LAUREN FOSTER: Hello, and welcome to the *Take 15* podcast from CFA Institute. I'm Lauren Foster. And this is the show where we bring you an unbiased lens on investing in capital markets through short conversations with some of the world's most interesting and accomplished people.

This week, we're exploring a fascinating topic. Truth and lies, or for those of you in the investment industry, fraud and deception. My guest has spent many years thinking about and researching how financial analysts can improve their ability to tell truth from lies. In fact, he even wrote a lie detection guide for investment professionals that was published by CFA Institute.

Jason Voss is a CFA charter holder, and CEO of Active Investment Management Consulting. He's written lots of popular posts over the years, including a perennial favorite, "Advice on How to Become a Research Analyst."

Now, how many times have you heard that one way to tell if someone is lying is to watch their facial expressions and body language? I feel like I hear that all the time. In today's episode, you'll hear why body language is not the key to lie detection. And you'll hear why Jason believes computers can give investment professionals a huge advantage in evaluating the truthfulness of company communications. We talk about the process for developing data, and some of the real world applications for investment professionals.

Now, before we start, a quick reminder that the *Take 15* podcast now has its own YouTube channel. So be sure to check it out and subscribe, so you can stay up to date with our latest interviews. We've also added show notes to the episode. So you'll find links to the articles, books, and song that Jason mentions. And now, on with the show. Please enjoy today's conversation with Jason Voss.

Jason Voss, welcome to the show.

JASON VOSS: Hey. Nice to be here.

LAUREN FOSTER: Well, it's great to have you back again. And I thought I'd start somewhere kind of fun, in pop culture and the world of spy thrillers. And the reason is that I just finished watching *The Bureau,* and it's a French-- they call it a cerebral spy thriller. And of course, deception is the currency of agents, and polygraph tests loom large. So I'm so curious to know, do polygraphs work?

JASON VOSS: They can, is the answer. They're not reliable enough across interview subjects, and they're easy to spoof if you know a little bit about them. So they do work. They're not super accurate though.

LAUREN FOSTER: So I guess I just jumped right in. So let's give the audience a little bit of context here. You've been interested in this sort of field of deception since you were a fund manager. And I think listeners may be surprised to hear that you did some pretty groundbreaking work at your time at CFA Institute. So dial back a little bit for us, and tell us how you became interested in this field.

JASON VOSS: Yeah, sure. So it began, as you said, Lauren, when I was a fund manager. And I recognized pretty early on that I was super reliant on the statements that came from management about the future of the business. And all the things that, as an investor, make you money, which is understanding how the business is going to perform in the future. The best source of that information is from the companies themselves.

And you recognize fairly early on, oh my God, I have to be able to trust these folks. So I began then-- God, this is a quarter of a century ago. I'm dating myself massively. But I read a book called *Never Be Lied to Again,* which teaches how to read body language. Which I later learned does not work. And from that moment forward, I've been super interested in that as a pursuit.

And as you know, Lauren, when I first started at CFA Institute, within weeks of me starting, and of you starting there, that was one of the first things I pursued. Because I still understood, all those years later, just how important it was to investment managers to be able to discern truth from lie. It's super important in our business.

LAUREN FOSTER: So you just mentioned that body language doesn't work. And I think people will be surprised to hear that. Why doesn't it work? What are the data that support that?

JASON VOSS: Yeah, sure. So let me take first that it's been examined since 1958 in the scientific literature. It's actually one of the most researched beliefs in all of social psychology. There have been hundreds of studies that have been done. There was a meta analysis done several years back. There's been another meta analysis done subsequently.

For those in the audience who don't know what a meta analysis is, it's a study of studies. So it's basically looking at all the work that's been done on a subject, and trying to glean signal from amongst all the noise. And those meta analyses, both of them have found that about 54% is the accuracy of people using body language to be able to discern between truth and lies. So just barely better than chance.

There are theories as to why it doesn't work. One of them is that those who believe that body language is indicative of lies tend to think it's because liars are more anxious when they're lying. And what has been discovered by science is that both liars and truth tellers can be anxious. For example, in an interview situation like we're in right now. And so yes, you can tell anxiety from body language. It's hard, but that isn't necessarily directly implicated in deception. And there's no Pinocchio's nose, in other words, as to what constitutes deception.

