's writing about rivers, he's writing about wonders in different lands. He's writing about how Egyptian men squat to go to the toilet and Egyptian women stand up, and how Scythians get stoned on bongs, and all kinds of extraordinary, mad, weird, fascinating stuff. …he was the first person to be doing this. He was the first person to be pursuing the infinite curiosity he felt about the vast expanse of everything to its absolute limits… He's doing it for the first time."

Writing predated the Greeks, but before the Greeks got their hands on it, Egan says, it was mostly used for simple matters — listing out the names of rulers, or itemized debts. People like Herodotus realize writing has the potential to immortalize the greatest, strangest things in the world. The word that comes to mind when reading it is "adolescent". (The first time I opened my copy, my eyes landed on the sentence "There is a place in Arabia… which I visited because I wished to know more about the flying snakes". The fourteen-year-old in me was eager to read more.)

This, then, is the origin of the tools Egan lays out for middle school. Searching for a name for this mermaid of an understanding — half in the Mythic water, half in the Philosophic air — he settles on "Romantic". (The name is a nod to the Romantic period of Western art, which tried to re-infuse the Enlightenment's rationalism with emotion and intuition. But don't confuse the two — the 18th century European movement is just one place we see "Romantic understanding".)



With that history, we can answer the question: why should there be any connection between indigenous knowledge and elementary school, or between Plato and high school? These reflect the ages that people in our culture undergo revolutions in language — and revolutions in language lead to revolutions in understanding.

When children learn to understand spoken language (and speak themselves), they gain the ability to tell stories, use metaphors, understand jokes, and so on. Those types of speech can be used as tools for understanding the world; a society with those tools (and centuries to use them) will develop rich oral traditions.

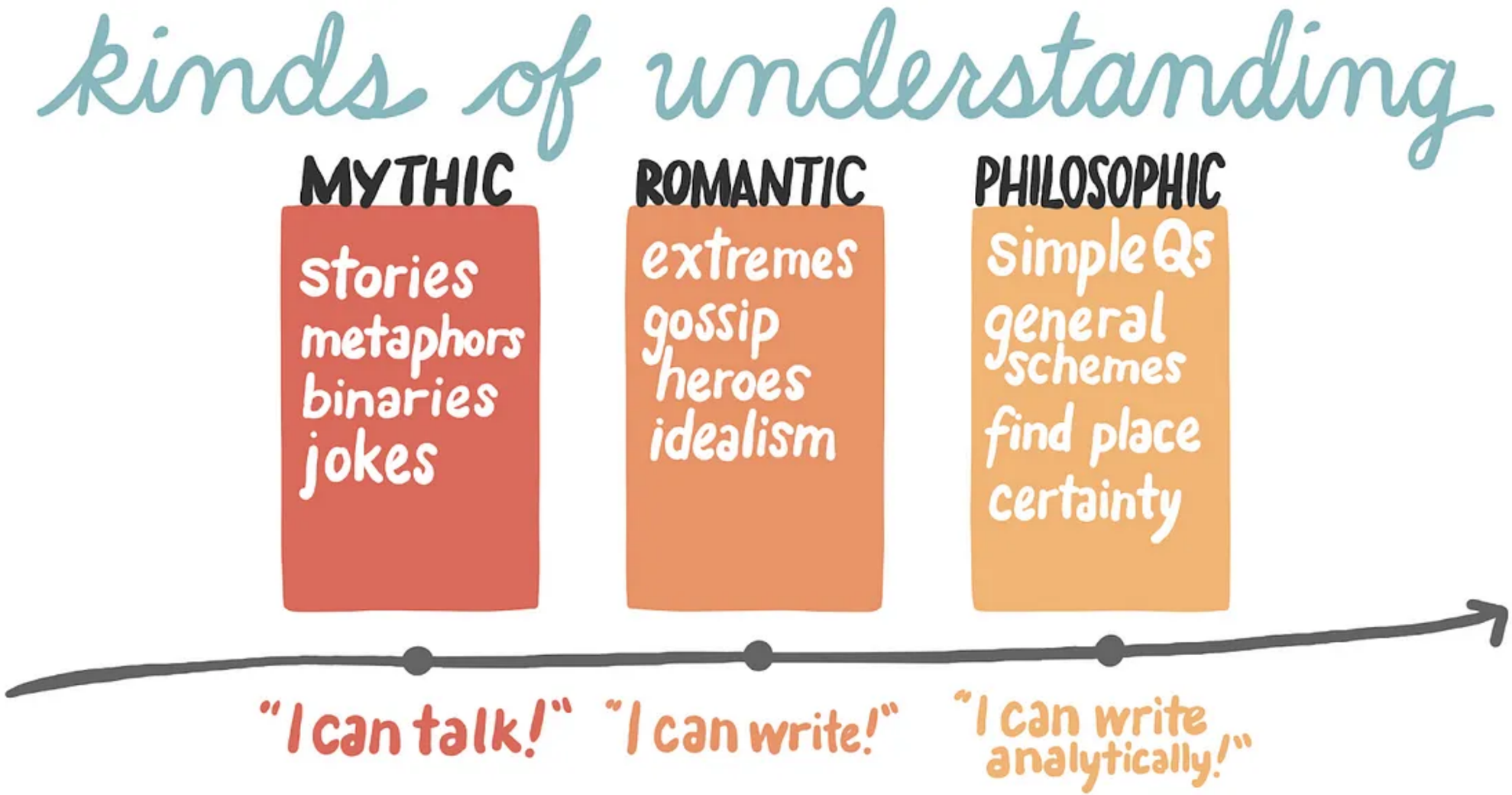
When students learn to read (and write) simple prose, they can connect to a much greater quantity of information. Details can accumulate. We get the sense that the world is more complex than our mind can contain, and we focus on the bright details, to get our bearings.

And when students learn to read (and write) scholarly, systematic prose — think technical manuals, intricately-argued blog posts, encyclopedia entries — they gain the ability to see the world in abstractions. If before they saw a problem as being caused by individual people, now they might see it as being caused by huge systematic forces. If language is to point to truth, it must be tamed — words precisely defined, literal meanings

explicated.

Or, to put it more simply:

> "Educational development, I am suggesting, is a process whose focus on interest and intellectual engagement begins with a myth-like construction of the world, then 'romantically' establishes the boundaries and extent of reality, and then 'philosophically' maps the major features of the world with organizing grids."



Q: My mind is flashing to the phrase "ontogeny recapitulates phylogeny" — the notion that when an animal is an embryo, it goes through stages where it takes on the appearance of its evolutionary ancestors. Isn't that a discredited bit of pseudoscience?

This is actually a helpful way to understand what Egan is and isn't arguing.

"Ontogeny recapitulates phylogeny" — the rare academic concept whose popularity is increased by how difficult it is to say aloud — was sparked by the 19th century biologist Ernest Haeckel, who developed a fascination with embryology when he saw in it a new way to defend Darwinism.

