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36. Logic: How to Do it Wrong

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Logic and Logical Fallacies

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Brilliant People Believe Nonsense [because]...

They Contradict, Leave out Valid Options and Knock down Straw Men

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"Anyone who denies the law of non-contradiction should be beaten and burned
until he admits that to be beaten is not the same as not to be beaten,
and to be burned is not the same as not to be burned.

— Avicenna

Those Who Question Logic

To the mind that's yet to be "enhanced" by some strains of modern thought, the above quote probably comes across as amusing, but useless. After all, who would deny something as basic as the law of non-contradiction or the basic laws of logic? If saying "My roommate annoys me" is no different than saying "My roommate doesn't annoy me," then how can we ever say anything meaningful? Moreover, the very act of denying non-contradiction assumes the law to be true.

Yet, some argue that our brains, like our opposable thumbs and other body parts, evolved not to perfect our logic, but to optimize our survival. According to these thinkers, when early man moved up in the world from hunter-gatherers to the African Delta, survival of the fittest favored those who learned to cooperate to grow crops, raise families, and breed domestic

animals. Thus, our brains evolved to foster domesticity, rather than think through logically rigorous legal or scientific or philosophical arguments.[1]

(Digression: Surely it's equally plausible, even when reflecting upon recent history, that evolution should favor brains that are ruthless and conniving; employing a logic that's better suited to achieve selfish ends than to seek truth. When dispassionately objective intellectuals taught ideas that displeased Stalin, he removed them from the gene pool by the thousands. Thus, a large portion of 20th century man, under such regimes as Lenin, Stalin, Mao, Hitler, and Pol Pot, survived by suppressing their creativity and independent thought and perfecting a "don't piss off the morons in charge" type of thinking. In my mind, it would be difficult to prove that long ago, living in small communities on the Delta, brilliant misfits would have survived any better.)

Thus, following this naturalistic line of argument, our brains developed primarily for primitive survival, not to reflect accurately on the great scientific theories of cosmology or macroeconomics or to develop rigorous rules of logic. Those who walked about the early Delta with their minds distracted by such matters were almost certainly eliminated from the gene pool by animals higher up on the food chain.

Rather than being equipped for higher level thinking, according to this theory, we find our brains uniquely suited to think in ways that enhance our self-confidence, enable us to compete, socialize, and convince the opposite sex to mate with us.

What if everyone played the "caveman" card?

I eat meat because cavemen ate meat!

I poop in my yard because cavemen pooped in their yards.

I chew lice out of my wife's hair because cavemen chewed lice out of their wives' hair.

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As a result, today's brains should resonate more with *Glamour Magazine*, *Playboy and Sports Illustrated*, than *Physics Today* or *Philosophy Now*. In its favor, this theory successfully predicts the type and quality of magazines available for purchase at service station check-out counters. Such academics as Psychologist Susan Blackmore and Philosopher Alex Rosenberg similarly argue that our brains, in their present state of evolution, deceive us in many ways and can't be trusted. Why then should we trust in the ability of our empirical investigations or logical argumentation to help us find truth?[2] Without recounting the intricate details, I should also mention that eighteenth century philosopher David Hume argued, with breathtaking influence on modern thought, that taking empiricism to its logical conclusion leads to skepticism concerning any certain knowledge. His works, and many who built upon his foundation, have led some contemporary intellectuals to a

thoroughgoing despair of finding truth through science or logic or any other means.[3] This is all to say that if you read widely, you'll run across many who teach that all truth is relative and a search for truth is futile. Rather than set forth a defense of our ability to find truth, or at the very least that we have the ability to weed through nonsense in order to get *closer* to the truth, I'll just note that I've never found a thoroughgoing skeptic who lives consistently with his skepticism.

As soon as he opens his mouth or wields his pen, he begins making statements that depend upon the very laws of logic he denies. When Blackmore argues that our minds deceive us and can't be trusted, why does she go on to write the next chapter? If *she* really believes what she wrote, she can't trust *her* reasoning. If *I* believe what she wrote, I can't trust in either the accuracy of her writings or my ability to interpret them. So why keep reading? After a professor teaches his students that we can't know truth, no sooner has he left the classroom and met his department chair than he engages her in an argument, based upon the facts and logic he denies in class, about his deplorable salary. And he certainly won't be satisfied if his boss responds that the argument is pointless because all truth is relative.

In the end, whether you claim to be a thoroughgoing skeptic or a believer in our ability to find truth, logic would seem useful, at least in arguing for a raise. So since this isn't a book on epistemology, let's proceed as if logic is indeed useful, and try to sharpen our ability to use it.

Quiz Me

Logic is questioned by:

[mark all correct answers]

☐ **a.** people who read Glamour Magazine or Sports Illustrated

☐ **b.** psychologists like S. Blackmore

☐ **c.** philosophers like A. Rosenberg

Check Answer

The Syllogism* as a Useful Starting Point

Increasingly, I find myself putting complex, convoluted, or long-winded arguments into the form of syllogisms in order to evaluate them. The value of this process was demonstrated to me at a recent philosophical conference. I was astonished to hear a philosopher attack a 450 page book by reducing the author's line of argument to a simple, three-line syllogism. If the philosopher succeeded, then no matter how many studies the author quoted, no matter how much data he accumulated, no matter how many more pages he wrote; if his line of argument was illogical, his conclusion wasn't warranted.

Here's the classic example of a simple, correctly formulated logical syllogism:

> **Premise 1:** All men are mortal.
> **Premise 2:** Socrates is a man.
> **Therefore:** Socrates is mortal.

The beauty of a correctly formulated syllogism is that if we agree with the premises, then we must agree with the conclusion. Do you agree that all men are mortal? Do you agree that Socrates is a man? If so, then you *must* believe that Socrates is mortal. It's a logically air tight argument.

