# "Do Your Own Research"

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## 0. Introduction

Economic dislocations, wars of conquest, terrorism, social fracture, corrupt elites, creeping authoritarianism, climate disruption, pandemics—these are a few of the themes future historians will have to make sense of in our present era.

We believe they will also understand our age as a time of crisis for expertise. Academics and specialists in one field wander into areas of knowledge that are not their own and issue public proclamations. Laypeople dismiss the guidance of experts and take advice from people who are not. For example, a remarkable number of people favor medical treatments hyped on social media over ones recommended by public health specialists.

What's notable is that people know there is a crisis about expertise—its defenders and opponents alike. But they differ sharply about what the nature of the crisis is and how it should be addressed, either by individuals or society as a whole. This essay is an effort to make sense of one prominent idea that plays a fascinating role in these debates and controversies.

That idea is DYOR. (If the reader has not heard of it, we recommend: Do Your Own Research.) The slogan is flexible and versatile, used frequently on social media platforms, in messages about topics from medical science to financial investing to conspiracy theories. Interestingly, some proponents of the open science movement seem to presuppose that laypeople are proficient in doing their own research—that is why, according to them, articles and data on primary and unfiltered scientific research should be available online to anyone (UNESCO 2021).

Some observers have noted the rise of the DYOR slogan in recent years (e.g., Hughes et al. 2021; Ballantyne and Dunning 2022) but surprisingly little has been said about it. The basic idea behind DYOR is that laypeople should not follow the conclusions of experts but instead seek out information on their own to arrive at their own conclusions.

DYOR invokes significant and complex issues. Scholars in many fields have raised questions about how people should balance thinking for themselves and deference to authority. We view DYOR as a multifaceted phenomenon that encapsulates one currently popular way to strike that balance. Yet our discussion will show that DYOR raises further issues connected to reasoning, methods of inquiry, and persuasion. What at first appears to be a simple internet meme turns out to be a fascinating phenomenon. That said, DYOR resists easy assimilation into any one theoretical or disciplinary perspective. For instance, psychologists have examined how people seek out and interpret information (e.g.,

Ashford and Tsui 1991; Ditto and Lopez 1992; Druckman and McGrath 2019; Kunda 1990; Petty and Cacioppo 1986), and philosophers have considered the reasons for and against intellectual autonomy and deference to experts (e.g., Foley 2001; Huemer 2005; Zagzebski 2012). But these findings and perspectives don't furnish a pre-packaged, off-the-shelf account of what DYOR means, how it should be done, or whether it should be done at all. We are motivated by psychologist Paul Rozin's (2001) call for "informed curiosity" and the need to situate psychological issues inside a rich social context.

Herein, we use conceptual and empirical resources—drawn from philosophy, psychology, and history—to examine how DYOR operates in human cognition and epistemic culture. Our aim is to provide a detailed first sketch of issues related to DYOR and identify important but unsettled issues concerning human inquiry. Five questions guide our exploration of DYOR:

1. What does the DYOR slogan mean?
2. Where did the slogan come from?
3. Why is it so compelling to some people?
4. Can people do their own research competently?
5. How can we improve people's research?

Beginning to answer these questions reveals obstacles for experts who seek to convey accurate information to novices who may be inclined to reject well-established ideas and expert consensus. Looking carefully at DYOR tells us something about the challenges of communicating truths in our current moment.

## 1. The meanings of DYOR

The DYOR slogan has a variety of meanings in thought and conversation. We can describe its functioning in many separate guises: as a command, a signal of values, a maneuver in debate, and most centrally a method for forming beliefs.

For readers who are unfamiliar with "DYOR" discourse, let us begin by noting some typical expressions that embed the slogan:

> "Don't believe me, use your brain cells, DYOR."
>
> "I'm not doing the work for you. You seem like such an expert I'm sure you can do your own research."
>
> "This is not financial advice. DYOR."
>
> "There's so much misinformation… DYOR."
>
> "We can't trust the so-called experts anymore, so I always do my own research."

"DYOR and don't trust the mainstream media."

"Don't be afraid to DYOR."

"You want evidence? DYOR."

Observe that the slogan is an imperative sentence. It asserts a command by the speaker to a listener. In particular, it is a command to be intellectually independent and autonomous; to be open to new ideas; and to seek the truth where there could be confusing or misleading information. But the slogan goes beyond being a command. A speaker can also use it to signal their commitment to values such as autonomy, fact-checking, evidence-based thinking, and perhaps anti-elitism. Alternatively, it can sometimes function doubly as a command to a listener and as a signal of a speaker's values.

More centrally, we think of the DYOR slogan as representing a method for forming beliefs. In contexts where the slogan is used, people are aware of a question and know that experts and authorities have expressed answers to that question. That is, people are typically aware that experts and others have investigated a question and asserted that an answer to the question is correct, best supported by the current evidence, or represents the consensus view of qualified investigators. But, to reach an answer to the question, you must do research yourself. The slogan affirms the primacy of you, the individual, over and against experts who would tell you what to believe. Do not let the experts see it for you—go and see it for yourself.[1] So, our discussion treats DYOR as a methodological idea that insists on answering questions without depending on other people's answers.

