

BRAIN SCIENCE PODCAST

With Ginger Campbell, MD

Episode #70

Interview with Dr. Scott Lilienfeld, Co-Author of *50 Great Myths of Popular Psychology: Shattering Widespread Misconceptions about Human Behavior*, Recorded Live at Dragon*Con 2010

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INTRODUCTION

Welcome back to the *Brain Science Podcast*. I'm your host, Dr. Ginger Campbell, and this is Episode 70. As always, you can get complete show notes and episode transcripts at our website at brainsciencepodcast.com. Send your email feedback to docartemis@gmail.com.

Before I get into today's interview I want to thank everyone who has sent me email or voice mail during my summer break from podcasting. Because of your encouragement I have decided to continue producing the *Brain Science Podcast* on a modified schedule. I'll tell you more about that after the interview.

My guest today is [Dr. Scott Lilienfeld](#) who is a professor of psychology at [Emory University](#) in Atlanta, Georgia. Dr. Lilienfeld is the author of several books, including [*50 Great Myths of Popular Psychology: Shattering Widespread*](#)

[Misconceptions about Human Behavior](#), which he co-authored with [Steven Jay Lynn](#), [John Ruscio](#), and [Barry L. Beyerstein](#).

This interview was recorded live at [Dragon*Con](#) in Atlanta, Georgia on September 3, 2010. This is the third year in a row that I have recorded a live interview at Dragon*Con, but I want to give you a little bit of background about this particular interview. It was part of the Skeptic Track, which is a track devoted to critical thinking and the promotion of science. I was very fortunate to have the slot immediately after the opening panel, which featured several leaders from the skeptical community, including [James Randi](#).

One important point that was made during that panel was the fact that scientific reasoning does not come naturally. This was the perfect lead-in for my conversation with Dr. Lilienfeld, because psychology is one of those fields where many so-called “common sense” ideas turn out to be wrong. In this interview we don’t get into the kind of neuroscientific detail that many of you prefer, but I think the ideas that we discuss are important, and definitely in keeping with my original goal to make this a show for everyone who has a brain.

I’ll be back after the interview with some announcements and to give you some information about upcoming episodes of the *Brain Science Podcast*.

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INTERVIEW

Dr. Campbell: Well, welcome to Dragon*Con, and thanks for choosing to come to this instead of somebody famous. Scott, my guest today, is the co-author of a great book I recommend to all of you, called [50 Great Myths of Popular Psychology](#). What we’re going to talk about today really is a follow-up on what we talked about in the early session in the opening round. I want to follow up on what Derek and Jamie said about the fact that a lot of the critical thinking errors

that we make, and our tendency to believe stuff that's not true has to do with how our brains work. Dr. Lilienfeld is a professor of psychology, and he has a passion for studying this area, I think—don't you?

Dr. Lilienfeld: I sure do.

Dr. Campbell: Have you ever been to Dragon*Con before?

Dr. Lilienfeld: This is my first Dragon*Con. Do you believe it? And it is going to have to be the first of many. I have to say, I just love these get-ups—costumes. You guys are so much more cool than my academic colleagues (we are so stuffy), and it's so rare that I'm the most normally-dressed guy in the room—it feels great. But it's great to be here. I'm looking forward to it.

Dr. Campbell: Can you start out by just telling us a little bit about yourself?

Dr. Lilienfeld: Let's see, where can I start? I was originally an astronomy major—undergraduate. I went to [Cornell](#), and I had this unbelievably naïve idea that I was going to study with this guy named [Sagan](#)—I think his name was. I swear to God, I literally thought I was going to do this. It's so embarrassing. And in the four years I was there he was filming the show [Cosmos](#) on PBS, and I think I saw him a grand total of once on campus. I was walking by him and I mustered up my courage, and I said, "Hello, Dr. Sagan." And he said, "Hello." He was actually very nice. But many years later I did get to meet him, and had a great time with him—a real gentleman, and a tremendous person.

But I did end up switching, for various reasons, to psychology undergraduate. It has always been my love and my passion. I did my graduate work at the [University of Minnesota](#) in the clinical psychology program. So, I'm a clinical psychologist by training. I study mental illness and its treatment. I don't do psychotherapy anymore. I once did—once upon a time. I miss doing it, and may

go back to doing it a little bit. I had my first job at a place called [SUNY Albany](#) in upstate New York—actually not too far from Ithaca and Cornell.

And I have been at Emory since 1994, and have gotten really interested in scientific thinking and how it applies to clinical practice. Much to my dismay, I have to say, I was very naïve, again, going into the field. I really assumed that the field of psychology—especially my own field—was one in which scientific thinking was widely accepted and was very prevalent. But I was wrong.

There is actually a lot more openness to it than many of us may think, but I also think that we don't do a very good job as a field. And mea culpa—when I first started teaching it, as well, I think I just assumed that scientific thinking comes naturally to people. And I realized the hard way that it does not. It didn't come naturally to me, either. And I think we need to do a better job of imparting it.

Dr. Campbell: Yes, that's why I wanted to have you here today; because we talk a lot in the skeptical community about trying to get rid of what we call “woo,” and a lot of paranormal thinking, and all. I think it's important to realize that the problem of poor critical thinking skills even goes into professional areas where you would assume the people had those skills. And that's kind of what we're going to talk about a little bit today.

I think you already answered my first question, which was going to be how did you get into investigating these myths and pseudosciences.

Dr. Lilienfeld: It was really by accident. I've always been sort of a lover of skepticism and scientific thinking, but I really did not intend to get into it until maybe the early '90s. I found this magazine called [Skeptical Inquirer](#) around 1991-92. And also I started seeing some things in the field—my own field of clinical psychology—in terms of psychotherapy diagnosis, that I had not expected to find. I was actually pretty shocked to find how prevalent some bad practices

were. And just by hook or crook, and partly by accident I just started doing some writing about this and started getting both some hate mail and some fan mail. And I think that actually made me realize there was a real need for it, because it's not something many people in our field do.

Dr. Campbell: And that's also, I guess, what motivated you to end up writing this book.

So, to start out with, could you define for us what you mean by the term "pop psychology?"

Dr. Lilienfeld: Yes, that's a good question, Ginger. What we mean by "pop psychology" is really kind of this amorphous industry. It's not one big monolithic thing, but this kind of amorphous industry that is this big other world out there that is outside of academia and scientific psychology. It consists of self-help books (about 3500, by the way, published per year, of which about 95% remain uninvestigated), magazines, TV, cable news, Internet—everything that propagates largely kind of common sense inductions about human nature that aren't necessarily grounded in science.

Just to be clear, I think there is some good pop psychology out there; I think there are some good self-help books out there. So, we try in this book—whether it's successful or not is something I think readers will judge us on—but we try to point out that not all pop psychology is bad. But there is a real disconnect between a lot of pop psychology and a lot of scientific psychology, and I don't think our profession—those of us in academia—has done a very good job of educating the public about what aspects of pop psychology are well-supported and which are not.

Dr. Campbell: And how does pop psychology relate to what some people call "folk psychology?"

Dr. Lilienfeld: Folk psychology I sort of think of as what's often loosely termed "common sense." There are probably four or five different definitions of what common sense is. But what we often mean by "common sense" (what we talk about in our book) are what one of my PhD mentors, [Paul Meehl](#), called "fireside inductions"—kind of things that seem natural, they kind of seem right, they're passed on from one person to another. They are kind of folk wisdom. So, I think a lot of the pop psychology industry feeds on folk wisdom. It often seems to make sense, it accords with our intuitions, it accords with our gut hunches, so as a result I think it inadvertently capitalizes and seizes on our folk wisdom.

