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Passionate about science communication and promoting women in STEM, Berlin is a committee member of the National Academy of Sciences’ Science and Entertainment Exchange and a member of the American Association for the Advancement of Science’s Committee on Science and Technology Engagement with the Public.

She hosts *Startalk All-Stars* with Neil DeGrasse Tyson and has hosted series on PBS and the Discovery Channel. Dr. Berlin cowrote and stars in the off-Broadway production *Off the Top*, about the neuroscience of improvisation, and she premiered her comedy about the brain basis of desire, *Impulse Control*, at the 2019 Edinburgh Fringe Festival. Her numerous media appearances include the BBC, *National Geographic*, TEDx, and the documentary *Bill Nye: Science Guy*.

Influence and the Unconscious

Based on your view of the world and your neuroscience background, how do you define the word influence?

Influence is when someone or something has an effect, either positive or negative, on someone else’s thoughts, feelings, or behavior. It doesn’t even have to be humans—the sun can have an influence on which direction a plant grows. But in the realm of people, influence makes us think, feel, or behave in a way we would not have otherwise.

There are many factors that go into determining why and how much people can be influenced, many of which come down to psychology. For instance, suggestibility, or how readily a person will take on a suggestion, or how that person will respond to perceived authority. There’s a “white coat” phenomenon where people are more likely to trust and be influenced by someone wearing a white coat; people think, “Okay, this is the doctor, the

scientist, the one who knows the information—I’d better listen.”

A lot of people who are easily influenced are looking for answers or aren’t sure what direction to go in their life, and they seek guidance from people they admire or think are authority figures. This puts the influencer in the position of having to be careful with their degree of influence. With great power comes great responsibility, right? You have to be aware of your influence and how it will affect other people.

The thing to remember is, all of us are being unconsciously influenced by our environments all of the time. The unconscious processing capacity of the brain is vastly greater than the conscious processing capacity, and only a small subset of the information processed by the unconscious brain becomes available to our conscious minds. So a big part of cognitive psychology and neuroscience is

working out and measuring the ways our behavior is influenced by things we are unaware of and what is happening in the brain when those influences occur.

In a way, you can think of influential people as those who have figured out, consciously or unconsciously, how to navigate the brain's natural heuristic "shortcuts" to taking on information. Everything around the brain is vastly more complex than it can track, so the brain has evolved to simplify information in ways that are useful, if not necessarily accurate. Influencers find ways to get "taken in" by the brains of their audience via side routes, like the Khaleesi conquering the city of Meereen in *Game of Thrones*, not by smashing down the gates but by sending soldiers to sneak in through the sewer system. The more you learn about the brain, the better you can fortify your city!

What do you think drives people to want to be influential?

Some people, I think, are just influential without being motivated to be so; they are simply doing what they enjoy doing or what they're good at, and that has an effect on other people. For example, take Einstein studying physics. He was doing it because he wanted to understand the laws of the universe, and he inadvertently influenced the work of many other people.

But there are other people who set out to influence others, whether they're in politics and want to make a change in the world or they crave fame

and popularity. I've been really interested in that. What's happening in their brains? Why do some people seek out fame? It turns out that the markers of popularity, such as getting likes or follows online, activate the reward networks in the brain. Pursuing fame can be addictive. These people want to be influential because it makes them feel good.

It makes you wonder what separates the people we view as "attention seekers" from the people we view as more genuine, when really we all want to be authentic and we all want to follow our passion. But we often go to great lengths to protect our egos. How much are we willing to share about our own selfish desires to be famous? How much do we hide, even from ourselves? For some people, this can lead them to lie to themselves.

Even dictators don't have a narrative of "I'm doing this for power" or "I'm evil." They have some other story that they tell themselves to protect their egos. I imagine that Hitler had a narrative in his mind that he was doing the right thing for the world. It's hard to distinguish our true motives from the stories we tell ourselves, much less reveal the truth to other people.

Would it be authentic or ok to say out loud, "I want to be famous, I want to be an influencer"?

Sometimes we applaud people who just come out and say the honest truth even though it's ugly. Right? Like, if someone says, "Yeah, I just want to be famous. I just want to do stuff that's going to provoke people and get more followers," we can

almost respect that honesty. But there are certainly many other people who won't admit they're driven by this motivation; they'll create some other narrative for themselves about what they're doing.

Kim Kardashian is an interesting case study. What is she famous for, really? Her looks? Maybe she was telling herself a grander story in the early days than, "I'm just trying to be famous for fame's sake," and maybe she wasn't, but now her narrative is that she's doing important things for the world. For example, she went to talk to Trump about prison reform, and now she's working toward becoming a lawyer and criminal justice advocate. There are people who become famous for other reasons and then try to use their powers for good and actually exert a positive influence.

How have you gained influence? What do you feel like your path has been to building the career platform you have?

I'm in that category of doing things that I'm passionate about, which may lead to me having influence in a certain area, but influence isn't my end goal. First and foremost, I'm passionate about understanding how the brain and mind work and helping develop more effective treatments for psychiatric and neurological disorders. But I also want to help people understand how their brains work and what motivates their behavior. In understanding the science, they may also be influenced by it and change their behavior accordingly or know themselves better.

