

worse they were off in terms of language skills, attention span, motor speed, things like that.” Seven years later, there was no evidence that the children’s bodies had recovered or compensated for the damage. What’s more, the data suggest that as the children matured and began eating mercury-tainted whale meat and other seafood themselves, the brain damage continued—even at relatively low exposure levels. “Our concern is that we are now seeing evidence that the brain’s susceptibility is not just limited to the fetal period,” says Grandjean. “The brain is still vulnerable throughout childhood and into the teenage period. This is an entirely new observation.”

In the United States and other nations, mercury’s harmful effects have been known for years. It is outlawed in thermometers and regulated by environmental agencies; pregnant mothers are warned away from potentially contaminated seafood. Still, mercury hasn’t fueled the same public outcry as lead, a neurotoxin with a devastating and well-documented legacy. In fact, critics of Grandjean’s study charge that there is little cause for alarm because most of the rest of the world doesn’t share the Faroese taste for whale.

Grandjean disagrees. First, he says, whales aren’t the only animals that “bioaccumulate” the poison. Across the globe, for example, inorganic mercury is belched into the atmosphere in smoke from coal-fired electricity plants and garbage incinerators. (China, for example, fuels its booming economy with a mercury-rich form of coal and is one of the chief mercury polluters.) It returns to earth in rain, where microorganisms absorb it. Small fish graze on the microorganisms; larger fish, like mackerel, eat the grazers; and then top marine predators such as whales, sharks, tuna, and swordfish eat the mackerel. Because this grand digestive process doesn’t reduce or expel mercury, it concentrates in fish at the apex of the food chain—where humans often dine. Freshwater fish also accumulate the heavy metal, especially in New England, which has become a landing zone for air-borne mercury from power plants in the Midwest.

Grandjean stresses that his research

also underscores a more disturbing picture: of humans adrift in a sea of potentially brain-damaging chemicals they have manufactured but don’t fully understand. “This is much more serious than telling pregnant women to avoid eating canned tuna fish,” he says. “There are about 150 substances I can recite that are known to be toxic to the human brain. Out of those substances... we’ve looked at three—lead, mercury, and PCBs [polychlorinated biphenyls].”

Grandjean believes other chemicals that haven’t yet been thoroughly researched share mercury’s toxic traits. He worries that governments and health organizations will be slow to realize new threats to young brains, and he speaks from experience. In the 1970s, as a medical student studying lead poisoning, he sat through government hearings as the United States faced a poison that seemed ubiquitous: in lead-based paints, gasoline, and leaded cans and pipes. It took nearly a decade before meaningful laws were

passed phasing the metal out of such products. “There was tremendous resistance to regulating lead,” Grandjean remembers. “I also see resistance to regulating mercury. Are we going to take another 20 years to look at another chemical? We have to find a way to use our best judgment and eliminate the types of exposures that can harm the nervous system. You don’t get a second chance to build your brain.”

—NEIL SHEA

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The small coastal village of Eysturoy in the Faroe Islands, located in the North Atlantic midway between Iceland and Norway. Seafood is a staple of the diet here.



THE DAVINCI MODE

Ideas Rain In

IN 1675 Isaac Newton suffered a mental breakdown—some modern psychiatrists diagnose him as a manic-depressive—and he was still recovering in 1679. But long before that, Newton had already invented calculus and formulated his law of gravitational attraction. Throughout history, genius and madness have often dwelled together: think of Vincent Van Gogh, William James, M.D. 1869, and, more recently, mathematician John Forbes Nash (portrayed in the book and film *A Beautiful Mind*). Delusional psychosis and inspired creativity, ostensible antipodes of human experience, ironically also seem to be next-door neighbors. Over the centuries,

thinkers have wrestled with this enigma, usually on a purely speculative basis. Now, a new empirical study suggests a specific style of cognition shared by those who hear the Muse and those who merely hear voices. The research also suggests variables that distinguish the two groups.

In a paper published in the *Journal of Personality and Social Psychology*, lecturer on psychology Shelley Carson, Ph.D. '01, Harvard graduate student Daniel Higgins, and Jordan Peterson of the University of Toronto (formerly assistant professor of psychology at Harvard) focus on “latent inhibition,” a cognitive mechanism discovered as a result of experiments with animals in the late 1950s. La-

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tent inhibition is the capacity of an animal to unconsciously screen out stimuli perceived as irrelevant to its needs.

Psychologists have generally linked a low level of latent inhibition to psychotic conditions like schizophrenia; the lack of filtering can even flood the mind with random inputs. But the eminent psychologist Hans Eysenck also speculated that low latent inhibition might be one of the cognitive deficits that creative and psychotic people share. Although too much material entering the "cognitive working area" might disorient psychotics, Carson wondered whether "highly creative people could use those many bits and pieces in the cognitive workspace and combine them in novel, original ways."

The researchers studied two groups of Harvard undergraduates, of 86 and 96 people, respectively. They rated the subjects' creativity using three types of psychological tests, including one that inventoried actual creative accomplishments. One instrument, a "divergent thinking" task,



GETTY IMAGES



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He had a genius for physics, but Isaac Newton may have also been subject to manic depression: he endured a nervous breakdown lasting several years.

asked subjects to write down, in three minutes, a list of alternate uses for a common object like a brick, or to list edible things that are white. For the latter challenge, creative thinkers go beyond potatoes and popcorn to "responses like paper, paste, Eucharist wafers, and underwear," Carson notes. The researchers also gave subjects IQ tests and measured their latent inhibition levels with a task that involved abstract audio and visual signals. The data showed that high lifetime creative achievers had significantly less latent inhibition than low creative achievers.

