ANNALS OF THE NEW YORK ACADEMY OF SCIENCES
Issue: *Unlocking the Unconscious: Exploring the Undiscovered Self*
COMMENTARY

Delving within: the new science of the unconscious

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What exactly is the relationship between conscious awareness and the unconscious mind? How, for example, does the brain classify and sort its different functions into conscious or unconscious processes? How has the history of human conceptualizations about the unconscious influenced current theories? Steve Paulson, executive producer of *To the Best of Our Knowledge*, moderated a discussion among neuroscientist Heather Berlin, psychologist Efrat Ginot, and psychiatrist George Makari to shed light on the history of the mind and the latest insights into the still emerging science of the unconscious.

Keywords: unconscious; consciousness; psychoanalysis; Freud; mindfulness; transference; Jung; neuroscience; therapeutic techniques; brain; mind; the self

Steve Paulson: It is great to be back at the New York Academy of Sciences. A huge *thank you* goes to the Academy and the Nour Foundation for making this series possible. This evening, we are delighted to kick off our new series "Unlocking the Unconscious: Exploring the Undiscovered Self."

In the last few decades, there has been an explosion of interest in the nature of consciousness, both as a scientific problem, as we try to pinpoint the neural networks underlying conscious experience, and also as a philosophical problem as we try to bridge the enormous gap between the physical stuff of our brains and the entirely nonmaterial world of our thoughts and feelings. Strangely, the unconscious has, to some degree, gotten lost in this discussion. I say strangely because Freud made the unconscious the centerpiece of his investigation into the human mind more than a century ago. Yet, at least the way I read some of the current scientific discussion—now I should point out, I am not a scientist, so what do I know?—it's as if everything that happens in the unconscious is just fast and automatic, almost machine-like, as if a puppeteer is yanking us around, totally beyond our control and even our awareness; it's far-reaching for sure, but perhaps not all that interesting. Yet clearly, our unconscious minds are profoundly important to us, whether we're trying to understand our dreams or where our creative inspiration comes from, or why we get so bogged down in negative feedback loops. Even though we're desperate to try to get past all of this negative thinking, we often don't know how to make it stop. We have a fascinating and complicated subject to unpack this evening and one that has very practical implications, and we have a great panel to help us sort out these questions.

Let me introduce our speakers. Heather Berlin is a cognitive neuroscientist and assistant professor of psychiatry at the Icahn School of Medicine at Mount Sinai in New York. She received her PhD from the University of Oxford and an MPH from Harvard. She explores the complex interactions of the human brain and mind, with the goal of contributing to improved treatment and prevention of impulsive and compulsive psychiatric disorders. She's also interested in the neural basis of consciousness and dynamic unconscious processes, and is a visiting scholar at the New York Psychoanalytic Society and Institute.

Efrat Ginot is a graduate of the New York University Postdoctoral Program in Psychotherapy and Psychoanalysis. She's an instructor at the Institute for Contemporary Psychotherapy and a supervisor at the Fifth Avenue Center for Counseling and Psychotherapy. She also has a private practice in New York. Her work focuses on enhancing the understanding of complex psychotherapeutic processes, such as effective communication, enactments, self-narratives, and their importance to therapeutic growth. She's the author of *The Neuropsychology of the Unconscious: Integrating Brain and Mind in Psychotherapy*.

doi: 10.1111/nyas.13390

George Makari is director of the DeWitt Wallace Institute for the History of Psychiatry, professor of psychiatry at Weill Cornell Medical College, and an adjunct professor at both the Rockefeller University and the Columbia University Center for Psychoanalytic Training and Research. He received his MD from Cornell University Medical College and completed his training at the Columbia University Center for Psychoanalytic Training and Research. He maintains a private practice at the Payne Whitney Psychiatric Clinic, and he is the author of *Soul Machine: The Invention of the Modern Mind* and *Revolution in Mind: The Creation of Psychoanalysis*. Welcome all of you.

George, let me start with you—a very basic question. When we use the word *unconscious*, what are we talking about?

George Makari: It's a great question to start with. You'll notice immediately when you think about the word *unconscious* that it is a negative category: it's *not* conscious. In a way, to really understand the word unconscious in some depth, you have to start with the word *consciousness*. Now consciousness started its life at a very specific time. For Lockean notions, it was around 1689 and a few decades earlier for Descartes. They had a very specific idea; the mind had conscious experience. There was no such thing as mental experience that wasn't conscious. When Descartes said, "I think, therefore, I am," that was what consciousness was for him. When Locke thought of the mind, he thought of it exclusively as a conscious entity.

That went on for about 100 years until Kant and a number of Germans said that this was actually wrong; there was something else in the mind that's structuring experience. Kant made it metaphysical. The Germans started to say that there are unknown selves and processes within us that structure consciousness. That happened in the late 18th century and continued into the early part of the 19th century—the notion of an unconscious that's mental—not an unconscious that's physiological—people had already thought about that, but an unconscious that was mental. That then led through a number of nooks and crannies to Sigmund Freud about 80 years later.

Paulson: Efrat, let me bring you into this. Is there a clear dividing line between the unconscious and the conscious?

Efrat Ginot: In order to answer this, I want to go back and tell you what interested me in the whole area of the unconscious. In doing years and years of work trying to help patients, I was always struck by the phenomenon of why it is so difficult for people to change? People really want to; they have insights, yet all kinds of patterns keep sneaking up on them. Even if we have the intention to do things differently, we sometimes slide into another self-state, and, lo and behold, we repeat the same patterns. The more conventional explanations, namely *resistance* to change, are too scary. We are attached to all kinds of attachment figures, like our parents; we don't want to separate from them. All of these may have a place, but I think there must be something else that drives a lot of what we do. We think that a lot of what goes on happens under the radar—like Damasio said, the *vast unconscious*. Only a few patterns come up to the level of consciousness. To be very, very brief, we all have different self-states—self-systems. Each one of them develops within a particular intersubjective parental situation. We learn and we make interpretations about the world. We built up an unconscious self-system, but the unconscious doesn't stay unconscious, because, as creatures, and because the motor area in the brain is very involved with all the other areas, we enact what's in there. In the past we had the idea that the unconscious was like a container, like a sealed-off place for wishes that were not fulfilled because of trauma and memories we couldn't remember because they were too scary or stuff that was rejected. We don't think like that anymore, at least in a cognitive sense.