For me, it's less about the messenger than the message, but I do realize that people are only going to care about the information if they care about who's delivering it. People are not going to absorb the information if I just stand there delivering boring talks about neuroscience. I try to get people excited about the information. I have a background in theater, which I think may have helped with my communication techniques. I was a fine arts and theater minor through college, and I acted in school plays from the time I was in kindergarten. I've always enjoyed getting up in front of audiences and connecting with people in that way, and all that theater experience came together for me in the realm of science communication.

But it wasn't an active process of seeking out influence over people. I just cared so much about this cool stuff that was going on in the lab and wanted to get other people who were not in my field excited about it.

You never really know how much of an influence you're having. It's so subjective. Even people I know who are objectively famous usually have a hard time gauging that. It's this weird dynamic where you have your own personal view of yourself and then this image that other people see. How to reconcile them is interesting and difficult.

Can you elaborate more on the importance of the message versus the delivery?

Most of my career has been as a basic scientist. In my field today, there are graduate students with

their own blogs, and they're on Instagram, but when I was coming up, no one did that. You were just doing your science. That was it. There was no formal field of "science communication." Now you can get graduate degrees in it.

But I was just a scientist who was getting frustrated with putting in so much time and effort only to have the research go nowhere in the real world. You spend years writing and submitting grants, running research projects, and finally writing a paper, only to have to wait for the peer review and editorial process until it finally gets accepted. And then you have maybe a hundred people in your field who really care about it, and then it gets buried in some scientific journal somewhere, unless of course you discover the cure for cancer or some other Nobel Prize-worthy discovery.

Few people in the general public were hearing about the fascinating and important research happening in labs around the world. I started out just communicating my research results at science conferences among my colleagues, and I found that I really enjoyed that. Communicating the science and the findings for my peers transformed into doing it for more public audiences, and I really enjoyed that as well.

There are a lot of people who are good communicators but who are not experts in a scientific discipline. On the other hand, there are a lot of great scientific experts who are not good communicators. I was interested in how I could combine the two: doing really good science and communicating

it effectively. Communication is a difficult skill to develop. It was important to me to keep working on it because I noticed that people cared more about the message when they connected with the person delivering it.

Can you share how you've developed that communication skill? What have you done?

One little trick that I've learned is how to focus your attention when you're in front of an audience. You should talk to the camera, or to one audience member at a time, like you're talking to your best friend—your best friend who's not an expert in the field, but whom you want to tell about some cool, new, exciting finding.

You try to break down the information in a way that is true to the science but doesn't contain a lot of the jargon. That's been one of the hardest things: you want to abstract it to avoid getting bogged down in the minutiae, but you also don't want to abstract it so much that it loses touch with the actual findings. For instance, you might say, "Okay, so we found activation in the amygdala—oh, the amygdala is a part of the brain involved in emotion."

You also have to try to make it exciting and meaningful to the person you're trying to communicate with. Storytelling is key; it's a great way to communicate. People remember stories. You can start with a personal story, then bleed into the science, and then come back around to something related to your story.

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You're doing this fascinating work around impulses. How do you mesh the concept of impulses and influence? Is there a relationship between the two?

Most of what's happening in the brain is happening unconsciously, and it's influencing our behavior, which is why I've been focusing on unconscious processes. I'm doing a show now at the Edinburgh Fringe Festival, along with my husband Baba Brinkman, all about impulse control. We do an experiment every day with the audience where I have them make a decision, but we manipulate them: half the audience sees what we call an anchor—let's say a certain price for a product—and the other half of the audience sees a different anchor for the same product.

They have to make a decision, and they're blatantly influenced by the anchor. It's just like some ads on TV. If you say, "These knives normally cost \$19.99, but you can get them for just \$7.99," it convinces people that they're getting a good deal even if the knives aren't actually worth more than five dollars. We can influence people with these framing effects.

We can also influence people with their senses. For example, a study found that if you put a lemon cleaning scent in the room where people are eating cookies, they are more likely to clean up after themselves. There are a lot of ways to influence people's behaviors so they think they're doing things out of their own volition, but they're really being unconsciously manipulated by stimuli in their environment. Unconscious neurological processes play a big role in influence.

“We're being influenced all the time by everything in our environment.”

As we understand the brain better and you say things to me like, “I can know your behavior ten seconds before you do it by studying the brain,” how do you think about that power as it permeates more of society?

It helps if you can accept that you *are* your brain. I see patients with brain lesions that can completely change their personalities. Our sense of self is really just a narrative that's created in the brain that we can then disrupt and change. I mean, now we're using neural implants to treat intractable movement disorders and psychiatric illnesses. But ultimately that's going to move into cognitive enhancement, where we can actually just go in with electrodes and manipulate people's emotions—and maybe someday their memory capacity or attention spans. But that opens up the possibility that people can potentially get hacked, right? Other people could potentially control your electrodes and directly manipulate your thoughts and behavior.