To evaluate someone's argument, try to put it in a syllogistic format and focus on two questions:

> 1. Do you agree with the premises? (Are they either intuitively obvious or well-supported by evidence?)
>
> 2. Does the conclusion logically follow from the premises?

Of course, arguments can get quite complicated, requiring complicated syllogisms to replicate them in logical form. If you're interested in exploring the more complex forms, study deductive logic. But I find that basic syllogisms suffice to evaluate the vast majority of meaningful arguments, even when evaluating chapters or entire books.
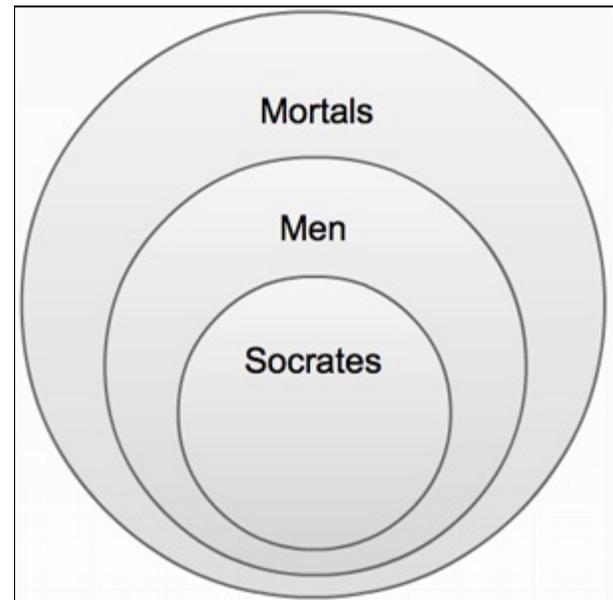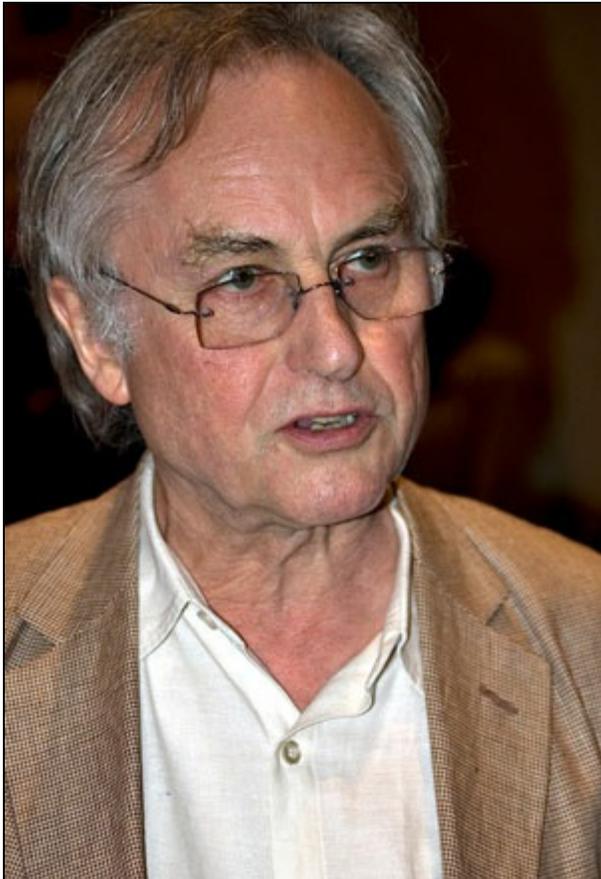
Breaking arguments down into their relevant premises and a conclusion is formulating a

_____.

Check Answer

Let's Analyze an Argument!

Let's start with an argument proposed by a bright person and analyze it. Here are a couple of formulations of an argument put forth by Richard Dawkins, a popular science writer who once taught at Oxford University.

In his book, *The God Delusion*, Dawkins seeks to establish atheism, primarily by attacking theism. But he does present one positive argument for atheism, which he claims demonstrates that there is almost certainly no God. Dawkins believes the argument is devastating to theism— "an unrebuttable refutation."[4] It makes for a good argument to examine, since Dawkins states it in a few sentences rather than arguing it extensively.

Here's how he puts it:

"...any creative intelligence, of sufficient complexity to design anything, comes into existence only as the end product of an extended process of gradual evolution. Creative intelligences, being evolved, necessarily arrive late in the universe, and therefore cannot be responsible for designing it."[5]

Later in the book, he puts it this way:

"The whole argument turns on the familiar question 'Who made God?', which most

thinking people discover for themselves. A designer God cannot be used to explain organized complexity because any God capable of designing anything would have to be complex enough to demand the same kind of explanation in his own right. God presents an infinite regress from which he cannot help us to escape."[6]

Think!

Before reading any further, try your own hand at responding to Dawkins. He says that he has "yet to hear a convincing answer" to his argument.[7] Do you think it's irrefutable? If the argument seems rather muddled to you, start by reading one sentence at a time and asking yourself, "Do I agree or disagree with this statement, and why?" Perhaps trying to put it in syllogistic format would help, or trying to express it as a line of argument. (Caution: Try not to let your personal worldview interfere with your reasoning. The question I'm asking is not "Is there a God?" but rather "Is Dawkins' argument irrefutable?")

Quiz Me

Dawkins makes a mistake in arguing against the existance of a God by:

○ **a.** failing to understand that the complexity of life points to a intelligent designer.

○ **b.** making an ad hominem fallacy.

○ **c.** making a bifurcation fallacy.

○ **d.** making a non contradiction fallacy.

Check Answer

Using a Line of Argument* and Syllogism to Clear Muddy Waters

*Line of Argument

If I understand Dawkins correctly, here's his line of argument:

There are only two possible ways that God's existence could be accounted for:

1) He was created by another being. But that explanation doesn't really help because then we have to ask, "Who made *that* designer, and the one who made him?" which leads to an infinite regress of questions which we can never fully answer.