So, to take one example, the belief that expressing anger when you're ticked off about something is always good for you. I think that makes a certain amount of folk common sense because, in fact, we do observe most of the time that when we get angry and we express it, we feel better afterwards. The problem with that, the research seems to show, is we are mistaking basically a correlational finding for a causal finding.

What probably is actually happening there is that anger, as we all know, tends to be a very short-lived emotion. If we do absolutely nothing, the odds are high the anger will subside on its own. But what ends up happening is we get angry, we yell, we scream, we hit the wall—whatever—we feel better later. We then may make the mistake of attributing that decline in anger to our action. There's a good example of folk wisdom making a certain amount of sense, but it's probably not that well scientifically supported.

Dr. Campbell: That's kind of like in my area people are always so convinced that those antibiotics they got for their cold made them better, when it was really just that they were going to get better anyway.

Dr. Lilienfeld: Right; exactly.

Dr. Campbell: Early on in your book you say we can't trust our common sense. And that's kind of an important principle here. Do you want to talk a little bit about why that's true?

Dr. Lilienfeld: Sure. And this is probably kind of old hat to most people in the audience. I think skeptics are really familiar with this concept. But to me it's really important educationally. I tend to agree with some science writers, like [Lewis Wolpert](#) and [Alan Cromer](#), and my colleague, [Bob McCauley](#) in philosophy at Emory, that a lot of science is really uncommon sense. If you look at the history of science and many of the most misguided notions in science, I think a lot of them were very subjectively compelling because they really fit our common sense notions. The most obvious ones, of course, are [flat earth](#) and the [geocentric universe](#).

I think a lot of us skeptics are bewildered as to why [intelligent design theory](#) is so popular. Some of it undoubtedly is its religious connection, of course—there's no doubt about it. But I think some of it also, we forget, is that it kind of seems right to a lot of people; it kind of makes sense. I mean for me—I'm a big lover of nature, a big lover of wildlife—I have to sometimes step back and say, "My God, this was actually produced by natural selection."

And it was; but it seems very implausible, because the human mind did not evolve to grasp such huge expanses of time, did not evolve to grasp these kinds of naturalistic processes. So, again, intelligent design theory and a lot of notions that we debunk, I think are really resistant to change. I think there are a lot more obstacles to debunking those ideas because they do seem to be intuitive to so many people.

Dr. Campbell: We're going to talk about some specific examples, but I thought you might want to go over some of the basic critical thinking skills; which are

going to be familiar to many people in the audience, but they're important when evaluating claims in psychology.

Dr. Lilienfeld: Sure. In the book we talk about a tool kit of critical thinking skills—again, a lot of these are going to be familiar to skeptics. But I mentioned one already: [confusing correlation with causation](#). That may be the biggie. I think [Steven Jay Gould](#) argued that may be the single most common mistake. And, again, I'll tell you, I teach introductory psychology—I was actually teaching my class just yesterday—and it is so easy to get students to repeat this mantra: correlation isn't causation. They remember it, but when it comes to actually applying it to a real-world example that seems plausible, they forget all about it. It's really, really hard to get that notion across.

So, when you give them a really silly example—this was undoubtedly found by a researcher with too much time on his hands, who found that there was a substantial negative correlation between the number of PhDs given out in a U.S. state and the number of mules in that state (actually true)—it's funny, my students can usually figure that one out. It takes a few seconds, but pretty quickly they realize, no it's probably not that the mules are driving the PhDs out of the state, it's probably because there's some third variable like rural vs. ethnic status. Wyoming doesn't have many universities but has a lot of mules; and my home state of New York has a lot of universities but I didn't see a single mule, growing up there.

They usually get that. But because of what sometimes is called [belief bias](#), when there is a correlation that is intuitively plausible (so, for example, that teenagers who listen to more rock and roll have more sex, or something like that) they think, oh, there must be some direct correlation (well, it is a correlation, actually), so therefore, because it's correlate, it must be causal; therefore, listening to rock and roll must make you have more sex—because there you can actually draw a causal link more clearly. So, that's one we talk about.

We also talk about a related one (you mentioned it earlier with regard to the cold/antibiotics example, the anger example): [post hoc ergo propter hoc](#) (after this, therefore because of this). If A precedes B it is so tempting to think that A therefore must cause B. If there's a key theme I think we tend to forget in the skeptical movement, and if there is a flaw in the skeptical movement, I think it's that we often forget that these are quite natural tendencies.

These are ones that have to be not really just learned, but unlearned. We have to unlearn these tendencies, because that's the way our brains tend to think. Our brains do tend, I think quite naturally, to see causal connections. That's probably, by the way, a basically adaptive tendency. That's good most of the time, but sometimes it will lead us astray. So, that's two examples of a bunch of others we talk about.

Dr. Campbell: Those are, like you said, probably the two most important ones. I think another one that really struck home to me was the exposure to a biased sample. Anyone who works in a specific field—like a psychologist or a physician—if you see a lot of sick people, for example, you get a feeling that there are more sick people, and that they're the dominant species. This is one that scientists and clinicians can easily fall prey to.

Dr. Lilienfeld: Yes, absolutely. I'll give a real quick example of that—and this is a touchy one, just to be honest. I have to be very sensitive about this when I talk about this to my intro students. But there is a very widespread belief that child sexual abuse is very, very closely linked to later psychopathology. Now, I personally actually would be shocked if there were not some direct causal link between child sexual abuse and psychopathology. I think the literature actually kind of points in that direction. There is probably some link. But it's also probably been massively overestimated—which I actually don't think is necessarily a good thing. As a field, we often send the message that if you've been

abused, you are doomed to developing problems later in life. A lot of websites even talk about being scarred for life.

Now, why is that? When I've talked about this in clinical audiences I often get the following criticism. Clinicians will say, "No, you're wrong; you're stuck in the ivory tower, you're not seeing the cases I'm seeing"—which is actually a valid point. So, what's their point? What they say is, "Well, all the people I see who have been abused are having problems." True. The problem is they're doing psychotherapy, so they're not seeing the other cells of that four-fold table.

And I don't want to speak for physicians, but I can speak for clinical psychologists. I think one big flaw in our training that has been talked about—in fact, it was even talked about by someone named [David Shakow](#), who was the founder of our field in 1949; he actually said this, but it's been ignored—it's really important that clinical psychologists get exposure to lots of normal people, too.

It's really important, because if they do that they will see that there are plenty of sexually abused people who undoubtedly have been through hell and undoubtedly have been through things that most of us cannot understand, but they have survived. And some of them have thrived, in spite of what happened to them. And I think that's a really positive affirmative message our field can send, that we often don't send.

Dr. Campbell: And, of course, it's always easier to see the errors in reasoning of somebody else's thinking than your own.

Dr. Lilienfeld: Absolutely. We're all prone to that—myself included.

Dr. Campbell: I bet anyone who reads this book, you're going to find at least one thing in here that you thought was true, that's not. I found a couple—maybe more.

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A book I'd like to recommend because it's relevant to today's conversation is [*Mistakes Were Made \(But Not By Me\): Why We Justify Foolish Beliefs, Bad Decisions, and Hurtful Acts*](#) by Carol Tavris and Elliot Aronson. I got to meet Dr. Tavris at [The Amazing Meeting](#) in July of 2010, and this book is a very good introduction to [cognitive dissonance](#) and how it affects many areas of our lives.

