

Reasoning in School



For this I'm indebted to my Dad, who has over the years wisely entertained my impassioned ideas about education, to my Mom, whose empathy I've internalized, and to many liberal teachers.

Preface

A fifth grader taught me the word ‘metacognition’, which, following her, we can take to mean “thinking about thinking”. This is an analogical exercise in metacognition. It is secondarily an introduction to the process of reasoning and primarily an examination of basic notions about that process, especially those that are supposed commonsense and those that are missing from our self-concepts. As it turns out, subjecting popular metacognitive attitudes to even minor scrutiny calls some of them seriously into question. It is my goal to do so, and to form in the mind of the reader better founded beliefs about reasoning and thereby a more accurate, and consequently empowering, self-understanding. I would love to set in motion the mind that frees itself.

I am in the end interested in reasoning in school as it relates to the practice of Philosophy for Children (p4c). It is amazing that reasoning is not a part of the K-12 curriculum. That it is not I find plainly unjustifiable and seriously unjust. In what follows I defend this position and consider p4c in light of it.

Because I am focused on beliefs about thinking, as opposed to the cognitive psychology of thought, I am afforded some writing leeway. I am not a psychologist, but I have a fair metacognitive confidence thanks to my background in philosophy. Still, I do not refrain from presenting as fact one or two basic ideas about how reasoning works – where appropriate I include citations. Also, of course, I work from a set of psychological assumptions. Nevertheless,

this essay is not supposed to be academically rigorous nor philosophically formal (rest assured it has been carefully composed).

In fact, I think philosophy, education, and p4c in particular stand to benefit from more accessible scholarship. That is, rather than advocate for p4c in a jargony philosophy journal, I suspect proponents are better off engaging teachers, students, and parents directly. But to this end, what is the point of trying if the audience does not value what p4c supposedly brings to the classroom? (The person who does not value cardiovascular health cannot so easily be persuaded to take up the habit of cardio). We should not assume that people value reasoning, inquiry, empathy, and so on by default. Before we explain in advocacy how p4c develops these important skills, we need to make a convincing case that the skills it develops are important. But, as far as I can tell, too often this preliminary step is skipped and as a result the scope of people who might be receptive to the practice is needlessly limited. And, I believe, we should feel most compelled to reach the individuals overlooked in this manner. That is where this longform essay comes in. Written for administrators, teachers, and parents of K-12 children, students of p4c, and equally for anyone who does not think very much about thinking, here goes the case for reasoning, and for p4c, in school.

Glossary

Argument: An implicit or explicit reason or set of reasons (premise(s)) given in support of a conclusion (Oxford English Dictionary, <https://www.lexico.com/en/definition/argument>). By ‘argument(s)’ I do not mean verbal disagreement between two people. Arguments, as understood in this essay, are the subject of study in critical thinking and informal logic courses in which students usually learn, among other things, how to identify, reconstruct, and evaluate arguments given outside the classroom (Internet Encyclopedia of Philosophy, <https://www.iep.utm.edu/argument/>).

Cognitive Bias: A systematic error in judgment and decision-making common to all human beings (Encyclopedia of Human Behavior, https://webpace.clarkson.edu/~awilke/Research_files/EoHB_Wilke_12.pdf).

Cognitive Heuristic: A judgment or decision-making mechanism or cognitive shortcut that relies on little information and modest cognitive resources (Encyclopedia of Human Behavior, https://webpace.clarkson.edu/~awilke/Research_files/EoHB_Wilke_12.pdf).

Conclusion: A judgment or decision reached by reasoning and established by the premises of an argument stepwise (Oxford English Dictionary, <https://www.lexico.com/en/definition/conclusion>).

Fallacy: A fallacy is a kind of error in reasoning. Fallacious arguments should not be persuasive, but they too often are. Fallacies may be created unintentionally, or they may be created intentionally in order to deceive other people. The vast majority of the commonly identified fallacies involve arguments. (Internet Encyclopedia of Philosophy, <https://www.iep.utm.edu/fallacy/>)

Premise: The premises of an argument are the reasons offered systematically in support of its conclusion (Internet Encyclopedia of Philosophy, <https://www.iep.utm.edu/argument/>).

Reasoning: Reasoning is the conscious, deliberate, and rational evaluation of arguments according to clearly identified and ideally objective standards of proof (Elizabeth Oljar and D.R. Koukal “How to Make Students Better Thinkers”, <https://www.chronicle.com/article/How-to-Make-Students-Better/245576>). We can think of the terms ‘reasoning’ and ‘critical thinking’ as interchangeable in this essay. There is no widely agreed upon definition of either.

Sound: An argument is sound if and only if it is both valid and all of its premises are actually true. Otherwise, the argument is unsound (Internet Encyclopedia of Philosophy, <https://www.iep.utm.edu/val-snd/>).

