

NEUROSCIENCE

Arts and the Dreaming Mind

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In a small but elegant museum on Manhattan's West Side, one finds watchful Buddhas, many-limbed goddesses, and tapestries depicting religious visions. The Rubin Museum is a place where people come to learn about Himalayan art, and for three months of the year it is also a place where people come to learn about the science of the human brain.

The museum's fourth annual Brainwave Festival brought heavy hitters from the worlds of art and science to explore the theme of dreaming. How do we dream? Why? What can dreams teach us about who we are? The



The Edge of Dreaming.

festival investigated these questions through a wide-ranging variety of events, from a series of workshops linked to the U.S. premiere of Amy Hardie's award-winning documentary *The Edge of Dreaming* to the museum's first "dream-over," an adult sleepover at the museum that included art meditation workshops and personal dream analysis. At the heart of the festival was a series of 15 on-stage conversations between prominent artists and neuroscientists, including evenings that paired actress Debra Winger with Robert Stickgold, puppeteer Roman Paska with Rodolfo Llinás, musician Henry Rollins with David Eagleman, and painter David Salle with Ian McGilchrist.

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These carefully considered pairings offered the opportunity for insight through unexpected juxtaposition. In their conversation, cognitive neuroscientist Amir Raz and writer Nathan Englander compared the hyperfocused state of consciousness the author experiences while writing to the state of consciousness achieved during dreaming. Englander likened writing to the sensation of watching oneself that is so common in dreams, and Raz speculated that writers are experts at achieving this unusually dissociated state, in which the brain can explore avenues of thought not possible during normal attentional states.

Whereas dreaming and creativity offered an obvious focus for these conversations, many stepped beyond such comfortable ground and even eschewed the topic of dreaming altogether. Best-selling author and attorney Scott Turow and cognitive neuroscientist Michael Gazzaniga engaged in an illuminating discussion of neuroscience and the law. How does the court define a defendant's mental state in a given context, thereby ascribing responsibility? If a neurological disorder is found to underlie psychopathy, does that somehow absolve a murderer of guilt? When, if ever, can the death penalty be said to have a place in a

just judicial system? Profound considerations about the notion of brain states and the self emerged from these questions.

Some events, however, seem to offer only a tenuous association with science. For the dream-over, participants signed up to sleep under a piece of art and have their potentially art-inspired dreams interpreted by a team of analysts led by psychiatrist Edward Nersessian. Although it was great fun to spend the night in the museum, the evening's preparation for dreaming and the morning's "personal dream analysis" felt less like a scientific endeavor than a creative and amusing parlor game.

Nonetheless, most events offered satisfyingly robust connections between science and art. In her lyrical, autobiographical *The Edge of Dreaming*, Hardie recreates a nightmare in which her late first husband foretells

her death in the upcoming year, a "prophecy" that seems even more ominous after she develops an ailment that threatens to collapse her lungs. Her quest to understand the dream eventually leads her to undergo a shamanic journey in which she revisits the memory of her late husband to "undo" the prophecy. Although such a film could easily fall into the familiar trope of spiritual awakening, Hardie takes a more measured approach, using the neuroscience of memory and dreaming to investigate her experience.

The film implies that experience is real for the brain, whether it is lived, imagined, or dreamt. Only by returning the awake brain to the state of the dreaming brain, during which her fateful memory was formed, could she alter the pathways that had locked it into place. While Hardie's experience clearly remains beyond the explanatory grasp of modern neuroscience, there is accumulating evidence that brain state affects the properties of memory formation. Highly emotionally charged memories are thought to be consolidated by a pathway that involves the amygdala (central to fear circuits) instead of the hippocampus (which seems to help consolidate many other memories). By recreating her experience emotionally, Hardie may have gained access to such alternative memory formation circuits—a strategy commonly employed by psychologists treating patients with such disorders as posttraumatic stress disorder.

The Brainwave Festival's greatest strength may lie in its potential to bring together the scientific and artistic communities. Yet the audiences were composed mostly of artistically minded folks curious about science. There was a conspicuous lack of scientifically minded folks curious about art; at most events, the neuroscientist seemed like an exotic animal in the room. The question-and-answer periods were generally thoughtful and intelligent, but the questions, not surprisingly, often reflected curious but uninformed minds grappling with complex scientific concepts. If the ever-increasing roster of public events that purport to build bridges between science and the arts are to be more than just glittery bones tossed to a hungry crowd, a greater engagement from the scientific community is in order. If more scientists engaged with public events such as the Brainwave Festival, that could help add depth to a widening public conversation—and help put a face on the abstract and often misunderstood endeavor of science.

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Brainwave 2011 Dreams

Tim McHenry, Producer

Rubin Museum of Art,
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www.rmanyc.org/brainwave