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Dr. Campbell: So, one area that I think is a good jumping-off point is myths about memory. And I was talking to this gentleman down here about this earlier. I'm going to just ask you this as a question: are our memories as reliable as we think they are?

Dr. Lilienfeld: Well, mine is, but... Well, you know it's a tough call. The answer is, probably not. Our memories work pretty well—and sometimes our memories are remarkable. There's one classic study, for example, done in the '70s, where they showed people, if I recall correctly, I think it was 2500 (that's amazing!) paired photographs of one object they had seen, one object they hadn't seen—like a scissors and a fork, a dog or a cat, a specific thing—2500 flashed about a couple seconds each. Then a couple days later they brought them back, and they had to identify which of those do you remember seeing. And the accuracy rate overall was 93%.

So, a lot of the time our memory works pretty well; and natural selection has endowed us with a remarkable system. But, by the same token, our memories are clearly fallible. And I think what people forget is that we are often very prone to

what are called—to be a little technical here—“[source monitoring errors](#).” It’s not so much that our memories, per se, are wrong, but that we often confuse what we’re remembering. So, we actually are remembering something, but we’re confusing it.

So, the whole term (and I use this term, too) “false memories,” and so on, I think that term may be a little bit misleading in that when we have a false memory of something (and I’ve had plenty of them) what happens—or when someone has a false memory of being abused, or being abducted by an alien, or something like that—in a sense it’s a false memory, but in a sense it’s probably more accurate to say it’s a true memory but of something that didn’t happen.

They’re remembering either a fantasy or remembering something they imagined, and then confusing that with an actual objective memory. So, I think sometimes it’s easy to think of our memory system as just making up stuff out of whole cloth. Sometimes we do, admittedly; but, more often than not, what’s happening, I think, is we are getting confused about the origins or source of that memory.

Dr. Campbell: And then our memories are dynamic, so every time we think about something, we actually have to generate that memory anew, and so, anything that’s happened in the meantime can influence what we remember. You mentioned one of the examples from the [Challenger disaster](#), which is a really famous one. A couple of years ago I was interviewing [Dr. Robert Burton](#)¹, and he also quoted that one.

Because they actually interviewed people right after the Challenger disaster: had them write down what they were doing, what they were feeling; brought them back two years later, asked them what they were doing, what they were feeling. And the correlation—I think it was like 25% of them matched, and the rest of

¹ Dr Burton’s book [On Being Certain: Believing You Are Right Even When You're Not](#) (2008) was discussed in [BSP 42](#) and he was interviewed in [BSP 43](#) (both episode aired in 2008)

them had entirely different memories. And there were even people who they showed them their own handwriting—“This is what you wrote”—and there was one guy who said, “Yeah, I wrote that, but that’s not what happened. What I remember now is what happened.”

Dr. Lilienfeld: Yes. That study was actually done a couple of miles from here, where I teach at Emory University; these were Emory University students. And about two-thirds showed some marked discrepancies, and about a third were wildly different. And it is interesting, you’re exactly right that a lot of people actually preferred their later memories to their first memories—even though, given what we know about memory, almost certainly the first memory had to be more accurate.

But I think what ends up happening is we end up kind of constructing a narrative, we get comfortable with that narrative, and we just kind of live with it. And that’s one reason why we’re often so sure of our false memories: “Yeah, I kind of like that story better.” You know? “Remember that time at the wedding when these two guys got into a big argument, and they made up later?” No, they didn’t make up. They’re not talking to each other. “No, I kind of like the ending I thought of later, better.”

And our memories are very much like possessions. They are part of us. And I think oftentimes many of us get offended when someone questions our memory, because it’s part of our identity. It’s something that belongs to us in a very powerful way.

Dr. Campbell: What about the idea that people commonly repress traumatic memories?

Dr. Lilienfeld: Yes, that’s a really contentious one in the clinical community. That’s one I think you’re going to get a lot of disagreement on. I have to say I’m

probably a bit more open to the possibility that there are truly repressed memories than some skeptics are, but I'm also not terribly persuaded by the evidence. I'm open to it, but I keep waiting for a really clear-cut case, and I haven't really seen it yet.

And some of this is definitional. Usually what we'll mean by "repression" is it is a kind of motivated forgetting, and once you forget it, it is not accessible, unless you, of course, undergo some kind of psychotherapy or hypnosis—ostensibly. That's the way the story goes. I don't believe that, but that's the claim.

There's no question that people will often forget unpleasant experiences: they often will not attend to them, they want to not think about them, and so on. The question is can people literally repress painful memories—especially traumatic memories. And then, of course, the converse part, which is even more controversial, is can they then bring them out in accurate, pristine form years or decades later. And I think the evidence there is still inconclusive.

I think the one thing that should not be controversial, though, in my view, is that a large proportion (nobody knows how many; but a large proportion) of so-called "recovered memories"—especially those in psychotherapy—are confabulations or not accurate. Whether any of them are accurate I think is still up for grabs.

Dr. Campbell: So, this brings up the issue of how do you evaluate a claim like this. We often talk about the importance of [double blind studies](#), but I'm not sure I can figure out how we would do a double blind study of this.

Dr. Lilienfeld: One big problem is in some domains of psychology you can do double blind studies, in some you can't. So, psychotherapy being one obvious example—it's an area I do some writing in—you can't do a double blind study of psychotherapy. There's no way to keep someone blind to the fact they're

receiving psychotherapy. You just can't do that. You can't. You can approximate, but you can't do it.

Same thing is true here. The best you can do—and people have done this—is to try to find cases where there is very, very specific evidence that the person claims to remember that then matches other kinds of evidence that they presumably did not otherwise have access to.

Now, there were some interesting cases that were unearthed by someone named [Jonathan Schooler](#), who was actually a student of someone named [Elizabeth Loftus](#), who is a big memory researcher who is a big skeptic of recovered memories². But Schooler claimed to find some of these cases—I actually saw some videotapes of them—of people who seemed to recover very distinct memories of abuse. And, in fact, some of the details did match some external corroborating information.

But here's the catch—this is what's fascinating about these cases. In a lot of the cases he looked at, if not all, what happens is if you ask friends or relatives about the time the person claimed to have forgotten the memory (so, the person said, “I never thought about this; oh, my God, I remember, I was abused, and I never realized it”), they will say—in the cases he identified—“No, that's not true; you did talk about it. You did talk about it.” Now, it's almost like the person forgot that they remembered.

And Schooler's explanation—and a few other people have argued this, too—is that what's actually happening (I don't want to say this is completely agreed on, but it's an interesting one) is that what you see in these cases (and I do think this sometimes happens) is that people actually remember the abuse, but it's not until later that they re-conceptualize it as abusive.

² Loftus, E.F. (1993) The reality of repressed memories. *American Psychologist*, 48, 518-537.

They always have a memory of being touched, for example, by daddy, but it didn't quite kick in, wait a minute, that was abuse. Then they're watching *Oprah*, or they're reading a book, or they're in therapy and they go, "Oh, my God! I was abused." And it has the force of a new memory, but, in fact, the memory is not changing, it's rather their conceptualization of the memory. But that's still a very controversial issue. I don't think it's scientifically resolved.

Dr. Campbell: One that I really want to touch on before we go to the questions is the idea that expert judgment and intuition is the best way to make clinical decisions.