2) He slowly evolved through time. But if He evolved, He would not have developed His incredible intelligence and power until *the end* of a long process of evolution. Yet, in order to create the universe, He needed this intelligence and power *at the beginning*. Thus, He couldn't have created the universe. Besides, what are the odds that such a complex being could evolve through purely naturalistic causes?

Dawkins thus concludes that since both of these scenarios are highly unlikely, it's highly unlikely that God exists.[8]

Put in a syllogism, it might read like this:

Premise 1: If God exists, he must have come into existence by either being created by another being or evolving slowly through time.

Premise 2: It's highly unlikely that God came into existence by either being created by another being or evolving slowly through time.

Conclusion: It's highly unlikely that God exists.

Think!

Does laying it out as a line of argument and as a syllogism help? Do you think I did it accurately? Now think through the line of argument and syllogism. Do you agree with each of the premises? (Is it sound?*) Did Dawkins argue correctly from these premises? (Is it valid?*)[6]

Sound Syllogism

Valid Syllogism

As we continue with this chapter, we'll introduce some logical fallacies and apply them to both Dawkins' argument and the introductory discussion.

Fallacy #1: Bifurcation

Dawkins' argument seems to be a good example of a fallacy called bifurcation, whereby the

argument assumes that only two (note the prefix "bi", meaning "two") possibilities exist, whereas there are actually more. This fallacy is particularly pernicious because it seems to contain an element of sleight of hand. If it is presented by a person we respect or agree with, we tend to assume that his premises represent all possibilities and we focus on the validity of the argument rather than the accuracy of the premises.

So here's how Dawkins' argument appears to be guilty of bifurcation.

He assumes that there are two and only two possible explanations for the proposed existence of God:

> 1 - He was either created by another being, or

> 2 - He evolved by natural means slowly over time.

To justify limiting the existence of God to these two options, Dawkins should have eliminated a third, seemingly viable option: that God could have simply existed from eternity past. After all, until well into the 20th century, the majority of scientists saw no problem in believing that *matter* existed from eternity past. Why then could *God* not have existed from eternity past? Is there evidence (either empirical or logical) that if God exists, He could not have existed from eternity past (or, alternately, could not exist outside of time and space)? If there is such evidence, then Dawkins should forward it. Otherwise, his premises are misleading and inaccurate in that they unnecessarily ignore this option.[9]

To put it another way, Dawkins claims that there are two and only two ways the existence of God could be explained. By explaining those two away, he claims to have explained away the existence of God. Yet, he's ignored (or deflected his readers from) a third possibility which he needs to explain away as well: that God existed from eternity past. By overlooking this third option, his argument fails, falling to the fallacy of bifurcation.[10]

Other Examples of Bifurcation

- *"The Atlanta Falcons' loss to the New England Patriots was due to either inept play or poor coaching."*

But aren't there more options than two? Perhaps they lost primarily because of a brilliant strategy by the opposing coaching staff, or the Patriots quarterback was on a roll, or the injury to the Falcon running back caused the Falcons to resort to "Plan B" rather than "Plan A", or any number of other possibilities that the armchair critic needs to rule out.

- *"The president must be either insane or stupid to make that decision."*

What other factors may explain the decision? Isn't it possible that the president was privy to facts we weren't aware of, or had made a wise political bargain that required that decision,

or any number of other factors?

- *"What a despicable child! He obviously either inherited bad genes or has inept parents."* What are some other possible contributing factors to the child's behavior? Perhaps he's sick or tired or teething.

Tip: Bifurcation becomes easier to spot once you're aware of it. When someone presents two options as if they're the *only* two options, I immediately ask myself, "Are there more options than he's presenting?" Ask the same question if someone presents three or more options as if they're the only ones. We could call it "trifurcation," etc.

Fallacy #2: The Straw Man

I'm dealing in this chapter with arguments that are very common. Familiarize yourself with them and you'll begin to see them everywhere—in articles, news broadcasts, Facebook discussions— everywhere!

The Straw Man fallacy presents a weak form of an opposing argument so that it's easy to destroy it and declare victory. The writer or speaker never actually attacks the opponent's arguments. Instead, he avoids the opponent's arguments by "knocking down a straw man."

Dawkins seems to have erected and knocked down a straw man in the argument we considered above. In brief, he argued that it's very unlikely that an evolved or created God exists. But the vast majority of theistic theologians and philosophers of the Western world would likely agree with this statement. In fact, I don't believe I've ever met a theist who believes in a created or evolved God. So arguing against this kind of a God says nothing about the existence of the eternal God that most of Dawkins' opponents believe in.

Thus, Dawkins has set up an irrelevant straw man (or in this instance, a Straw God), and tried to disprove His existence. If successful, he merely succeeds in knocking down a position that his opponents never held. The philosophers and theologians he's attacking overwhelmingly define God as one who existed from eternity past (or exists outside time and space). Dawkins should have attacked the position held by those he attacks.

Michael Ruse, Professor of Philosophy at Florida State University, himself an atheist, criticizes Dawkins' argument in part for this very reason. He concludes:

"…I want to extend to Christians the courtesy of arguing against what they actually believe, rather than begin and end with the polemical parody of what Dawkins calls 'the God delusion.'"

Another Example of Arguing against a Straw Man

A friend remarks to you: "The last three winters have been colder than average. So much

for the theory of Global Warming!"

Your friend assumes that Global Warming advocates argue in this manner: "If temperatures are truly rising, *every year* and *every geographical location* should show increased warmth." But nobody argues this. It's arguing against a straw man. Global Warming advocates actually argue that *over long periods of time* the average temperature is increasing. Those who argue against global warming should argue against this rather than a straw man.