Paulson: Heather, let me bring you into this. From the neuroscience perspective, is there a clear dividing line between the conscious and the unconscious?

Heather Berlin: First, we have to operationalize it—definition is really important. Consciousness is a first-person subjective experience—only I know about my own consciousness. I assume you are conscious, but I don't know that you are. When you're investigating conscious perception in the lab you can ask

people things like, "Did you see the stimulus or not see it?" We assess consciousness mainly via self-report. And we put a lot of things into this big basket that we call the unconscious. I'd like to divide it into four different types. First, I am unconscious of things that are happening in the room behind me that I have no awareness of—I'm unconscious of it. My brain isn't even processing that information. Then you have people who are unconscious when the battery power system of their brain is turned down, damaged, or otherwise not functioning properly—that is, when key brain stem and midbrain areas that infuse the brain with neurotransmitters that make it awake and active are damaged, malfunctioning, or underactive. When someone's in a coma, under general anesthesia, or in a deep dreamless sleep, they are considered unconscious, but that type of unconscious refers to their level of wakefulness, that is, you're unconscious because you're not awake. Then you have the intact fully awake brain. You have certain things that the brain is processing that it's not aware of, versus things that it is aware of. That's another type of unconscious. You're fully awake and information is being processed by your brain, but you don't have any subjective awareness of it. We can test what we call the cold unconscious by presenting information to the subject subliminally and testing whether it has an effect on their subsequent behavior. And then there is the more dynamic, warm unconscious that is emotive and has to do with drives and motives—the really juicy bit that is the focus of psychoanalysis.

When you talk about the unconscious, it's not one uniform thing. If you're talking about what the brain is processing that we're not aware of versus what it's processing that we are aware of, then there are some distinctions we can start to make in terms of brain function. Ideally and ultimately, we can start to predict at the neural level whether a person's going to have subjective experience of information he/she has presented or if that information is going to be processed in the brain outside of awareness.

Paulson: Partly, what you're saying is, there will always be certain brain functions that remain unconscious. They will never come to conscious awareness.

Ginot: Yes—if I may. That's why I think it's good to talk about unconscious processes rather than the unconscious, because the unconscious is made up of all brain processes that are going at the same time.

Berlin: Once we have a full theory of the neural basis of consciousness, then we can know whether something is conscious or not. There are a couple of theories. One says that you need to have feedback loops from the prefrontal cortex or thalamocortical loops—going from the subcortical areas to the cortex and back, and that you need these reverberating loops to have conscious experience. And you also need feedback loops within the cortex as well. For example, if you were to process something, let's say visually, unconsciously, you'd activate the primary visual cortex. As you become aware of it, you start to activate secondary visual cortices in the brain that process the information more deeply or evaluate it further, and finally when you get activation in and feedback from the prefrontal cortex to the primary visual processing areas, that's when you have the full conscious experience of the stimuli. It's not a place in the brain. It's a process, and it has to do with systems and networks.

Paulson: There are several different ways we can talk about the unconscious. One is the science of it or the neuroscience of it. The other is the unconscious as an idea. George, you were starting to take us to the history. We got up to Freud. Are we still dealing with Freud's definition of the unconscious?

Makari: Let me pick up on some of the comments my colleagues have made, because, in a way, you get to Freud and there's this huge problem. The problem is epistemological. It's so hard to know consciousness because it's based on self-report. You ask something; they can lie to you—they cannot be very aware. That's one level of difficulty. Now we're talking about things that, by definition, they will not be aware of, and we're going to count on self-report to understand it—that's mostly been the way. You can correct me if I'm wrong. In the cognitive neurosciences, you need to rely on that internal report. So researchers have to be very careful and clever. I think this is actually a really interesting thing that one can use in one's everyday life. Freud was very clever. How do you notice that there's an unconscious process? You notice it by its impact, its weird impact on consciousness. If you can start thinking about some of the weird things

that happen in consciousness, you can start to infer backwards. Inferring backwards isn't knowing, but you can try to infer backwards as to what might be happening. This is when Freud started to look at these things that most people just ignore in normal social conversation—the slips of the tongue, jokes that land badly, the best man speech that really goes badly, and dreams. A big one that he started to look at was the way that we mold interaction between two people through what he called *transference*. By examining what's happening—not just in consciousness: we already have trouble with that—but also in the unconscious, that allows you to start to think in a richer way about your own inner life.

Ginot: If I may add, it's not just about the inner life, because all these unconscious systems have to be enacted outside. One of the ways to identify the patterns—and we can do it to ourselves—is that we need to identify repeated patterns that we don't like. In this way, the *repetition compulsion*, which is a Freudian concept, is very helpful—the return of the repressed. Freud was right about that, too, because those patterns keep coming up in an automatic unaware way. I want to emphasize the automatic nature of these patterns—we find ourselves in them. In addition to questioning, we observe our patients and ourselves. This is why transference is so important because this is the enacted unconscious pattern.

Paulson: To pick up the historical thread and to bring this up to the present, of course a lot has happened since Freud. He came up with his theory more than a century ago. We have neuroscience since then. We know a lot about what works in psychotherapy. This is a huge question, but if we can boil it down, what did Freud get right and what did he get wrong in terms of framing the whole notion of the unconscious?

Makari: I wrote a 600-page book about it. I'm going to pass [*laughter*].

Ginot: The idea of the repressed is something that is very interesting. What does it mean? It means that there's some little homo nucleus inside that directs what stays out, what goes in, what we remember, what we don't remember. Now we know there's no such system. There's no little person there that directs us—consciously or unconsciously. This was one of the bigger problems for cognitive scientists in terms of the unconscious. Also, if we think of the unconscious in terms of processes, it's not delineated events or one memory that is stuck there and is waiting to be unearthed in psychoanalysis. That would solve all my problems, but it doesn't usually happen that way.