Dr. Lilienfeld: It's not; it's just not. Now, expert judgment is not useless, and there's a big controversy in the field about expertise—when do people develop expertise; when does it work. And I'm not a cognitive psychologist, but my reading of the literature is pretty consistent that you tend to only get what are called "expertise effects"—by "expertise effect" what I mean is that people get better and better and better with something with practice—you tend to get expertise effects in fairly constrained situations, actually. You get expertise effects in a couple of cases where the feedback is quick, where the feedback is consistent, and the feedback is accurate.

So, in areas, like computer programming, or chess, or things like that, there you're going to get quick feedback, it's usually going to be accurate feedback, it's going to be pretty consistent and clear feedback. In domains like medicine, and especially psychotherapy, it's not that case at all. A lot of the feedback you get is vague. Is the person getting better or not? It's not clear. If they are getting better, is it because of what I did? If they're getting a little worse is it because of what I did? Who knows? It's often delayed. You may have to wait for months to see whether they're really improving or not. It's often inconsistent.

So, in my own field of clinical psychology most of the research shows that expertise effects are not very pronounced. What I mean by that—and it's a bit ignominious for people like me, who are clinical psychologists who used to do psychotherapy—but most of the research shows, for example, that amount of experience as a therapist is not very related to how good a therapist you are. If there is a correlation it's very, very weak. In some studies it's close to zero.

Amount of experience in learning to use a diagnostic method, for example, again, most studies show what are called “training effects” but not experience effects. You have to be trained up on the method. You have to know enough to know how to administer a particular test. But once you kind of get good at knowing how the test is given, it looks as though it kind of asymptotes very quickly after that.

And most of the research shows, in terms of how to combine information – And this is something that we all do as clinical psychologists in practice. We get a lot of diagnostic tests, for example, we get self-report questionnaires and we interview the person, we get information from relatives, we may give an IQ test, etc. So, we have like 10 different pieces of information in front of us. Then how do we combine that to reach a clinical decision, to make a prediction about how likely the person is to attempt suicide (these are important questions), make a diagnosis how likely is it that the person has schizophrenia as opposed to bipolar disorder (one of the classic distinctions in psychology; an important one)?

Most research shows that we would do better by using a formula that's already been derived on a sample, and just plugging it into a computer, rather than using our clinical intuition. Most studies show—virtually all of them show—that computerized mechanical formulas that are derived from data actually do just as well, if not better, than clinicians. And to the extent that clinicians do OK—and some of them actually do OK—it's to the extent to which they're following that formula.

Dr. Campbell: And the same thing is true in medicine, and I think that physicians have the same reluctance to accept that reality as clinical psychologists do. Those of us who are practicing physicians are constantly being bombarded by the studies. And, of course, one problem we have is figuring out is what we're being told reliable; is it publication bias, because they only publish the positive studies. But the key idea is that being an expert doesn't mean you're always right. You can make all the same mistakes. That's why I think, even if you were a psychologist, you might find something in here that you really, really think is true, that's not.

Before we open up to questions I just want to do one other thing, and that's give you a chance to tell us what your favorite pop psychology myth is.

Dr. Lilienfeld: Ooh, that's a good one. My favorite pop psychology myth: you know I don't know if I have one favorite, but I can tell you the one—I'm going to answer a somewhat different question, and maybe you guys can explain why this is—there's one that I get asked about maybe the most, and it's the one I get the most hate mail about. So, maybe you guys can explain why.

It's the full moon myth. You wouldn't think people would be that personally invested in it, but I get more hate mail about that saying, "You're an idiot. You don't know what you're talking about. Of course more weird things happen during full moon." And I love talking about it. It is such a pervasive myth.

And it's, again, a great example of what we were talking about before, where people see connections that are not there. In this case it's a somewhat different phenomenon. It's called "illusory correlation." People are seeing a correlation—a statistical association that's not actually there.

Again, I think one reason why people are so attached to that one is there's a core of truth in what they say—and I've come to realize this. So, again, I've had

arguments with people about this, and what they will typically say is, “You’re wrong, because I’ve seen it over and over again. I’ve seen it where there’s a full moon and people behave weirdly.” And, you know what? They’re right. They are seeing it; the problem is they’re weighting the observation incorrectly.

Again, I often tell my students life is like a four-fold table³ (it sounds kind of Buddhist, right?) and you have to look at all the cells in the table. But what ends up happening is, yes, they are seeing those cases, but what they’re forgetting about, of course, are all the cases in particular—there are other cells, too; but in particular—forgetting about all those cases in which there is a full moon and nothing weird happens. They’re seeing those too, but they are not attending to them.

So, again, in a sense that term—we use that term, “illusory correlation” in psychology—it’s a little bit of a misnomer, I think. I use it, too; but I’ll tell you what: it is a correlation. It is—but it’s up here, it’s not out there. And in a certain way our brains are actually being pretty smart. Our brains are actually computing a correlation in a certain way, and to some extent they’re right—or they would have been right if that cell had been weighted correctly. The problem is our brains are attaching too much weight to that one cell. So, that’s the one I like talking about because it’s a great illustration of illusory correlation, and it’s also one that’s very subjectively compelling.

If you’re curious about what the research literature on that shows, there was a great meta-analysis—which is a kind of analysis of analysis—that was done on this in one of our premier psychology journals, called [*Psychological Bulletin*](#)—I

³ The use of the four-fold table is illustrated on page 11 of *50 Great Myths of Popular Psychology*. It is a grid showing the following boxes: Full moon with psych admissions, Full moon without psych admissions, No full moon with admissions and no full moon without admissions. His point is that we tend to remember the first box more than the others.

can give you the reference if you want⁴. This was a paper done like 20-25 years ago, but it has held up again and again and again. There were like 40 different studies. They looked at pretty much everything under the moon, I guess. They looked at psychiatric hospital admissions, suicide attempts—other people have looked at like dog bites and hockey fights. Anyway, they found—I mean it’s so rare in psychology—they found absolutely nothing, when you pool all the studies together.

And, as I always tell my students, almost every psychology review article ends with the following kind of bland advice—maybe you guys can even finish the sentence. Almost every review article in psychology ends with the following sentence: “Clearly more research is needed in this area.” This is just about the only article in psychology ever read that in essence ended with the following advice: “In conclusion, no further research is needed in this area.”

Now, I wouldn’t go quite as far as that; it’s always possible some new finding can come up. But they were sort of jokingly making the point that there’s just no good evidence for that effect, even though it seems so subjectively powerful. Again, things could always change in the future. But we can certainly say that, at the very least, people are perceiving a strong correlation when it’s not there.

Dr. Campbell: I still find it hard, even though I know that. When I’m getting ready for work in the morning and it’s still dark out, and I see the full moon, and I’m getting ready to go to the ER, I have to say to myself, no, it really doesn’t matter.

[music]

Dr. Campbell: If you want to ask a question, come on up to the mic so that everybody can hear you.

⁴ Rotton, J, & Kelly, I. W. (1985). Much ado about the full moon: A meta-analysis of lunary-lunacy research. *Psychological Bulletin*, 97, 286-306.

Woman 1: I have a mental illness, and I've been through a lot of therapy and I find it all useless. However, medicine has changed my life and made me so much better. And I'm so grateful for modern science. Now I see that my child is going through the same thing I am. And I feel pressured for her to go through all this therapy; and I feel like they're going to call the Child Protective Services on me if I don't do what they're saying. And also they don't want to prescribe the medicine that works for me.