Quiz Me

A straw man fallacy is:

○ **a.** criticizing an argument for its lack of cleverness.

○ **b.** criticizing something the other person never actually said.

○ **c.** criticizing an argument by using so many small irrelevant points that the person is looking for a "needle in a haystack" in trying to figure out what to respond to.

Check Answer

Fallacy #3: The Law of Non Contradiction

Man has been accustomed, ever since he was a boy,
to having a dozen incompatible philosophies dancing about together inside his head.
He doesn't think of doctrines as primarily "true" or "false," but as "academic" or "practical,"

"outworn" or "contemporary," "conventional" or "ruthless.""[12]

— C.S. Lewis

In Chapter 9, I mentioned philosopher Alex Rosenberg's recent book. In it he argues, among other things, that:

1 - There's no free will.[13] Thus, according to Rosenberg, we think only what we've been determined to think (by our genetics, etc.) How we think is determined by evolutionary processes that often have nothing to do with producing logical thinking. I can't direct my own thinking because there's no "I" outside my brain to direct my thinking. Our brains are just advanced computers, and computers can't think "about" things. Consciousness is thus an illusion.[14]

2 - Our thinking is flawed. "Mother Nature built our minds for purposes other than understanding reality."[15]

3 - We can learn nothing from history or people's life stories.[16]

With that background, here's where I see contradictions piling up.

- **On changing people's opinions** - In his preface Rosenberg

  states that he wrote the book to help people discover the real answers to such questions as "Why am I here?" or "What is the meaning of life?" But if there's no free will, and all of our beliefs were therefore predetermined, how can he possibly hope to change anybody's opinion about anything? If evolution absolutely determines everyone's thought processes and beliefs, then how can he possibly trust his own mental processes or hope to change other people's thinking?

- **On urging life change** - Why does he keep urging us to action, if everything's determined and his urgings are therefore worthless?

  Rosenberg preaches, "We need continually to fight the temptation to think that we can learn much of anything from someone else's story of how they beat an addiction, kept to a diet...." But what does it mean to "continually fight" a temptation if we're already destined to fight or not fight, to either beat the temptation or fall for it?

- **On recommending a course of action** - By the end of the book he's recommending that we adopt the philosophical nihilism of Epicurus, not take ourselves so seriously, and take Prozac

  if you're unhappy that life has no meaning.[17] Can't he see that if we believed what he said earlier about that we can't learn anything from other people's life stories, we can also learn nothing from his own experiences and recommendations?

- **On learning from history** - He says we can learn nothing from history: "History, even when corrected by science, is still bunk."[18] But then he recounts history to make his points.[19] For example, how can we know if Prozac works, unless we accept the testimonies of other patients and rely on their stated medical histories?

Thus, it seems evident to me that Rosenberg's book is riddled with internal contradictions. Now perhaps if I asked Rosenberg personally about the apparent contradictions, he could clear them up. But in the present state of his book, they seem flagrant, leading me to

question many of his conclusions.

Sometimes contradictions are not so obvious. For example, a central tenet of Logical Positivists, whose views were very influential in the early 1900s (not only in philosophy, but also psychology and other sciences), expounded the verification principle, which can be stated as: "the only meaningful statements are those that we can verify through observation." Yet, their critics pointed out that this very statement (the verification principle) can't be verified through observation, making it self-contradictory, or self-defeating. In other words, they couldn't verify the verification principle with the verification principle, making it (to be consistent with Logical Positivism) a meaningless statement.

Well, that was rather embarrassing to Logical Positivists. This insight, in part, led to Logical Positivism's demise in the latter 1900s.[20]

Quiz Me

The law of non-contradiction establishes that a logical argument cannot contradict itself.

○ True

○ False

Check Answer

Summary

The arguments we've examined in this chapter were put forth by bright people with topnotch education credentials—often PhDs holding prestigious positions. If *they* are subject to falling for logical fallacies, how much more the rest of us?

Why do brilliant people believe nonsense? Because they fail to sufficiently check their beliefs against logical fallacies. How can we guard ourselves from similar errors in thinking?

Action Points

How to Spot Logical Fallacies and Keep from Using Them

1. Take time to think through arguments that are important to you.

Most don't. In fact, they barely even pay attention. Philosopher and scientist Francis Bacon once wrote: "Some books should be tasted, some devoured, but only a few should be chewed and digested thoroughly." For the latter books, articles or lectures, if the argumentation is complicated or unclear, I often summarize it with a line of argument, sometimes chapter by chapter. It takes a bit of time, but it keeps me from ending the book in a mental fog.

2. Don't be intimidated by credentials and claims.

Surely this is, in part, why people take nonsense promoted by well-credentialed people at face value. Never listen to anyone without engaging your critical thinking.

3. Beware of the tendency to uncritically accept the arguments of those you agree with, or arguments that have an agreeable conclusion.

Professor H. Allen Orr, in the *New York Review of Books*, reflected on Dawkins' argument and his way of arguing. According to Orr:

> "Indeed he suffers from several problems when attempting to reason philosophically. The most obvious is that he has a preordained set of conclusions at which he's determined to arrive. Consequently, Dawkins uses any argument, however feeble, that seems to get him there and the merit of various arguments appears judged largely by where they lead."[21]

4. Ask yourself, "Are there facts or personal experiences that don't fit with either the premises or the conclusion?"

When I read Rosenberg's argument that we can't learn anything from history or life stories, I couldn't help but reflect on the wealth of valuable lessons I've learned from observing people's lives and reading great biographies. For example, by watching people make wise and poor financial and health decisions, I've learned much from their successes and failures. My personal experience represents one strike against his conclusion, causing me to look more critically at his argumentation.

5. Put it in a syllogism(Or line of argument) and ask yourself two questions:

- Are the premises supported by sufficient evidence?