Berlin: On this topic, I did a very extensive review of the neuroscience literature. Most people in cognitive neuroscience aren't really setting out consciously, at least, to investigate psychoanalytic ideas. Some are doing it without even knowing it. I sifted through a lot of the literature and wrote a review on what we're starting to glean from our understanding in basic cognitive neuroscience research about classic psychoanalytic ideas. The evidence shows that we are uncovering neural correlates for classic psychoanalytic phenomena like *suppression*, *repression*, and *dissociation*. For example, let's say somebody suppresses a memory; you'll have increased activation of a part of a brain called the dorsal lateral prefrontal cortex, which will downregulate a memory area of the brain called the hippocampus.

You can see a distinct pattern of activation in the brain, via neuroimaging, when somebody is actively trying to push a memory away. Now some people argue that you get the white bear effect when trying to suppress a thought. For example, if I say, "Don't think of a white bear," that's all you'll think of. But researchers in the suppression study had a really great strategy to get around this issue. They had their subjects learn word pairs and then said to them, in the suppression condition, "Don't think of the word that goes with this word." It was this two-step process that enabled people to actually suppress the words in the study. And when they gave subjects a memory test later, they actually did worse on the words that they were told to suppress. The same thing happens with *dissociation*. You can see a distinctive pattern of brain activation associated with dissociation. Repression is hard to get at, because repression, as you were saying, happens automatically. You can't just say, "Repress now." There were some studies that got at it quite subtly and creatively.

In one study, they presented a naked women and naked men subliminally. Then they tested where the subject was attending to unconsciously. They found that, sure enough, heterosexual women unconsciously attended to the image of the naked man, and heterosexual men would unconsciously attend to the naked women. And interestingly, heterosexual men would avert their attention from the naked man. This would happen *unconsciously*. So, this was a way to explore what one might call repression of homosexual desires. Obviously, tests of repression are not perfect. It's very difficult to measure repression in the lab. But at least we can start to test these kinds of things experimentally. Some of Freud's other concepts, for example, the Oedipal complex and his ideas on monotheism—are harder to actually investigate experimentally.

Paulson: George?

Makari: That actually is wrapped around a very big idea that Freud was right about. It's a weird idea, because what he postulated was that the mind like a biological organism was in some way self-regulating. He did this when he was surrounded by mechanistic models of the body as a machine with clanking gears and things like that, and religious models of the soul. Unlike a machine, he said the mind actually sought to protect itself from overstimulation. That was the basic idea for the concept of *defense*. There were two ideas about the unconscious that Freudians had. One was descriptive—descriptive just meant it's a jungle out there; your attention is focused on whatever it's focused on, but if I say, "Hey, think about that part of the jungle back there, you can pull that up and examine that. That's the descriptive unconscious."

But he postulated this other thing called the *dynamic unconscious*, where there is a barrier to bringing certain contents to consciousness. You couldn't just focus your attention there and pull it up. This is the beginning, as you know. You just heard there are all sorts of different manifestations of it; some of it will end up being right; some of it will end up being not so perfect, or maybe even wrong. The general idea is that we as mental beings have the capacity to self-regulate and protect a kind of internal homeostasis. That's a fascinating idea, and it was quite original.

Ginot: Which, by the way, is totally supported by evolution, because in every organism, even the amoeba, the most important function is to protect. If you shine a light on the amoeba, it will skirt away. There is an innate need to come back to homeostasis.

Paulson: When we talk about the mind, is that another way of talking about the self?

Ginot: The brain.

Paulson: I'm talking about the mind here. I'm interested in this notion or this question of whether we each have some sense of an individual self. What goes into that presumably would be some combination of the unconscious and the conscious, right?

Makari: There's a very specific history to that; it started with John Locke. John Locke postulated a *mind* that's not the *soul*. He says there's a material thing called the mind; it has lots of memories. Over time, if you remember those things, he calls that a *self*. Internal memory at any one time, he calls *consciousness*. He is laying the foundation for not just the political world that we live in, but also for the psychological world that we live in. That's his definition of what the difference is between a self, which is memories over time, and the mind.

There was a problem though that people immediately said, "Wait—the self is really memories over time? What's going to happen with unconscious experience? What's going to happen with all the stuff that we don't fully process?" This came up as a critique of him rather quickly. By 1750, people were saying, "There are all sorts of things happening to us that we don't remember, and they're somehow part of who we are."

Berlin: The self is a construct of the brain/mind. I think mind/brain is one and the same. The self is made up of memories and there's continuity for this entity of self that we construct. However, our sense of self can change. There are patients who have certain brain lesions or dissociative disorders, where they lose

their sense of self. The sense of self is a construct that's very vulnerable to manipulation, whereas the mind is just the product of the brain, which is also malleable. For example, the way your mind functions will change in very distinct ways when the brain is damaged or dysfunctional.

Paulson: Let me pursue this a little bit. Do any of you think we have such a thing as a true self—something that's essential about us?

Ginot: That's an interesting question. I can only start with Winnicott, who talked about the *true self* and then a *false self*. Essentially, I think we are a whole self. Within that whole self, we have *self-states*. Whether we are aware of them or not, the states are part of us. When a patient comes and says, "Oh, I just did something good, but it's not really me because I usually don't succeed." No. That good is also part of us, but it's very weak; the other narrative of not doing so well is much stronger. Within that big umbrella of the self, there are self-states. Those self-states are on a continuum between the unconscious and conscious.

Makari: My answer would be that the thing that captured people was not how unstable the self was, but how stable it was—that we would go to sleep and wake up in the morning and be the same person. It was the philosophical problem that no one could quite understand. How did that happen? You wake up in this buzzing world but you are the same person that went to sleep. That said, as people started to experiment with things like hypnosis, and this started in the late 18th century, they started this weird encounter with unconscious selves.

This notion of there being an essential true self, which was exactly what Locke was trying to support, was exploded by experiences of people who, for example, had brain damage and changed selves, or entered hypnotic states, where they seemed to summon up a completely different self. This was the kind of phenomena that late 19th century spiritualists, psychologists, and psychiatrists tried to figure out. It becomes a very rich history at this point, because people came up with a lot of different ideas about what might be happening.

Berlin: I don't agree with the idea that there's one true self that doesn't change. For example, the self that you are when you're a parent with your child is different from the self that you are at work. Also, I like to think of the self as the *personality*. It's how we tend to behave in different situations—these behavioral tendencies make up our selves, at least how we present to other people. How we tend to behave in different situations is how we then start to identify ourselves. Temperament tends to remain pretty stable across the life span, but certain personality traits can change. Psychotherapy can help us change the repetitive behavioral and psychological patterns that drive us.