LAUREN FOSTER: So if body language doesn't work, it begs the question, what does work?

JASON VOSS: Yeah, sure. There are a number of things that do work. And many of them are sort of emerging. Because the body language thing was kind of a head fake, and led to a foggy sort of understanding of the subject for decades. With lots of people trying to replicate preliminary results done in the 70s on this work. They couldn't replicate it, and then people started saying, well, there have to be things that we can do.

I'll mention one, because it's highly potent. It's called strategic use of evidence. It's something that I discuss in a CFA Institute product that I authored when I was there, along with criminal justice professionals. And it is a way of conducting a conversation, like we're having right now, in such a way where lies and truth are more likely to be discerned by the practitioner. And the success rate there has been measured as high as 88%. When you compare that to that 54%, it's a quite remarkable difference.

And then there are other techniques. One is called cognitive load technique. You might have noticed if-- I mean, it's COVID as we're recording this, in the midst of COVID. But prior to COVID, you might have noticed going through the airport, especially customs, the nature of the questions that they ask you has changed.

And that is because research has shown that liars have a higher cognitive load. That is, they're manufacturing reality in real time often. And that's hard to do. So by increasing the cognitive load of the questioner-- or, I'm sorry, the questionee, the interviewee-- It's been shown to be more revealing of deception.

And then, of course there's text-based deception analysis, which is a particular area of focus for me for the last couple of years.

LAUREN FOSTER: So I should just tell listeners that you have the two acronyms. So the first one is the SUE, the strategic use of evidence. And this text-based is another kind of clever acronym, DATA or DATA, depending where you're sitting. And that's the acronym for deception and truth analysis. And so if I understand correctly, this is based on language signals. So tell us a bit about that.

JASON VOSS: Yeah, sure. And this is work that, as I alluded to, I've spent a couple of years developing. And it's based on scientific research that was initially done by psychologists in a quite interesting application. And that application was people who were helping their patients, as psychologists, cope with PTSD.

And one of the therapies that was first advised was journal keeping. And sadly, some of the psychotherapists who believed in the journaling noticed that there was a high proportion of suicides, and that, in other words, there were lies in the journal. That the journals gave no indication as to whether or not people were suicidal. And so they became very interested in researching, hey, can we glean deception within text, based on our understanding of sociolinguistics. And the answer was yes. And so they began testing for that. They began publishing preliminary research on that.

If the audience is interested, go look at James Pennebaker's work. He was sort of the pioneer. He also has a book called *The Secret Life of Pronouns,* which maybe only Lauren and I would appreciate. But it's about the sorts of signals about a person's underlying psychology that are leaked out, if you will, in their communications. And so DATA, which you mentioned, is a more sophisticated way of trying to glean deception or truth from text-based communications.

LAUREN FOSTER: Actually, before we go a little bit further, let's spend just a quick moment on the semantics of fraud versus deception.

JASON VOSS: Sure. Yeah, so that's a great question. It's possible to deceive without being fraudulent. And this is something that the folks that research lie detection spend a fair amount of time on. And the easiest distinction, and related to investing is, is it possible for a high growth company that's performing exceptionally well to want to guide the analysts down in terms of its performance? Yes, and that's a frequent occurrence, in fact. That is deceptive behavior, but not necessarily fraudulent behavior.

Fraudulent behavior is literally manufacturing something that does not exist. It's creating an alternate reality, as opposed to skewing reality. And so it's an important distinction to make when considering this kind of work.

LAUREN FOSTER: So you spent the last couple of years working on this DATA slash DATA project. And I know you've also written a blog post for *Enterprising Investor* quite recently. And just so listeners know, in our show notes we'll make sure to link to that blog post, as well as the books that Jason just mentioned. So tell us a bit more about how this DATA process or DATA process actually works.

JASON VOSS: Sure. Great question, Lauren. The mechanics of it are less sophisticated than most people think. Most people, when they hear this, because AI and natural language processing are sort of de rigueur in circa 2021, people tend to think that this is some form of artificial intelligence. And it's not. It's dumber than that.