- Does the conclusion follow logically from the premises?

(To remember this point, reflect back on the **D**. **R**. of Dr. Cackler. Is the data complete and accurate? Is the **r**easoning from that data clear and accurate?)

6. Have others look at the argument.

Learn from Hewlett Packard's practice of running an idea by the person next to you. If the idea is important to you, discuss it with others. We all think a bit differently and it's very likely that others will see aspects of the issue that you don't see.

For example, Einstein once observed that scientists are typically poor philosophers. Whether he's right or not, psychologists do find people typically having strong and weak areas of reasoning. If a scientist is trying to reason philosophically, he might be wise to run his arguments by a philosopher. It's often wise to run important arguments by people who think differently from you.

7. See how others in the field respond.

Dawkins' argument is philosophical and the field of philosophy has a rich history of arguments concerning the existence of God. It would seem unlikely, though not impossible, that an expert in animal behavior (Dawkins) would dream up a slam dunk argument than never occurred to any great philosophical thinker from Plato to Immanuel Kant to Bertrand Russell. If Dawkins' argument were truly original and significant, I'd expect a loud chorus of respected philosophers to be hailing this argument's arrival.

Yet, the responses I've seen by philosophers and academics have been underwhelming at best. Philosopher William Craig went so far as to declare it "the worst atheistic argument in the history of Western thought."[22] Academic biologist H. Allen Orr noted that the argument was "shredded by reviewers."[23] For example, some attack the argument by noting that an explanation doesn't typically require an explanation of the explanation (responding to Dawkins' contention that theists must forward an explanation as to where God came from). In other words, if we were to visit the dark side of the moon and find an advanced, but long-abandoned (at least a century old, deduced from its state of natural aging) mining operation, where all the inscriptions were in a non-human language, wouldn't we be justified in positing that alien intelligences were behind it, *even if we had no idea how the aliens came to be or where they were from*? And it's not just theistic philosophers who find Dawkins' argument lacking.

Atheist Michael Ruse attacks Dawkins' argument in this way:

"Like every first-year undergraduate in philosophy, Dawkins thinks he can put to rest the causal argument for God's existence. If God caused the world, then what caused God? Of course the great philosophers, Anselm and Aquinas particularly, are way

ahead of him here. They know that the only way to stop the regression is by making God something that needs no cause. He must be a necessary being. This means that God is not part of the regular causal chain but in some sense orthogonal to it. He is what keeps the whole business going, past, present and future, and is the explanation of why there is something rather than nothing."[24]

Surely such rejoinders are legitimate challenges that Dawkins should respond to. Had he run his argument by some philosophers prior to publishing, perhaps he could have responded to their objections.[25]

Quiz Group

Think Different (Creative Thinking)

One of philosopher Immanuel Kant's most valuable contributions to practical human thought was his insight that we don't experience things entirely as they are. While some people insist that seeing is *believing*, we all know that seeing can also be *deceiving*. For example, Kant notes that we don't see objects directly. Rather, we're a step removed in that we see reflections of objects on our retinas. We take another step back from real objects when our brains bring our own interpreting mechanisms to those objects, such as "quality" or "cause and effect."

Modern psychology confirms and extends Kant's insight. We don't "see" the reflections on our retinas in the same way. While *you* may see a green object on your retina, *I* may see it as brown, since I'm color-blind to certain greens. And we're well aware of common optical illusions and misperceptions. That's why eye-witness testimony is often contradictory, even when the witnesses are honest. Often, what we see shouldn't be believed.

Example: You've probably seen illustrations such as this, where our minds fool us. How many "F"s do you see in this passage?

FINISHED FILES ARE THE RE

SULT OF YEARS OF SCIENTI

FIC STUDY COMBINED WITH

THE EXPERIENCE OF YEARS.

Most people see only three. That's all I saw the first two times I read it. Actually, there are six. (Look slowly at each letter and count again, perhaps starting at the end.) This is similar to the problem drivers have spotting motorcycles on streets where they are rare. We're watching for cars and trucks and may not see the motorcycles at all.

Example: Are the horizontal lines below curved or straight? Use a ruler or straight edge to see.
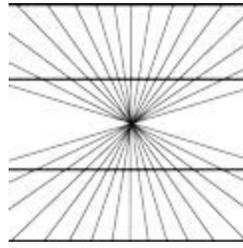
Fallacies such as bifurcation, like a good magician or an illusion, play on our brains' tendencies to see certain things incorrectly or to be distracted from crucial details. How can creativity help us to overcome distractions and wrong directions in order to innovate productively?

1. Broaden your range of input.

Who would you prefer to edit your writing?

   a) A dyslexic, who struggles to read well?

   b) Slow readers?

   c) An autistic who often misses the big picture?

   d) A top academic who teaches grammar and literature?

   e) A person so proficient at reading that she can polish off an entire novel in an evening?

Intuitively, most authors seem to seek out exclusively d) and e) types, and I agree that their input has a place. After all, shouldn't avid readers and top grammarians have valuable input?

But I'm increasingly seeking editorial input from a wider range of people. True, autistics often miss the big picture because they're fascinated with the details. But this attention to detail makes them more likely to see the "F"s in the above illusion. Proficient readers hardly see the word "of," and may miss a broad range of errors in my manuscripts. Higher functioning autistics may see all those little details that most of us miss.

While fast readers may excel at telling you if your story is interesting and flows well, the slow reader may be better for thinking through your line of argument, spotting places that need more documentation, or helping you with the rhythm produced by combinations of long and short sentences. Literature professors tend to love clever analogies and brilliant descriptions, whereas the average reader may see these as distractions from the story line. That's why I like input from both.