And I don't know what to do. I just feel that there's no good evidence for what they're telling me is wrong, and that changing someone's thinking is not going to make them better. What would you suggest I do in the face of all these experts telling me these things?

Dr. Lilienfeld: Well, first you're very courageous, and I appreciate the question. I don't have an easy answer to that, other than to give you some support, because I don't know the exact nature of the treatments they're prescribing. But I do think that, unfortunately, there is a real problem with a lack of evidence-based practice out there. Again, I'd have to know more about the specific treatments they're prescribing, and so on. But you are right that a lot of treatments for particular disorders are very popular, or may be sort of commonly accepted, that do not necessarily work.

And in my own field of psychology, psychopharmacology, I think, does get a bit of a bad rap. There's no question that some medicines have been over-hyped—there's no doubt about that. On the other hand, there's also good evidence that for severe problems—take depression, for example: even though we do know that some of the efficacy, some of the effectiveness of antidepressants has been over-hyped, we do know that for severe depression, medicine can be helpful, and it clearly is more effective than placebo.

So, all I can say is—and I'd be happy to talk with you later—to stand your ground. And ask for evidence. I think that's the most important thing a consumer can do, is to turn things around. The burden of proof ultimately should be on the people who are delivering the treatments. And ask them what is the evidence that this treatment works: "Show me; show me the studies."

And by the way, it's a little easier to do that—I'm not saying it's easy—it's a little easier to do that nowadays, because there are large databases like the [Cochrane database](#), where they've meta-analyzed just about everything under the sun.

"Show me a Cochrane review. Show me a meta-analysis that these treatments are actually effective," and put a bit of the burden of proof on them. I know that may not be a panacea; it may help a little bit. But I applaud your efforts.

Woman 1: Thank you.

Man 1: Hi. I'm wondering about hypnosis. I know there are a lot of people who seem to have no credentials at all. On the other extreme I know of someone who teaches in a university setting who's a neuropsychologist, and he claims to have used hypnosis methods to especially prevent blistering in burn victims. So, I'm just wondering if there's a body of evidence that either debunks or supports hypnosis in any form.

Dr. Lilienfeld: Right. That's a good question: so, what about hypnosis? I'm glad you raised it. I'm a bit of a skeptic about a lot of the claims regarding hypnosis. On the one hand, I do think sometimes skeptics are a little too dismissive of it, however. There is good evidence, actually from meta-analyses, that hypnosis can be a helpful adjunct (and I say "adjunct," not a stand-alone treatment) when combined with more traditional therapies like cognitive behavioral therapy, behavioral therapy. It may actually add a little bit to the treatment of depression and anxiety disorders. I would not say blisters, however. I mean I've heard those claims, but I'd be a little skeptical of that.

The controversy, though, is, is it really specific to hypnosis, or is it merely the fact that in modern society—and this is what I lean to, but I’m willing to be persuaded otherwise—what I lean to thinking is that in modern society a lot of people think hypnosis is a powerful way of inducing expectancies, and it can be effective. So, I suspect that for some people in society, giving them a bit of hypnotic induction is a little bit more motivating, makes them think that the treatment is plausible, may make them more likely to try the treatment—and that’s good. So, for those purposes, hypnosis may be somewhat useful.

I do not recommend it as a stand-alone treatment—because there are certified hypnotherapists that use it by itself. I don’t think that’s justified. And, in particular—and this maybe is a little off from where your question is, so, forgive me, but I do want to mention this—where I don’t think hypnosis is justified is using it for memory enhancement or memory refreshment purposes. There I think the evidence is pretty consistent that what hypnosis does is it merely lowers the threshold for reporting all memories, both true and false, and it probably increases the risk of false memories.

I was involved in a court case in this where, to make a long story short, the prosecution was using hypnosis to refresh memories of a crime, and someone was arrested, I think quite unjustly. And there’s just no evidence at all that hypnosis can improve the accuracy of memories. It will sometimes. I think some of the popularity comes from the fact that it will sometimes yield some accurate memories. But so will getting somebody drunk. People will start reporting all kinds of stuff. Every once in a while something will be accurate, but there’s a lot of inaccurate stuff, too. So, you’ve got to be very skeptical.

Man 1: Sure. Thank you.

Dr. Lilienfeld: Thank you for the question.

Woman 2: My first question is do you have copies of the book, so I can get an autographed one to take back home with us?

Dr. Lilienfeld: Oh, that's nice. I don't, with me; no. But send me one; I'd be happy to autograph it.

Woman 2: Thank you.

Dr. Lilienfeld: I'd be honored.

Woman 2: My second question is when you were talking about in the early '90s, or the mid '90s, where there were some things in the field that you saw as practice that you were like this is not — Can you talk about that just very briefly?

Dr. Lilienfeld: Yes, I can. There were a lot of things; but there were two in particular that come to mind that were bothering me. So, in the 1990's one thing I saw in particular was what I would now call the "recovered memory craze," in which therapists all over the country were using highly suggestive techniques (we just got a good question about hypnosis, which is not good for memory recovery, whatever its other merits may be) using leading questions: asking people to put down in diaries or journals, might they have been abused? There were self-help books recommending these kinds of things.

I was pretty appalled, actually. I was appalled by two things. I was appalled by the fact that a lot of therapists (and we know from two different surveys at the time, about 25% of therapists) were regularly using these techniques to recover memories of early abuse, even though they may not have existed. And I was equally appalled, I have to say—and I may sometimes make some enemies saying this—but I was equally appalled by the silence of much of the academic community in response to this. There were some courageous people who I'm proud to call friends—like Elizabeth Loftus, Steven Jay Lynn, [Stephen Ceci](#), and others—who railed against this. But a lot of people just stayed quiet.

The other one that was very big at that time, that many skeptics will be familiar with, is [facilitated communication](#) for autism^{5,6}. That was also getting very big at that time. The claim, as many of you may know, is that autistic individuals, supposedly who were previously uncommunicative—even totally mute—could communicate on a letter pad keyboard with the aid of a facilitator. That was very popular at the time, even though there was, I think, pretty overwhelming evidence that it was due to inadvertent control of the individual’s finger movements by the facilitator.

Incidentally, one thing we have to remember as skeptics is that people have a very short memory—the population has a very short memory. Unless we’re eternally vigilant, these things will come back. Facilitated communication is an example. It’s making a big comeback. It’s being used all over the place again now. I don’t think it’s as popular as it once was, but it is being used a lot. And *CNN* has broadcast some documentaries, including [Autism is a World](#), that were very uncritical about facilitated communication. So, we have to be very, very careful.

So, those were two among many. But those two, in particular, bothered me.

Woman 2: Thank you.

Dr. Lilienfeld: Thank you.

Woman 3: I guess that’s one of the benefits of getting older. At least you can remember this previous stuff, and it’s like, well, wait, wasn’t that just popular yesterday?

⁵ Delmonico, L.M., & Romanczyk, R.G. (1995). Facilitated Communication: A critique. *Behavior Therapist*, 18, 27-30.

⁶ Jacobson, J.W., Mullick, J.A., & Schwarz, A.A. (1995) A history of facilitated communication: Science, pseudoscience, and antiscience. *American Psychologist*, 50,750-765.

