

Has neuroscience  
replaced psychology  
in explaining behavior  
flashcard



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In the following essay I will be looking at both sides of the debate of whether neuroscience replaced psychology in explaining behavior. To begin with we must firstly understand what exactly neuroscience is and what it entails. It is generally defined as the study of how the nervous system develops, its structure and the functions it carries out. Neuroscientists study the brain and how it impacts on human beings behavior and cognitive functions. The study also looks at what occurs when things don't go right. It aims to understand neurological, psychiatric and neurodevelopment disorders.

Only in recent decades has neuroscience become a recognized discipline. It has now joined other fields in becoming unified and integrating with biology, chemistry, and physics with studies of structure, physiology, and behavior, including human emotional and cognitive functions. Psychology is the scientific study of behavior. It can range from the study of large crowds, through the dynamics of small groups interactions, to the study of an individual. In general terms, psychology emerged out of two traditions: philosophy and natural science.

Philosophers have always been concerned with understanding the meaning of human experience, and many basic concepts in psychology trace their origin back to philosophy. Much behaviourist research involves studying learning in animals under laboratory conditions, using experimental methods. Animals are used because behaviourists assume they learn in the same way as people but are more convenient to study. Laboratory settings are favoured because they allow researchers to control very precisely the conditions under which learning occurs (e. g. the nature and availability of reinforcement and punishment).

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Behaviourists use two processes to explain how people learn: classical conditioning and operant conditioning. In classical conditioning, people learn to associate two stimuli when they occur together, such that the response originally elicited by one stimulus is transferred to another. The person learns to produce an existing response to a new stimulus. For example, Watson & Rayner (1920) conditioned a young boy ('Little Albert') to respond with anxiety to the stimulus of a white rat. They achieved this by pairing the rat with a loud noise that already made Albert anxious.

The anxiety response was transferred to the rat because it was presented together with the noise. This means that generalizations between species must be made with more caution than many behaviorists apply. There were several philosophers and scientists whose work had strongly influenced the development of psychology because their work established the philosophical and scientific assumptions for the new discipline. The three most influential individuals in this respect were the philosophers Descartes, Locke and the scientist Charles Darwin.

They each had a main field they focused on and in the case of Descartes he was responsible for putting forward the idea now known as 'Cartesian dualism'. This was the idea that the mind and body are separate and independent of one another. Descartes believed the body is essentially a machine, although a very complex one. It functions mechanistically, and its workings are essentially automatic. The mind, though, is the seat of the soul. As such, it forms a kind of essence, interacting with the body through the brain, but not really being apart of it. Cartesian dualism is also concerned with the distinction between human beings and animals.

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Descartes believed that animals operated by instinct, blindly programmed to act in ways appropriate for their survival. Human beings, on the other hand, are able to reason; and it was this which made them special. John Locke argued the case that knowledge was obtained through the senses and that human beings did not inherit any knowledge or instincts. This was known as empiricism, which argued that the external stimuli which an organism was receiving, and the behaviour which it showed as a result, counted as valid data for understanding the human being or other animals also.

Lastly the theory of evolution was put forward by Charles Darwin which exerted a powerful influence on psychology as it did in the rest of the scientific world. The theory essentially, proposed that environmental demands results in a continuous process of development of species, as animals gradually adapt to them. This functionalist approach carried into psychology. This led the assumption that psychological characteristics shared by all human beings, like consciousness or social awareness, have evolved to serve some kind of evolutionary or adaptive function is very deeply rooted indeed in psychological thought.

Before continuing, we will firstly look at what exactly the nervous system is. The nervous system operates through a network of billions of neurons. Human beings are known to have about 100 billion neurons in their brain alone. All neurons consist of three main components, a dendrite, axon and a cell body. Dendrites receive information from another cell and continue to transmit this information to the cell body. The cell body has within it a nucleus which contains structures such as mitochondria, Golgi apparatus,

rough endoplasmic reticulum, smooth endoplasmic reticulum and other cell structures typical of eukaryotic cells.

The axon then takes information and messages away out of the cell body. There are three types of neurons, sensory neurons, motor neurons and interneurons. The main difference between these three is that they have different structures. For example, sensory neurons have long dendrites and short axons, they carry information from sensory receptors to the central nervous system (the brain and spinal cord). Whilst motor neurons on the other hand have long axons and short dendrites, also they carry messages from the CNS to muscles or glands.

Lastly, interneurons are only found in the CNS and are only there to connect one neuron to another. Because axons carry the messages they are wrapped in a protective layer of plasma membranes that consist of Schwann cells. Between the Schwann cells are small gaps, these gaps are known as the node of Ranvier, their purpose being a space to generate an signal. These gaps enable the signal to travel much faster than any signals passing through the axon alone. Neuroethics is a new field , due to the rapid advances in the sciences of mind, and pressing have the ethical issues surrounding them become.

Neuroethics has two main branches, firstly being the ethics of neuroscience and the neuroscience of ethics (Roskies 2002). The ethics of neuroscience refers to the branch of neuroethics that seeks to develop an ethical framework for regulating the conduct of neuroscientific enquiry and the application of neuroscientific knowledge to human beings ; the neuroscience

of ethics imply's neuroscientific knowledge upon our understanding of ethic itself. The "ethics of neuroscience" concerns the conduct of neuroscience itself, the ethics of withholding findings and so on.

