

Hemispheric specialization: effects of drugs on the brain



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INTRODUCTION

The human body is divided into many parts called organs. All of the parts are controlled by an organ called the brain, which is located in the head. The brain weighs about 2.75 pounds. The brain is made up of many cells, and is the centre of the body. The brain sends messages to all the other parts of the body ("The Human Brain." 123HelpMe.com. 19 Feb 2015).

The human brain is seen to be in a spherical form. A hemisphere is half of a sphere, so this means, the brain is divided into two parts or hemispheres.

There is the right and the left. These hemispheres appear to be identical, but closer examination reveals that they are highly specialized regions that serve different functions.

The left hemisphere enables our ability to express ourselves in language. In over 95% of right-handed people the left hemisphere is dominant for speech. The figure is somewhat lower for left handers, approximately 70%, but still highly significant. The left hemisphere is better than the right at recognizing sequences of words and letters. It controls our logic, our reasoning, and our analytical thought processes. It can focus on details, however it has difficulty comprehending the whole picture.

The perceptual functions of the right hemisphere are more specialized for the analysis of space and geometrical shapes and forms, elements that are all present at the same time (not so sequential like language). The right

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hemisphere is the creative half, it can “ see” the whole out of parts, that is allowing us to connect puzzle parts together. The right hemisphere also plays an important role in the comprehension of emotion.

However, the control of drug intake from childhood stages to late adulthood increases gradually in life. Even for medical purposes, the intake of drugs may not just help a patient recover but can also have other negative side effects that later on in life reveal themselves. Drugs affect brain pathways involving reward, that is, the dopamine system in the reward pathway. Within seconds to minutes of entering the human body, drugs cause dramatic changes to synapses in the brain.

LITERATURE REVIEW

Hemispheric specialization refers to the study of cognitive functions, dividing them up by the hemisphere of the brain responsible for them ([www. ask.com/science/define-hemispheric-specialization](http://www.ask.com/science/define-hemispheric-specialization)). Cognitive function refers to a person’s ability to process thoughts. Cognition primarily refers to things like memory, the ability to learn new information, speech, and reading comprehension. In most healthy individuals the brain is capable of learning new skills in each of these areas, especially in early childhood, and of developing personal and individual thoughts about the world.

The brain has two halves or hemispheres. The two sides look like mirror images. This is called bilateral symmetry. The word bilateral means two-sided, while symmetry means the two sides look the same. So bilateral symmetry refers to the fact that the brain consists of two halves that are nearly mirror images of each other. Some function locations vary depending on the <https://assignbuster.com/hemispheric-specialization-effects-of-drugs-on-the-brain/>

dominant hand of the patient. In general terms, literary functions are focused in the left hemisphere, particularly in right-handed people, while creative and figurative functions center in the right hemisphere.

Also well-known is that the brain is “cross-wired”, with the left hemisphere controlling movement on the right side of the body, and the right hemisphere controlling the left side of the body. Most, but not all, of the different structures, lobes and organs of the brain have a left and right hemisphere element, and communication between the hemispheres is achieved by means of a thick bundle of nerve tissues known as the corpus callosum, which effectively makes a full brain out of two half-brains.

HANDEDNESS AND LANGUAGE PROCESSING

It was the French physiologist Paul Broca in the 1860s (as well as his less well-known countryman and near contemporary, Marc Dax, almost 30 years earlier) who noted that, at least in general terms, a person's handedness tends to indicate a specialized hemisphere on the brain's opposite side, so that a right-handed person probably has a left-hemisphere language specialization, and vice versa. Indeed, for almost a century, until the Wada test (a technique involving the anaesthetizing of one side of the brain using a drug such as sodium amytal or sodium amobarbital) was introduced in the 1960s, a person's handedness was just about the only clue an operating neurosurgeon had about which hemisphere of a patient's brain was probably the one specialized for language.

Following Broca's findings, it was initially assumed that handedness and the hemispheric dominance of speech processing were inextricably and

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intimately connected. However, it soon became apparent, even to Broca, that exceptions and mismatches existed, and that perhaps the association was not as fixed as he had initially thought. Although the incidence of right-hemisphere language dominance does increase more or less linearly with the degree of left-handedness, it turns out to be not quite as simple as that.

In fact, after the work of Springer & Deutsch, Damasio & Damasio, and others in the 1990s, we now know that, although about 95% of right-handers do have left-hemisphere dominance for language functions, only around 19% of left-handers have right-hemisphere language dominance, with another 20% or so processing language functions in both hemispheres (the incidence of language distribution in ambidextrous people is broadly similar to that found in left-handed people). Other studies report percentages for left-handers of 70%, 15% and 15% (rather than 61%, 19% and 20%), but the findings all suggest that, perhaps unexpectedly, some 60% - 70% of left-handers process language in the left hemisphere, just like right-handers. Indeed, around 93% of all people have left hemisphere language dominance ([http://www. rightleftwrong. com/brain. html](http://www.rightleftwrong.com/brain.html)).

One half-brain is not “logical” and the other “intuitive,” nor is one more “analytical” and the other more “creative.” Both halves play important roles in logical and intuitive thinking, in analytical and creative thinking, and so forth. All of the popular distinctions involve complex functions, which are accomplished by multiple processes, some of which may operate better in the left hemisphere and some of which may operate better in the right hemisphere, but the overall functions cannot be said to be entirely the province of one or the other hemisphere.

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And far from having separate lives, the two halves work together. They are not isolated systems that compete or engage in some kind of cerebral tug-of-war; one is not an undisciplined child, the other a spoilsport that throws schoolyard tantrums. Rather, as we have stressed, the brain is a single, marvelously complicated, and deeply integrated system. Like those of a well-maintained bicycle, the parts of the brain do have different functions but, like the parts of a bike, they are designed to work together.

Finally, as we discussed earlier, there is solid evidence that none of us relies primarily on one or the other hemisphere. We all use all of our brains; none of us are truly “left-brained” or “right-brained.”

DRUG ADDICTION

A drug is, in broadcast terms, a chemical substance that has biological effects on human beings and animals. In pharmacology, a drug is a chemical substance used in the treatment, cure, prevention, or diagnosis of disease or used to otherwise enhance physical or mental well-being. Pharmaceutical drugs may be used for a limited duration, or on a regular basis for chronic disorders.

Recreational drugs are chemical substances that affect the central nervous system, such as opioids or hallucinogens. Alcohol, nicotine, and caffeine are the most widely consumed psychotropic drugs worldwide.

They may be used for effects on perception, consciousness, personality, and behavior. Many recreational drugs are also medicinal.

Some drugs can cause addiction and habituation and all drugs have side effects. Many drugs are illegal for recreational purposes and international treaties such as the single convention on narcotic drugs exist for the purpose of legally prohibiting certain substances (<http://en.wikipedia.org/wiki/Drug>).