Academics have a high tolerance for detailed argumentation and theory. While I'll get their input on this book, I can't quite trust their verdict if they tell me it's interesting. If I'm writing, not primarily for professors, but for their students and the broader public, I treasure input from those who aren't naturally interested in my subject matter. I'm blessed with dyslexic twins, and love their input. That's one reason I use lots of white space, bullet points, and illustrations. Dyslexics cringe when they see a page full of unbroken words. I've found that if I can hold the attention of struggling readers, I'm more likely to captivate a broad range of readers, and in the end delight academics as well.

2. At times, ignore the current theory that drives your research, and allow non-experts to offer ideas; or just throw a bunch of stuff against the wall to see what sticks.

Sometimes our theories and methods keep us from trying potentially fruitful experiments. Since we seldom recognize that the ruling theory may have deflected us onto a side road, it sometimes helps to toss it and try something new.

Isn't this the way inventor Thomas Edison often proceeded? I still picture him in his later years, stopping beside the road to sample plants that might be used as a substitute for the rubber used to make tires, which was in short supply during World War II.

- A thirteen year old, Jack Andraka, took an intense interest in trying to cure pancreatic cancer, after it killed a family friend. Being new to the field, he took a different direction from the standard research, resulting in his inventing a simple, cheap test to detect pancreatic cancer early, when it can be successfully treated.[26]

- Don Valencia, a cellular biologist who developed tests to diagnose autoimmune diseases, had worked on isolating molecules in human cells without destroying them. It occurred to him that this technique might work for making a concentrated extract of coffee that could capture its flavor more successfully than other extracts. He experimented with it in his kitchen, trying out different flavors on his neighbors. Once perfected, he took it to Starbucks. They eventually hired him and used the technology to expand their product line to coffee ice cream, bottled beverages, etc.[27]

3. Employ higher levels of reasoning.

Bloom's Taxonomy (most refer to the "revised" taxonomy), distinguishes different types of thinking, suggesting ways for us to move past rote memory. Unfortunately, many students seem to seldom move past merely identifying and memorizing the important parts (what might be on the test) of texts and lectures.

Yet, to succeed in real life, we must go further than recognition or rote memorization (see Level 1 in the below graphic.). We need to develop the skills of comprehending (Level 2),

applying (Level 3), analyzing (Level 4), synthesizing (Level 5) and evaluating (Level 6). Search "Bloom's Taxonomy" in Google and you'll find many lists of specific characteristics of each level of thinking. Referring to such lists when working through an issue can suggest new ways to approach it.

For example, in our discussion of Richard Dawkins' argument, I first stated it (Level One) and several times put it in my own words to try to clarify it (Level Two). We skipped application, but analyzed it (Level Four) by putting it in a line of argument and syllogism, so that we could identify and examine the premises. We did a bit of synthesis (Level Five) when we brought in outside ideas of how theists conceive of the eternal existence of God, and how other thinkers have responded to the argument. Finally, evaluation (Level Six) came to play when we noted that there seems to be an element of smoke and mirrors involved in the fallacy of bifurcation.

So if you're evaluating an argument or a proposal, consider running it through Bloom's Taxonomy to expand your ways of looking at the issue. Note how several levels involve creativity.
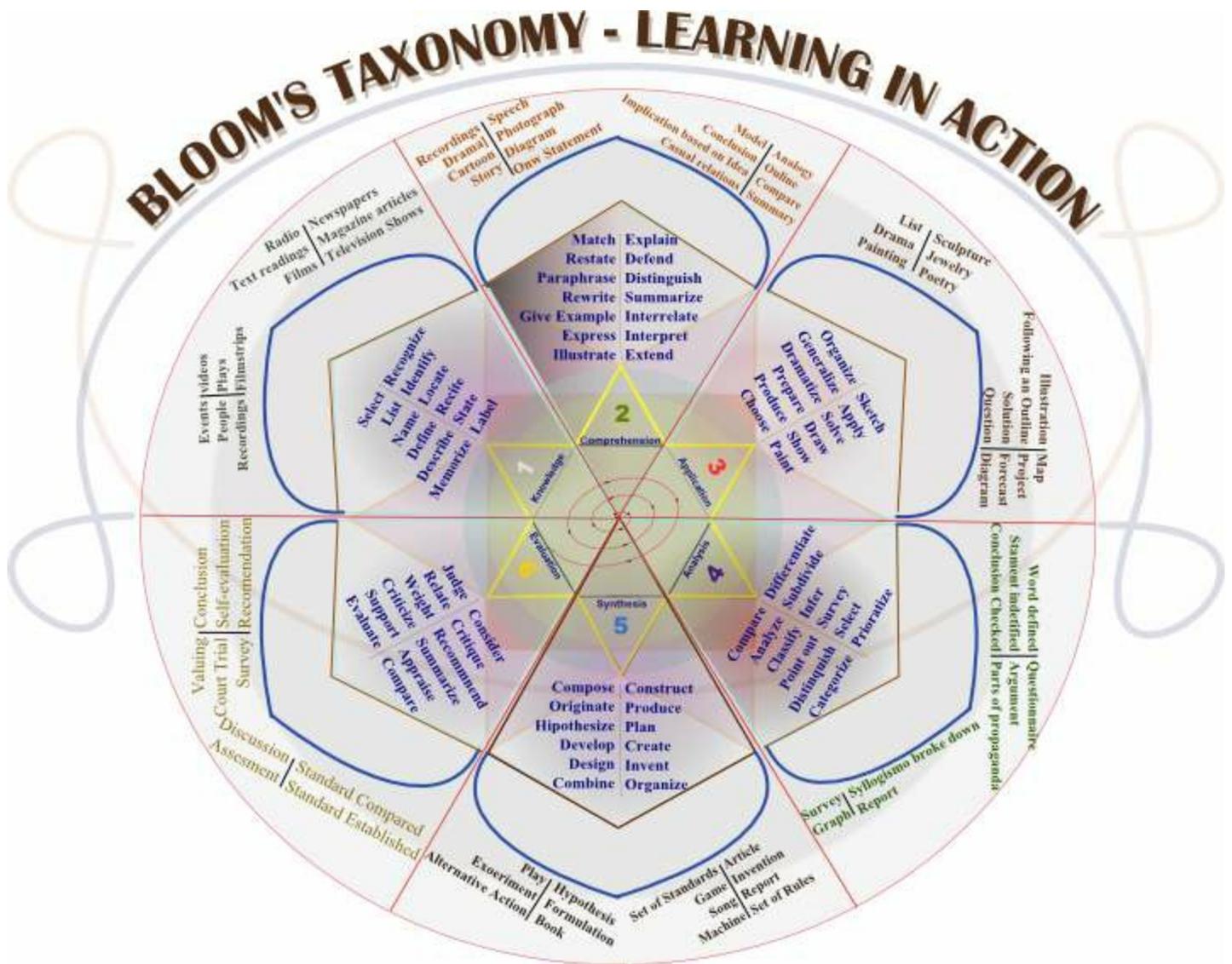
Quiz Group