DYOR also plays various rhetorical roles in debate and dialectic. It serves both *offensive* functions, where the slogan is used to challenge another person's thinking, and *defensive* functions, where it is used to protect the speaker's view from a challenge. Although these are conceptually distinct roles, in some situations they happen simultaneously.

Take an example of an offensive function. A speaker asserts a claim without supplying the listener with any premises or supporting evidence and then drops the slogan, insinuating that the burden of proof has shifted to the listener. The slogan operates as a sort of "teaser" for argumentation, suggesting there are premises available that support the asserted claim within the listener's reach if they merely put in the effort. In another offensive case, a speaker does not flat out assert the truth of some claim but instead says it could be true, or notes that "some people say" it is true, and then invites the listener to investigate it for themselves. Thus, this conservational maneuver allows a speaker to share a potential falsehood without explicitly endorsing it. As an example, a speaker could say, "Some say that vaccines cause cancer—that's an important idea and you should do your own research." The slogan can become a sort of vector for misinformation without the speaker actually asserting that misinformation (much like "retweets ≠ endorsements"). Another offensive case involves the speaker asserting the slogan to instill self-doubt in her listener. Hearing the slogan, the listener could think to himself: "The speaker has apparently

[1] The DYOR method can be taken either broadly or narrowly, in this sense: someone could embrace DYOR for all questions or only for some specific questions.

looked into things more carefully than I have, so I'm potentially missing a lot of facts…" The slogan makes the speaker appear more knowledgeable to her listener without actually committing to a knowledge claim. The assertion allows the speaker to take the epistemological "high ground" in the conversation.

Defensive cases, by contrast, do not implicitly assert knowledge or undermine a listener's confidence but instead bolster the speaker's position. DYOR can be used as a reaction to questions or challenges from an interlocutor. One common question in debate is: "What is your evidence for that claim?" In response to the request for evidence, a speaker can insist they have done extensive research and invite the interlocutor to do their own. The slogan achieves a rhetorical evasion in the form of a fallacy—the so-called red herring, where an irrelevant issue distracts from a relevant question. Even if it is true and mutually recognized in the discussion that one side has researched a topic, that fact alone fails to satisfy a request for further evidence, nor does it show why the request can be properly ignored. In a second defensive case, the speaker uses the slogan to sidestep responsibility they would normally bear for making an assertion. The speaker does not retract or withdraw the assertion, but instead avoids being held accountable to others for it, should it turn out false or unjustified. "DYOR" is supposed to limit liability. It is an epistemic version of *caveat emptor*.

## 2. Conspiracists and Cartesians

When did DYOR emerge in history? Is the idea old or relatively new? A first observation is that the search term "do your own research" has gained prominence over the last decade, as revealed in results on Google Trends and Twitter.

But in an effort to find the idea's source, we contacted a few experts. (Let's be honest: a philosopher and two psychologists should probably avoid doing their own research on historical matters.) We wrote to a few social scientists investigating conspiracy ideologies and groups. They reported that the slogan is entrenched in recent conspiracist discourse and likely arose during the age of social media. We also contacted historian of science Michael Gordin, an expert on the history of pseudoscience and fringe movements. Gordin reported that the slogan does not appear to be part of the ideology of any mid-twentieth century fringe figures or groups he has studied. Interestingly, some of the people on the fringe explicitly discouraged laypersons from doing their own research.

For instance, the influential pseudoscience superstar, Immanuel Velikovsky, proposed a sweeping reinterpretation of Earth's history, starting with his best-selling book from 1950, *Worlds in Collision*. In ancient mythology and literature, Velikovsky found sources describing fire raining down from the heavens, devastating earthquakes, and colossal tsunamis. Since the "Enlightenment" era, critical readers had interpreted those ancient passages as metaphorical or perhaps visionary, but Velikovsky claimed they reported actual cataclysms on a global scale when other planets nearly collided with the Earth (see Gordin 2012 for more). Velikovsky's books attracted a massive popular following among the counterculture of the 1950s through '70s and stiff rejection by establishment scientists. But, as Gordin told us, Velikovsky discouraged people from doing their own

research.[2] "The very insurgent quality that had drawn the counterculture to Velikovsky," wrote Gordin in his 2012 book, "made them want to push further, question his conclusions, edge closer to finding the *real* truth [...]" (191). But Velikovsky would have none of it. Doing research on these matters was beyond the capacities of most of the people who were attracted to the Velikovskian outlook—these people should quit speculating and defer to the master himself.

In searching for the origins of DYOR, we could have stopped there, and maybe we should have, but the possibility of non-historians discovering the slogan's origins for themselves was too strong to resist. (DYOR is fun.) The earliest source of the slogan we know of comes from an American conspiracy theorist named Milton William ("Bill") Cooper. Bill Cooper's elaborate system of anti-government distrust and paranoia hinges on a hidden scheme by the Illuminati, Freemasons, and other nefarious actors to institute a world government, enabling extraterrestrials to enslave human beings, and thereby trample on every citizen's constitutional rights. According to Cooper, President John F. Kennedy was assassinated in 1963 because he was about to blow the whistle to the American people about the UFO invasion. And what's more, Lee Harvey Oswald didn't kill Kennedy: the real assassin was the chauffeur who shot Kennedy using a gas-pressure weapon created by the aliens themselves (Jacobson 2018).