But, I want to make one comment, and then I have a question. When you mentioned earlier the idea that anger is something that builds up that you have to release: I've just finished reading an anger management book—for personal reasons—and that is actually one of the myths that he lists in that book. And he attributes that to Freud, that, yes, it is not something –

Dr. Lilienfeld: Well, good for him.

Woman 3: Yes—that it's not something that builds up. The reason you get that build-up effect is because you're reliving the trigger over and over, and you keep retriggering yourself. That book talked about anger hooks, responses, needs—things like that. I found it very helpful.

Dr. Lilienfeld: Yes, sometimes self-help is good. So, there's a great example.

Woman 3: Yes. Well, the author seems to have decent credentials.

Dr. Lilienfeld: And if I could just interject one point there, I think people forget that we humans are a smart species, so we can think about what we're thinking. And I think one reason that anger often feeds on itself is (and I think many of us will realize this) when we get angry it's not very pleasant, and then we get angry about the fact that we're angry—because it's not a lot of fun. And then we get angry about the fact that we're angry about that we're angry, and it just kind of feeds on itself, and it doesn't help very much.

Woman 3: Yes. So, I'm trying to learn to be less reactive in certain things, because in this day and age you can't express anger; it's not appropriate.

But what I actually wanted to ask—and I think this is something that's rooted in some kind of popular psychology idea—is the idea of employers having you evaluate yourself. Collective groan! I've had to do it; my husband has had to do it. We both think that this is five shades of wrong; because if you're one of these

people who think you're awesome, you're going to give yourself a really good evaluation, and if you're somebody who's deeply critical of yourself, you're going to pick yourself to pieces. And obviously they have some reason for wanting to do this, but I don't –

Dr. Lilienfeld: It feels good, that's why.

Woman 3: I don't see it as any kind of useful tool, and I just want to hear some commentary on that.

Dr. Lilienfeld: I can say a bit about that. Actually I had this once. I had to do my clinical internship part of my training in a place called Western Psychiatric Institute in Pittsburgh, and I had that on one of my rotations. I had to evaluate myself, and give myself a grade from A to F on different aspects of my functioning. And, amazingly, I gave myself an A on everything. What a shock! I don't know why it's so popular. I suspect one reason is that it excuses employers from the difficult task of having to make hard evaluations—which I can tell you is not fun, having had to do it, myself.

It's probably not a good idea. One thing we know: there's a researcher at Cornell, [David Dunning](#), and [Justin Kruger](#) at Brown, who have done a lot of work. If you want to look it up, there was a wonderful review⁷ of this in a journal called [Psychological Science in the Public Interest](#) a couple of years back—very comprehensive. It's been a big area of research in psychology, actually over the last decade or so. There's been a lot of work on self-evaluation—how good are we at evaluating ourselves. We're not so good—we're not too good.

And you have it exactly right. What ends up showing is—it's not a very politically correct term, but they often call it the “double curse of incompetence” (and let's face it, we're all incompetent in some domains)—people who are not very good in

⁷ Dunning, D., Heath, C., & Suls, J.M. (2004) Flawed Self-Assessment: Implications for Health, Education, and the Workplace. *Psychological Science in the Public Interest*, 5.3, 69-106.

a particular domain are often the very people to think they're the best at it. And if you look—and I've seen this anecdotally in my own psychology classes; and there's actually research showing this—that the very people who think, for example, as they're walking out of the exam, that they aced it, are the very people who did the most poorly. And conversely, you're exactly right that oftentimes people who are doing the best on the exams often think they bomb.

And I think the secret here is what psychologists call “metacognition”—thinking about thinking. If you're someone who is very thoughtful, if you're always introspecting on how you're doing, you're always racking your brain against something—“I'm not sure I know this very well”—you're often going to do better, but you're actually going to have more doubts about how well you did. We're not particularly good at self-evaluation.

It's not useless. If you ask people to estimate their IQ scores, for example, it's not totally uncorrelated with their actual IQ. The correlation is about .2, .3, or so, with a maximum correlation of 1.0. It's not 0, but it's pretty low. You can use it as one adjunctive guide, but I would not rely on it.

Woman 4: I'm just curious about your opinion. This may be new to me: but a lot of the books that are currently out with neuropsychology, and changing your brain, and looking at specific activities that may help to bring together a particular balance, especially in the elementary situation.

Dr. Lilienfeld: I would not say I am an expert in that. I appreciate the question. I do know enough to know that there is a lot of hype and a lot of pseudoscience in the educational field—a lot—and I would be really skeptical of it. And I think the problem is that we in psychology—with apologies to Sigmund Freud—tend to have a little bit of a case of neuroscience envy. It makes us seem more scientific to talk about things at the neural level of analysis, somehow. There are all these techniques like brain gym—and my late dear friend, Barry

Beyerstein, who passed away a couple of years ago, was a real expert in this—brain tuners, and these things are so big in the educational community. And a lot of them really are massively over-hyped, so I'd be a little bit careful.

Another big one that sometimes is talked about at the neural level, sometimes not, is this whole idea of matching students' learning styles to particular teaching styles—that more visual learners do better with visual teachers, and more kinesthetic learners do better with kinesthetic teachers. And some people have brought in neuroscience to explain it.

The evidence actually does not support that claim very well. There are, not surprisingly, certain teaching styles that just work better across the board. Teachers who have high standards, high expectations give students good skills to meet those expectations, do better. But this whole matching hypothesis, a lot of which is derived from neuroscience notions, is just not supported very well.

Man 2: I work in a behavioral health ward. I work in inpatient behavioral health, and I like our psychologists and psychiatrists. It's just our nurses are so full of this pseudoscience and stuff like that. And these are the people with most of the direct contact with the patients. And it's just really frustrating for me, working there, because I'll have nurses come up to me—because I have some medical problems—and they'll look at me like, “Oh, all you'll need is just do this holistic stuff; and here's the card from my holistic doctor.” And I'm like, “You know what, I have a urologist or a nephrologist that says you're wrong. So, I'm done now.”

I am so appalled by how much pseudoscience is there. And these are the people that actually sit and talk with the patients far more than the psychologists and psychiatrists. I mean we have an acupuncturist on the ward—he's also a nurse—but we have an acupuncturist on the ward who actually one time — I've passed about 12 kidney stones in the last year, and he's like, “Oh, I can do this. I can

help you out with that. I know some acupuncture for kidney stones.” Like, “No, you don’t. I don’t care what you say.”

Dr. Lilienfeld: Let me try to answer your question. I’ve seen this, too. It’s not unique to nurses. Back when I did clinical work I worked with a lot of psychiatric nurses, some of whom were great, some of them were not so good. It’s not unique to nurses. It may be somewhat more prevalent. It wouldn’t surprise me, because I think the quality of training in that field is not so good. I’ll give you one example. At Emory University, when I first got here in the mid 1990’s they were teaching courses in therapeutic touch to the Emory nurses. They were actually teaching formal courses in this stuff.

Here’s what I think. My take on this – And it’s not unique to nurses; it may be somewhat more common among them. I see it among social workers. I also see it among psychologists, even at the PhD level. I think what often draws people to those kinds of professions—and frankly, what drew me in part, too—is something healthy, which is nurturance. I think what you tend to see among people who are drawn to those professions is they are very caring, very nurturant. And that’s good. You need to have that.