So the way it works is it takes a given communication, and it looks at each word in that communication individually, and it asks a very simple question. What part of speech is this word? If it's a verb, is it a verb that relates to some sort of motion? For example, walking, talking, running, something like that. Or is it a different type of a verb.

If it's a noun, is it a personal pronoun? Is it a noun that relates to an object? What are the use of prepositions, quantifiers? There's a category called differences, which if we're making this conversation, you asked me a difference question before. What's the difference between fraud and deception? So the word "but," the word "however," are difference type words.

So on the front end, it looks at each word and it sort of categorizes them. And then what researchers have found, and what I have found in my own research, is that the way liars and truth tellers communicate, and how they use these different parts of speech, is quite different. And so we look at, in DATA, over 30 language fingerprints, I'll call them. To be able to render an assessment about the level of deception or truthfulness that a given communication has.

LAUREN FOSTER: So there was something that you had mentioned in your *Enterprising Investor* blog, and that was a fairly mind-boggling statistic. And I know that this audience likes data and numbers. And I think I've got this correctly, you had written that you were looking at hundreds of documents. And that numbers only constituted about 13.5% of annual reports, or quarterly reports. Is that correct?

JASON VOSS: Yeah, that's correct. Yeah, so one of the ways that DATA works is it takes a given document of a kind, and then relates it to many other documents. Alias, normative data.

That said, and I'm going to take half a step back. DATA was developed, or the algorithms were developed, out of sample. Meaning it's based on how human beings in general lie. Not how human beings in finance lie. And so we've developed these lie detection algorithms, if you will. But then applied them to a finance setting.

Why is that interesting? It's interesting because that information comes from a huge cache of normative data that we collected to refine the results for finance specifically. And that's where that 13.5% comes from. What we were shocked to find is that numbers are only 13.5% of an annual report on average. The other 86.5% is all text-based.

One more fascinating thing. What we are finding is that we are able to detect fraud well in advance of regulators or the market. And our working hypothesis for why that's the case is because words that people are using are indicative of underlying behavior. That's the theory of how DATA works. But the numbers themselves are outcomes based on the initial behaviors.

So people are talking about their behavior, say in 2009. It may be 2014 until a scandal breaks and is visible in the numbers. Said another way, liars can only lie with words for so long before it shows up in the numbers. But if you're not looking at the words, you would never know that.

LAUREN FOSTER: And you're speaking of things turning up in the numbers. When we were chatting offline, you had mentioned something about the [? Warcard ?] database But is that related more to SUE or to DATA or DATA?

JASON VOSS: It could be related to both, but more to DATA, deception and truth analysis. It is among a handful of databases considered a gold standard for doing double blind testing of this kind of a technology.

And the reason it's considered gold standard is, a reporter, actually a group of reporters, your profession by root nature, did a quite wonderful public service back in the early 2000s. And that was they logged and recorded the statements from politicians that were taking place. And they verified and fact checked that, and they created a database of 935 proven lies. But then miraculously, they have 935 proven truths from those same communicators.

And so what that allows you to do is double blind testing. So you can run these statements from these politicians through your algorithms, and it gives you a really good rendering of how effective is it at surfacing deception. How effective is it at discerning truth, and what's the overall success rate. Which then allows you also to report cool stuff like, how many false positives or false negatives does your algorithm render. There are a couple of other databases, but the [? Warcard ?] database is the name of the original article that data was originally gathered for.

LAUREN FOSTER: OK. So we are going to spend some time talking about why investment professionals should be caring about this. Before we go down that sort of rabbit hole, I wanted you to talk a little bit about some earlier work you had done, that exposed I think what you call the strong truth bias in the investment profession. Can explain that a bit more?

JASON VOSS: Yeah, sure. So research I did with Dr. Maria Hartwig, Laure Brimbal, and D. Brian Wallace. All of various universities, but all criminal justice professors who research this stuff formally. And done on behalf of CFA Institute-- and by the way, it resulted in a *Journal of Behavioral Finance* article too. If people in the audience are interested, they can go find it.