Valid: An argument is valid when, if all of its premises were true, the conclusion would necessarily follow. If it is possible for the premises to be true and the conclusion nevertheless to be false, then an argument is said to be invalid. It should be noted that an argument with false premises and a false conclusion can be valid. The validity or invalidity of an argument depends on its form, not on the truth or falsity of its content. (Internet Encyclopedia of Philosophy, <https://www.iep.utm.edu/val-snd/>)

Part I; Reasoning

Imagine someone who does not know much about math is browsing a convenience store. Say they grab a couple of items and bring them over to the register for ring up. The cashier tallies the items out loud, *“A bag of chips for one dollar and a six pack of soda for seven dollars, plus a three percent tax, okay that’ll be fifty dollars.”* The process by which the cashier arrived at \$50, however it went, cannot be arithmetically justified. The correct total is \$8.24. But, the shopper does not know enough about math to figure this out, or to even be suspicious of the cashier’s miscalculation. So, the shopper hands over \$50, accepting on authority the purported total.

Now, suppose someone who does not know much about reasoning is watching a television program. At some point the talk show host argues, *“We can look out for everyday Americans and bolster the economy, or we can fight climate change. Obviously, we need to look out for everyday Americans and bolster our economy, so we can’t address climate change.”* No matter what you think of it, this inference is not logically justified. The argument either exemplifies the informal “false dilemma” fallacy, or the formal “affirming a disjunct” fallacy. Both are common forms of invalid reasoning and neither should be convincing in the least. But, the viewer does not know enough about reasoning to figure this out, or to even be suspicious of the host’s invalid argument. So, the viewer, thinking the argument sound, gains the belief that we should not fight climate change.

Here we have two similar situations that we tend to treat very differently. In the first scene, the shopper's lack of knowledge of math is taken advantage of by the cashier whose calculation is objectively incorrect. The sum of a one dollar snack, a seven dollar six pack, and a three percent tax is not \$50. There is no need to spell out the arithmetic; the charge should have been for \$8.24. In the second scene, the viewer's lack of knowledge of reasoning is exploited by the talk show host whose argument is objectively invalid. Thanks to a technical complication¹, the argument is fallacious in one of two ways. Either it relies on a "false dilemma"², where two options are presented as mutually exclusive and the only possibilities when in fact there are others (we can bolster the economy *or* we can fight climate change, *and we can't do both, nor anything else*), or it is an example of "affirming a disjunct"³, in which case the problem can be explained as follows. It's true that among the many things we can choose to do, we can bolster the economy *or* we can address climate change. Perhaps it's also true that we should bolster the economy if doing so really would benefit everyday Americans (and not harm anyone else). So, assuming it would be beneficial, we can safely say that we should choose to bolster the economy. From this however, there is no logical link to the conclusion that we should not fight climate change. Of course, we can do both things at the expense of neither. But, I am not actually making a case for either course of action.⁴ The purpose of this paragraph is rather to show that the cashier's math and the news host's reasoning are equally, and objectively, erroneous.

This analogy exposes a telling contrast. The shopper's and the viewer's experience are comparably absurd, and yet we only view one as such. The situation at the convenience store is

so implausible as to be almost unimaginable. The viewer's experience, on the other hand, we shrug off. All of the time, and perhaps even more often than not, people are fooled by patently bad arguments. And we seem to think that's just the way it is. And then we seem to stop thinking. Really... why do we accept this?

This state of affairs, and our apathy towards it, reflects a serious flaw in our education system and commonsense. What makes the shopper's experience so unrealistic is the fact that math is a core K-12 subject. An understanding of basic math is required of all high school graduates; it's unusual, even for a kid (who's being educated), to not know anything about math. As a result, math skills are rightfully respected and widespread. General reasoning, on the other hand, is totally absent from the K-12 curriculum and there is no good reason why. Just as anyone properly instructed can learn basic math, anyone can learn basic reasoning. And, *reasoning is a skill that everyone should learn*, given that we form beliefs based on how we reason (or don't) over information and that our beliefs in large part determine the character and quality of our life! Nevertheless, it's because K-12 students don't learn the first thing about reasoning in school that the viewer's experience is common (a disconcerting plenty of adults know nothing about argumentation). If we didn't teach math because we undervalued it, we wouldn't think much of the shopper's situation. It would probably be realistic. Instead, because we undervalue and thereby don't teach reasoning, we are indifferent towards the alterable fact that people's beliefs are easily manipulated by bad arguments. We don't expect people to be capable mathematicians absent instruction in math. Why do we apparently expect people to be capable reasoners absent instruction in reasoning? It's amazing.

Let me pause to address a couple of salient objections. Foremost, it looks like the belief that schools *don't* teach reasoning is unpopular. It's commonly, even if disingenuously, thought that schools *do* teach "critical thinking". A lot of classes at least, across a wide range of subjects and grade levels, claim to develop "critical thinking" skills. I've taken them. The thought is that working through a number of sufficiently challenging science problems, for example, will sharpen a student's ability to reason. This belief is not only bad because it's false, but wherever we accept it we make impossible the progress we want; if our goal is to teach reasoning, it's counterproductive to think we are meeting that goal if in fact we aren't (same goes for any goal)!