The mistake, I think, that’s often made in training is what people don’t realize is that to be an effective provider—mental health and medical provider—nurturance is essential, but it’s not enough, and it has to be combined with a scientific approach. And I think what we know (and this is where it gets a little tough)—and this is something psychologists, I think, have discovered over the past decade or 15 years, or so; I don’t think it’s widely appreciated among us skeptics—is that those very traits (being empathic, being nurturant, liking people), if you look at the literature, they tend to be actually somewhat negatively correlated with knowledge and interest and aptitude in science and math. And I get undergraduates like this: “I just want to help people.” Those are often people who are not very good at science.

So, what we need to do as a field, I think, is two-fold. First, we need to find people who are in that cell—and there are plenty of them—who are very nurturant, who are very empathic, but also are interested in acquiring scientific training, and, very importantly, for those people who maybe science doesn't come as naturally, help them to understand that science is our very best safeguard against those kinds of errors; that science is ultimately the most humane approach. And if you are truly empathic, if you are truly nurturant, science, because of the way we often teach it, may seem kind of inhuman, cold, calculating, but, in fact, it's ultimately a prescription for humility, and it's a prescription for the best helping.

Woman 5: On the very “pop” side of pop psychology is the psychological plot device on television: the temporary amnesia that was rampant in soap operas in the '80s; and Stockholm syndrome takes about 10 minutes to develop. Do you have like a favorite, when you watch a television show, and then you say, “Does anybody buy this?”

Dr. Lilienfeld: Well, the first thing you have to realize is that I'm a professor, which means I have no life; so, I don't watch TV nearly as much as I once did. But, you're right. I used to be a bit of a movie buff. I don't go much anymore, but that's one of the things that would make me pull my hair out. I would always be amazed—and maybe you guys have seen this, too; and I have a friend, [Sid Perkowitz](#), actually at Emory, who has written about science and the movies—but I'm always amazed when you go to these movies and you see they spend like thirty, forty million dollars on all these special effects and things blowing up, and then they didn't bother to pay someone like Sid or me (or someone a lot better than me; I'd probably do it for free, or maybe two hundred dollars, or something like that). They would have solved all these problems, and been more accurate.

The amnesia is a great one. We actually do talk about that in our book. That's a really common one: this myth that people frequently wake up, for example, and

they forget (it's so comical) all the details of their previous life—who they were, where they were born. Otherwise they're completely normal.

Woman 5: They still speak a language, they can drive a car, but they don't know their own first name.

Dr. Lilienfeld: Right. Well, that's a hopeful myth, I think. Unfortunately, there is a case—sometimes debunking myths comes with a hopeful message; that one, I have to say, comes with a somewhat less hopeful message—when people have been unconscious for a long time, for many years (it's very important for people to know this) they're not very likely to wake up without some pretty significant deficits. The other big problem—and this is also the other mistake—is amnesia for the past (so-called “retrograde amnesia,” where you're forgetting what happened in the past) is a lot less of a problem than anterograde amnesia (the ability to remember new things). That is far and away a much more common and serious problem.

The film, [Memento](#), actually is one case where the movie industry got it mostly right. It's not a perfect movie, but it's actually pretty good. I actually talked to a friend of mine, [Stephan Hamann](#), who is a memory expert at Emory—he actually gave that film, I think, about an A-. He said it was pretty good. The one thing he said was not accurate is in the film—I forget the character's name—but he put like signs on himself, I think. He said that sometimes people with anterograde amnesia will try that, but it doesn't work, because they forget to look at the sign. So, it doesn't work too well. But by and large that was a rare case where it was fairly accurate.

I have time for one more question.

Woman 6: What do you think of the criticisms of IQ tests and the [theory of multiple intelligences](#)?

Dr. Lilienfeld: So, what do I think of the criticisms of IQ tests and multiple intelligences? It depends on the nature of the criticisms. I think that IQ tests have gotten a bit of a bad rap, I think including by some people in the skeptical community. I do think that they are surprisingly predictive of important real-world outcomes. They do predict occupational performance pretty much across the board; and the more complex and difficult the occupation is, the better they are as predictors. They predict a lot of real-world behaviors. They predict educational performance, they predict ability to learn new tasks, and so on. So, they're not useless.

One criticism, however, I think that has some force: [Keith Stanovich](#) is at the University of Ontario. He has written a pretty good book called [What Intelligence Tests Miss](#). I think it came out in 2009. I'd recommend it highly to you. I was pleasantly surprised to read this book. I have a lot of respect for Stanovich. It was not the typical diatribe against IQ testing. But he argues, I think pretty persuasively, actually, that IQ tests are pretty useful for predicting kind of the strength of our mental engines—kind of the ability to learn new things. But—and this is relevant to the skeptical community—he argues that they're not very good predictors of critical thinking. If you look at correlations between overall IQ and lots of life outcomes, they're pretty high. For critical thinking they're pretty low.

And that, I think, helps us to explain why a lot of us are puzzled in the skeptical community when we see like Nobel Prize winning people endorsing techniques that don't work, and a lot of people who endorse things that are paranormal actually seem pretty smart. And it may not be because they're dumb; they may just not have learned scientific thinking skills. And again, maybe to come back full circle, it comes back to the point that scientific thinking does not come naturally.

Multiple intelligences—final point—it kind of reminds me of the learning styles myth. I think it's a politically correct notion. There's no question that we all have certain strengths and weaknesses intellectually. That's true. Whether or not, though, these are truly multiple intelligences, I think is not entirely clear. What you typically find is a lot of those strengths and weaknesses, it's true we have them, but, in fact, a lot of these specific abilities—like linguistic ability, mathematical ability, spatial ability, musical ability, artistic ability—they actually are somewhat correlated with each other. They're not as independent as some people, like [Howard Gardner](#) and others, think. So, I would prefer, rather than call them “multiple intelligences,” just to point out that there is probably one general factor of intelligence, some people probably have somewhat stronger mental engines than others, but within that we also have specific patterns of strengths and weaknesses.

Derek: I'd like to thank Dr. Campbell and Dr. Lilienfeld for coming on.

[music]

I want to thank [Dr. Scott Lilienfeld](#) for being my guest on the *Brain Science Podcast*, and I also want to thank all of the people who contributed questions during the live recording at Dragon*Con 2010. Actually, Dr. Lilienfeld stayed for about 30 minutes after the recorded discussion, answering more questions from the audience. So, I think he was a big hit.

I highly recommend his book, [50 Great Myths of Popular Psychology: Shattering Widespread Misconceptions about Human Behavior](#). This is the sort of book you can leave on your coffee table or in your office waiting room. It's a great way to introduce critical thinking in an interesting way, but it also demonstrates that even experts can fall for bad ideas. Our brains are wired to jump to conclusions, because we evolved in a world where making rapid decisions based on incomplete data was often a matter of life or death. We see cause and effect everywhere, even

when it doesn't exist. Ironically, the more intelligent you are, the more prone you are to see correlations and to mistake them for causes.

Even if you don't read Dr. Lilienfeld's book, there are a few key ideas that I hope you will remember from today's conversation. One is that experts are not always right. And even ideas that seem to make sense should be subjected to scientific rigor. One thing Dr. Lilienfeld and I didn't have time to discuss in detail was the role of double-blind studies. In a double blind study neither the experimenter or the subjects know who is getting a particular treatment. This is very important when your evaluations are based on subjective measurements—which they often are in medicine and psychology. Dr. Lilienfeld's book is full of examples of treatments and ideas that did not hold up to the scrutiny of double blind studies.

A final key take-home point is one that Dr. Lilienfeld made during the question and answer session. He recommended that we always ask for the evidence, and look for evaluations from independent sources like the [Cochrane](#) reviews.