The patterns that he saw really are there, at least to some extent; a dog and a chicken and a human do really resemble each other at certain points in their development. But Haeckel's hypothesis that this demonstrated some deep cause and necessary cause didn't pan out. Those similarities are now understood to be the result of some constraints facing any embryo (you probably want to grow a circulatory system before you grow individual fingers) and, of course, the fact that we share most of our genes with other animals.

Egan isn't positing that there's any mysterious force directing children to progress in the pattern of their culture; he's not even suggesting that this progression is "natural". Our genes don't make us develop Romantic understanding around age 8 — our culture does. The fact that these come in a certain order in both individual kids and cultural history — Mythic, then Romantic, then Philosophic — stems from certain constraints (like the fact that it's easier to learn to speak before we read, and that the latter kinds of understanding are helped along by the accumulation of knowledge).

Minding our bodies

There are two more kinds of understanding — one explains how we have any of these, and the other explains what the goal of education is.

Q: What's the base of all this — how do humans have any of these kinds of understanding at all?

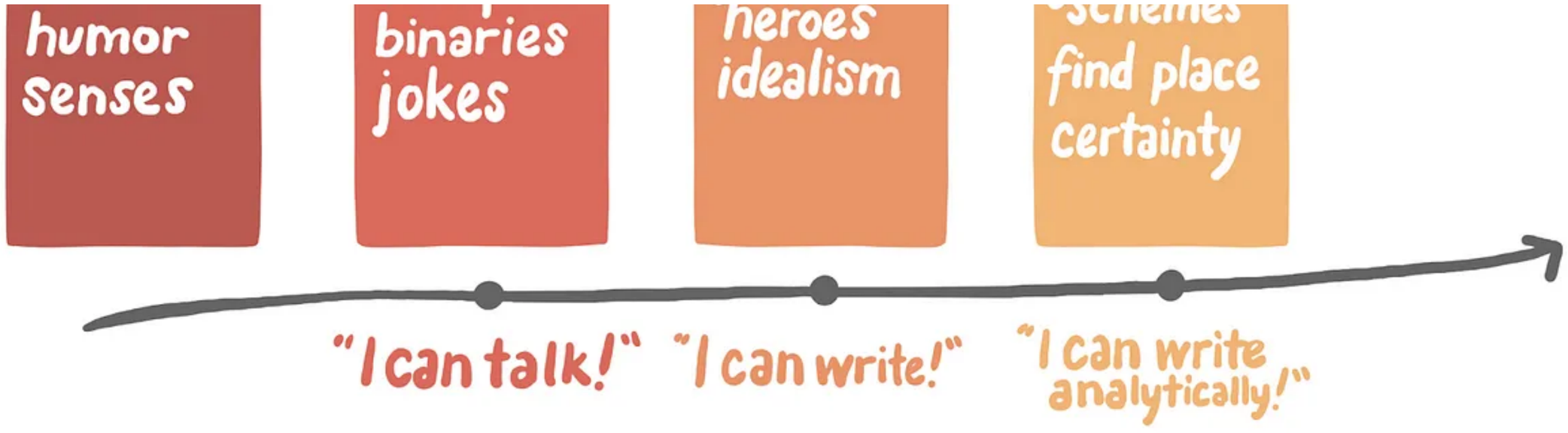
We often imagine that language is the trait that sets us apart from the animals, but why was it that humans — rather than (say) meerkats, or vampire bats — developed language in the first place? Egan suggests there's a kind of understanding hiding inside all the others, and that acknowledging it can help us make education deep and personally meaningful.

He dispatches this kind of understanding frustratingly quickly — just nine pages — but he points to bodily senses, emotional attachment, humor, and one other one that drives everything.

We can see it if we ask, what can a hunter-gatherer deaf-mute child who's not yet learned to sign do… that a chimpanzee can't?

The answer turns out to be quite a lot! She can play the games other kids play, she can figure out her group's social organization, act out her social role, and learn toolmaking. How can she do this, without language, Egan asks? Mimesis. We are the apes who imitate. "Monkey see, monkey do" is more true of us than actual monkeys; we're parrots who intuit the meaning of the things we're repeating. Though Homo sapiens has used language for around 50,000 years, we've been around for at least four times that long — and we survived by copying each other. Mimesis, more than words, is the anchor of our uniquely human way of being in the world.

Looking for a term to encompass this non-linguistic, body-oriented way of knowing, Egan settles on "Somatic".



Oh, the irony

Q: Where's this whole process headed — is Philosophic the last, best kind of understanding?

No, Egan answers — and it can't be. There's a fatal flaw baked into this whole recapitulation theory: the kinds of understanding want to destroy each other.

Have you read Plato's *Republic*? His plan for building an enlightened society was to kick out all the poets, storytellers, and actors — more than anyone before him, Plato recognized that the tools of Mythic understanding give us false understandings of the world. Stories lie! Metaphors lie! He and his students hammered out the Philosophic tools so we could climb out of our mental cave, and see the world as it really is.

And for its part, Mythic understanding doesn't much appreciate Romantic and Philosophic. Egan writes: "A complaint of aboriginal people on the west coast of Canada who had been compelled to send their children to residential schools was that 'they taught them to read and made them stupid.' The schools disrupted and significantly destroyed the children's native oral culture, and in its place were able to put only a crude and debased literacy." (He adds: "This is analogous to what we do to most children in schools.")

If we hope to make these kinds of understanding gel, we need another kind of understanding.

Q: Excellent; I was worried Egan's paradigm was getting too easy to follow. Where can we find this cure-all kind of understanding?

Well, what came after modernism?

In the end, Egan writes, Plato's project failed. The zealous pursuit of truth was supposed to lead us, well, to the Truth! We were supposed to arrive at a place beyond shifting arguments and subjective perspectives. The twentieth century was not kind to this optimism. Many intellectuals have despaired that we'll ever be able to find anything like Truth with a capital 'T'. As J. B. S. Haldane put it, "The Universe is not only queerer than we imagine — it is queerer than we *can* imagine." In logic, Gödel's Incompleteness Theorems exposed basic limits to formal axiomatic systems, showing that even math has intrinsic limitations. More and more, we recognize that ape brains which evolved to throw rocks at hyenas may not be able to take in the naked truth of reality.