Cooper let his fantasies rip on radio broadcasts and in public lectures; he peddled books and tapes by mail order. One fan of Cooper's book was Timothy McVeigh, who later murdered 168 people in the bombing of a federal building in Oklahoma City. But Cooper appealed to more than just domestic terrorists and militia types. American rap and hip-hop acts such as Wu-Tang Clan, Public Enemy, Jay-Z, and Tupac Shakur were also fans of Cooper, in part because his message of radical distrust made sense to them—including his claims that the CIA was pushing drugs into communities like Harlem and that HIV was a bioengineered at Fort Detrick (the home of MKUltra) and intended to target Africa. Distrust of elite institutions permeates Cooper's thinking (Jacobson 2018).

But unlike Velikovsky, Cooper said he wanted his audience to think independently. "Do your own research," he said, "read everything, believe nothing until you can prove it with your own research" (Jacobson 2018, 13). Doing research figured centrally into Cooper's own narrative for how he had uncovered deceptions and conspiracies: "What I'm after is the truth. I'm telling you what I saw in these documents and where my research has led me over the intervening seventeen years. That's what I'm imparting to you. I want you to go and verify this or not verify it or prove it wrong or whatever you can do on your own" (Cooper 1991, 194). As it turned out, Cooper ran into some trouble with the law (tax evasion) and vowed that he would never be taken alive. In 2001, Cooper was killed in a gunfight with police in southern Arizona. This ending ensured Cooper would gain the special kind of notoriety that being killed by police bestows on an anti-government conspiracy theorist who had predicted his own demise at the hands of the authorities.

Perhaps Bill Cooper is the origin point for DYOR, perhaps not. But listening to what he says, you might be reminded of methodological ideas associated with the French

[2] Email correspondence in September 2021.

philosopher René Descartes. In his famous treatise from 1637, Descartes recounts the personal story behind his method. He says his education and his culture had bestowed upon him many opinions and ideas, but he eventually recognized much of this was confusion and falsehood. In seeking truth, Descartes realized he couldn't blindly follow what peers and authorities told him. And so he devised a method to help him sort out what is clearly and distinctly true and only believe such propositions, starting with "I think, therefore I exist" and proceeding from there to a rich picture of the world. The full title of Descartes' 1637 treatise is *Discourse on the Method of Rightly Conducting One's Reason and of Seeking Truth in the Sciences*.

It is perhaps a bit silly to imagine Descartes transported from the seventeenth century to the present moment. The Frenchman would tell us we cannot trust conventional ideas and myths. Adopting the contemporary jargon, Descartes could say that we must "do our own research." Of course, for him, the meaning of "research" would be highly particular: the specific rules of his method.

Descartes was not the only thinker in the eras of "Scientific Revolution" and "Enlightenment" to emphasize such ideas. The basic psychological impulse behind Cartesian epistemic autonomy was widely embraced by intellectuals who fiercely disagreed with Descartes. The Royal Society of London used as their motto "Take nobody's word for it" (*Nullius in verba*). Immanuel Kant summed up the spirit of enlightenment as "Dare to think for yourself!" (*Sapere aude!*).

We offer a speculative hypothesis: DYOR has its origin in the radically autonomous epistemological values of early modern philosophy, but the original impulse got remixed by the radical individualism of Western liberalism and populist distrust of institutions and elites, and eventually crystallized into a four-letter internet meme. We do not insist that our speculation is true or even minimally plausible, but we still find it an intriguing possibility. Cartesians and conspiracists might spring from the same intuitive source.

## 3. Why is DYOR compelling?

We already described some functions the DYOR slogan can play—commanding, signaling, and so on—but at the time of writing it has viral energy. It leaps from one person to another, jumps from discourse to discourse. And crucially, some of its advocates do not merely talk about DYOR. They do it—reading articles, watching videos, sharing and refining their ideas on message boards and social media platforms.

Why is the slogan compelling to some people? Why do they feel it is correct or insightful, share it with others, and try to follow its guidance? We would like to understand better the forcefulness and wide application of this idea in contexts involving inquiry, judgment, and debate.

A first observation is that what makes the slogan compelling for people is conceptually distinct from the reasons people would report about why they find it compelling. Although we do not know of any descriptive research on why people embrace DYOR, we informally consulted social media sites and blogs. People frequently mention values they try to exemplify through DYOR: intellectual autonomy, evidence-based thinking, direct access

to information (in contrast to mere trust that experts have information), and open-mindedness toward new ideas. And, plausibly, there are other values connected to the slogan less directly—not values secured by the activity of doing research but ones implied by an openness toward DYOR, such as tolerance for intellectual diversity. Notice how the slogan also affords people "wiggle room" to accept or reject all manner of ideas and authorities. What someone should believe depends on how their research turns out, but two people might not reach the same conclusions. Since DYOR is often invoked in contexts where people are trying to generate respect for counter-consensus positions, this kind of tolerance for differences seems to be an important value.