Reasoning forms the base of performance in every school subject; in order to work out an answer to any question posed in any class one must reason, at least to some degree. But, taking a science test (or writing a reading comprehension response, or doing anything else done in school that supposedly develops reasoning skills) merely *requires* reasoning skills that are *domain specific*. No K-12 core subject actively works to *develop* reasoning skills that are *generally applicable*. Simply put, reasoning can't be taught from a distance, in service to other subjects. No matter how many word problems you complete in math class, you will not be any more than minimally better at evaluating day-to-day arguments. Surely, there are more efficient ways to teach reasoning, actually teaching it for one. After all, if every class that claimed to teach reasoning ("critical thinking") really did, then the viewer's situation would be far less familiar than it is. And, for those who might think the following, insofar as "good students" are better reasoners than those less studious (which, as far as I can tell, is by no means generally true),

their reasoning abilities cannot be attributed to their success in school. If anything, the reverse attribution would be more applicable.⁵

Naturally, objectors will rationalize the absence of reasoning education. They'll most likely contend that math is learnable and reasoning is not. This, they'll say, is because math is universally governed by a set of formalized rules, whereas reasoning can't transcend subjectivity. Thus (maybe the thought would go?), reasoning is an aptitude that some people are born with and others are not. Let's think about this. What if it's not this belief that motivates us to exclude reasoning from the curriculum, but our neglect for reasoning in schools that motivates this belief? If we didn't teach people math we would be liable to assume, wrongly of course, that math can't be taught and that one's ability to do math is therefore inflexibly innate. As it happens, some people are naturally better at reasoning than others, just like some people are naturally more mathematical, or musical, or what have you, than most. It only makes sense then, that where these skills are not taught in school, people are bound to be only as good at them as their nature makes possible. However, we don't assume that mathematical or musical abilities are inflexible, nor should we! Why, then, based on present-day educational inaction, do we appear to assume that reasoning can't be taught?

Granted, reasoning, unlike math, is to a certain extent subjective. Our reasoning process is inseparable from our knowledge, life experiences, emotions, and other human factors that vary in character from person to person and from time to time. However, just because reasoning is an impure process does not mean that all reasoning is therefore equal.

There are still better and worse ways to reason with what we have and there are things we can learn as K-12 students to markedly improve our skills. In fact, that reasoning is somewhat ambiguous by nature is more, not less, reason to teach it in school. After all, reasoning skills are life changing and everyday. Is anything but trying to teach them to every child just?

It's worth further contesting the belief, in case it lingers and even if it's unpopular, that because all of us reason there are no better or worse ways to do it. It's true, everyone is constantly reasoning. But, if this implies anything at all, it's that we should feel compelled to teach children how to reason *well*. Sure, we are free to form beliefs based on any criteria that "works for us". We can believe things because they have long been held true, for example. Likewise, we are free to call the sum of seven and three seventy-three because "it looks right". But, where we want to figure out what's true, we should have no problem acknowledging that it is best to believe things based on whether or not they follow logically from factually correct premises, just like it is best to do math according to the rules thereof. There is such a thing as bad math (e.g. $7+3=73$), and there is such a thing as bad reasoning (e.g. appeal to tradition⁶). Seven plus three does not equal seventy-three and nothing is necessarily true just because it has long been believed. No matter how strongly anyone disagrees with them, these are facts. And, just as we "do the math" accordingly, we should "do the reasoning" accordingly too, at least as best we can.⁷

The basic principles of reasoning are like the basic principles of math in that they are not arbitrary constructs. There is a reason we cannot program computers with invalid arguments!

Theorists have labored to discover the fundamentals of reasoning for at least as long as they have concerned themselves with the fundamentals of mathematics. We know reasoning that is valid is better than that which is invalid. We also know evidenced and/or axiomatic premises are stronger than unevidenced and/or controvertible ones. And we know more about reasoning that should be taught in school.

What, then, would it look like to teach general reasoning skills in school? I am not going to pretend to be exactly sure, as I have not set out to answer this question. Though, I am sure that it can be answered. I will say what I think, however arbitrary the thought. In order to teach children general reasoning skills, students must begin to engage metacognitively in the subject of reasoning in kindergarten and continue to engage in it all the way through 12th grade. At least once or twice weekly. I would imagine that in this time successful teachers of reasoning would introduce their students to philosophy, psychology, practical reasoning, informal logic, probability and statistics, decision theory, information literacy, the “scientific method”, and so on. A half-year philosophy course in high school simply won’t do (would be nice). Only by methodically and consistently engaging with knowledge explicitly relevant to general reasoning will students develop a healthy rationality. By year twelve students should be better able to seek truth, avoid intellectual oppression and control, evaluate arguments, deal with cognitive bias, judge information as (un)reliable, and more, than had they not engaged in the subject at all. This is to say, they should become better reasoners. And, thereby, we would expect their performance in other school subjects to improve⁸! Still, the goal of these lessons would be to better the lives of students outside of the classroom, by refining and fortifying their reasoning

process. We don't want anyone to be easily taken advantage of by obviously bad arguments. Conversely, we want everyone to be able to recognize their own best interest and reach their intellectual potential. We want intelligent, free minds, because they are possible.

Undoubtedly, this proposal will be dismissed as unrealistic by some. To these people I would simply point out that school as it is is "unrealistic". The thinking student's favorite question is "why are we learning this?", and rarely is the teacher's answer satisfactory (through no fault of their own; often there's no clear reason). It's important to build a foundation in a wide range of subjects, yes. But, not everyone will need to expertly write essays, or do math, or consider history, or whatever it may be day-to-day. However, I can guarantee you that everyone will need to reason everyday, and anyone who wants to maintain a free and honest intellect will need to do it well. If there is one subject to teach in school it is reasoning. And, I bet if you ask teachers who are burdened year after year with bureaucratic regulations and reforms, they'll agree that things as they stand are not so "realistic". I'm not about adding to their burden. I'm only suggesting that we seriously rethink our curriculum's priorities and our culture's metacognitive commonsense. Especially now that people can educate and miseducate themselves online where all of humanity's information and disinformation awaits reasonable and unreasonable minds, and motivated and unmotivated learners, indiscriminately. And we should probably start this rethinking in the colleges of education where teachers are trained.