Ginot: True. It is hard because at a certain point, those patterns are different self-states; they get a life of their own. They get triggered from this reservoir in the subcortical areas. There's always a fight between the prefrontal cortex and the subcortical areas. The subcortical areas have larger domesticity and enact stuff. The prefrontal cortex says, "Hey, wait a minute. Do I really have to do this right now?—insult this person?" The balance is between those two areas, the subcortical and the cortical. It's hard work, because the brain is about conserving energy. It wants to repeat itself to conserve energy. It doesn't want to learn new things, necessarily. I'm talking very generally. It doesn't want to put in a lot of effort. A lot of this effort is for mindfulness. I don't know if this is what you have in mind—recruiting the prefrontal cortex to become mindful.

Paulson: Let's talk about that. The question you're all raising is, How much can we change these unconscious impulses? The larger question is, How much can we access this unconscious part of our minds? How do you sort that out?

Ginot: One of the best ways is through psychotherapy and psychoanalysis, which are places where a person can be themselves in a fundamental way. Whoever they are, they act in very similar ways as they would outside the therapeutic setting. *Free association*, for example, or the slip of the tongue is very interesting. Do they really get to the heart of the unconscious?

Makari: Free association was a brilliant, brilliant technique. The imperative was to try to do everything you could to foreground and make empirical, internal experience as it may be represented and expressed. Is it really a record of internal experience? Of course not. But, it's an attempt to make a pragmatic strategy that asks the person, "Tell me everything, everything, everything that you think. Don't censor. Don't *not* say the weird things—say every weird thing, everything." Of course, the great challenge is to look for the ruptures in that. You're actually interested in the times when the person fails to free associate, because for Freud, that was the moment of something unconscious interrupting and disrupting this, otherwise, pattern of free association—he looked for the moments of un-freedom. I think it's a very powerful method. Does it work with everybody? No.

Paulson: From the therapeutic perspective, how important is it to make the unconscious conscious?

Ginot: It's very important, because, first, it's there—not in terms of content; I do not remember my fourth year or my fifth birthday. We don't remember those distinct memories, especially because in the first few years, we don't have a hippocampus that records those memories. What we do have are those patterns that are based on the effects that I was feeling—interpretations as a child I gave to all kinds of events, self-doubts, and very negative feelings. Think of a young child feeling very upset; the interpretation most likely will be that something is wrong with me. From there, we get to a narrative. "Okay. Something is wrong with me. I'm not good. I'm not lovable"—whatever direction it takes. It's really important because those patterns then continue; they became part of the self, if you will.

Paulson: Heather?

Berlin: From a neural perspective, and it was alluded to before, there are two systems. You have the subcortical areas that control basal drives for immediate pleasure and avoidance of pain. They're working outside of awareness. And you have the prefrontal cortex, which is weighing in on the future consequences of your actions: "Should I behave this way or not? I want to rape that person, but maybe that's not such a good idea." Usually these two systems are in balance, which leads to adaptive behavior balancing immediate rewards with the future outcomes of one's actions. However, when these two systems are out of balance, that's when people can have impulse control problems where they act on their basic drive for immediate pleasure, or avoidance of pain, despite the consequences. This can occur when they have a lesion to the prefrontal cortex, overactivation of limbic areas, or poor connectivity between these two systems.

And when you're suppressing, when you're repressing, when you're keeping memories at bay, unconscious processes/thoughts are allowed to operate in the brain without any self-reflection. But we can access unconscious processes by turning down the prefrontal cortex, which is normally suppressing unconscious thoughts and keeping them at bay. How can we do that? With techniques like hypnosis, certain types of meditation, or during dreams, states in which your prefrontal cortex is less activate. The same thing happens with certain drugs, including alcohol, where activation of the prefrontal cortex is turned down. It allows for the things that are normally going on behind the scenes to come to the surface: *in vino veritas.*

That being said, one thing that I'm interested in is looking at people who are being spontaneously creative during improvisation. There's some neuroimaging work now that shows that when you're in these improvisational states, whether it's doing, for example, jazz improv or freestyle rap, you have decreased activation of the dorsal lateral prefrontal cortex—the part that is active when people are suppressing information. And you have increased activation of the medial prefrontal cortex, which is involved with the generation of new ideas that come from within. So when you remove the suppression of the prefrontal cortex, you can bring unconscious processes to the surface. Now why would that be therapeutic? From a neural perspective, one idea is that you are now allowing the brain to form new connections.

Let's say you have an anxiety-provoking repressed memory that's acting behind the scenes and causing you to act out a specific maladaptive pattern of behavior. If you can bring that repressed memory to the surface and reinterpret it somehow, associating it with a new positive or neutral emotion or feeling, maybe

you can break that pattern of unwanted behavior by creating new neural pathways. But you can only do that when you bring the repressed memory into consciousness and re-encode it somehow with the prefrontal cortex.

Ginot: We know that when we remember things, the protein that laid down the memory has changed. The memory is subject to change. When you remember something that you thought of a week ago, you don't remember the original memory—you remember the memory of the memory. This is really important for therapy, because if those patterns come up, you can contextualize them. You're not a 4-year old anymore. You're not at the mercy of your parents, or whatever it is that we know from the patient's history. But one of the most brilliant things—with regard to Freud—is *transference*. Transference shows how we operate in relationships. We all have transferences to our significant others. It's just part of the intersubjective interaction. When we get in therapy and we see how a person is with us, the therapist, it's a very rich field in which to catch the transferences.

Paulson: We've been talking a lot about the tradition of psychoanalysis, in particular, coming from Freud. Of course, there are many other therapeutic techniques: cognitive behavioral therapy is very common right now. Can we weigh the pros and cons of some of these different therapeutic techniques in terms of effectiveness?

Ginot: There are about 450 therapeutic techniques. It means that we want to find that golden road to change—this is what therapists want to find. Also, I think because there are so many techniques, it's not so easy to find the right one. The recent development of CBT and DBT techniques are much more focused on symptoms and mindfulness.