It's also a myth that we only use 10 percent of our brains. We use all of it all the time, but we're only consciously aware of a very little bit of what's happening in our brains. If we could let go of our need to be so much in control we'd be more at peace with ourselves. We have to learn to say, “Yeah, my brain's making decisions unconsciously. It's being affected by what's in its environment. I'm not necessarily making rational decisions based on the intrinsic value of things. And that's okay.” Perhaps our unconscious has free will and we're just the last to know about it.

We're being influenced all the time by everything in our environment. Certain very strong people, with strong personalities or ideas can easily slip in and have a strong influence over many people if their voices are loud enough, if they have enough to say, or if they do something that grabs a sufficient amount of attention. It doesn't take that much to influence people.

Leonard Mlodinow opened my eyes to how much of what happens is on a subconscious level and how that's manipulated against us by advertisers. Looking five or ten years down the road, where do you see this trend going? Advertising is already so powerful.

Len's a friend and colleague, and he even consulted with me when he was writing *Subliminal*. Advertisers are getting more and more insidious. They are openly admitting that they're using techniques that we understand about psychology to make products more likely to be addictive. For instance, with games or apps, if you introduce a reinforcement schedule that's not consistent, that's random, you're more likely to become addicted because you never know when the next reward is going to come.

If there's a question of how we gain more control over ourselves, I think part of it is spending time detaching. Be outdoors, go for a walk, find time away from all the stimulation. Remove yourself from all the incoming stimuli that's influencing you, and force yourself to just detach. It's hard for people to do, but nature has a really positive effect

on the psyche. You're filling your brain with positive, or at least neutral, stimuli.

I want to ask for your advice. Let's assume I'm a young person just starting out in my career. I don't necessarily want to be famous, but I want to be influential. I want my messages to be shared. What advice would you have from your purview of neuroscience, impulse, and subconscious behavior?

Be the best you that you can be. I'm going to paraphrase advice from two people who I can't believe I'm quoting in the same breath: Jay-Z and Steve Martin. Jay-Z once said that everybody has something in them, a talent, and our job is to find out what it is and then nurture it. And Steve Martin would tell comedians asking for advice on how to get famous, "Just be good. Just be good consistently and over time. There's no shortcut."

So find that talent in yourself, whether it's the ability to play an instrument or communicate or play a sport or write books. Practice it and develop it. And put yourself out there. It's hard for people who are more introverted, but you have to be able to sell it or connect with people who can.

For me, I was just doing what I love to do, and a scout from Discovery Channel contacted me out of the blue after they saw an online talk I had given. They then flew me to London to audition to host a new series. Because they found me pretty last minute, I didn't have the pressure of the whole long audition process that some other people were

faced with. It enabled me to be pretty relaxed and calm and, I guess, relatable when I did the audition.

I got the job and went on the road just a few weeks later to shoot the show! They flew me around the world to meet people with extraordinary abilities who could do mind-blowing things. I was tasked with trying to figure out scientifically how they could do these seemingly impossible feats. It was a whirlwind and I just learned on the job, and then things snowballed from there.

I was very fortunate to have been given this opportunity, but it only happened because I was doing the thing I enjoyed doing and making sure it got out there, and eventually someone noticed.

Who has been influential in your life and career?

I was lucky enough to have some very strong women role models, like my grandmother, when I was coming up in the male-dominated world of science. My grandmother was one of the first female contractors in New York in the 1960s. She supervised all these very rugged male construction workers on site. In her time this was just unheard of.

And then there was Professor Susan Iverson, one of my PhD supervisors at Oxford. Not only was she head of the Department of Experimental Psychology, she was also a pro-vice chancellor of the university. She's a strong, intelligent woman who was also kind and generous with her time—a really great role model.

But outside of my personal life, in pop culture, there wasn't really anyone influencing me in terms of what I could be as a scientist. I used to think you had to be nerdy. You couldn't be cool or attractive in any way. You couldn't be feminine.

You had to be like Bill Nye the Science Guy?

You had to be Bill Nye, exactly. Funnily enough, I ended up meeting him at a conference at Google when I was an adult, and he became a real friend and mentor as I began my journey into science communication. But there were no female Bill Nyes when I was coming up. I would love it if young girls today could see women like me and others excelling in our fields as scientists and think, "Hey, I can do that too." I want to lead by example and show young girls that they can be women as well as scientists. We don't have to fit into any stereotypes.

If you want to be influential, or if you are already influential, pay it forward. Give advice. Mentor people. Put your ego aside. See what you can learn

from other people as well, because you don't know everything. If you're constantly open and evolving, you're going to influence others in the best way possible. Be humble, and be true to yourself.

I'm going to give you a billboard, and millions of people are going to see it every day. You get to share an important message with the world related to influence and your work and research. What do you want it to say?

I would say something like, "Be true to yourself, and the rest will follow," or "Find the thing you're good at and enjoy doing, and keep doing it."

EDITOR'S NOTES

Berlin's point that everyone is unconsciously influenced by the world around them recalls Dan Ariely and Moran Cerf, who maintain that engineering people's choices or environments is more effective than direct motivation.

“Find the thing you're good at and enjoy doing, and keep doing it.”

—Heather Berlin