Flex Your Neurons!
Pursuing the Point of Know Return

1. Write your own example of a "straw man" argument.
2. Write your own example of a "bifurcation" argument.
3. If you agree that Dawkins' argument makes no sense, why do you think such a smart person would forward such a nonsensical argument? If you believe that the argument could make sense if reformulated, how would you change it to overcome the difficulties scholars have brought forth?
4. How could you use Bloom's Revised Taxonomy

   as a practical tool for thinking more critically about issues you study and write about?

5. How could you use Bloom's Revised Taxonomy to think more creatively?
6. Since our brains often deceive us, how can we protect ourselves against such deceptions?

Making It More Personal
Practical Takeaways

What are one or more ideas provoked by this chapter that you can apply to help you think more critically?

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_____

What are one or more ideas that you can apply to help you think more creatively?

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What else do you want to make sure you don't forget?

Recommended Trails
For the Incurably Curious and Adventurous

1. To more fully understand a fallacy, it's often helpful to read other people's explanations and examples. To do this, Google "bifurcation" or "straw man."

2. Learn more about "Bloom's Taxonomy." This Wikipedia article is a good starting point to introduce it, discover the main controversies, and find other resources: http://en.wikipedia.org/wiki/Bloom%27s_taxonomy

3. Here's a TED talk of Jack Andraka talking about his development of a test for pancreatic cancer. Why do you think a young teen was able to develop such a test, when the experts had failed?

   http://www.ted.com/talks/jack_andraka_a_promising_test_for_pancreatic_cancer_from_a_teenager?language=en

1. Analytical philosopher Alvin Plantinga argues that this line of reasoning is consistent with, and even demanded by, philosophical naturalism. http://www.nybooks.com/articles/archives/2012/sep/27/philosopher-defends-religion /.

2. Susan Blackmore and Alex Rosenberg argue that since our brains were constructed solely through naturalistic evolutionary processes—for survival than for finding truth—our brains build mental models that we can't control (there is no "I" or "self" directing the brain, in the view of both authors) and they can't be trusted to lead us to truth. Susan Blackmore, Dying to Live (Buffalo, New York : Prometheus Books, 1993), pp149-164; 221-225; Alex Rosenberg , The Atheist's Guide to Reality (New York: W. W. Norton & Company, 2011).

3. For example, Hume's radical empiricism led him to deny that we can establish cause/effect relationships—a belief which would obviously wreak havoc in science.

4. Richard Dawkins , The God Delusion (New York: Mariner Books, 2008), p. 187.

5. Ibid., p. 52.

6. Ibid., p. 136.

7. Ibid., p. 187.

8. Ibid., see also pp. 186-188.

9. Academic biologist H. Allen Orr suggests that Dawkins failed to consider that, rather than

ending in an infinite regress ("Who made God?" "Who made the being that made God," etc.), God could be a brute fact, like subatomic particles or matter. "It could, after all, be a brute fact of the universe that it derives from some transcendent mind...." H. Allen Orr, "A Mission to Convert," The New York Review of Books, January 11, 2007. http://www.nybooks.com/articles/archives/2007/jan/11/a-mission-to-convert/

10. In The God Delusion, Dawkins doesn't even mention the option of God being eternal, much less argue against it. In one of his earlier books, The Blind Watchmaker, he least acknowledges that some would argue that God exists eternally, but brushes this option off (rather than forward an opposing argument) with a sentence: "You have to say something like 'God was always there', and if you allow yourself that kind of lazy way out, you might as well just say 'DNA was always there', or 'Life was always there', and be done with it." Richard Dawkins, The Blind Watchmaker (New York: W. W. Norton & Company, 1996), p. 200. But why does Dawkins consider "something was always there" an invalid option? After all, prior to the 20th century, the majority opinion of scientists was that the universe was always there, extending into eternity past. Was that "lazy" on their part? In fact, when we consider ultimate origins, we'd seem to be left with two options: either there was nothing prior to the Bang (the standard scientific view of the Big Bang, according to Dawkins), so that something appeared out of nothing, with nothing to cause it, (that's absolutely nothing— no empty space, no vacuum), or that the beginning of the universe was caused by something that existed in some non-material form outside of time and space, existing from eternity past. Is the latter option really stranger than something coming from nothing on its own accord? If not, then why does Dawkins think it so inconceivable (or lazy) that God could have existed eternally? He fails to address this question.