Makari: I'm not an expert, but my reading of the evidence says that everyone wins—they do these studies with psychodynamic psychotherapy, IPT, CBT, and pharmacology—and they all work. We need to start being more specific: we are both vastly similar as human beings and also importantly different. One of the grave problems with psychological theorizing is that people start with a small group of patients and they end up making a theory about everyone. Then it really dilutes the actual power of the theory. I would say we need to get a lot better at figuring this out. For instance, the Hitchcock movie phenomenon of making the unconscious conscious—it's not for nobody, but it's for very, very few. More often, it's the work in the transference, the slow slogging of making the unconscious conscious, again and again. After the 400th time, it's changed. It's not the Hitchcock thing. That slow process is much more common.

As a clinician, there are certain groups of patients where you should know what you're in for. That's what researchers are going to have to do better. CBT is going to work very well with certain people, but in others, it *ain't* working. We need to be much better about differential therapeutics and understanding how different modalities, including medication, work.

Paulson: What are we supposed to do? One is plagued by anxiety, by negative thoughts. Who am I supposed to see?

Berlin: There has been a lot of research about different techniques used for different types of disorders or psychological problems. Different therapies work better for various types of problems. Exposure therapy can work very well for phobias, for example. You can go for 10 years of psychoanalysis, but we can probably cure you of your phobia much quicker using exposure therapy. And there are studies with depression that show that, yes, drugs work. And yes, psychotherapy works, but when you put them together, you can get a synergistic effect, which can be even more effective than either treatment on its own. Also, every individual is different. Some drugs work with some people well, but not others, even if they have been diagnosed with the same disorder.

When we have a better understanding of the underlying genetics of mental illness and how genes encode for brain function, we will be able to develop more personalized treatment strategies. We'll come up with more targeted treatments—both psychopharmacological and psychotherapeutic, but it's going to take a while.

Ginot: Even though you trace the development of psychoanalytic thinking—even though it's already over 100 years old—it's still really in its infancy, because we are latecomers to the brain because of the new tools we have. We need more time to look into the brain, to do studies like you were doing [*gesturing toward Berlin and Makari*] and come up with a better understanding of the connection between the brain and mind.

Paulson: Who would be the best candidates for psychoanalysis, for that kind of very in-depth, long treatment?

Ginot: It depends what the person wants. If someone wants to come three or four times a week and just talk and talk, with a silent analyst, okay. That's a privilege. People can hear themselves talk—it's fine. But, I think that something more active needs to take place. The brain responds to attention, for example; put attention on something. It responds to mindfulness, recruiting the prefrontal cortex. It can rebound within the umbrella of psychoanalysis. When someone is just using the cognitive brain—just the verbal, then I don't think it works, because we can rationalize anything. You know the joke: the right brain does something; the left brain explains it.

Paulson: George, do you want to weigh in?

Makari: Yes, I would. I don't think that psychoanalysis is just engaging the cognitive. A good psychoanalysis should be a very emotional experience. Look, it's at the price point where it is prohibitive for most; it's a treatment that people go to after they've tried a lot of other things that haven't worked for them. They should be correctly screened for the right kinds of problems. I would say a lot of different people with very serious character disorders who have tried medication, who have tried mindfulness, who have tried CBT—and this is the Canadian experience—those are the people who end up going to psychoanalysis, and a lot of them get help.

Of course, it is a huge commitment that takes a lot of time; no one really does it like the *Partisan Review* crowd used to do it in the 1950s. No one's going because it's cool. It's expensive and it's really time consuming. However, it is, I think, effective, even lifesaving, for that group of people.

Berlin: There is something that cuts across all these different types of therapies. It's the relationship the patient develops with the therapist that has a positive effect on the patient, regardless of whether the technique being used is CBT, DBT, or psychoanalysis. If you have a really good CBT therapist who is forming a therapeutic alliance with you, whether they're setting out consciously to do it or not, that can be just as helpful to a patient as psychoanalysis.

There's a lot that's going on independently of the actual technique, which is related to the therapeutic alliance and having someone there who's empathetic, and who you can feel connected to. We can't quite quantify it, but psychoanalysis is going to be helpful to a lot of people for that reason alone.

Paulson: Why are some people better able to make changes? One can be stuck in some negative pattern; then they go to therapy, and they really change their lives. Other people keep going back, they're stuck, and they can never change. What's going on there?

Ginot: From a neurological point of view, we talk about the balance between the subcortical and the cortical. People talk about how flexible that balance can be. If there's no flexibility—if the prefrontal cortex cannot engage the lower parts—a person can be very inflexible.

Paulson: Are you saying it's the way certain brains are wired as opposed to it's more of a . . . ?

Ginot: It's inherent. I'm not saying the wiring cannot be changed. Of course, it can. But this flexible–inflexible continuum exists. We see it every day in patients.

Makari: Flexibility and inflexibility is a big problem. I'm not sure it's a neural problem; I don't think we know that. We know that phenomenologically, however, certain people make rapid change and others don't. We're not so good in figuring out why. It's a problem, frankly, that psychoanalysts have wrestled with without much success. It's a clinical wisdom thing—figure it out; it's very difficult.

Berlin: Even though we don't know the exact mechanisms yet, I do think that we're born with certain genetic predispositions. You can see the temperament of a baby and make predictions about how their personality is going to be more or less for the rest of her life. I often say with patients who come in with severe anxiety disorders or obsessive-compulsive disorder that there's a genetic component to it. Research shows that there's lineage there. I tell them that "with therapy, you're never going to be the calmest, most relaxed person in the room, but we can get you to a place where you're not at the highest level of your anxiety range. We can get you to the bottom of your range within your biological constraints. I think there is room for change, but there are also certain limitations based on how you're brain is wired or what your genetic predispositions are."

Paulson: Are there still some fundamental mysteries? I don't know if this is specifically a science question about how the unconscious works. Or do we more or less know the basic outlines and we're just working out the details?

Ginot: We see how people struggle with those patterns and how difficult it is for them to change—some more than others, of course. Some change very quickly; most of us are somewhere in between, and some don't. This is a fascinating thing because inside, people wish for something else. The question is, Why isn't it easier to decide that I don't want to feel anxious next time? The body/brain/mind is one unit, and it takes over.

Paulson: For Heather and George, are there big questions still to be answered about the unconscious. What would you say are some of the biggest questions?