To be sure, the values people say they embrace may only be part of the story. People seek information and form opinions to fulfill many goals, some of them more covert (Katz 1960). DYOR activity, to be sure, may be spurred by goals of curiosity or by a quest for a more accurate and complete understanding of the world that can inform future actions—an inquisitive function. But DYOR activity may be motivated by other goals, such as reducing the anxiety associated with a confusing, uncertain world by making things seem more coherent and predictable (Douglas, Sutton, and Chicocka 2017)—an emotion-regulation function. Further, DYOR may be fueled by a need to feel safe and in control—an existential function. Or a person may seek to enhance their standing in a social group, or esteem in their own eyes, by gaining expertise through DYOR pursuits—a social-adjustive function.

Many possible covert motives can underlie DYOR activity, but we still believe the values people explicitly endorse in favor of the slogan must be considered carefully. Although the reasons people give for DYOR aren't always strong evidence for why they are motivated to embrace the method, it's important to know what those reasons are. Those reasons can inform our thinking about the possibility of interventions to put people on a better path. Take an example. Suppose you decide to DYOR on medical treatments and your friend tells you that is unwise because you are untrained in medicine. You may hear in your friend's criticism a denunciation of cherished values—autonomy, self-reliance, rational thinking, and the rest. So, we suspect that criticism of the DYOR method could in fact make some people more committed to it out of defensive motivations. We have observed this in social media exchanges. A critique of DYOR inspires criticism of the critic. Proponents of DYOR accuse their opponents of conformist thinking, paternalism, and an irrational resistance to "just ask questions." Given that DYOR can sometimes be bad and dangerous, it is essential to find ways to communicate that message effectively in context.

We've said something about the internal perspective that people might take on why DYOR is compelling to them, but there is also an external view that considers aspects of the slogan's resonance that do not necessarily register with people consciously. What can we say on that score? Here are a few ideas.

First, the slogan grabs attention because it is an imperative. When someone commands you to do something, as opposed to asserting that something is true, you snap to attention. Try to ignore someone when they say "Heads up!" or "Stop, drop, and roll!" Even if you do not think you need to follow their directive, you might wonder whether you are missing something relevant. As an imperative, "DYOR" also sounds like reasonable advice to

initiate a kind of metacognitive check, applying prudent doubt to your ideas or your capacities to know. Hearing the command, you might want to preserve your reputation, lest others see you as not smart enough or too lazy to keep up.

Second, DYOR is associated with novelty and excitement. (We proved this point to ourselves when we tried to understand the historical origins of DYOR.) Learning, curiosity, the thrill of gaining hard-to-find knowledge: all of this helps makes the slogan stick.

Third, the slogan gives people a convenient "out" during debate and conflict. When they do not have all of the details at hand, or when they have claimed to know more than they do, they can tell others to look into things for themselves. The slogan provides a way to save face under pressure, self-presenting as knowledgeable without sharing (alleged) knowledge. It is striking how frequently "DYOR" is the final comment in an online exchange.

Fourth, people are seduced by the feeling that they are unique. They want to "see things for themselves" and the slogan rationalizes that impulse. In *Leaves of Grass*, Walt Whitman wrote:

> You shall no longer take things at second or third hand… nor look through the eyes of the dead… nor feed on the spectres in books,
>
> You shall not look through my eyes either, nor take things from me,
>
> You shall listen to all sides and filter them from yourself (1855, 29)

Psychological findings on self-ascriptions of epistemic authority (Kruglanski 1989) suggest that people such as Walt Whitman, Bill Cooper, and René Descartes are not so different from the rest of us. We take ourselves to be competent judges on many topics. And we believe that our personal experiences are the best way to reach truth, despite decades of research showing that people's basic perceptions of both physical and social environments are often distorted (Hastroff and Cantrill 1954; Nisbett and Ross 1980; Kunda 1990; Balcetis and Dunning 2006; Leong, Hughes, et al. 2019; Leong, Dziembaj, et al. 2021). We feel that seeing things for ourselves affords us a deeper truth than objective facts and the opinions of experts.

Fifth, DYOR may seem essential in societies where there is low trust in institutions. In the United States, for example, levels of institutional distrust have been stable but fairly low since the 1980s (Pew 2021). In the Social Survey Series of Gallup Polling, average trust in institutions (i.e., "a great deal" or "quite a lot") has dropped from 48% in 1979 to 41% in 2000 to 27% in 2022. When people do not trust elites and authorities, where do they turn? One possibility: themselves. The feeling that scientists, academics, journalists, pundits, politicians, and corporate elites are untrustworthy feeds into DYOR's forcefulness. When the broader world appears untrustworthy, one natural reaction is to circle the wagons and restrict trust to oneself and people perceived to be close, such as family, friends, and ideological compatriots.

## 4. Can people do their own research competently?

We have noted some reasons why people find DYOR compelling. Our list is not exhaustive, of course. But we should add that people appear to believe they are good at doing research. Our next question is: Are they right? Can people do their own research competently?

Let's begin with the true but admittedly disappointing answer: It depends. People are not omni-competent but neither are they omni-incompetent. The trick is to determine what is required for someone to do adequate research on a question. Insofar as we can figure out when those requirements are met, we can say something about when people are and are not capable of doing their own research competently. (We note in passing that competently pursuing research often does not merely require answering a question competently but also identifying the right question to ask in the first place. We ignore that for now.)