Worse, Plato's was a spiritual project: we were supposed to find the truth, and the truth was supposed to set us free. But many of the truths we've found seem less than edifying? Egan quotes the physicist Steven

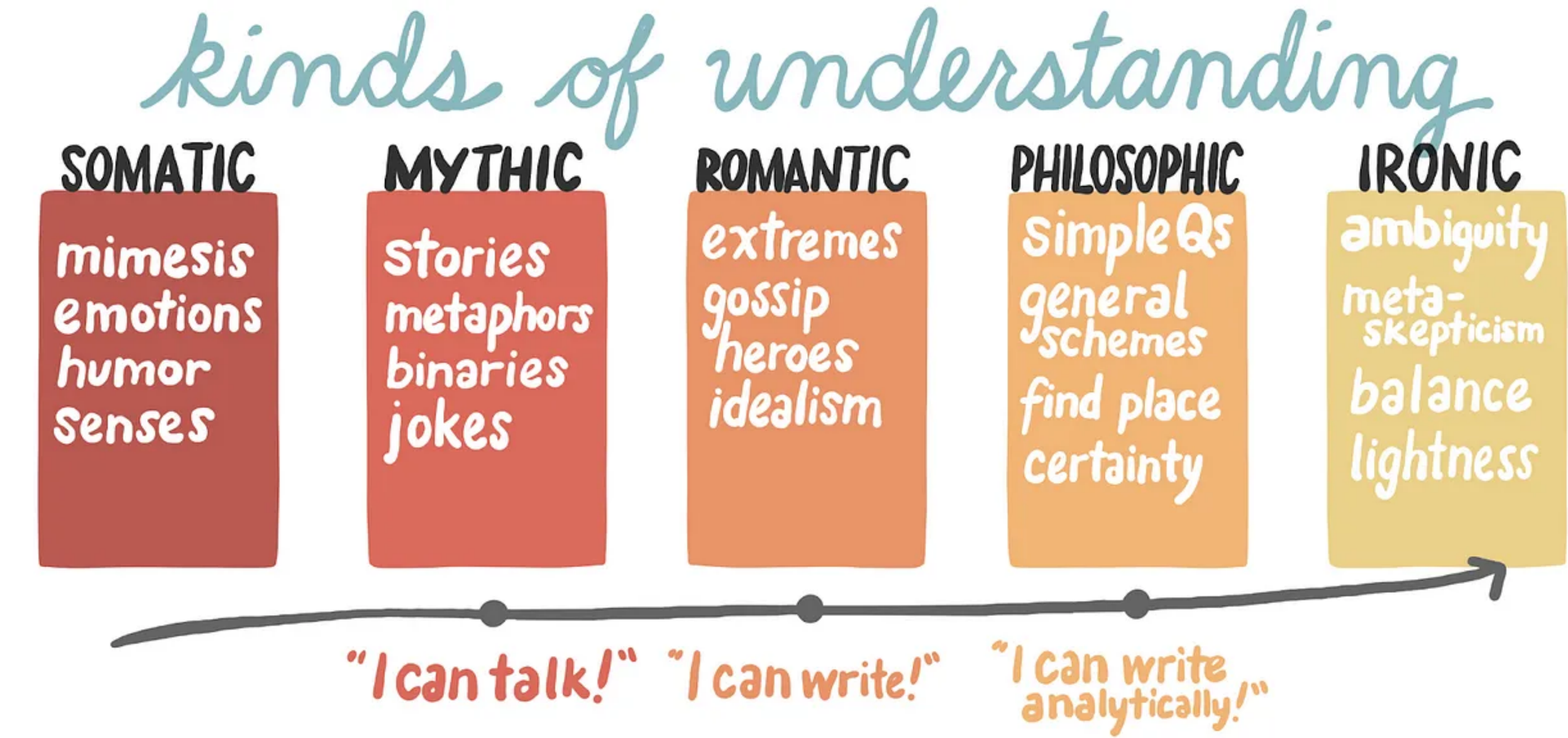
Weinberg: “The more the universe seems comprehensible, the more it also seems pointless”. This has sent some intellectuals to nihilism — or, worse still, to a snarky, clove-smoking postmodernism.

Q: You do know this is a book review contest for a Rationalist blog, right? We’re not exactly despairing about the end of the Enlightenment here. (Read. The. Room.)

I promised self-understanding for the capital-R-Rationalist community back at the beginning, and here it is.

You might assume that the Rationalist community is squarely in Philosophic understanding — and I think that’s mostly right. Just looking at Eliezer's “Twelve Virtues of Rationality”, I’m seeing argument, empiricism, simplicity, precision, and scholarship — pitch-perfect expressions of what Egan means by “Philosophic” understanding.

But at our best moments, I think, we have one toe in the Ironic.



Q: Extraordinary claims require extraordinary evidence. Your evidence, please!

I think you see it, for example, in the community's penchant for yelling "Chesterton's Fence!" whenever anyone criticizes something they don't understand. Philosophic understanding is obsessed with things making sense; Ironic understanding says, reality is always a few steps beyond you. "Chesterton's Fence" is a Rationalist shorthand for the idea that we should expect the world to be more complex than our models; if something looks stupid, you should consider that the stupidity may be in *you*.

I think we see a sign that we're stepping into Ironic, too, in our skepticism toward political ideologies.

A person in Philosophic thinks we build beliefs the way a mason builds a house: a general scheme is a house, each data point is a brick, and logic is the mortar that holds them together. An Ironist thinks we build beliefs the way that you'd wrestle a trans-dimensional octopus: *carefully*. A catchy idea isn't an object that will just let you put it down, it's a slippery, multi-tentacled monster that wants nothing more than to crawl in your brain, grab the levels of motivation and speech, and use you to spread itself to others. Anyone entering the octopus-wrestling arena needs to take proper care.

The metaphor (with all its problems!) is mine, but the idea fits what Egan is saying. An Ironist, he writes, will mistrust all ideologies.

Q: And then collapse in indecision, unable to believe anything except their own skepticism?

Well, yes, that happens sometimes! This is a known fail state of Ironists — Egan refers to them as "alienated", cut off from the world.

His ideal is something very different: someone who can be skeptical even of their skepticism, so they can see what's good (or useful, or valid, or beautiful) in every perspective. Such a person can, say, "support a neo-conservative or liberal or radical political initiate for its likely beneficial effects without becoming a neoconservative or a liberal or a radical". They can have control even over their Philosophic metanarratives; they can keep their octopuses in line.

Q: Goodness — has anyone really achieved this?

At least one person has: Socrates. Egan points to him as an exemplar of Ironic understanding done well. Socrates demonstrates radical doubt toward virtually everything; Egan cites Kierkegaard in saying that Socrates "seizes the columns bearing the edifice of knowledge and plunges everything down into the nothingness of ignorance". This infuriated his fellow citizens of Athens — and that fact that his irony gained him a following among some of the city's young men led, ultimately, to their decision to execute him.

And yet, Egan points out, Socrates was "buoyantly cheerful, even while facing death". He's jaunty — the original philosophical Tigger.

How? Not in spite of his irony, but because of it. The payoff of Socrates' irony is freedom from metanarratives. It's a kind of lightness — the ability to float above the fights that others are embroiled in, engaging only where you want.

Q: A lofty goal; how can anyone hope to achieve it?

Egan says: by using Irony to balance all the kinds of understanding. He writes that "irony without Philosophic capacities is impotent"; adding in Philosophic allows beliefs to have stability and strength. Philosophic understanding by itself can become anxious about making every last piece of data fit into a general scheme; Irony lets Philosophic relax.