In brief, I have tried to show that it is absurd to be okay with the fact that countless people are all of the time falling victim to terrible arguments. I've argued that this state of

affairs is unjustifiable, and that we can change it for the better by adding reasoning to the K-12 curriculum. Now, I'll explain why we should.

First, let me acknowledge a worry. Advocacy for Logic and Reason taken to the extreme tries to mechanicalize the natural, quantify the unquantifiable, and in general oversimplify humanity. That's not at all my goal. We need a "logic" guided by empathy (if there's a most important sentence in this essay, it's this one). In the absence of emotion – even though at least as far as we can utilize them the two are inextricable – reasoning can be severely inhumane; we have to decide what to reason about after all. For example, we can utilize reasoning to help revitalize indigenous languages or to build more efficient weapons of mass destruction. Between them, which we should choose is obvious thanks to our humanity, not thanks to reason in and of itself. The Human Spirit goes deeper than reasoning can. Furthermore, I have not argued that there is a "right way" to think (there obviously isn't), only that there are better and worse ways to *reason*. In fact, I think reasoning is a creative process, one that certainly benefits from, if not ultimately requires, viewpoint diversity. In certain circumstances it can also be smart to be unreasonable. But, at the same time, at no point in your life would better reasoning make you worse off. Therefore, I believe the more present danger is not overemphasizing reasoning, but underemphasizing it.

To not teach reasoning in schools is to accept political dysfunction. To the extent we want to live in a reasonable society, we need a reasonable citizenry. We don't want others to be easily manipulated such that they act against the collective best interest, for example. Every

social condition that's desirable is achieved collaboratively, in communities, in countries, and on Earth. It is very difficult to collaborate with unreasonable people. And yet, seemingly all we do is complain about unreason (the alternative clearly being to actually address the indeed very serious problem by teaching children the reasoning basics). Thankfully, we don't think of the people who cannot do math because they haven't learned how to as inherently unintelligent. We know they can be taught. And yet, we tend to call the least reasonable among us – people who have never had a chance to learn how to reason – “stupid”. This tendency is not only morally wrong, but factually baseless too. There is no such thing as an intrinsically unintelligent person, there are only people who have learned how to reason and people who have not had the same good fortune. And here I have in mind the prevailing idea of what intelligence is, which is itself deeply flawed, and whose collapse under minimal scrutiny is further evidence to my thesis that there are no inherently “unintelligent” people. But that's for another essay. Anyways, there is nothing great about “us and them” thinking with respect to reason and unreason. I reject it, but I'll adopt it momentarily. Let “us” not just complain; let “us” make it “our” responsibility to teach “them” reasoning for everyone's sake, and, as you'll see, most sincerely for “theirs”. You don't need to know a lot about the world in any sense at all to identify a bad argument. Good reasoning is something anyone can learn, and whether or not it's recognized to be, it's a basic human right that everyone deserves (think of it like we think of literacy).

Would effective reasoning education put an end to motivated reasoning? No, of course not. There will always be unashamed irrationality, even among those who know how to reason. Would there be people for whom good reasoning is very difficult to internalize? Yes, for sure.

Although, children's minds are remarkably flexible and adaptive (consider the scope and variety of world cultures and technologies to which we have adapted). There is no reason to think that children wouldn't be able to learn how to reason well under the right circumstances. Would every social problem be solved if reasoning was taught in school? Not to be expected. Wouldn't we be collectively better at problem solving, though? And wouldn't we be better able to prioritize which problems to solve? But, not only is our disregard for reasoning politically disadvantageous, it is much more so, even if less obviously, for individual persons.

Remember the shopper and viewer? It's clear in what way the shopper is taken advantage of, they are effectively robbed of \$41.76. But, how is the viewer taken advantage of in any way comparable? What does it matter that they gain an unreasoned belief, namely that we can't fight climate change? Without getting into the specifics of this particular thought, whose consequence is self-evident, I'll answer. Historically speaking, we are lucky to live in a time and place in which physical force is not acceptably used to coerce and control. We enjoy our freedom. Or so we think. As it turns out, institutions and individuals have not stopped exercising influence and control over us. Their means of doing so have simply changed from force to arguments.

If I am a fossil fuel corporation, I not only want you to, I need you to believe that climate change is not worth fighting, irrespective of the truth of the matter. If I am a political candidate, I don't just want you to believe that certain people are bad, and that I will fix things, I need you to believe it, whether or not it's true. If I am selling you a product, it's not enough to

want you to think it's great, I need you to think it's great, and I need you to think you want it. For business to go on as usual, you need to believe things. The same goes for journalism. Immoral actors benefit from your indifference. The downtrodden benefit from your empathy. Fundamentalism requires dogmatism. Progress requires advocacy. State-corporate entities manufacture ignorance. Universities manufacture "knowledge". All of these things make arguments with the explicit goal of changing your beliefs, even when there's no legitimate argument to be made. If you cannot reason, then, you will take seriously invalid, unsound, and otherwise objectively bad arguments, and as a result you will believe false things. And, no matter the truth or falsity of your beliefs, no matter the strength or weakness of the reasoning process by which you came to them, you will think and act on their basis. This is just to say that those who cannot reason well are bound to be unfree because they can be easily influenced and controlled by illegitimate arguments. The freethinker, on the other hand, defends themselves from certainty and disinformation; the freethinker keeps an open mind; the freethinker pursues truth critically; and therefore, the freethinker reasons well, necessarily. Where there is not freethought, there's not likely to be freedom in any real sense.