The psychologists also identified a third group: 25 Harvard undergraduates who were "eminent creative achievers" in a single domain. Inclusion in this group required accomplishments like having a novel, book of poetry, or musical composition published (or recorded) and sold, having a prototype invention patented and built, or having a private showing of original artwork at a recognized gallery. Such young creators proved seven times more likely to have low latent inhibition scores than high ones.

Intelligence (the mean IQs of the three subject pools fell between 120 and 130),

The twentieth century's most famous male ballet dancer, Vaslav Nijinsky (1890-1950), seen here in *Le Spectre de la Rose* in 1911. Diagnosed with paranoid schizophrenia in 1917, Nijinsky's career ended with a psychotic breakdown in 1919; he spent the rest of his life in and out of mental hospitals.

Right Now

when married to low latent inhibition, may potentiate original thought. These two factors combined to explain one-fifth to one-quarter of the variance in creativity among the three groups of students. "Intelligence allows you to manipulate the additional stimuli in novel ways without being overwhelmed by them," Carson explains. "IQ may act as a protective factor. That does not mean it will prevent psychosis.

"If a cause of psychosis is a failure of filtering, those who suffer from it may have difficulty determining if stimuli are internally or externally generated," Carson says, noting that the average age of onset for schizophrenia is 16 for males and 20 for females, a time when adolescents are defining their boundaries. "A memory or a mental image may *appear* to



As a young man, Harvard psychologist and philosopher William James suffered from prolonged bouts of depression, suicidal thoughts, panic attacks, and even hallucinations.

be coming from the outside; consequently, psychotics attach emotional significance to random stimuli. They develop an associational network that is not comprehensible to anyone else—their network is both broader and shallower than that of the general population.

"This is also true for creative persons," Carson continues. "Imagination comes from *image*, an internally generated image.

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What you do with that image has a lot to do with whatever else is in your mind. Preparation is a part of creativity. If you're a real artist, you know your field; when ideas start coming, you know when there is an aesthetic fit. Creators can communicate their associations with other people in a form that is original,

useful, or that resonates with a certain portion of the population."

However, while intelligence and preparation may be necessary, they may not be enough to produce creativity. "Maybe it's working memory capacity that is the protective aspect," Carson says. "How many things can you hold in your mind and

process and manipulate?" In a preliminary, unpublished study, she says, "The combination of low latent inhibition and high working memory also predicted creative achievement." —CRAIG LAMBERT

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UNCOLORING BOOK

The End of Blackness?

"BLACKNESS has been shrugged off by the force of events," says Debra Dickerson, J.D. '95. "Things are not perfect racially, but they're pretty damn good and it's up to us [African Americans] to step up to that. The shackles are off, the ball and chain are gone." Dickerson's new book, *The End of Blackness: Returning the Souls of Black Folk to Their Rightful Owners* (Pantheon) is a passionately argued manifesto that aims to liberate black Americans from the very idea of "blackness."

Intentionally using the past tense, she defines "blackness" as "that which allowed you to predict and manipulate the behavior of African Americans. Blackness doesn't predict any more. Neither does whiteness. I'm not saying blackness *should* go away—it is going away. The concept has lost its cohesion; it's collapsing under the weight of its own contradictions and limitations. If your father has Alzheimer's, is that a black problem or a white problem?"

Consider the case of a 51-year-old high-school principal in Los Angeles, a man of Louisiana Creole ancestry who had always considered himself an African American and lived his life accordingly. On a whim, he sent a mouth-swab sample to a company in Florida that, for a fee, will analyze DNA to

genetically locate the origin of one's ancestors. He learned that he was 57 percent Indo-European, 39 percent Native American, and 4 percent East Asian—and zero percent African. "So, *was* he black?" asks Dickerson. "Is he *still* black?"

The old truisms—like "Black people don't play golf, or ski, or vote Republican"—have fallen apart, Dickerson says. "Look at Tiger Woods or Condi Rice: in

terms of the old-school notion of black, they don't compute. You have white people on TV in Minnesota talking about 'busting a move' [acting with great vigor] or 'pimp-slapping' [slapping someone publicly as a humiliation]. And dating interracial in 2004 does not mean what it did in 1964." On a personal note, she adds, "I used to hide the fact that I like classical music, because other black people gave me grief about it."

During a 12-year career in the U.S. Air Force, Dickerson learned Korean, worked as a linguist, directed intelligence programs, and rose to the rank of captain. "I

spend a lot of time thinking about how history lives in people's lives," says Dickerson, whose book draws on research she did while an associate of Harvard's Afro-American studies department in 1996-97. (She is now a senior fellow with the Babcock School of Management at Wake Forest University.) Her book, which combines history and critical race theory, frequently cites black visionaries like Frederick Douglass, Carter Woodson, Ph.D. '12, and W.E.B. Du Bois, A.B. 1890, Ph.D. 1895. (Its subtitle references Du Bois's 1903 classic, *The Souls of Black Folk*.)

"Those three were the pivot points, the ones who most influenced my thinking. I was looking for guidance in how to be black in a post-movement context, and I wasn't getting it, so I had to go back into the past, to these writers," Dickerson says. "They were so far beyond the black-white paradigm. They made me understand that



Debra Dickerson