Romantic understanding gives Philosophic energy and life (recall that Egan's basic critique of schools is that they press down the Philosophic before building up Romantic). And, in return, Philosophic understanding gives Romantic direction; instead of just going from shiny fact to shiny fact, details can be used to build new theories. Ironic understanding, meanwhile, gives Romantic an expanded moral universe — the heroes we celebrate don't need to be just our kind of people, we can celebrate the excellence of our opponents, too.

All of this is fueled by the power of Mythic understanding. Philosophic understanding, traditionally, looks down its nose at Mythic, but Ironic can swoop in and remind Philosophic that its metanarratives are, in the end, more narratives — even while reminding Mythic that its simple stories shouldn't be confused with the world as it is, but are accounts that we choose to tell.

Q: I'm not sure I got all that. Could you re-cap this recapitulation scheme?

Here's what it amounts to: if the goal of a development economist is "getting to Denmark", Egan's goal is "getting to Socrates". The aim of Egan's entire educational theory is "to keep alive as much as possible of the earlier kinds of understanding in the development of irony".

That is to say: these aren't stages we move through, they're Pokémon we collect. And the goal — of course! — is to collect 'em all.

Q: I've gotten so tired of postmodernists sniping at science, saying that it's "just another narrative". Is Egan saying that? (Please don't tell me he's saying that.)

He's not. He does want to admit the limits of science — objectivity isn't the only game in town; our minds allow us other kinds of understanding. But he also acknowledges it as one of our best hopes for understanding the world:

> "Ironic understanders remain open to the possibility that the Enlightenment project might not be exhausted, that rationality might not be the deliverer only of nightmares, that knowledge, truth, and objectivity might not be confined only to contingent agreements, that Western science and rationality might be discourses more privileged than some others in terms of access to reality."

Q: Got any other evidence that the capital-R-Rationalist community should understand themselves as having — how did you say it? — "one toe in Ironic"?

I think the best indication comes from the twelfth (and, Eliezer writes, most fundamental) rationalist virtue — to keep in mind that what we call "rationality" may itself become a trap:

> How can you improve your conception of rationality? Not by saying to yourself, "It is my duty to be rational." By this you only enshrine your mistaken conception.

Where do we see this? Only a few months ago, in his book review of *What We Owe the Future*, Scott responded to the Repugnant Conclusion (a seemingly-unwinnable philosophical paradox) by saying:

> "I'm not sure I want to play the philosophy game. Maybe MacAskill can come up with some clever proof that the commitments I list above imply I have to have my eyes pecked out by angry seagulls or something. If that's true, I will just not do that, and switch to some other set of axioms….
>
> "I realize this is 'anti-intellectual' and 'defeating the entire point of philosophy'. If you want to complain, you can find me in World A, along with my 4,999,999,999 blissfully happy friends."

For someone who has only Philosophic understanding, logic isn't something that can be easily disobeyed. But logic, for an Ironist, is a game that can be played — or not! Egan writes that, for the "sophisticated" (Socratic) Ironist, the point of logic and science and intelligence is to live well, and not cause others pain. I suspect Scott would concur: in a follow-up post, he writes:

> "On questions of truth, or questions of how to genuinely help promote happiness and avoid suffering, I will follow the crazy train to the ends of the earth. But if it's some weird spur line to "how about we make everyone worse off for no reason?" I don't think my epistemic or moral commitments require me to follow it there."

Part 6: In conclusion, a conversation

"Alice" is a Rationalist-with-a-capital-R who's interested in educational reform; she lives in a large metropolitan area with her son. She runs into "Reviewer" in the supermarket, who is wearing a mask.

Alice: Great to see you! I looked at that book review you sent me.

Reviewer: Oh? How'd you like it?

Alice: Oh, much too long: I didn't really pay attention to any of it. Could you "nutshell" all that stuff about… was his name "Egan"?

Reviewer: Sure thing. Egan argues that schools don't work because they ignore the tools that *have* worked for hundreds (and thousands) of years — things like humor, emotion, stories, metaphors, extremes, gossip, idealism, general schemes, finding one's place in the world, and the lure of certainty.

> If we rebuild the school curriculum on those things, organizing in something like the order they first arose historically, we can guide many more people into a rich, meaning-soaked, daring intellectual life, understanding that the complexity of the world will always strain the limits of what their minds can hold. (You might even call them "rational".)

Alice: Huh. Forgive me if this sounds rude, but I find that paradigm janky and filled with holes.

Reviewer: So did Egan! I remember my reaction when I first read the end of one of his final chapters:

> "I confess that this theory still seems to me like an engine with bits falling off, steam coming from inappropriate joints, oil dripping, some gleaming pieces attached insecurely to scavenged old bodywork".
>
> He continues:
>
> "but it does seem to chug forward a bit, better at least than the traditional-conceptions-of-education engine with its massive crew and smartly uniformed technicians, which hums and clangs admirably but doesn't actually go anywhere".

Alice: What was your reaction to that?

Reviewer: I thought, "How Ironic". [*sees Alice rolling her eyes*] No, I mean that literally: it's an instance of an Ironic stance toward reality — the admission, by someone putting the finishing touches on his *magnum opus*, that all models are insufficient, that the map is not the territory. Even if Egan's paradigm is correct, it's not the final word on what education is.

Alice: Well, I guess I can appreciate that. But now I have a devastating critique that will dismantle Egan's entire project… and also a bunch of cutesy, softball questions! Which would you like first?

Reviewer: Oh, the softball questions, please! (Let's build up to the fun stuff.)

Alice: Say someone created an entire school — kindergarten through twelfth grade — on Egan's principles. What would it look like, if I took a visit?

Reviewer: Very possibly, like any boring ol' school.

Alice: What? I thought Egan promised the moon!

Reviewer: He does — but he doesn't promise it will look shiny. When I toured an Eganian charter elementary program in Oregon — the only one of its kind, and now defunct for the usual awfulness of local politics — I could have missed the magic that was going on there, had I not talked to the kids.

Alice: What were the kids like?

Reviewer: Thoughtful, hungry to talk about everything they were learning. Like everything I wanted my own kids to be like.

Alice: That's nice to hear! I'm still struggling to enunciate how the "looks dull on the outside" part doesn't sit well with me.

Reviewer: I actually think it's a problem for anyone wanting to get this sort of education off the ground. If you follow the conversations about "educational innovation", you find that it's chockablock with examples of futuristic-looking "Schools of the Future!!!" which, upon inspection, typically turn out to be white-collar vocational training. (In fact, there was even a Simpsons episode about this.)

Alice: Would you expect an "Eganian" school ("Eganish"? "Eganesque"?) to at least raise test scores?