If you're confused at all, it might be helpful to adopt the following idea. To extend the analogy, just like we participate in monetary transactions, we participate in what could be called 'belief transactions' too, when we try to convince others with our arguments and when others try to convince us with theirs (where beliefs are the currency, the value or disvalue of which corresponds to their proximity to truth). Belief transactions happen everyday, many times daily in fact, and most often implicitly. Friends and family, social customs, news,

advertisements, teachers, whatever; insofar as anything can affect your beliefs at any given time, it makes an argument. For example, a plainly stated fact is an argument, granted not always a good one. The fact itself is a conclusion that is inferred, if at all, from implicit premises. The goal of the statement is to get you to believe it. Even more abstractly, that everyone cuts their lawn, for instance, is an argument on this view. This is because when you observe those around you cutting their lawn, you come to believe, or not, that you should cut yours (“because everyone else is doing it”). Most belief transactions, though, involve multiple inputs and are drawn out over long periods of time. There is no default set of beliefs or behaviors, yours you’ve come to transactionally – you’ve encountered arguments that lead you to them.

Really, we can say that arguments are everywhere, oftentimes implicit and other times explicit, constantly pushing and pulling on our beliefs. If you cannot or do not reason about the arguments you encounter, you’re likely to end up acting rather mindlessly against your best interest, or, at least, in ways you wouldn’t had you reasoned about them. The shopper loses money in an illegitimate monetary transaction because they do not know the first thing about math. The viewer gains a false belief in an illegitimate “belief transaction” because they do not know the first thing about reasoning. If either knew just the basics, they would have come away much better off. But, as they stand, neither the shopper or the viewer knows what they have lost (money and freethought respectively). How could they? If you’ve not learned anything about reasoning, it’s almost certainly the case that more than a couple of your beliefs are untrue (we all have some number of false beliefs). You wouldn’t know which because you can’t help but believe

them, by definition. You can retrospectively assess the integrity of the process by which you came to them, though. Unlearning and learning are equally important. Anyhow, to go on without making an effort to be reasonable is to go on losing money (gaining false beliefs) left and right, without even knowing it.

Consider once more the viewer. Maybe the news host is propagandizing a special interest. Maybe they are arguing fallaciously despite knowing it's illegitimate to do so. More likely, though, the news host is arguing in good faith. That is to say, there's a decent chance the news host *genuinely believes* what they are saying. Not everyone who argues poorly sets out to maliciously influence others. Don't get me wrong, some do. But, a lot of the time those who argue fallaciously to false conclusions don't know what they are doing because they themselves cannot reason well. Their arguments are honest.

A retail example of this phenomenon would be the average climate change denier living in a flood zone. Such a person sincerely wants whatever is best for themselves, their children, their grandchildren, and maybe even for their country. They genuinely believe, on the basis of poor reasoning (this they don't know), that climate change doesn't pose a problem for anyone or anything they care about. In fact, they may think the very concept of a climate crisis is altogether incoherent. So, when they argue that we need to concern ourselves with other things, from their perspective they *are* looking out for themselves, their children, their grandchildren, and their country. Little do they know that they are arguing against their own, and everyone

else's, best interest. Only well-reasoned individuals can break easily from cycles of unreason. And, some such cycles are very dangerous; irrationality is the motor of immorality.

Isn't ignorance bliss, though? No, not really; sure, unreasonable beliefs can be consoling, but, as the antithetical aphorism goes, the truth will set you free. Never mind the pragmatic case above, the value of true belief was best elucidated by Plato in the "Allegory of the Cave"⁹, thousands of years ago. In the Allegory, there are "prisoners" who are chained such that they always face the back wall of a cave, from birth. Shadows are projected onto the wall by people who walk back and forth along a bridge behind them. These shadows and the noises of their creators make up reality for the prisoners, who never realize that they are in a cave, let alone that there is an outside world. One prisoner escapes and is at first blinded by the sunlight. When things come into focus, his conception of reality collapses under the sensory experience of the "real world". Eagerly, he goes back down into the cave to free the others. But, his claims about the world outside are so foreign to the prisoners that they confidently dismiss him as crazy. You might conclude from Plato's Allegory that it's possible to not know what you're missing. To the extent you think that you have everything figured out, you are effectively a "prisoner" in Plato's Cave. Don't, like the prisoners, reject this possibility. Next time you consider a thinker to be aloof, test their thoughts against good reason. Maybe you're happy with your beliefs as they are. If so, why change a thing? The prisoners thought the same and were forever unaware how much happier they could be. Were they able and willing to reason thoughtfully, perhaps they would have made it out.