I have included links to the references that Dr. Lilienfeld mentioned in the show notes for today's podcast. As always, you can find these detailed show notes, along with a full episode transcript at brainsciencepodcast.com. There you will also find a link to get a [newsletter](#) to get these show notes automatically via email. You can send me feedback or comments at docartemis@gmail.com.

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The next episode of the *Brain Science Podcast* will be coming out in November of 2010. Going forward I am going to try to put the *Brain Science Podcast* out approximately every other month. I'll talk a little bit more about that after I finish my usual announcements.

First, I would like to remind you to check out my other podcast, *Books and Ideas*. I am going to be trying to put that out in the months in between the *Brain Science Podcast*. You can find that at booksandideas.com. Also, if you want more science podcasts, don't forget to check out sciencepodcasters.org.

As I mentioned before, I would love for you to visit the website, brainsciencepodcast.com. Jeff King has been helping me with some redesign of that site, and I'd like to have your feedback.

Also, don't forget to sign up for the [newsletter](#). Not only does this get you the show notes automatically, it will be a great way of knowing when a new podcast comes out. Even if you are subscribed, when a show is only coming out every couple of months it is really easy to miss a new show. If you haven't already done that, please sign up for the newsletter.

One thing that I would like to mention is, especially for those of you who are nurses, [Jamie Davis](#), from [The Nursing Show](#)—which is a podcast about nursing—is sponsoring a cruise where you can get CME and go on a cruise. And this you can learn more about at NursingAtSea.com. It's scheduled for January 16, 2011.

If you decide to sign up for this please be sure to tell Lorene—that's Lorene@nursingatsea.com—please be sure to let them know that you heard about the cruise from me. If at least 16 people sign up that refer to me, I will actually

get to go for free. Even if you're not a nurse, if you're interested in going on a cruise—maybe a *Brain Science Podcast* cruise—be sure to email Lorene@nursingatsea.com and let her know. I think that if there is enough interest we may be able to make that happen some day in the future.

I mentioned that [Jeff King](#) has been helping me with the website. I'd like to thank the other people who have been providing volunteer work: [Diane Jacobs](#), who helps with the [Discussion Forum](#) and did some of the early transcripts; and recently Paul Hoffmaster has been working on the sound of some of the early shows that were hard to hear, including [Episode 38 with Jeff Hawkins](#). [Lori Wolfson](#), who does my transcripts—although she does get paid for this, I think she goes way beyond the call of duty in giving me extra things. Like she always makes sure the transcripts are full of links to everyone that is mentioned during any particular interview.

If you use a BlackBerry, you probably know that BlackBerry recently added podcasts as a feature in the BlackBerry software. And I'm happy to announce that the *Brain Science Podcast* and *Books and Ideas* were included in the first 1000 podcasts when this was launched. So, if you're listening to the *Brain Science Podcast* and you use a BlackBerry, please go in to the Blackberry Store and leave a review for the *Brain Science Podcast*—and for *Books and Ideas*, if you listen to it. Right now there is only a limited number of shows in the BlackBerry podcast feature, so this is a good time for your review to actually reach potential listeners.

Finally, I'd like to mention that I have an essay in the latest revised edition of [The Myth of Free Will](#), which is edited by [Cris Evatt](#). You'll find a link to that on my website, but please be advised, I'm not making any money off of this. It's just an opportunity for me to reach, hopefully, a larger audience.

[music]

Now, for those of you that are interested, I am going to talk a little bit about the reasons for my decision to cut back the frequency of the *Brain Science Podcast*. When I started podcasting in 2006, I did so with the hope that I'd eventually be able to make enough money to stop working as an emergency physician. Well, this was probably a naïve goal. The reality is that despite the quality of the shows I have produced, my podcasting income barely covers my expenses, and it hasn't allowed me to reduce my ER schedule.

In the last few months I've gotten quite a few good suggestions about how to make money, but the problem with those suggestions is they require that I spend even more time doing things that have nothing to do with producing content, and they usually involve some reduction in the availability of free content to listeners. I realize that I'm just really not an entrepreneur. What I really like to do is share ideas.

I'd love it if I could just prepare and record interviews and podcasts and give them to somebody else to produce and distribute. But that's not happening right now, and the problem is that, even though I cut the *Brain Science Podcast* back to a monthly show, I still have found that podcasting has continued to devour most of my free time, because the nature of the content I create requires a lot of research and preparation. This is especially true for the *Brain Science Podcast*.

Maybe I should remind you that I'm not a neuroscientist. My training in engineering and medicine gives me an excellent background, but every *Brain Science Podcast* represents reading and research that mostly doesn't have anything to do with my job as an emergency physician. I bring this up because it is relevant to my decision about continuing the show.

I don't want to bore you with the economic realities, but given the mounting evidence that my efforts are unlikely to generate significant income, I have been forced to reevaluate my goals. My primary goal for the *Brain Science Podcast* has

not changed. I think it's vitally important for people from all walks of life to learn about how their brains really work. Discoveries from neuroscience are changing the way we see ourselves and the way we see other animals.

My primary goals for the future are: 1) To continue producing high quality podcasts, and, 2) To find ways to reach new listeners. This is where you come in, because I think that going forward it is going to become increasingly important to get listeners involved as volunteers. So, if you're interested, please send me an email at docartemis@gmail.com. I look forward to working on this with you in the future.

Now, one last thing I'd like to address is how the reduction in the frequency of the show is going to affect content. In the past the *Brain Science Podcast* has represented a wide diversity of content, ranging from basic neuroscience to leading-edge research. But the most popular episodes have been the ones that have application to people's daily lives, like [John Ratey's interview](#) about the importance of exercise and the brain.

One consequence of reducing the frequency of this podcast is that I can no longer attempt to satisfy everyone. I am extremely grateful that this show is enjoyed by both practicing neuroscientists and non-scientists. This also presents an ongoing challenge when it comes to choosing and preparing content.

So, I've decided that, going forward, I am going to focus on three criteria: I'm going to be looking for material that's accessible and relevant to general audiences; I'm also going to be doing follow-up on previous episodes; and, as always, my personal preference will be a strong factor.

Because there's just so much material, even when I was putting out the show twice a month I couldn't cover everything. If there's anyone out there that's

interested in starting a related podcast to cover the areas that I can't get into, I would love to help you. And, as always, I welcome your ideas and suggestions.

Finally, I want to emphasize that this decision is not just about money—though, of course, while I was approaching it as a potential career, I had a willingness to sacrifice all of my free time, which I don't have if I'm now approaching it somewhat more as a hobby. However, even if I had never expected the *Brain Science Podcast* to produce any income, I would still be facing its increasing demands on my limited free time.

The reason I took several months off was so that I could have a little bit of time to do the things I used to do before I started podcasting four years ago—things like read about other subjects, and even playing video games with my husband. So, moving forward, one of my priorities will be that I can make some time to pursue new interests and new projects. I'd like to have more time to devote to sciencepodcasters.org; perhaps even working on a book to help more people get involved in science podcasting.

For those of you who have been supporting the show, and even those of you who are new listeners, I really appreciate your ongoing support. I encourage you to be sure to sign up for the newsletter, so that you don't miss episodes when they do come out. And, as always, please continue to send me your feedback at docartemis@gmail.com.

Thanks again for listening. I'll talk to you again in a couple of months.

[music]

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Transcribed by [Lori Wolfson](#)

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