Reviewer: Yes — because students would care more about what they're learning. I suspect the scores would particularly go up in reading, because those exams don't just measure skill in "reading comprehension", but content knowledge. Kids who know more about the world will look like better readers on standardized tests… and kids in an Egan school would know a *lot* about the world.

Alice: Would they reduce the achievement gaps between rich kids and poor kids, between Black kids and white kids… that sort of thing?

Reviewer: I'm really curious about that, actually. A pretty typical thing in educational improvements is for the lower-scoring students to go up a little, and for the higher-scoring students to go up a lot. (It even has a name: the Matthew effect.) But what's interesting about Egan is that he expands the number of ways kids can engage with learning.

Alice: How do you mean?

Reviewer: Put it this way: the traditional way schooling works is that we identify the things most kids are terrible at — logico-deductive reasoning, cramming lots of facts into their head, that sort of thing — and then we build lessons based on those things. From Egan's viewpoint, this is sort of insane? Better to build learning on the things that kids are already good at, so they can achieve the other things.

> It's almost like, in the dominant paradigm for learning, you'd *expect* massive performance gaps. My intuition is that people are much more similar in their capacity for things like stories and metaphors and emotions. If that's right, then it at least *seems* possible that an Egan school would reduce those gaps.

Alice: Speaking of gaps, there's a huge one in your treatment of this — what about IQ? It's the most-tested, most-validated measurement in all of schooling! Is Egan one of those "everyone is equally smart" romantic navel-gazers who find *The Bell Curve* too scary to open?

Reviewer: No, he acknowledges that differences in intelligence are real, and matter: even in his system, "differences in ability to learn will no doubt affect the speed, the degree, and the richness of understanding different children will attain—"

Alice: Ah, so this ends up being an elitist system! The cognitively gifted ascend to the heights of Philosophic and Ironic reasoning, while the poor midwits are left to play with their Mythic toys?

Reviewer: You interrupted me; it's quite the opposite. The quote continues, "but none of this implies dismissal of students who are at least able to develop Ironic understanding". And many, many people currently locked out of the life of the mind are able to achieve Philosophic and Ironic understanding, if only they were guided to it in the right way.

Alice: But you're admitting that not *everyone* can enter the "life of the mind"?

Reviewer: Look, not everyone has the cognitive capacity to put their shirt on by themselves; I have nieces and nephews who are developmentally disabled. This "all children" rhetoric that you hear so much in educational reform seems to shut its eyes to the existence of people on the far end of the bell curve.

> But we shouldn't overlook that someone can have profound intellectual experiences just with Somatic and Mythic understandings — sometimes, especially with those. At present, our schools are mostly blind to that.
>
> Anyhow, at the other end of the bell curve, Egan has something interesting to say, too.

Alice: And what's that?

Reviewer: You'll have heard of the Flynn Effect — the observed fact that, over the last century or so, IQ scores have been going up, and fastest of all in the most abstract sections of the test. (The average score now is defined to be 100; the average score in 1900 seems to have been 70 — two full standard deviations lower!) The causes of this are debated — some suggest that it's as simple as better nutrition. But the more intriguing hypothesis is that modern life is becoming more cognitively demanding; we practice abstract, decontextualized reasoning many more times a day than we did in the 1800s.

Alice: And what does Egan say of the Flynn Effect?

Reviewer: So far as I know, he didn't write about it — but I think the intriguing hypothesis is the *same thing* as the spread of Philosophic understanding! Philosophic understanding is all about the abstract, the general, the decontextualized. As low-level Philosophic understanding structures our society more and more, we have to practice elements of it, even outside school. This constant practice at Philosophic reasoning will probably show on an IQ test.

Alice: You haven't mentioned much in the way of neurodiversity. Would an Egan school work well for a student with, say, ADHD?

Reviewer: As a person with ADHD who has two kids with ADHD and who teaches students with ADHD, the two words that pop into my head are: *hot damn*. And this seems to be the common opinion of Egan-fans around the world. For a lot of us, school is just *so boring*, and bringing back in emotional binaries and extremes and big ideas makes it not just bearable, but enjoyable.

Alice: That reminds me, I don't remember you mentioning "attention" before, or a lot of other aspects of cognition that my educational research friends might spend their entire careers studying — I'm thinking things like "motivation", "long-term memory", "metacognition", "creativity", or "long-term thinking skills". Is Egan silent on those?

Reviewer: He thought they were too small, and stole our focus from the bigger reality of how they all worked together. If you wanted a curriculum that maximized students' metacognition, for example, you shouldn't spend an inordinate amount of time training "metacognition" — you should aim to help them develop the five different kinds of understanding. Get the big picture right, and the details will follow.

Alice: "A rising tide lifts all boats"?

Reviewer: Sure, why not… except that, in this case, Egan is the first person to clearly explain what "the tide" is.

Alice: How about "rationality"? You opened this review raising the idea that, just maybe, a new kind of school could make the world rational. Does Egan talk about "rationality" a lot?

Reviewer: He does! For Egan, "rationality" is what begins to grow in Romantic understanding, and reaches full bloom in the Philosophic.

Alice: Oh, so he wants to move us all *past* rationality, then, in the Ironic stage? (Did you think you could lure me into planting the seeds of my own community's destruction?)

Reviewer: No, he's using a slightly different definition of "rationality" than the Rationalist community does — one more in line, actually, with the historical use of it. Don't forget the twelfth Rationalist virtue — the rationality that can be named is not the true rationality.

Alice: Oh, yeah, I think I actually do remember that. If his big goal isn't "rationality", then what is it?

Reviewer: In this book, he mostly uses the word "educated". But in the years after he wrote it, I think he realized that word wasn't distinctive enough (and to some potential allies, actually had a negative connotation), because he switched to using another one-word summary of his whole "five kinds of understanding" model. But frankly I think it was a terrible choice, and I've tried hard to scrub any mention of it from the review so far.

Alice: What word was it? Out with it!

Reviewer: [*suddenly finding his shoes very interesting, and speaking in a quiet voice*] "Imagination".

Alice: That's a pretty word. What do you think the problem with that is?

Reviewer: I think most people hear it and make a bunch of wrong assumptions about his philosophy. The word falls on one side of a binary in education that goes "serious/unserious", "challenging/easy", "intellect/imagination". This is ironic — and not in the good sense — because I think Egan's approach would give us the most intellectually vibrant schooling we've ever had. Anyhow, that's why, if you Google Egan, you'll see the phrase "Imaginative Education" popping up.

Alice: What term would you have preferred?

Reviewer: If I had to choose, I might have gone with "human".

Alice: Why "human"?

Reviewer: Because it's about embracing our evolved human nature — through the Somatic — and connecting to a wide span of cultural innovations that our genetic programming let us cultivate. With that as the frame, I think Egan might have said that the problem is we haven't built schools for humans — we've built schools for Vulcans.

Alice: That's interesting — I think I was imagining that, in some ways, this was secretly a program for turning the whole world into *geeks*, those most Vulcan-like of humans.