Makari: Pretty much everything [*laughter*]. It depends on what you mean by *knowledge*. I think we have a lot of pragmatic knowledge from therapeutic encounters—I count on it every day. That's not scientific knowledge that's universal, reliable, and valid. We have interesting, fascinating, and new kinds of cognitive neuroscience models that we are trying to work with—both mental *and* neural functions together. We don't know how to put those together. No one has a model for top-down regulation that shows how minds interact with brains. We have a way of reducing minds to brains, but the critical question for us is not just that. The tougher question is how the minds make us do things. How do we have intention? We have no idea about that. How do we have intention that's unconscious? We have double no idea about that [*laughter*].

Berlin: I would agree. There's still this great mystery of what the neural basis of consciousness is. How is my brain making me consciously aware of the simple things? For example, I'm seeing that exit sign, the edges of it, and the color is red. There's some understanding of how the visual system works, but how the physical brain creates my subjective experience is a question that some philosophers say can never be answered. And that's just in the realm of conscious experience that people can report.

We still have many unanswered questions about the unconscious as well; that being said, we know a lot more than we did in Freud's time. For example, in terms of the concept of *free will*, we can now measure neural processes that are going on in the brain that predict a decision we will make—for example, to press the right or left button—milliseconds to seconds before we're consciously aware of making the decision. There are some really interesting things we can start to look at now with advanced technology. So we're not totally in the dark, but we're not even close to fully understanding the unconscious.

Paulson: I want to go to the audience in just a minute, so get ready with your questions. Before I do that, however, you panelists have been studying these questions, you've thought about the nature of the unconscious, and you know what a healthy life is. I'm wondering through your study, whether you've done anything differently in your own lives. Have you changed anything based on what you've learned about the way our brains and minds work? Efrat?

Ginot: I've learned the importance of slowing down, rather than jumping into something impulsively—slowing down to really think about it for a second. One of the most helpful things is *mindfulness*. People

who meditate can slow down the process. The problem with the unconscious negative states is that they can take over. For a moment, they convince us that it's the end of the world—I'm anxious; I can't do it. We are so convinced because of the experiences inside our skull. What I like to do is give homework to my patients and teach them in real time how to engage other systems and not to drown in a particular self-state.

Paulson: George?

Makari: I agree with some of those things. I would say it forces you to live with a certain amount of skepticism about your own convictions. That is a very healthy thing. It shouldn't mean that you never have a conviction, but it does mean that you worry that there are aspects to the way that you're processing the world that you simply are unaware of. If you live like that, it means that you are pretty open to other people's views. You're pretty open to questioning your own views, and that's been a great and healthy thing for me to try to wrestle with. You forget it every day, but you have to keep reminding yourself that subjectivity is, by definition, a narrow little beam in the jungle.

Paulson: Heather?

Berlin: The issues for me are *control* and *letting go*. Many of the things I do and the decisions I make are being governed by things outside of my control, and I've accepted that. A lot of people want to fight to have control over everything they do. But I know that much of what I am doing is being dictated by forces outside of my awareness. There's a freedom, in that you need to just let go of the idea of having control.

At the same time, there's the knowledge that I can have greater control over my negative tendencies or impulses by becoming more aware of them. I think mindfulness is key. For example, when it comes to eating healthily, one strategy is to slow down and pay attention to what you're eating and say, for example, "I'm going to enjoy this meal. How does it taste? What does it feel like?" Pay attention to each bite of food and don't eat "mindlessly." That is something I've consciously tried to do.

And now that I'm eight and a half months pregnant, my physiology is changing and I have much less control over my emotions than I did before. I'm still the same person, but it's amazing how much less control I have. When my hormones change and, in turn, the way my brain is functioning changes, it helps me relate to some of the patients I have treated with impulse control problems. I can see how one's emotions can take over. Having that first person experience of this has really been interesting for me. As much as I know the techniques to help modulate strong emotions, putting them into practice on myself when my hormones are raging can be very difficult.

Ginot: Knowing that you're under hormonal, emotional stress—all kinds of sways—helps a lot.

Berlin: It's helpful because I'll apologize after—it's true.

Paulson: Let us go to the audience.

Audience member 1: Is understanding the unconscious just a matter of increasing our knowledge of biology? If so, how would Jung's notion of the collective unconscious be explained?

Ginot: It's not just about the neurons and the synapses—it's really about what goes into them. The most important element, which in our discussion we didn't get to, is the environment, the intersubjective environment in which we all grow—the baby growth—whether it's good, not so good, very bad, all of those relationships, the memories, the effects, especially, that are generated go into that unconscious. Other things go into that, too—the social elements, so you can explain Jung. Yes, we do have a social unconscious.

Paulson: Jung went way beyond the social unconscious. He talked about a collective unconscious that goes beyond just an individual brain.

Makari: I would agree; I would expand your notion of biology, for example, to include things like mental states, experiences, and social and familial experiences. Once you start to do that, then you start to encompass mind and brain together. Jung had a biological notion. It was Lamarckian heredity at the time—he believed in it. The notion was that learned experience was taken into the mind and could therefore be transmitted biologically to the next generation. His notion was a lot like the Renaissance notions of God—that all of human history was in the unconsciousness of each person. He predicated it on what he thought was the sound biological idea that turned out to be mostly wrong, which is Lamarckian heredity.

Paulson: To follow up on this question, it sounds like all of you are saying that even if we have a very thorough mapping of the brain, there will still be all kinds of questions about that.

Berlin: Dave Chalmers, a very well-known philosopher, based now at New York University, came up with the hard and the easy problems of consciousness. The easy problem, which is actually not that easy, is if we can map out every neuron that fires that is directly correlated to every thought, every experience, every emotion, we would have solved the easy problem of consciousness or even unconscious processes. However, the hard problem, which might never be solved, is why is it that these physical neurons firing and neurochemicals slushing around give us subjective experience? We might not be able to ever make that leap of understanding. Even if we understood all the biology and solved the easy problem we may never be able to solve the hard problem.

Also people are constantly changing and evolving. There's really not a static state of the brain. Human behavior is very difficult to predict. Experiences can change the way the brain functions. Then, because it's a process that's constantly evolving and changing, even if you knew a person's complete genome and every neuron that fires when they had a particular thought, it might still be difficult to be able to predict human behavior or understand the unconscious.