Research is *inquiry*. An inquiry is an attempt to answer a question using evidence. When we inquire, we must undertake two distinct tasks: acquiring evidence and evaluating it. For example, imagine you wonder to yourself: "Is it raining outside?" Your question leads to an inquiry when you seek to answer it using evidence. You draw up your window blind and look outside. There are droplets of water on the windowpane—it appears to you to be raining out. But you know that sometimes your neighbor's sprinkler runs, making it appear from the window that it is raining when it isn't. You walk to your front door, step outside, and raindrops fall on your head. You answer your question in the affirmative. In this simple inquiry, you acquired different bits of evidence and evaluated them to answer a question.

Undertaking any inquiry competently calls for particular tools (or skills, capacities, or epistemic virtues) for the tasks of acquiring evidence and interpreting it. So, what makes an inquiry competent or not?

Here is an intuitive gesture toward an answer: Competent inquiry matches the tools for acquiring and evaluating evidence to the research task. It is like fitting a square peg in a square hole, or round peg in a round hole, as the circumstances decree. Incompetent inquiry fails to match the tools to the task—it's like fitting a round peg in a square hole. In incompetent inquiry, there is a misalignment between tool and task. But there also needs to be a fit between the tool user and the task itself. If you are trying to slot a round peg in a round hole, but you believe the peg is square and won't fit the hole, that manifests a kind of incompetence.

The nature of competent inquiry is illuminated by the tool–task "fit" metaphor. Think again about your question concerning rain ("Is it raining outside?"). Imagine you had looked out the window, noticed water droplets on the pane, and concluded it must be raining outside. Plausibly, your inquiry here would not count as competent, because you know that when your neighbor's sprinkler goes off, this windowpane seems to indicate rain when there has been no rain. You are aware of the sprinkler and thus have reason to doubt that checking that window provides sufficient evidence for rain all by itself. By answering the question solely on the basis of looking out the window, you would do

something intellectually irresponsible—namely, ignoring the fact that your evidence could be misleading.

Keep that point about irresponsibility in mind and switch to a different scenario. Imagine instead that you are and have always been unaware of your neighbor's malfunctioning sprinkler. The sprinkler goes off randomly twice daily for an hour or more. During those times when it isn't raining the window misleadingly indicates rain. In that situation, you could easily have a false belief about rain but you would not know any better.

These reflections lead to a first-stab answer to the question of research competence. Your inquiry is competent only if (1) on the basis of the ways in which you acquire and evaluate evidence, you would reach an accurate answer to your question a good enough proportion of the time and (2) you are not in a position to recognize your inquiry is intellectually irresponsible.

Consider briefly our rationale for the two conditions. To see why condition (1) is needed, imagine a scenario where the sprinkler runs once a week for 10 seconds at 3:45 am. The risk of being led astray about your question on the basis of looking out the window is negligible. In other words, your inquiry is good enough most of the time to count as competent. Of course, if the sprinkler runs a lot more frequently, all bets on competence may be off. That's because research competence depends on the world beyond your head. And to see why condition (2) is needed, notice how believing (for good reason, let's say) that your evidence could easily be misleading makes an inquiry dubious. Even when you reach an accurate answer, the fact you irresponsibly ignored the potential for error means your inquiry lacked competence.

Research competence is commonplace, but the fact someone knows how to navigate one domain does not mean they can navigate well in another. One frustrating fact is that cognitive skills, attitudes, and perspectives required to do research effectively in one domain, or even in the same domain in different situations, do not always transfer to another domain or another situation (Ceci and Liker 1986); for example, the critical thinking skills a philosopher uses in a professional setting don't always help them in online debates about politics. Typically, when someone gains competence to undertake research, they received training and had structured opportunities to practice in a context.

How do beginners transform into competent researchers? By being embedded in, and engaging with, the social world. The novice scientist enrolls in courses, completes homework problem sets, asks the instructor questions when something is unclear, and spends hours in the laboratory. Some of what she picks up is explicit teaching—information and models in lectures and textbooks, feedback on tests, and so on. But other elements shaping the novice scientist's development are implicitly embedded in the situation and go unnoticed. These are the environments in which the novice scientist's skills for acquiring and evaluating evidence are formed by the particular pedagogical methods of her discipline. Historians and ethnographers of science claim that some crucial elements of research craft and technique are hard to write down and articulate, and that even highly competent practitioners may have no way to represent all of the important aspects of what they do. Sociologist of science Harry Collins (2010) underlines

the importance of different types of "tacit knowledge," which arise out of the conditions of embodiment and social life, undergirding educational practices and training regimens.

A subtle mix of these elements—whether explicit or tacit, consciously recognized by anyone or not—support the development of a researcher's competence. Borrowing from educational psychology, we call these elements "scaffolding" (Bruner 1978; Wood, Bruner, and Ross 1976). These are the cognitive, embodied, social, technological, and cultural resources that allow someone to perceive, presuppose, think, and act in such a way to transition from beginner level skill to competence for inquiry. Note that although competence is something individuals have, scaffolding tends to be produced and sustained by social processes.