Reviewer: I can understand that interpretation: geeks seem to be natural systematizers, and creating logical systems is a very Philosophic thing. But remember that Egan's big complaint is that schools don't recognize the more obviously emotional, more story-centric kinds of understanding, so they try to press down the one kind of understanding they *do* understand on children who are mostly unready for it. His whole project is helping people cultivate all the kinds of understanding, and using Ironic to balance them.

Alice: I'm curious — might "geeks", in this system, be defined as the people who have a natural predilection for Philosophic reasoning?

Reviewer: That's pretty good! Yeah, maybe.

Alice: Well then, I have a major bone to pick with you. Even if I had the chance to send my super-geeky son to an Egan school, I'm not sure I'd feel comfortable doing so — wouldn't he be limited, in elementary and middle school, by being in these Mythic and Romantic classrooms?

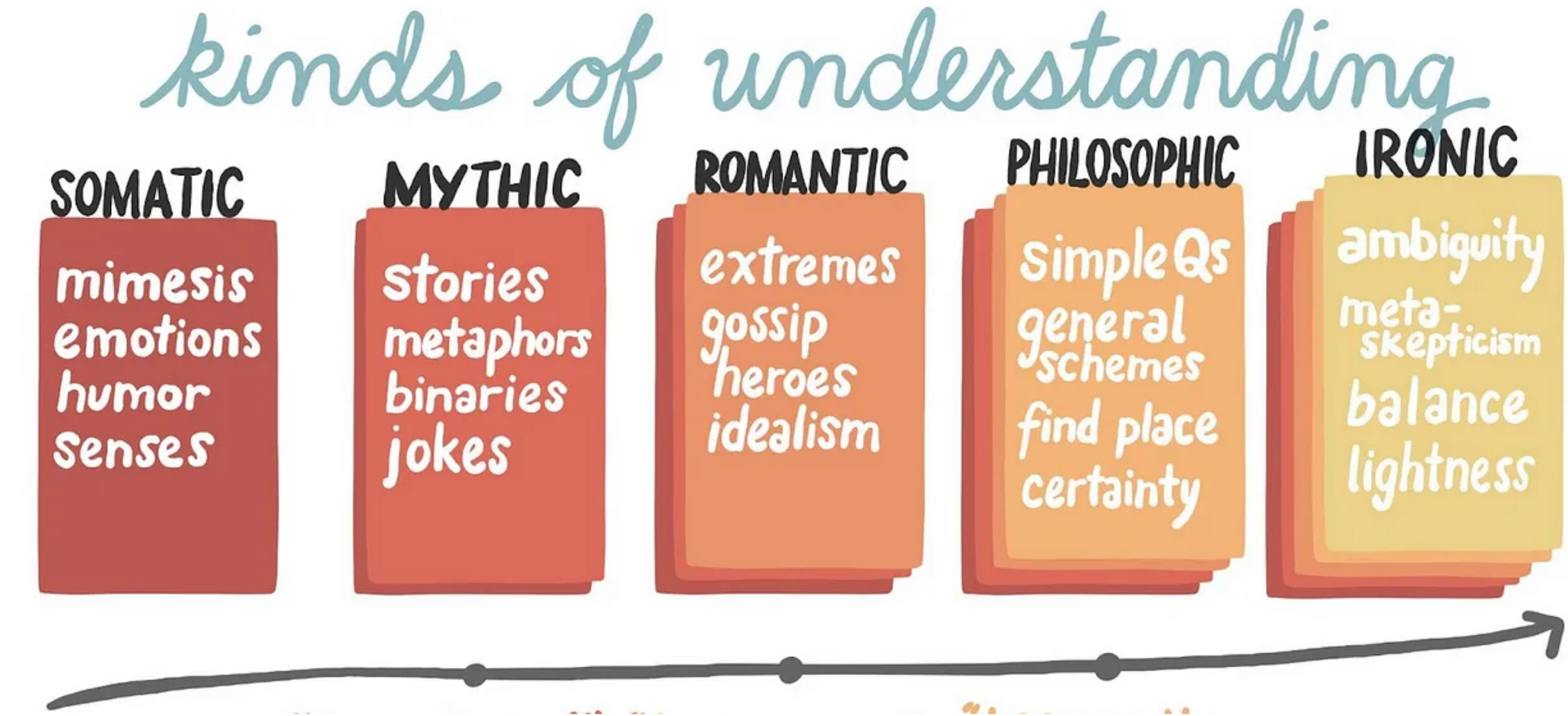
Reviewer: Ah, I'm very glad you asked that: I've been meaning to tell you that those pretty diagrams I showed you were profoundly wrong.

Alice: You— what?

Reviewer: I've been drawing Egan's "kinds of understanding" like they were "stages" — categories that you move between, one to the other. From that, you might imagine that an elementary school teacher will only be making Mythic lessons, and a teacher in middle school will only be making Romantic lessons, and so on. That's not true — and it's actually a misunderstanding of Egan's system which, if not watched out for, could actually make education *worse* off.

Alice: Worse off! How's that?

Reviewer: First, if we want to persist in using the "stages" metaphor, note that, at the very least, these stages stack on top of each other:



