One Person . . . Two Brains?

Period of Study: 1967

Introduction: Victoria had experienced intense epileptic seizures since she was six years old. Doctors placed Victoria on medication that prevented seizures for a period of time. However, after many years, the seizures returned with greater intensity. Weary and disgusted from living her life with the uncontrollable and agonizing seizures, Victoria decided it was time to seek a new treatment.

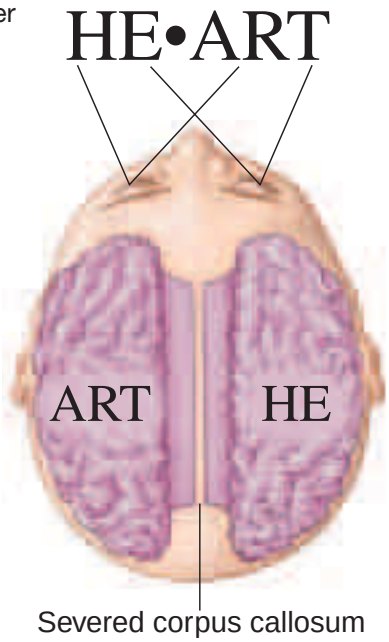
Doctors suggested and Victoria opted for a split-brain operation—an innovative procedure that has proved successful in treating patients with seizures. This operation involved opening the patient's skull and separating the two brain hemispheres by cutting the corpus callosum. Split-brain operations disrupt the major pathway between the brain hemispheres but leave each hemisphere functioning almost completely independently. The procedure prevents the spread of seizures from one hemisphere to the other. This reduces the chance of having a seizure or shortens the seizure if one does occur.

Upon completion of Victoria's split-brain operation, the time came to test her various brain functions that now involved nonconnected, independent hemispheres.

Hypothesis: Researchers wanted to explore the degree to which the two halves of the brain could communicate and function on their own after the operation.

Method: Researchers asked Victoria to stare at a black dot between the letters HE and ART. The information from each side of the black dot will be interpreted by the opposite hemisphere in Victoria's split brain. Victoria's right hemisphere will see HE and her left will only see ART (see diagram).

When Victoria was asked what she had seen, she reported to have seen the word ART. The word ART was projected to her left hemisphere, which contains the ability for speech. She did indeed see the word HE; however, the right hemisphere could not make Victoria say what she had seen. With her left hand, though, Victoria could point to a picture of a man, or HE. This indicated that her right hemisphere could understand the meaning of HE.



Results: Four months after Victoria's split-brain operation, she was alert and could easily remember and speak of past and present events in her life. Her reading, writing, and reasoning abilities were all intact. She could easily carry out everyday functions such as dressing, eating, and walking. Although the effects of her operation became apparent under special testing, they were not apparent in everyday life. Victoria, now free of her once-feared seizures, could live her life seizure-free, split-brained but unchanged.

Analyzing the Case Study

1. Why did Victoria choose to have a split-brain operation? What did the operation involve?

2. What questions did researchers set out to answer after Victoria's operation?

3. Critical Thinking What problems do you think Victoria might encounter in everyday life?