The idea that competence demands scaffolding has an interesting upshot for DYOR. In one literal sense of "do *your own* research," there is no way to do that. Doing your own research is like driving your car on *your own* highway—impossible. In the same way drivers depend on the planners, surveyors, engineers, and construction crews who design and build the highway, your competence to do research depends on what we call scaffolding—again, a set of facts about cognition, embodiment, technology, society, and culture that support perception, presupposition, thought, and action behind research. No matter who you are, doing your own research means relying on some scaffolding and thereby on the social world. In seeking knowledge, people have no escape from dependence on others, as John Hardwig (1985), Richard Foley (2001), and Linda Zagzebski (2012) have argued.

There's another way to express our question about whether people can do their own research *competently*: Do people have enough of the right scaffolding in place to do their own research?

An initial problem is that people often don't recognize they *need* scaffolding (Kruger and Dunning 1999). They naively trust their perceptions of the world are veridical and objective (Ross and Ward 1996), even when they tend to make systematic errors they are unequipped to recognize (Ballantyne 2022). But if they feel their experience gives them an accurate view of things, they have low motivation to seek out new skills for acquiring and evaluating evidence. For all intents and purposes, what they see is all there is (Kahneman 2011, 85ff.). Take a beginner who's highly confident that they already know some domain and try to convince them to upgrade their epistemic skills. Good luck with that.

Of course, sometimes people do recognize their own limitations and see the need for more or better scaffolding. They see there is more than merely what they can see. What motivates openness to gain new skills for inquiry? We can only speculate here. The intrinsic desire to know the answer can drive skill acquisition. Archeologists who desire to unearth more fossils are energized to acquire new tools to expand their search. Sometimes, debate and conflict can energize skill acquisition. Suppose you desire to humiliate or "own" your opponents in a political or philosophical debate, so you acquire new resources to evaluate their arguments. Such a motive could leave patches and gaps in your own skills, leaving you unable to self-criticize. It is well-established that people are more adept at finding flaws in threatening arguments than supporting arguments

(Ditto and Lopez 1992; Ditto 2009), and one potential source of asymmetrical scrutiny could be a tendency to favor acquiring scaffolding that is more beneficial for waging war on others' ideas than for testing and refining our own.

Suppose you want to learn more about a topic, but you face a set of mixed evidence. Some of it supports one hypothesis, some supports another. How do you move forward? Competent research utilizes tools for acquiring a representative sample of the available evidence and discerning high-quality data from its less valuable counterpart. But people often fall short of that standard. Even when they do not have a preference for one hypothesis or outcome, they tend to sample information in a biased way (Fiedler 2000). For example, imagine you have two coins and you want to determine if they are biased toward heads or tails. You toss the first one five times and each flip comes up heads. Then you toss the second one five times and you get three heads and two tails. For which coin would you feel most comfortable drawing a conclusion about its fairness? Recent research suggests that most people would be ready to judge the first coin but not the second. However, five flips are not a large enough sample to distinguish the coins from one another; a much larger sample of flips for each coin is needed (15 for each coin in this example—if the percentages held up). People are generally insensitive to sample size when sampling available information, leading them to stop sampling too quickly when their early evidence strongly favors one hypothesis over another (Coenen and Gureckis 2021). Conversely, they overly discount evidence drawn from large samples (Benjamin et al. 2016).

Now suppose you are a DYOR enthusiast searching for information on YouTube. The algorithms are designed to produce results for you that you are likely to care about and act on, no matter how unhinged the videos may be. That is, in search of profit, YouTube selects for you data that is biased. People are notoriously neglectful of how biased (Hamill, Wilson, and Nisbett 1980) or credible (Griffin and Tversky 1992) the information they receive is, often taking it at face value. If you previously showed interest in skepticism toward vaccines, you will see results tailored to engage you. You could scroll past the first five videos, all of which contain denialist messages, in order to find a video of an elite Ivy League epidemiologist, telling you to "trust the science." Or maybe it's more like the coin flip example: you will be satisfied that the five videos represent available knowledge about vaccines.

Sampling bias aside, people also go off track because they are not necessarily impartial concerning the direction of their research. They know the conclusion where they want to end up, and they will do what it takes to get there. In cases where someone has a stake in arriving at a particular conclusion, they tend to seek out information affirming what they already want or believe (Hart et al. 2009). Few people instead follow Karl Popper's version of DYOR—which is to swap out the "research" in the slogan and replace it with "refutation," looking for evidence that calls favored or salient hypotheses into question. Take the domain of politics as an example. Partisans are passively exposed to a wide spectrum of political information online (Bakshy et al. 2015), but their consumption habits reveal consistent in-group, pro-attitudinal biases (Derreumaux et al. 2021; Peterson and Iyengar 2021). Although the extent to which people selectively seek out content that fits their desires and beliefs remains contested (Cinelli et al. 2021; Muise et

al. 2022), partisans' tendencies to engage with attitude-consistent media appear to be increasing across the political spectrum (Rodriguez et al. 2017). Thus, without proper scaffolding in place, many people seeking to do research will often fail to acquire bias-free information. Moreover, biases influencing information search are joined by biases influencing the evaluation of information found. People evaluate information that is consistent with their beliefs more favorably than information challenging their beliefs (Ditto and Lopez 1992; Ditto et al. 2019).