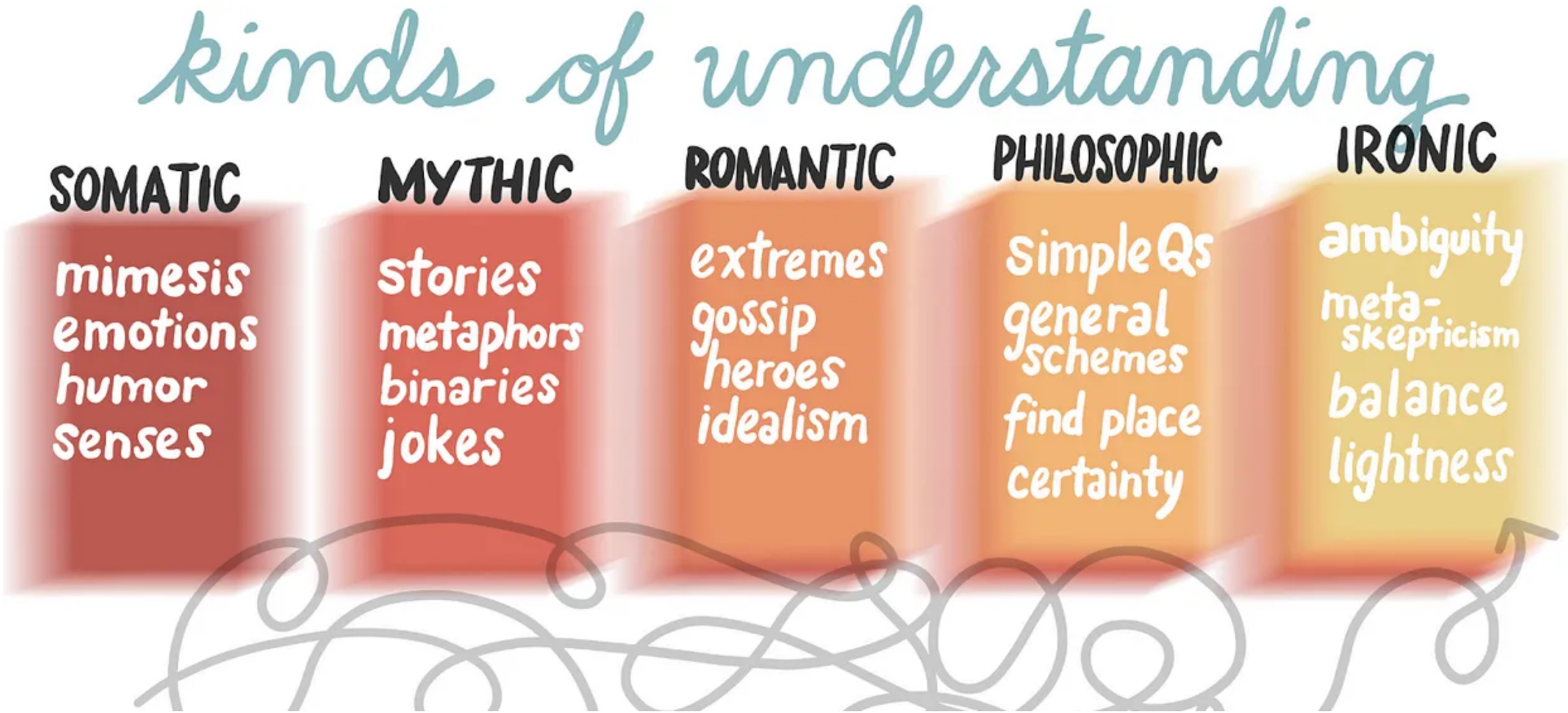
That means that, at the very least, a middle school teacher can (and should) be using Romantic *and* Mythic *and* Somatic tools.

Alice: And if we don't persist in thinking of them as "stages"?

Reviewer: Well, then we get to acknowledge something that's obvious: everyone uses some of these kinds of understanding, to at least a little extent, all the time. So even a preschool teacher has to be thinking about, say, how to bring out her students' Philosophic understanding, even if only a little.

Also, the divisions between the kinds of understanding aren't neat — Egan acknowledges that "how one slices up the developmental continuum is in part a strategic matter, determined by your particular interest".

So a more accurate diagram might look like this:



Alice: Hmm. I can see why you didn't lead with that.

Reviewer: Thanks.

Alice: If you're willing to make the boxes blurry, then what's the use of saying they're still different boxes?

Reviewer: Think of the boxes (blurry or not) as attempts to capture a common historical pattern (and a common statistical reality, now) — humans usually master simple stories before they master gossipy, complex stories, and they usually master those before they master general schemes.

> You should expect that, sometimes, the wisest thing you can do is to break the pattern; that's not a good reason to throw out the pattern.

Alice: Okay, I can accept that, but — forgive me for asking this, but: why? Why can't we just go straight to rationality? Why do we need to go through all the others? This really does seem terribly inefficient.

Reviewer: You mean, why can't we just slap up some cognitive biases posters on the classroom wall, and call it a day? I'll agree that Egan's approach does seem a rather circuitous way to get to rationality.

> But then, we've been trying clever shortcuts for a while. Dewey's shortcut was to put kids in small democratic communities; Rousseau's was to let the individual student follow his interests; Plato's was to cram minds full of truth. By and large, they've failed.

Alice: Hey, I loved those posters!

Reviewer: Me too!

Alice: I'm reminded, actually, of how in the early days of AI research, a lot of people thought there must be a shortcut to getting computers to reason flexibly — if only we could get them to play, or use symbolic reasoning, people thought, then they'd bring themselves the rest of the way there. But it turns out there was no shortcut — LLMs need to be large! The inefficiency seems to be part of the recipe.

Reviewer: That's good. Although, if you zoom out to the big picture, it took our species a *long* time to get to rationality. If we evolved speech fifty thousand years ago, and Egan is right that Socrates achieved something like "sophisticated Irony" around 400 BC, then it took us… well, about fifty thousand years! Compared to that, gaining five kinds of understanding over twelve-or-so years doesn't seem so inefficient.

Alice: Are you ready for my big question now?

Reviewer: Absolutely. I've never been more ready for anything in my life. Bring it on!

Alice: [*looking skeptical*]

Reviewer: Please don't hurt me.

Alice: Here it comes: why should we have confidence that this approach would work, when every single other exciting-sounding "this will change everything" educational reform has failed, failed, failed? Maybe I can be convinced that Egan's paradigm is fully twice as likely to succeed as all of the others combined — I think that would put it at a 1% chance of working.

Alice: I guess so.

Reviewer: I've noticed the skulls.

Alice: And how do you respond?

Reviewer: I think there are five possible ways we could try to suss out how likely Egan's paradigm is to work. The first is through lots of formal, peer-reviewed studies of Egan-inspired educational interventions in classrooms, and then meta-analyses of those studies.

Alice: And have those been done with Egan's methods?

Reviewer: *Barely*, and it frustrates me, and I think the fault lay with Egan. He was quite pessimistic on how much you could learn from this sort of study. One of his books was actually reviewed by the then-Second-Lady-of-the-United-States, Lynne Cheney. She really liked how he lambasted the developmentalists, but she criticized him on his pooh-poohing of educational research.

Alice: I feel like "visionary proposes radical new method of *x*, says standard tests don't apply" is a fifty-foot-tall glowing red flag. Does this make you skeptical of Egan?

Alice: And what did it find?

Reviewer: Oh, it found a statistically significant positive effect — but it was just one study. And the trouble in education is that almost *everything* seems to work in individual studies. There are more studies that test Egan-inspired stuff, but not so many that you could call them a trustworthy research base.

Alice: You said there are five ways we could try to figure out if this really works. What's the next?

Reviewer: Look at how the components of Egan's paradigm have fared in the broader scholarly literature.

Alice: And how have they fared?

Reviewer: *Educated Mind* came out in 1997, but he had built the fundamentals of his paradigm by the late Eighties. And since then, the cognitive sciences have swung toward embracing the power of the tools of what Egan's dubbed "Somatic" and "Mythic" understanding — see Jonathan Gottschall for a popular account of the move toward narrative, Douglas Hofstadter for one on metaphor, Antonio Damasio for one on emotion, and Rebecca Schwarzlose for one on mental images.

> Actually, that makes me think that a better way to ascertain how much stock we should put in Egan would be to ask what it would take to falsify his "kinds of understanding". If we woke up tomorrow, and the front page of Reddit announced that scientists had concluding that stories and metaphors and emotions and mental images *weren't* actually useful in cognition.