But we were looking at the success rate of lie detection on the part of financial professionals. We think, still, that was the first time in human history that had been done. And the success rate was below people. So I said earlier, 54% is the global average. Finance pros, just 51.8% in finance. So we're slightly better, though, than we are in our normal lives, which is just 49.4%. So we're basically flipping chance.

And what we've discovered in that same research was a very pronounced truth bias on the part of financial professionals in their own domain, meaning working within finance. That was over 60%. So said another way, when we encounter information in finance, our bias, strong bias, is to think that that's a truthful statement that's being reported to us. So the actual lie detection ability of finance pros is only around 39%, because it's one minus that 61%.

In other words, we're more frequently than not guessing as to the truth of something. And when you mix that result, plus the lie result, you get that 50-- whatever it was I said. 51.8% success rate. So when you do the mixture of the truths and the lies, you get that 51.8%. But it's skewed strongly towards truth.

LAUREN FOSTER: OK. So if you think of like the strong truth bias, and you combine that with an overconfidence bias, which is pretty prevalent in the industry, that seems like a pretty diabolical combination.

JASON VOSS: Yeah, you're right. And that's something else in another piece of research that we did. Same research group, sans Laure Brimbal. That was actually the first research we did. So we looked at the belief about lie detection on the part of finance pros.

And so we asked them, what level of success do you believe that you have? And that was approximately 20% better than they actually logged and recorded. So finance pros think they're are about 75% able to tell the truth. In fact, it's about 50-50. So there's an extreme overconfidence there.

LAUREN FOSTER: So at your core, when you really are rooted in fundamental investing, what are some of the real world applications for DATA slash DATA for analysts and investors?

JASON VOSS: Yeah, great question. I think the primary one is to narrow the focus of fundamental research. So right now as we're talking about this, active investment managers in particular are under duress. Expense ratios are falling because they're trying to compete with passive products. Because expense ratios are falling, analyst headcount is falling as well.

And what that means is people are covering the same size universe, but with fewer people, with fewer resources. So the obvious application is run given text documents, say, quarterly reports, or annual reports, or earnings call transcripts, through deception and truth analysis. Takes about a second to assess 70,400 words, which is extremely fast. It's about 99.997% faster than people can assess a similar document. And that would immediately identify, say, in a fishing pond or an investment universe of 100 names, these are the three that you need to focus on. So that's one application.

Another application would be take your portfolio or your fishing pond, that is your investment universe, investable universe. Run it through DATA. See if there are any black sheep that are hiding out there. It could be that you have already invested in a name, or are considering investing in a name where that's the case.

Or as one-off analysis would be another way to do it. Like you have a suspicion that this company may be deceptive. So you do one-off. Next application would be time series. So how does it change over time, right? And maybe the deception score dips over the course of a couple of quarters, and it alarms you because you're not seeing anything in the numbers that would alarm you.

And then the last application I could think of is screens. So right now many investors establish their investable universe with screens. And so that might be something like earnings per share growth each quarter needs to grow greater than 10%. So why not make this a part of the stock screen, and the part that actually looks at that 86.6% of text that you're not looking at right now.

LAUREN FOSTER: So GameStop has been very much in the news lately, and short sellers in the news. So is this one of the applications that it'll help analysts identify companies to short?

JASON VOSS: Yeah. Boy, I hesitate to-- yes, you could, quite obviously. The question is, what's the lag? And I think if I were a researcher in that space, I would want to understand and do backtesting on how long before the deception scores are negative until the market seems to recognize that. That's the trickery, or the difficult thing of short selling, is you have to get the direction right and the timing right. And the timing is the tricky part. But yes, you could use it.

LAUREN FOSTER: When we were chatting off-mic, you'd also mentioned that the lag time between when there is, I guess in this case, fraudulent behavior, and when it turns up in the numbers. And what is it? Something like six years?

JASON VOSS: 6.6 years is what we've found. So one of the initial tests that we did of DATA, to test to see if it was accurate, was-- well, actually let me take half a step back. The first thing that we did is, we tested the Dow Jones. And we had a very simple decision. It wasn't even backtesting plural, it was a backtest. We said, well, if there is, in fact, signal here in these algorithms, then presumably we should be able to make money based on this.