Yet a researcher need not be motivationally biased to engage in unreliable inquiry. Findings from the Stanford History Education Group have found that students, from middle schoolers to college level, struggle to identify reliable sources of information and evaluate the strengths and limitations of claims made on social media (McGrew et al. 2018). This is not only a problem for people who happen to be young, the so-called digital natives. For instance, one study of U.S. political disagreement using a representative sample found that participants placed more trust in a layperson's retelling of their personal experiences than in a scientist's opinion based on aggregate data from numerous sources (Kubin et al. 2021). When evaluating information—especially information connected to charged moral disagreements—people of all ages perceived subjective experiences as being more true than objective facts. Thus, even when people acquire relevant information competently, it can be hard to evaluate that information properly without leaning on the stabilizing structures of epistemic scaffolding.

To be clear, our skepticism about most people's ability to DYOR competently should not be confused with skepticism about knowledge or expertise. The defects people bring to inquiry do not make knowledge impossible or trust in experts invariably misguided. On the contrary. Lifted up by the right scaffolding, novices can transform into experts whom we should sometimes trust, though we must shrewdly identify them (Goldman 2001; Ballantyne 2019a, chapter 9; Brennan 2020) and watch for researchers who might overextend themselves by judging on matters beyond their real expertise (Ballantyne 2019b).

But how could people who are not competent at a research task become so deeply convinced they do in fact have that competence? Recent work by Carmen Sanchez and David Dunning (2018) reveals how novices at a task can become overconfident too quickly. Suppose you start off investigating a complex question about science, medical diagnosis, or technology. At first you feel unsure of yourself, but a little experience can spike your self-confidence inappropriately.

Their study asked participants to play doctor. That is, participants had to diagnose whether patients were healthy or sick, using symptom information that was helpful but imperfect, meaning their judgments should always contain some uncertainty. These would-be doctors were cautious to start, but after a few diagnoses, their confidence shot up dramatically—well beyond their actual rate of accuracy. More precisely, participants' subjective impressions of their abilities soared far above their demonstrated skill level. The experimenters called this the "beginner's bubble."

How does the bubble inflate? When people begin learning a new task, they quickly form a theory about how to approach the task and can reach decisive conclusions based on

skimpy data (remember those coin flips noted above). But the limited data they draw on to build that theory can contain noise, luck, and junk information. It looks right at the time, however, and so people become quite confident. Their theory is normally refined by further feedback, and some modesty is restored, but that takes time and the right circumstances. This is where scaffolding comes in. For beginners with limited experience or poor feedback, their theories induce unjustified exuberance. They feel they know how to do much more than they really can. Further experience can breed better understanding coupled with more appropriate caution.

What's so disturbing is that lacking competence about a topic doesn't merely result in screwing up the search for and evaluation of evidence. It is worse than that. We get fooled about what we have accomplished and what we can do. If DYOR led people to be uncertain and humbled by the inherent difficulty of research, that wouldn't be so bad. But beginners' efforts make them feel smart even when they don't grasp the errors they may be committing, even when they don't see the knowledge others have already established. DYOR is yet another opportunity for the unskilled to be unaware of it (Kruger and Dunning 1999). DYOR adherents lack the training and scaffolding to keep their research accountable to reality, so we should not be surprised when their self-image inflates far beyond the reality of their competence.

## 5. How can we improve people's research?

We have argued that people are often not competent enough to do their own research. Does that mean we think people in general should not engage in DYOR? By no means is that our message. DYOR is an expression of human autonomy that will not be easily suppressed—try to stop it and often people resist. The ethos driving the slogan is not going anywhere, at least in communities where people have freedom to browse the internet, visit libraries, join online communities, and share new ideas. So, there is an important question for anyone with potential insight and influence: How can we promote the pursuit of better research?

One possibility would be that advocates of DYOR fail to do enough research. Perhaps they need prodding to keep advancing their inquiry, and eventually they will reach more accurate views. Sometimes that will work. But beginners doing research frequently lack the tools needed to inquire effectively—the skills both to acquire and evaluate evidence. Without those skills, doing more research may lead people to confirm mistaken views, piling confusion atop confusion, and become less open to correction from legitimate experts.

The dangers of merely encouraging more research are illustrated by the history of "crank" and "crackpot" research. One example comes from geometry: angle trisection. Trisection is the attempt to use only an unmarked straightedge and a compass to construct an angle equal to one third of any arbitrary given angle. Ancient Greek mathematicians posed the problem of angle trisection, but then a mathematician in the nineteenth century named Pierre Wantzel demonstrated that angle trisection is impossible for arbitrary chosen angles. (Angle trisection can be done in some special cases, including a right angle of 90°, but not for angles in general.) Since Wantzel, many amateur mathematicians have sought

to do their own trisections, despite the fact that mathematicians now know that a trisection is logically impossible. These hobbyist geometers have sunk decades of their lives in developing their "solutions" and trying to persuade professional mathematicians that Wantzel's proof is wrong (Underwood 1983).