Ginot: What's interesting about that is the way we affect each other intersubjectively; it's especially true in intergenerational transmission. We know it exists; it can be nonverbal or verbal, but we transmit our experiences to our children and grandchildren. It goes down to generations, especially transmission of trauma. One very interesting study at Mount Sinai by Rachel Yehuda involved traumatized rats that give birth; the offspring had compromised ability to deal with stress. The rats themselves were not traumatized; it's the mother who was traumatized. This is a very important finding, because it shows transmission of some collective experience.

Audience member 2: The neurologist Helen Mayberg has done some interesting work with deep brain stimulation to relieve depression. Does her work tell us anything about the unconscious?

Berlin: I know Helen Mayberg's work very well. At Mount Sinai, we are running trials of deep brain stimulation for the treatment of obsessive-compulsive disorder, in people who are otherwise treatment resistant. It's important to remember that this is the last-resort treatment; they have tried many therapies, including psychotherapy and ECT, and nothing has worked.

Paulson: What does that mean—deep brain stimulation?

Berlin: You can think of it like targeted ECT or electric shock therapy, but without the side effects associated with ECT. Deep brain stimulation was originally used for treating movement disorders. You implant electrodes; it's minimally invasive neurosurgery, and the patient is awake during the surgery. Implanted electrodes stimulate specific, usually subcortical, areas of the brain. The electrodes are connected to a wire that's connected to a battery pack implanted in the chest wall. A clinician can control the amount and target of the stimulation. Usually there are four different contact points.

With Parkinson's, the electrodes are placed in an area of the brain that controls movement, the basal ganglia, and the tremors stop. Then, deep brain stimulation started being used to treat psychiatric illness. Mayberg found that across many different neuroimaging studies, there was one part of the brain that seemed to be involved in depression, Brodmann area 25, the anterior cingulate. So, she decided to put the

electrodes there to see what would happen—maybe they would disrupt depression-related neural circuits. It doesn't work all the time, but there are some extraordinary cases where in the operating room, you turn on the electrodes and people will say, "Oh, it feels like I've won a million bucks." And then you shut it off, without them knowing it, while they're talking, and their whole effect goes right back down again.

It's really amazing to see, but it doesn't happen all the time or in all cases. We still don't know exactly how it works. Is it disrupting a faulty network? Is it stimulating something that needs to be stimulated? We don't know the exact mechanism. There's a lot of trial and error. Each disorder has different targets. It's really complex, but the truth is, if you can hit the right target in the right kind of patient, it can completely change a person's effect and their quality of life.

Ginot: The key is the affect. We're dealing with mood—with depression, for instance. I'm not sure it's not unconscious per se. I think what it does show is the importance of subcortical areas for affect. Same with OCD, there's no break that stops the thinking process, and this thing does it.

Audience member 3: I have a question as it relates to the second brain, the enteric nervous system, located in the gut. It's considered to be one of the oldest, more than 500 million years old. Charles Darwin said the center of consciousness is in the solar plexus. In the last few decades, scholars like Peter Levine have done a lot of work with the enteric nervous system as it relates to PTSD. What are each of you seeing in your respective fields with this enteric nervous system as it relates to neurobiology of the mind, consciousness, and the subjective self?

Ginot: The work of Peter Levine and others is bringing back the importance of the body. The body is an entity that cannot be separated from a brain. There is a lot of work that's being done with the body, centering it, feeling it throughout. It's not that we know exactly how it relates to consciousness, but we are on the way. Body work is very, very effective.

Paulson: What kind of body work are you talking about?

Ginot: Let's look at the anxious patient. They're so anxious that they can't sit still. A therapist would anchor them by asking them to sit quietly to see where they feel the anxiety. A lot of people feel anxiety in the chest, in the solar plexus—it's very common. You can trace this anxiety; you see how sitting anchors them and how the chair affects it. The therapist may ask the person to free associate, to see what comes with that feeling in the chest. The body still becomes the repository. A lot of people say that the body is the repository for so many of the negative feelings we have.

Audience member 4: There is research that seems to indicate that you can't actually correct political misperceptions unless you stabilize a people's sense of self. Can you talk about the relationship between people's sense of truth and falsehood and how it relates to a sense of self?

Ginot: Many convictions are tied to a wider world view and especially to negative feelings that go back to one's childhood; they're very resistant to change. There is identification with the group—the group is so important. You can see them today; you're either Democratic or Republican, but the identification with the group, with a tribe, is really strong.

Berlin: I would recommend work by Jonathan Haidt. He's based here in New York at New York University. He's written a lot about political thinking and how it relates to different personality types. There are certain personality dispositions that are drawn to certain political ideologies. For example, people who tend to be more conservative usually have greater disgust responses. They're fearful of "the other"—by which I mean people outside their in-group—which could lead to a certain world view and adherence to a particular political philosophy. People's brains work differently.

There is some neuroimaging work to show that as well—differences in neural responses to certain stimuli between people who tend to vote more conservatively versus those who are more liberal and open-minded. Openness to experience is a personality trait that tends to be stable across the life span. I would suggest looking at this work.

Paulson: Is this another way to talk about implicit bias?

Berlin: Yes—I think so. There are implicit biases as well that are all tied into that—for instance, people who are xenophobic. It turns out that pregnant women tend to be more afraid of out-group members because of fear of contamination; one becomes more conservative when pregnant. That's evolutionarily adaptive—the idea of protecting oneself from germs or the unknown to protect the fetus. So yes, there are implicit biases, and that can be related to the way people tend to vote.

Makari: It's a very important question that has a very, very long history. Actually, it, I think, is the question that, in part, propelled the invention of the idea of the *mind*, because what Locke and others were really, really concerned about was religious fanaticism. They saw around them in the interregnum time where there were all these Protestant sects—people speaking directly to God, creating a sect, refusing to abide by the law. Of course, there were decades and decades and decades of inter-Christian warfare—bloodshed everywhere. Locke's notion was that we can't have a model of knowledge that is about absolute truth, because one absolute truth goes to war with another absolute truth. We need to have a model that is provisional, so that knowledge is provisional. Everything we know is provisional; it's parochial; it's prejudicial. It's about what we learn.