Holding poorly reasoned beliefs is in some ways a less manifest detriment than losing money, but it is one of more consequence (the viewer is worse off than the shopper, I think). Our beliefs make all the difference in our life, and the integrity of any given conscious belief depends on the learned process of reasoning. Therefore, it is our moral duty to teach every child how to reason well, for their own sake.

Everyone should have the chance to reach their full potential. All minds are owed a sense of possibility and wonder. Freethought is a grossly underrated freedom, but it is freedom in the truest sense of the word. It is something that everyone deserves, and it is something that everyone can attain.

Part II; Driving School for Reasoning

The next couple of pages concern a second analogy that some readers will find repetitive. I've included it because I suspect it may help those unclear to see the full scope of the idea. Furthermore, from it I transition nicely into a brief discussion of Philosophy for Children (p4c). Here it goes.

It would not make any sense if someone with no knowledge concerning the rules of the road or the elementary workings of a car could legally drive unsupervised on public roads. Most commuters would strongly oppose unregulated roadways seeing as their safety would be immediately compromised. And, not only would untrained and uninformed drivers pose a threat to other travelers, foremost they would imperil themselves. In order to drive, one must be familiar with the rules of the road (e.g. stop at a red light) and the elementary workings of a car (e.g. left pedal brakes and right pedal accelerates).

The purpose of driving school is obvious and communal. No driver wants to share the road with anyone who is unsupervised and wholly ignorant of the basics, nor, presumably, does any person want to endanger themselves by way of unpreparedness.

Now, imagine if everyone on Earth drove a car. Further imagine that very few of these drivers were taught the rules of the road and/or the elementary workings of their car, and that knowledge of these things was actually uncommon. I want to say that we are in this position

with respect to reasoning. In order to reason well one must know the basic rules of valid reasoning (informal logic) and the elementary workings of their brain (the car of reasoning). But, we do not teach children these things before we send them out into the world to reason! And, as you would expect, the world as a result is a wildly unreasonable place (in some ways that's actually a great thing, but there are many ways in which it isn't). Everyone is out there reasoning, and only a minority are lucky enough to have actually learned how to reason at all. It's as if we assume that everyone just knows how to reason well by default. This is not a good assumption for apparent reasons (for one, a majority of people don't!); it's analogous to assuming that everyone knows how to drive naturally and therefore no one needs to be taught how at any point before they take to the roads. None of us, I don't think, would take this bet.

The good news is that like driving, basic reasoning can be learned by anyone. Anyone who witnesses a car driving on the wrong side of the road at twice the speed limit recognizes immediately that what's going on is bad driving. But, take an equally obvious case of bad reasoning: say someone fallaciously "argues from ignorance"¹⁰. Far fewer people realize that this move is totally illegitimate. Nevertheless, like the reckless driver is in complete violation of the rules of the road, the lazy reasoner is in complete violation of the rules of valid reasoning.

Now, of course there should be nothing at all close to "enforcement" of the rules in the case of reasoning, no one would want to live in a world in which this was the case. It's not as though we should require a license to reason, that would be equally problematic. The analogy to

driving does not extend nearly that far. But, shouldn't we teach people how to reason, for their own and everyone's well-being, just as we teach drivers-to-be how to drive for the same reason?

We know what the rules of the road are (stop at a red light, proceed slowly at a yellow, go at a green, turn left from the left lane and right from the right lane, give the main road the right of way, etc.) and what counts as knowledge of the elementary workings of one's car (knowing which pedal accelerates and which brakes, knowing how to put the car into park, knowing where blind spots are, and so on). What, then, are the rules of valid reasoning and the elementary workings of (our car of reasoning) the brain?

As far as we're concerned, the rules of valid reasoning are simply the rules of logic, which we can think of informally. "[Informal logic] combines the study of argument, evidence, proof and justification with an instrumental outlook which emphasizes its usefulness in the analysis of real life arguing."¹¹ Informal logic provides us with an analysis of everyday argumentation from which we can derive generic rules of good reasoning. Many of these rules are negative rules in the sense that they tell us what *not* to do. That is, they tell us what kind of reasoning is invalid.

What are the "elementary workings of the brain"? Much like a car, our brain works in certain ways, and in order to operate it effectively we ought to know, at a basic level, how it tends to work. Without reading beyond it, answer this question: A bat and a ball cost \$1.10, the bat costs \$1 more than the ball, how much does the ball cost?

Most people will say ten cents. But, in order for the bat to be one dollar more than the ball, and the total to be one dollar and ten cents, the ball must cost five cents. This is one example problem of many – in which cognitive reflexes common to all humans make it difficult for us to perform easy reasoning tasks – from Nobel laureate economist Daniel Kahneman’s book “Thinking, Fast and Slow”¹². Objectively, it’s a very easy problem to solve, one that a computer could be programmed to solve quickly. For humans, something makes it difficult. Even if you got it right (in which case you should try the one at the end of this document¹³), why did it take so long? Our brain defaults to shortcuts – many of which are helpful most of the time – that can impair our reasoning process. These shortcuts are called cognitive heuristics, and they pervade our thinking. We are also cognitively biased in certain ways. For example, we tend to seek out and better recall information that confirms our preconceptions by a phenomenon called ‘confirmation bias’¹⁴.