Alice: That seems incredibly unlikely.

Reviewer: Indeed! And yet, schools don't systematically use those as tools for learning. Actually, there's a whole 'nother aspect of this that seems like it's the most important of all: cultural evolution. Have you read any Joseph Henrich?

Alice: The aerospace-engineer-turned-Harvard-professor-of-human-evolution who's helping reinvent how we understand anthropology, psychology, and economics? The author or *The Secret of Our Success* and *The WEIRDest People in the World*? I'm familiar with his work, yes.

Reviewer: Well, I think Egan is Joseph Henrich for education.

Alice: What?!

Reviewer: Both show how you can't understand psychological differences among individuals just by looking at their genes, or at their immediate environment — you have to see what's been happening in the hundreds and thousands of years of their ancestor's cultural history. They also both point to the importance of "cognitive tools" gained through culture, argue that we're smart because we connect up with others, and think that mimesis is at the very base of our cognition.

Alice: Woah.

Reviewer: Henrich makes a big point that the social sciences, thus far, have proceeded on the assumption that humans "are just a really smart, though somewhat less hairy, chimpanzee". But cultural evolution has

made us a fundamentally *new kind* of animal — and that the scholarly road ahead is wide open for exploring this. I sorta can't imagine a more Egan-y thing to say. I think that one of the reasons Egan's ideas didn't spread is that they were ahead of their time; *this* was the paradigm Egan's ideas make sense in.

Alice: And again I say: *woah*.

Reviewer: Yeah, I wish I coulda seen a conversation between the two of them! They both lived in the Vancouver area for a number of years; maybe they bumped into each other in the grocery store. So, anyway, that's two ways so far of adjudicating Egan: formal studies of classrooms, and looking at how the components of his paradigm have fared.

Alice: What's the third?

Reviewer: Promise you won't laugh.

Alice: It's a promise.

Reviewer: I feel like his system describes a lot of us Rationalists *oddly* well?

Alice: How do you mean?

Reviewer: I won't share too many personal details; I am wearing a mask, after all. But as a kid, a lot of my learning was driven by jokes — I read *Calvin and Hobbes* so many times, I probably had all the SAT words memorized. I got a feel for the constraints of reality through the copy of *Guinness Book of World Records* that my mom got for me when I was nine years old — right at the beginning of Egan's "Romantic" span. And I probed what might lie beyond the edges of reality by getting really into cryptids and paranormal nonsense.

Alice: Good for you! I think that describes a lot of kids.

Reviewer: I wouldn't disagree — I think I went further: I jumped into Philosophic understanding by becoming a young-earth creationist, when assigned to a middle-school science-class debate over the age of the Earth. Don't judge! The web was young, and I was, too. But I recall the absolute thrill of realizing that I could find *anomalies* that could overturn other people's entire schemas. There's a bit of Egan's writing that I find haunting:

> "As the years go by, we may forget the ardor of early Philosophic understanding, and, of course, it comes to some only partially, as a feeble glow rather than a lightning flash. But it can feel like what Faust sold his soul for."
>
> I felt exactly that, and I was hooked.

Alice: Did you stay a young-earth creationist?

Reviewer: No — and it wasn't because I was mocked out of the belief. I kept pursuing the truth, trying to build a general scheme that could hold all the evidence, and after a year or two, gave it up. But that got me into theology, which gave me an urge to learn history and philosophy — to understand where I fit in the cosmos.

Alice: Are you a theologian, now?

Reviewer: No — I'm an agnostic. I lost my ability to hold together my theological schema years ago. But the process of moving through that, of pursuing the truth no matter *what* it ended up suggesting to me, has made me an intellectual thrill-junkie. I sorely want to find something else big that I'm wrong about — something as big as "my entire worldview". I'm find myself deeply skeptical of my convictions, but I'm pretty skeptical of my skepticism, too, so it's not a downer — the whole thing is actually pretty danged freeing.

Alice: So you're saying that it's your religious history that birthed your rationalism.

Reviewer: In large part, yes! It's given me a deep fondness for religions to this day. And from my experience, I think an unusually high number of people in the capital-R-Rationalist community have similar stories, too.

Alice: How confident are you about that?

Reviewer: Oh gosh, no, not at all. It's just a beguiling intuition. I'd love to see some numbers.

Alice: Okay, so "personal experience" was number three. Four?

Reviewer: If the "tools" that Egan describes are real, then they're huge honking things. If we haven't paid much attention to them up 'til now, it's because they're too big for us to notice. If Egan is right, then we should be able to point to people making billions of dollars off these tools.

Alice: What would that look like?

Reviewer: I mean, "story" is the most obvious — how much money passes through Hollywood? The binaries are a bit harder, but it's funny: Egan discovered them through anthropology, but I discovered them by reading books on writing: Robert McKee's classic *Story* teaches the idea to screenwriters, *The Story Grid* teaches it to novelists, and *Building a Storybrand* teaches it to marketers.

> Pokémon takes the tool of "collections" and turns it into an international obsession. I feel like the more people learn to use these tools, the more money they can make. We're Egan-izing everything.
>
> There's a dark aspect of this, but, I know you need to get back home to feed your dog.

Alice: Thanks, but, um — what's the dark aspect?

Reviewer: I'm worried that Egan-izing is eating the world. That as these tools are perfected, they begin to constitute a mass of super-stimuluses that it will be harder and harder to turn away from and live in the real world. Erik Hoel wrote about this problem well, and included tips on how to avoid it.

Alice: How can we avoid it?

Reviewer: I'll let you read his piece for his thoughts; from my vantage point, the gradual Eganization of everything means that it's past time for us to apply these same tools to the real world, to re-enchant reality. And the ideal place to do that is school.

Alice: Okay — if I'm counting right, that's four ways we could try to figure out if Egan is right: classroom studies, scholarship more generally, personal experience, and capitalism. What's your final one?

Reviewer: Well, someone could make a school of it, and see how it went.

Alice: People make schools? Wait, wait, I knew that. People start schools all the time. But where would they find the teachers? And which brave families would send their kids?

Reviewer: The teachers already exist; the teacher-prep program that Egan started is still going. They just don't have any place to tie their teaching together. As for the families, it wouldn't even take so very many — small schools pop into existence all the time.

Alice: But wouldn't it be risky? It's an untested means of education, after all — the one elementary program you visited aside.

Reviewer: See, that's maybe the strongest evidence for the theory, as janky as it still appears to me — that the educational practices it recommends are so danged appealing to so many people. It gives the passion that people look for in the developmental approach, the great ideas that people look for in the academic approach, and the connection to the rest of humanity that people look for in the socialization approach.

Alice: *That's* how Egan claims to fulfill those three jobs, in a new way!

Reviewer: Well, something like that. Anyhow, you've got a dog that needs a-feedin'.

Alice: Thanks!

Reviewer: [*walks away*]

Alice: [*walks away*]