11. Gary Gutting, Does Evolution Explain Religious Beliefs? The New York Times (July 8, 2014) http://opinionator.blogs.nytimes.com/2014/07/08/does-evolution-explain-religious-beliefs/?_php=true&_type=blogs&_php=true&_type=blogs&_r=1&

12. C.S. Lewis , The Screwtape Letters (New York: HarperOne reprint edition, 2009), p. 1.

13. Alex Rosenberg, The Atheist's Guide to Reality (New York: W.W. Norton & Company, 2011), pp. 2,3.

14. Ibid., pp. 164-193.

15. Ibid., p. 16.

16. Ibid., pp. 2,3,310,311.

17. Ibid., pp. 313-315.

18. Ibid., p. 311.

19. Ibid., for example, pp. viii, 304-306. For a helpful critique of this book, see James N.

Anderson, Analogical Thoughts (blog), August 13, 2013, http://www.proginosko.com/2013/08/the-atheists -guide-to-reality/.

20. "Minus logical positivists, tremendously influential outside philosophy, especially in psychology and social sciences, intellectual life of the 20th century would be unrecognizable." Yet, "By the late 1960s, the neopositivist movement had clearly run its course. Interviewed in the late 1970s, A. J. Ayer supposed that "the most important 'defect' was that nearly all of it was false." http://en.wikipedia.org/wiki /Logical_positivism#Critics. For a brief history of Logical Positivism, see articles such as "Logical Empiricism" or "Theism" in The Stanford Encyclopedia of Philosophy , Edward N. Zalta (ed.). It's a wonderful (free!) resource for all things philosophical.

21. H. Allen Orr, op. cit. Dawkins would seem to be a master of the straw man . Perhaps he gives us a clue as to why in his introduction to The Divine Watchmaker, where he states his opinion that Darwin's first edition of Origin of the Species was more persuasive than the last edition, because in the first edition Darwin didn't deal with all the objections. Apparently, in Dawkins' mind, Darwin's stating other people's objections took away from his argument. So perhaps Dawkins knows many of the objections people would give to his arguments, but is afraid that if he presents the strongest arguments for all sides of his statements, that this will take away from his persuasiveness. Thus, he presents straw men , which are much more easily knocked down. Example: if you look carefully at his arguments against the existence of God in chapter three of The God Delusion, he doesn't present the arguments as his strongest opponents present them. In the form he presents them, they're easily destroyed. For example, on Dawkins' critique of the Cosmological Argument for God's existence, see philosopher Edward Feser's critique at http://edwardfeser.blogspot.com/2011/07/so-you-think-you-understand.html. Also, view Dr. William Craig 's presentation at Oxford on the same topic at https://www.youtube.com/watch?v=fP9CwDTRoOE.

22. Ed. by Paul Copan, William Lane Craig, Contending with Christianity 's Critics (Nashville: B&H Academic), p. 5.

23. H. Allen Orr, replying to Dennett's response in the New York Review of Books, http://www.nybooks.com/articles/archives/2007/mar/01/the-god-delusion/.

24. See Michael Ruse 's response in Does Evolution Explain Religious Beliefs?, op. cit.

25. Note other objections to this argument:

   1. Going along with our argument concerning the mining operation on the moon, philosophers argue that an immediate explanation doesn't require an ultimate explanation. Example: William Craig suggests that if we found artifacts of a lost civilization, that's sufficient evidence that the civilization actually existed, even if we have no ultimate explanation of where the civilization came from. Contending with

Christianity's Critics , op. cit., p. 4.

2. From a purely naturalistic perspective, we have no ultimate explanation of anything. For example, you may ask why this cat is sitting on my desk looking at me? I may respond, "It wants to lick the milk out of my bowl of cereal." But what if you counter, "That's no explanation, where did the cat come from?" I may say, "Its mom." And you may complain, "Yes, of course. But if you can't give me the ultimate explanation of where the cat came from, I refuse to believe that it even exists." Yet, from a naturalistic perspective, all scientific explanations end with the Big Bang, a place at which physics as we know it breaks down and at which scientists tell us all scientific questions stop. All reductionist scientific explanations end with the Big Bang, and if we ask one more "Why?" beyond the Big Bang, science lets us down, because the Big Bang is a singularity. Thus, if all arguments about the existence of this or that must answer the ultimate question of origins to be meaningful, aren't we stuck with no meaningful arguments at all? Thus, from a naturalistic perspective we can't ultimately answer the question, "Where did this cat come from?" But would Dawkins thus concede that we therefore can't argue for its existence? Surely not.

26. Jack Andraka , A Promising Test for Pancreatic Cancer...from a Teenager?, A TED talk , (Filmed Feb., 2013)
http://www.ted.com/talks/jack_andraka_a_promising_test_for_pancreatic_cancer_from_a_te
language=enhttp://www.ted.com/talks/jack_andraka_a_promising_test_for_pancreatic_canc

27. For the story of the development of Starbucks ' instant coffee, see Schultz , Howard and Dori Jones Yang, Pour Your Heart Into It: How Starbucks Built a Company One Cup at a Time (New York : Hyperion, 1997), pp. 216-218.

Syllogism = a type of argument that begins with two or more premises and draws a conclusion.

Line of Argument = a simplified form of a long or convoluted argument, summarized as a series of sentences.

Sound Syllogism - the premises are true and the form of the argument is valid.

Valid Syllogism - the form of the argument is correct, whether or not the premises or conclusion are true.

the premises are true and the form of the argument is valid

the form of the argument is correct, whether or not the premises or conclusion are true.

Value: 2

There are certain superior credentials which mark the people whose arguments you can take at face value.

○ True

○ False

 # 1 / 4

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Value: 4

Assuming access to each of these people, one should get input on their writing from:

- **a.** A dyslexic person with unique needs for reading comprehension.
- **b.** Slow readers.
- **c.** An autistic person who focuses on details.
- **d.** A top academic who teaches grammar and literature.
- **e.** A person so proficient at reading that she can polish off an entire novel in an evening.
- **f.** d & e.
- **g.** all of the above.

 # 1 / 2

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