There are hundreds of cognitive biases and heuristics, many of which come into play everyday. These facts of our cognition are analogous to the workings of a driver’s car. Before you drive it’s helpful (and necessary, no?) to have a rough idea about your car’s turning radius, and your car’s braking distance, for example. In the same respect, before you can reason effectively you need to know your brain’s tendencies, to neglect base rate information for instance¹⁵. Knowing how your brain works affords you the chance to correct for unhelpful imperfections – at least to some considerable degree – that otherwise naturally steer you away from quality reasoning of which you are capable.

By the very nature of our thinking process we do not reason perfectly, but because children aren't taught this fact about themselves, many go on into adulthood implicitly assuming that they do. And this unthought assumption leads to another, namely that the truth of any given matter is whatever they think it is. But, to assume that the truth must make sense to us, to assume that it's something we *know*, is to be recklessly self-confident. That matters of fact do not necessarily accord with our beliefs about them is an essential understanding. What's true is true, whether we know it or not and no matter how intensely we may believe it's false, and the same goes vice versa. If there isn't a teapot revolving around the sun, then there isn't a teapot revolving around the sun, even if I believe ever so strongly, for whatever reason, that there is. Truth does not fall into our lap, we need to actively and never-endingly quest for it, and we must reason if we can hope to approximate it. And, in order to reason well we need to know certain things about the process and about ourselves.

By no means is knowledge of the rules of valid reasoning and the elementary workings of the brain sufficient for good reasoning. But, a basic understanding of logic and cognition is necessary. It's a foundation from which reasoning skills can be developed. This is true in the same way that one needs to know the rules of the road and the elementary workings of their car in order to drive well. Yes, we all reason everyday. But, until we all learn how to reason, like we learn how to drive, the roads of reason will remain hazardous, and individual thinkers will be ill-prepared to navigate themselves to the places they want to go.

What we need in K-12 education is a driving school for reasoning.

Part III; p4c as Practice

A critical part of the process of learning how to drive is practice. New drivers learn in the company of experienced ones, in settings (maybe an empty parking lot, or in a car that includes a brake at the passenger's foot for an instructor) that are forgiving of mistakes. In school, there seems to be no analogous exercise. That is, "students of reasoning" start on the public roads. Their judgments from the beginning are evaluated on correctness by grades. This incentivises students to "drive to their destination", to reason to their answers, not in accordance with any principles, but just in some way that gets them there (rote memorization, say).

The practice of Philosophy for Children (p4c) is the practice of reasoning without penalty. Longtime practitioner Thomas Jackson puts it in terms of 'Intellectual Safety'. He writes, "All participants in the community [of inquiry] are free to ask virtually any question or state any view so long as respect for all is honored."¹⁶ Resources such as "The Good Thinker's Tool Kit"¹⁷ lay out a set of reasoning habits for students to practice. One of the p4c facilitator's roles is to gently guide students towards better reasoning. They do this in a manner that is always mindful of the fact that in order to improve at something one must practice it freely. That is, one must not be judged by their mistakes and instead be encouraged to learn from and keep risking them! Moreover, because p4c inquiry has no known destination or right answer, students can do nothing but reason to their conclusions. It's by no means clear that p4c is sufficient for developing reasoning skills, but something like it seems necessary to the extent practice is.

And, as an important aside, p4c is so much more than reasoning practice. It looks like students and their teacher sitting in a circle inquiring together, focused on a central question that they, “the community of inquiry”, decide(s) upon. This activity, done well, is of tremendous *intrinsic* value; so much in fact that I can’t describe (assuming it’s goodness is describable) all that’s good about here. Though, one thing in particular that I love about p4c is its relationship to empathy. Remember the “most important sentence in this essay”? “We need a “logic” guided by empathy.” With respect to this statement, what’s valuable about the practice is that students and teachers share, on an equal plane, their diverse ideas, experiences, knowledges, and thought processes. Participants’ worldviews necessarily broaden, and oftentimes deeply personal things are brought up in conversation. It’s impossible to come away from a p4c session without more empathy. We tend to look at ourselves subjectively and others objectively. p4c improves our ability to do the opposite.

Philosophy for Children originated with the late Matthew Lipman, a professor of philosophy at Columbia University. He founded p4c because:

“Back in the Early ‘70s, when my own children were about 10 or 11 years old, the school they were attending did not give them the instruction in reasoning that I thought they needed. I was teaching logic at the college level at the time, and I felt that I wasn’t accomplishing very much with my students because it was too late; they should have had instruction in reasoning much earlier. So I decided I would do something to help children at the middle school level learn to reason.”¹⁸

He goes on in the same interview to say:

“The most important thing that we can do for young children is teach them to think well. If we’re serious about wanting to teach students to think, we’ve got to go about it in a responsible fashion. This means giving students practice in reasoning, through classroom discussion involving concepts that reach across all the disciplines rather than those that are specialized within each subject.”

Let’s get serious about teaching students how to reason well.

Annotations

¹Which fallacy the argument exemplifies depends on whether we understand its disjunction, its 'or', to be exclusive or inclusive. For reference, here is the argument: "*We can look out for everyday Americans and bolster the economy, or we can fight climate change. Obviously, we need to look out for everyday Americans and bolster our economy, so we can't address climate change.*" An exclusive disjunction ('or') allows only one of two or more propositions to be true (think "either this or that"). So, if we take it to be exclusive, then the argument is fallacious because it presents a "false dilemma". An inclusive disjunction ('or') allows both propositions to be true. If we take it to be inclusive, then the argument is fallacious because it "affirms a disjunct".

