

# **Artistic works influence our minds and nervous systems, scholar reveals**

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Research by French neurologist Guillaume Duchenne de Boulogne in the 19th century influenced entertainers who used new information about brain sciences to manipulate their audiences. Here, de Boulogne demonstrates the mechanics of facial expression. Credit: Wikipedia

No two disciplines could seem further apart than theater and science, but, as it turns out, they're intimate bedfellows.

As Stanford professor Matthew W. Smith has discovered, modern theater – and, by extension, film and television – basically owe their life to the scientific study of the nervous system.

An associate professor of German studies and of theater and performance studies at Stanford, Smith's latest research shows how theatrical works converged with [scientific research](#) more than 100 years ago.

In his forthcoming book, "Theatres of Sensation: 19th Century Neuroscience and the Birth of the Modern Stage," Smith reveals how entertainers leveraged scientific research about human cognitive function to play directly on the nerves of spectators.

"Late Victorian-era brain science called free will into question as it began to show that humans could be studied, quantified, altered and redirected," said Smith, a playwright himself. "That seized the artistic imagination across Europe and North America."

Smith's investigation led him to an array of source materials including plays, archived production notes from theater directors, acting handbooks and histories of scientific and psychological discoveries.

Together, the evidence points to an emerging genre that Smith now calls "theaters of sensation."

From the Frankenstein dramas of the Romantic period through the avant-garde experiments of Antonin Artaud in the early 20th century, theatrical approaches under this grouping set out to thrill, electrify and disturb audiences. Such plays set the stage for the horror, action and thriller genres of film today. They also led to the use of the screen to motivate various responses and behaviors among viewers.

"People have always understood that the arts affect our minds and bodies," Smith said. "But what really took hold in the 19th century was an idea that artworks impact our nervous systems in particular – and that we are, by extension, neurophysiological beings. Today, we still say, 'That movie was exciting!' 'That play was thrilling!' 'That show was sensational!' 'That book was stimulating!' These ways of speaking have roots in the period of cultural change I'm writing about. And one product of this cultural change was the identifying of a person I call the 'neural subject.'"

Television advertising, for example, would be nowhere without the findings of 19th century neuroscience showing how easily the human mind may be programmed by tweaking people's nervous system and emotions, Smith said.

More than a study of theater alone, Smith's research demonstrates the importance of the neurological sciences for understanding 19th-century culture more broadly. His research shows how sensationalism in fiction and journalism also played – and continue to play – on the idea of the neural subject as eminently subject to trauma and therefore manipulatable.

"The neurosciences revolution of the 19th century anticipated and



helped create the conditions of our own," he said.

## Innervating entertainment

Smith, an expert in the connections between technology, science, and the arts,

said he found "plenty of evidence showing how playwrights were clearly parlaying what scientists knew about human [cognitive functioning](#) to affect audiences."

Think of the railway rescue scenario depicted in melodramas of the period – the woman tied to the tracks and released just seconds before the train barrels over her. "Such a theatrical trope drew on the scientific study of how the nervous system could be shocked," Smith said. "The Victorians dubbed it a 'sensation scene' and even debated whether it and other 'sensations' could be considered intellectual property. Can you copyright a neural stimulation?"

As Smith found, it was [19th century](#) science's "new conception of the person not principally as soul or mind, but instead as a host of interacting inner mechanisms, many of them unconscious," that influenced playwrights such as Percy Shelley, August Strindberg, and Georg Büchner, and other artists such as the opera composer Richard Wagner.

"Wagner was accused of writing not true music, but soundscapes to stimulate the nerves," Smith said. "In his own theorizing about his work, he indeed writes about art as a method of making an impact on the brain of the spectator, thus reflecting the scientific ideas that were starting to infiltrate public thinking."

The German playwright and scientist Georg Büchner's own research into the nascent field of neurology informed his portrayal of the protagonist

in his play *Woyzeck* in 1837, as well, Smith said. Such study enabled the playwright to depict a soldier being subjected to disturbing medical experiments, and fragmenting psychologically as a result. "The character shows signs of what today we might call schizophrenia."

Büchner's artistic sensibility further drew from the scientific literature to stir the audience's sensations in new ways by creating stage effects that directed their attention to light, sound and movement.

It was his fascination with *Woyzeck* that started Smith on this particular book project. "In hindsight, I think the interest goes back to my close relationship with my cousin, a visual and theater artist, who himself was diagnosed with schizophrenia about 20 years ago," Smith said.

## **Theater of the grotesque**

Smith is also one of the few scholars to take seriously the link between controversial pre-psychoanalytic figures such as Franz Mesmer and Jean-Martin Charcot, and less-studied but important neurologists such as Matthew Baillie, Johannes Müller, and Charles Bell. In this way, he further shows how neuroscience and psychology, which diverged in the early 20th century, were once united.

In an analysis of Charcot, the man widely considered the founder of modern neurology, Smith shows how theater and nerve science mixed in acutely dramatic ways.

"In his public lectures in the 1870s and '80s, Charcot exhibited and commented upon a parade of neurological patients with the panache of a born showman," Smith said.

Using primarily female subjects with psychological issues, Charcot demonstrated how people could be hypnotized to assume grotesque

bodily postures and be poked with needles without flinching.

His controversial methods were subsequently lambasted, parodied and turned into a new type of shocking entertainment in a form of [theater](#) known as Grand Guignol. Some of the plays were written as critiques of his methods by his own scientific disciples, Smith said.

Smith's work helps put into context the recent explosion of disciplines that draw on brain research, including neuroaesthetics at Stanford, where subjects have had their brains scanned while reading Jane Austen novels.

As to his views, Smith said, "I think there's danger in reducing a person to an aggregate of neurophysiological processes. In field after field, you can see the dangers of an uncritical embrace of the neural subject, and I hope that some caution is adopted.

"My work is ultimately implicitly political, in that it calls us to reflect more critically on the origins and destinations of the use of the neural subject."

Provided by Stanford University

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