And so our decision rule was, assess all the annual reports of the Dow Jones components at the beginning of a year. Wait until the end of the year, in fact, January 2nd of the following year. First trading day of the year. And then invest in the 25 companies that aren't the most deceptive. So the 30 composed from the Dow, don't buy the five most deceptive, buy the other 25.

And that resulted in an average of 104 basis point advantage over just buying the Dow directly. And so we thought, well, so it's working. What's another test, potentially, of these algorithms? And so we decided to look at the scandal companies, specifically the top 10 worst scandals of all time. And DATA was able to identify them with an average lead time of 6.6 years.

LAUREN FOSTER: Wow. It's a fascinating topic. And so much interesting work that you've been doing on it, Jason. So in our last few minutes, we're going to go to our closing questions. And it won't be true or dare, so don't worry about that.

So the first question is what I call sort of the ray of sunshine question. And so listeners know that this came from Trevor Noah about a year ago, just as the pandemic was starting. He had this little closing segment on his show that always had some sort of ray of sunshine. So I like to ask guests for what their ray of sunshine is on the pandemic. So one sort of long lasting positive impact that you hope to see as a result of the pandemic.

JASON VOSS: Well, ironically I think a greater appreciation that you can accomplish a lot working from home. I know that's not a universal experience, but globally now I think there's an appreciation for just how much we can do.

Me personally, because I'm concerned about environmental impacts on the world, office space, for the most part, sits unoccupied most parts of the day. It's only occupied for about 60 hours of the week. Homes sit occupied for a far longer period of time, typically. And so less real estate equals less footprint, equals less energy, and all of the things that come with office buildings. And so I'm hopeful that that has an environmental impact.

That, and selfishly I've gotten to spend way more time with my wife over the last year. And that's been quite lovely.

LAUREN FOSTER: That is great. It's funny, I was just thinking the other day, when I ask people this question, many say, oh, you know I've gotten to spend lots of time with my children. And hardly anyone says more time with my spouse. It's refreshing to hear that, so thank you.

JASON VOSS: Of course.

LAUREN FOSTER: So the second question is what I call the NASA question. And that's you're about to hop on a long duration space flight. You can only take one object with you. What do you take?

JASON VOSS: Oh, that would be-- I was about to say an iPod, but that would date me. But it would be music. Music is probably the most important sort of objectifiable thing that I could take with me. And I would-- my iPod, I'm a big collector of music. I think it has 43,000 songs on it, or something crazy. So I would take that. Because that's like taking a whole room full of CDs with me.

LAUREN FOSTER: Wow. So it begs the question, I have to sort of ask. What's in your all time top five favorite songs?

JASON VOSS: Oh God. Lauren Foster, that's a tough question. Boy, I would have to think long and hard about that. I think the most played song on my iPod, that may be the easiest way to answer it. Because I sort of check out and do work to it. It's a song by a reggae artist named Johnny Osbourne, and it's called "Murderer." And it is super catchy. And it has a very solid rhythm, and so there are times when I've listened to it for 12 hours on end, just on repeat. So I'm not sure that's my favorite song, but that is the-- I think it's been played like 1,000 times or something on my iTunes.

LAUREN FOSTER: That's amazing. So the final question, we're going to talk about superpowers. And you can choose one of two superpowers. Either flight or invisibility. Whichever you choose, you're the only person in the world that has that particular superpower. Which one do you choose, and what do you do with it?

JASON VOSS: Well, flight. Have fun. Easy. Yeah, that's an easy one. It's funny, my mom asked me that same question. It must be making the rounds. And she chose invisibility. A debate ensued as to that sort of thing. But I would choose flight, and just to have some fun. I might think of more productive uses for humanity or something, but I'll take the fun part first.

LAUREN FOSTER: Well, Jason, it's always fun catching up with you. Thank you so much for joining us and telling us more about your work. And like I said, we'll tell listeners where to find some of those references that you made. And thank you so much for joining us.

JASON VOSS: My pleasure. Thank you CFA Institute. Thank you Lauren Foster.

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