²A reasoner who unfairly presents two (black and white) alternatives and implies that one (and only one) of them can and must be chosen is using the False Dilemma Fallacy (Internet Encyclopedia of Philosophy, <https://www.iep.utm.edu/fallacy/#FalseDilemma>).

³One premise is a disjunction (a statement with 'or'), the other premise affirms one of the disjuncts (one of the two statements separated by 'or'), and the conclusion denies the other disjunct (Florida State University Math, <https://www.math.fsu.edu/~wooland/mad2104/logic/rules.html>). Consider a simpler argument of the same form. *Tom is polite or quiet.* (True, he may be polite, or quiet, or any number of other things). *Tom is polite, so Tom is not quiet.* Clearly, Tom can be both polite *and* quiet, and the fact that he is polite has no bearing whatsoever on whether or not he is quiet. In just the same way we can bolster the economy *and* address the climate crisis.

⁴In fact, the argument would be just as bad if it went like so: "*We can look out for everyday Americans and fight climate change, or we can bolster the economy. Obviously we should look out for everyday Americans and fight climate change, so we can't bolster the economy.*"

⁵See Elizabeth Oljar and D.R. Koukal's "How to Make Students Better Thinkers": <https://www.chronicle.com/article/How-to-Make-Students-Better/245576>

⁶A fallacious argument that presumes something is true just because it's long been held true.

⁷Just to be clear, I'm talking about truth in one sense of the word and not in any other. Nothing akin to Truth (with a capital T, of spiritual significance) can be attained by any process of empty reasoning. In this essay I'm concerned with simple truths, those we argue about day-to-day, such as whether or not we should fight climate change, and I'm interested in improving people's ability to approximate them (because I think that we can and that it's morally problematic that we don't even try to).

⁸As to quantitative performance in standard subjects, research on the effect of instruction in general reasoning is limited. The most comprehensive study to date of p4c concludes that the practice impacts positively test scores across subjects. The paper:
https://www.researchgate.net/publication/305787078_Evaluation_of_the_impact_of_Philosophy_for_Children_on_children's_academic_outcomes

⁹Here's the text: <https://web.stanford.edu/class/ihum40/cave.pdf>

¹⁰The Fallacy of Appeal to Ignorance comes in two forms: one, not knowing that a certain statement is true is taken to be a proof that it is false and two, not knowing that a statement is false is taken to be a proof that it is true. The fallacy occurs in cases where absence of evidence is not good enough evidence of absence. The fallacy uses an unjustified attempt to shift the burden of proof. The fallacy also goes by "Argument from Ignorance." *Nobody has ever proved to me there's a God, so I know there is no God.* This kind of reasoning is generally fallacious. It would be proper reasoning only if the proof attempts were quite thorough, and it were the case that, if the being or object were to exist, then there would be a discoverable proof of its existence. Another common example of the fallacy involves ignorance of a future event. *You people have been complaining about the danger of Xs ever since they were invented, but there's never been any big problem with Xs, so there's nothing to worry about.* (Internet Encyclopedia of Philosophy, <https://www.iep.utm.edu/fallacy/#FalseDilemma>)

¹¹(Leo Groarke. Informal Logic. The Stanford Encyclopedia of Philosophy.
<https://plato.stanford.edu/entries/logic-informal/>)

¹²(Daniel Kahneman. Thinking, Fast and Slow. New York: Farrar, Straus and Giroux.)

¹³*Alex, who is married, is looking at Bailey. Bailey is looking at Cam who is unmarried.
Is there a married person looking at an unmarried person?*

Many people will say that there is not enough information. But, there is. While we don't know Bailey's marital status, we do know that for any person, that person must be either married or unmarried. If Bailey is married, then Bailey looking at Cam is a married person looking at an unmarried person. If Bailey is unmarried, then Alex looking at Bailey is a married person looking at an unmarried person. So, the answer is yes, and we know it with certainty. This isn't from "Thinking, Fast and Slow", but again it's an objectively simple problem that is for us hard to solve because of certain facts about how our brain reasons.

¹⁴Confirmation bias is the tendency to look for evidence in favor of one's hypothesis and to not look for disconfirming evidence thereof, or to pay insufficient attention to it (Internet Encyclopedia of Philosophy, <https://www.iep.utm.edu/fallacy/#ConfirmationBias>).

¹⁵Here is a good example of “base rate neglect”, from Francis E. Su, et al.:
<https://www.math.hmc.edu/funfacts/ffiles/30002.6.shtml>

¹⁶(Thomas Jackson. Philosophical Rules of Engagement. Routledge: An Introduction for Philosophers and Teachers, 1st Edition.)

¹⁷Here:
<http://p4chawaii.org/wp-content/uploads/PI-Good-Thinker%E2%80%99s-Tool-Kit-2.0.pdf>

¹⁸(Ron Brandt. On Philosophy in the Curriculum: A conversation with Matthew Lipman. Association for Supervision and Curriculum Development Publications.
http://www.ascd.org/ASCD/pdf/journals/ed_lead/el_198809_brandt3.pdf)