Researchers who lack basic knowledge and skills for conducting an inquiry well cannot always be corrected, and more research will plunge them deeper into error. When an issue or question can be stated in terms that seem to make good sense to beginners, but the knowledge needed to understand it demands expert-level competence, beginners can easily get hoodwinked by the feeling that they know when they do not.

Moving outside one's circle of competence and making unreliable judgments is a widespread problem across fields of inquiry (Ballantyne 2019b). The dangers of overextending competence are often seen in situations of decision-making and medical judgment, including choosing whether to be vaccinated. For many issues, it is only highly competent investigators who will recognize the challenges of reaching the right view. "Some problems," wrote the education researcher Laurence J. Peter, "are so complex that you have to be highly intelligent and well informed just to be undecided about them" (1982, Sept 24). Thus, when it comes to research, more is not always better. Encouraging people to do more research might not produce good epistemic outcomes.

What, then, would stimulate better research? An intuitive idea is to help people upgrade their research skills. We observed that advocates of DYOR run into trouble when they have poor techniques to search for relevant information, distinguish trustworthy sources from untrustworthy ones, and so forth. The good news is that education and training programs can reliably give people better skills for inquiry; for example, the Stanford History Education Group has developed and tested programs that help students identify reliable online information sources (Wineburg et al. 2022).

But upgrading skills is only part of what is needed. As we argued, research competence requires the intersection of skills and scaffolding—the latter being those facts about cognition, embodiment, technology, society, and culture that enable researchers to see, presuppose, think, and act during some inquiry.

Is our suggestion that better research simply requires giving people skills and scaffolding that enables them to undertake the inquiry at hand? That's on the right track, but we think something more ought to be encouraged. To begin to see why, imagine two inquirers who independently encounter an unfamiliar type of question. One inquirer charges forward and answers the question on the basis of their skill set and particular expertise. The other inquirer perceives a new situation and pauses to reflect on whether their competence is aligned to the task. Both inquirers may or may not end up answering the question accurately, but we think the second inquirer has done something crucial for pursuing research that is more reliable across situations. Facing a new problem beyond their competence, the second inquirer at least has an opportunity to recognize an increased risk of error and then to take action informed by that recognition.

We use the term *humble inquiry* to pick out how the savvy inquirer acts: they try to determine the fit between actual competence and the inquiry at hand, and then proceed prudently on the basis of their assessment. A little more briefly, they ask themselves "Am I competent enough to do this?" and then prudently move forward. Importantly, what prudence requires depends on circumstances. Take some examples. If an inquirer judges they are out of their depth, they might defer to recognized experts; if they identify specific information or training they need to upgrade their skills, they might seek formal instruction; if they don't know of established bodies of knowledge that can help answer the question, they don't automatically assume such knowledge doesn't exist; when they judge that undertaking an inquiry might reveal useful information to better evaluate the alignment between their competence and the task, they might move forward cautiously; and so forth.

Humble inquiry can arise through a wide range of skills and traits, all of which might be distinct from whatever grounds first-order competence. That is, merely being competent to inquire into a question does not guarantee someone will humbly check the fit between their competence and their inquiry. Importantly, neither is humble inquiry guaranteed when someone merely asks whether they are competent to answer a question: an inquirer must also be somewhat attuned to whether their competence is sufficient for an inquiry, in light of their relevant evidence. After all, inquirers who reflect on their competence might be dogged by unreasonable self-doubt—think of a skilled Ph.D. student plagued by imposter syndrome. Other inquirers, touched by hubris, feel perfectly well-suited to a task when they are not. Although we are not committed to the claim that intellectual humility must be understood as a dispositional or character trait (Ballantyne, forthcoming), it may be helpful to think about humble inquiry as the "virtuous mean" between hubris and unwarranted self-doubt (cf. Whitcomb et al. 2017; Simmons et al., forthcoming). We add that humble inquiry could be related to intellectual humility, but the former is a process or outcome (Schwarz, forthcoming), not a dispositional trait.

According to us, better research requires competence—skills and scaffolding—as well as a healthy dose of humble inquiry. To improve the efforts of DYOR enthusiasts, competence and humility need to be more accessible and commonplace.

Let us end with a brief coda that may resonate with the reader—we presume you are a professional researcher, not necessarily a DYOR enthusiast. Our discussion has focused exclusively on lay inquiry, but it is striking how professional researchers face a parallel set of challenges.

What we have said about DYOR illuminates the biases that plague science: the limitations of beginner inquiry have some structural similarities to widely recognized problems in contemporary social science, problems sometimes noted in connection with the replication crisis. Like lay inquirers, psychologists often risk generalizing from small samples (Etz and Vandekerckhove 2016; Simmons et al. 2011), seeking confirmatory evidence (Scheel et al. 2021), and researching in ideologically homogeneous environments (Duarte et al. 2015). Scientists face difficulties gathering representative evidence and evaluating it judiciously. And just as we found with DYOR enthusiasts, more professional research is not always better: some evidence suggests that fields churning

out too many publications may neglect novel insights and struggle to advance beyond customary ideas (Chu and Evans 2021). It may be counterintuitive, but we would argue that the differences between lay and expert research are differences of degree, not kind.

Once we recognize that expert inquiry always contends with these same issues, we may arrive at a more empathetic view of the all-too-human struggles of DYOR enthusiasts.[3]

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