And P.S., Locke advised to get in there really early and teach the children well, because that's going to be who they are from those early associations. Locke was very interested, of course, in early education and trying to create rational subjects for liberalism. That was part of his project.

Ginot: It's amazing, because today I think that's what they're trying to do with schools. Some schools have mindfulness programs. Imagine if a little boy, rather than taking in all these misogynistic attitudes, has to think about the rights of the girls. I think this is so important. When you talk about Locke, it's just amazing—what an amazing mind and person.

Paulson: That raises the question: How much can you teach open-mindedness? Or is that something that we're basically wired with or we're not?

Berlin: There are studies that have been done in babies. There's work that's been done by Paul Bloom and his wife, Karen Wynn, at Yale's Child Study Center. They show that babies can perceive things that are unjust or unfair very early on. Most babies and children will prefer the puppet that was kind to another puppet versus the one that was a bully. But there are individual differences. There are some babies and children that prefer the nice puppet over the mean one, but there are others who don't care as much. So I do think there are these innate differences, but like everything, teaching and education can help modify certain behaviors, to an extent. It's not a lost cause, but there are always going to be genetic individual differences among people.

Audience member 5: My question is twofold: Have the effects of gender differences on the unconscious been studied? And how does socialization affect the unconscious?

Ginot: I think the second question is easier. Is there socialization in the unconscious? Basically, the vast unconscious of the mind is a reservoir of all our experiences, and parts of those experiences are gender specific. If a girl grows up with an angry father and a very subdued mother, what is her unconscious taking in? She's not going to remember day by day how her father abused her mother, but in that reservoir, the pattern has been set. Either she'll see men as abusive, even when they're not, or she will choose similar people, because the brain likes familiarity. Yes. Gender is incredibly important in boys as well. I think one of the ways to explain misogyny is through this reservoir of what goes into the unconscious. Those messages are everywhere—verbal and nonverbal—from TV, social media, everywhere.

Paulson: What I also heard in the question was, is there a biological component to this? Essentially, is the unconscious gendered biologically?

Berlin: There are gender differences; there are differences in hormones—even what you're exposed to *in utero*. They can show that children who are exposed to higher testosterone levels have more dominant traits. There certainly are differences in terms of our underlying neurobiology. Our unconscious is related to our underlying neurobiology. Therefore, there will be gender differences in our underlying neurobiology, in addition to the experiences that we have, which will mold the unconscious.

Ginot: Let's deal with anxiety for instance, which is one of the biggest organizers of all of us. If biologically I'm born with a higher level of reactivity or hyperarousal, my interpretation of what will happen to me and my mother are different from the baby who is placid and is okay with whatever happens. Are there any gender differences? Maybe, but I think that it was biological differences that Heather talked about—they are very significant, especially where it talks about anxiety.

Audience member 6: What is the role of emotional literacy in understanding one's unconscious?

Makari: One of the great things psychoanalysis has done with all this theory—probably a good percentage of it is wrong, a good percentage of it is right, however, and it's everywhere—is that it's given people a language to name things and to consider whether these things are important to them. That becomes a kind of literacy; you now have a whole array of names and theories about why you're feeling the way you're feeling. If you live in a community where that's frowned upon, you still can participate in the wider community of the West where this is very common. I think that's quite liberating for people—that they can come out of a world where maybe this kind of emotional introspection is not supported but need, in some way, to engage themselves in a new way and have this language and logic waiting for them.

Once, of course, this was not available. If you were French in 1850, you went to the church. If that didn't work, you didn't know what to do. Talking about the unconscious is the secular option that we now have to try to make sense and meaning of our internal experience, even when we might come from a family, a social group, or a culture where it's not supported.

Ginot: Just to support what you're saying, George, is that there are studies that show that just naming a feeling or a state reduces the level of anxiety. It's so important.

Berlin: Another important point to always remember—especially when people want to get rid of their negative emotions—is that they have evolved for a purpose. If we never felt anxiety or sadness, that would not be adaptive. Anxiety functions to help us deal with potential threats; it compels us to act in ways that protect us from harm. Sadness, some say, is a way to elicit help from others when you need it, to display signs that indicate that you need help. It would be maladaptive to not have negative emotions. Remember that. It's important that you can accept them, and then they become less bad. We can have less anxiety about our anxiety.

Audience member 7: Can you name anybody from the course of history that's been able to freely access their unconscious? Perhaps an artist, actor, or philosopher?

Makari: By definition, the answer is *no*. There's a vast amount that remains unconscious for even the most enlightened person. This is a secular model; we're not talking about Dante going to heaven. We're talking about a secular model, where this is the tragic nature of human knowledge. We only can know ourselves so much.

Paulson: I have to push you a little bit on this. There must be some people who are more adept at doing this.

Makari: That's a different question—more adept is not know their unconscious completely.

Ginot: No, you can't because the unconscious is formed in the first few years. There are memories but not explicit memories. You cannot remember what happened to you when you were two. You have an idea of what happened, but I think about artists like Picasso, for instance—I don't know, his wild attempts to look from underneath the woman's shape and change the face around. Maybe Picasso.

Makari: Ask his seven wives! [*laughter*]

Ginot: That's right, but he kept trying!

Berlin: There may be certain people who have a better ability to gain access to their unconscious processes. The thing about consciousness is that it has a limited capacity. You can only keep a certain number of items or thoughts in consciousness, but the unconscious is virtually limitless. If we were to be consciously aware of everything that was going on in our unconscious, it would be overwhelming—we wouldn't be able to function; it would just be too much. The idea of a person who's completely aware of his or her unconscious is inconceivable. It's anatomically not really possible either—it's like looking forward, and trying to see my rear end at the same time.

Ginot: Can I see how my pancreas is doing? Same thing—you can't.

Berlin: An artist can perhaps have an easier inroad to gaining access to some unconscious processes, but I wouldn't say that they're ever fully conscious of their unconscious.

Paulson: We have many more questions, but we have no more time. Thank you all for coming, and thank you to our wonderful panel.

Acknowledgments

The preceding is an edited transcript of the discussion from October 26, 2016, 7:00 PM–8:30 PM, at the New York Academy of Sciences in New York City. Funding for the discussion was provided by the Nour Foundation.

Competing interests

The authors declare no competing interests.

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