Neuroscience and other relatable fields give us an apparently unprecedented, and rapidly growing, power to intervene in the brains of subjects, to alter personality traits, to enhance cognitive capacities, to reinforce or to weaken memories, perhaps, one day, to insert beliefs. The neuroscience of ethics embraces our growing knowledge about the neural bases of moral agency. Neuroscience seems to promise to illuminate, central elements of our freedom of will, our ability to know our own minds, perhaps the very substance of morality itself.

It provides us with the human ability to make free choices and be a responsible human being. The neuroscience of ethics will help us to forge the very tools we shall need to make progress on the ethics of neuroscience. It also casts a light upon human agency, freedom and choice, and upon rationality. It could help us to reflect on what we are, and offer us guidance as we attempt to shape a future in which we can blossom. Neuroscience has dramatically increased understanding of how mental states and processes are realized by the brain, thereby opening doors for treating the multitude of ways in which minds become dysfunctional.

Reductionism involves breaking down a complex phenomenon into simpler components. It implies that this process is desirable because complex phenomena are best understood in terms of a simpler level of explanation.

There are many different opinions when it comes to reductionism in

psychology. One of the main arguments against reductionism is that it reduces human behaviour to something that does not relate to the real world. On the other hand there has been research that has provided evidence that in the real world many other factors influence the learning process, such as motivation and teacher styles.

Reducing human behaviour to that of animals has provided some insight into behaviour as conditioning can explain behaviour. Another argument against reductionism is to do with the mind - body, if we reduce behavior to psychological activity, we would encounter a problem explaining the mind. Dualists suggest that the mind is something which is separate. There has been psychological evidence which found that people's states of mind can affect the functioning of their nervous system. A study showed that psychotherapy resulted in the same sort of hormonal changes as drug therapies (Martin).

This suggests that the mind can interact with the body and provides evidence to suggest that reductionism makes sense. In favour of reductionism is the view that it permits us to explore the causes of behaviour, as in the biological approach, where behaviour is reduced to the activity of the nervous system and hormones. For example schizophrenia, where dopamine levels increase the chance of someone developing the disorder. The treatment arising from this approach (drugs) is also very reductionist and has been argued to be successful.

The important question for psychologists is how far reductionism is an adequate form of explanation. It can be useful for some kinds of enquiry, but

it does not often tell us everything we need to know. One of the main problems is that the final product is often more than the sum of its parts. There are emergent properties, which the complete thing has, but its elements do not. The alternative to reductionist argument is interactionism, which explores how different levels of analysis interact with one another.

The behaviorists' view that all behaviour, no matter how complex, can be broken down into the fundamental processes of conditioning makes it a highly reductionist approach to psychology. Free will is known to be the ability to make decisions at one's own impulse or discretion. It was believed before that free will was solely a topic of philosophy, however, recently it has been understood that it is a subject of both philosophy and science. In terms of philosophy, different areas of free will have been identified. One is that free will is compatible with a notion called determinism.

This viewpoint is then further split into two categories, 'libertarianism' and 'determinism'. Libertarians believe that as humans, we do have free will due to the idea of cause and effect, meaning our conscious decisions make us solely responsible for our actions. Determinists believe that free will doesn't exist because either determinism (i. e. our actions are controlled by factors such as biology or the way we have been brought up) is right or indeterminism i. e. randomness doesn't actually give us control or responsibility over our actions.

Both these groups have been challenged by 'compatibilists', a group which debates that free will is compatible with determinism. In terms of free will in neuroscience, one significant piece of modern research is that a person's



brain can commit to doing specific actions before the person becomes aware that they have actually made a decision. Scientists have found the gaps between the period of the brain making this decision and us, as humans becoming aware of them to be up to a second. Experiments which support these findings include studies taken in 2008 where researchers could predict, with 60% accuracy if subjects would be able to choose to press a button with their left or right hand up to ten seconds before they actually became conscious of having made that choice. It is studies such as this that make the idea of free will easy to reject. However, it is extremely hard to come to concrete conclusions about whether free will is really a myth or not. This is because although technology is as modern as possible, no good brain function measure of the conscious generation of decision making and intentions actually exists.

Manslow and Rogers argued the notion that one's behaviour is at the mercy of external forces is inaccurate and that individuals have free will in that they can choose how they which to co-ordinate themselves. The psychologist known as Rogers was known as the facilitator and his role was to help his patients practice free will. The approach states that determinism is too mechanistic and being unfalsifiable it is impossible to assume behaviour is determined. With regards to mental illness, it is a result of the patient not being able to accept themselves or others around them. The ethical argument also supports free will.

In order to expect moral responsibility, one must accept the concept of free will. If an individual's behaviour is determined by forces beyond an individual's control then the individual cannot be held responsible for their

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actions. However our laws insist that adults do have individual responsibility for their actions and so implicitly society supports freewill. Soft determinism is an approach that argues that people's behaviour is constrained by the environment, but only to a certain extent. Some behaviour is more constrained than other. There is an element of free will in all behaviour however it can also be controlled by outside forces.

William James advocated this approach which is a medium between the two extreme views. The issue of the extent to which we have free will is more of a philosophical question rather than scientific, as both beliefs are unfalsifiable. All psychologists agree on the fact that behaviour is made up, to an extent of biology, past experiences and present environment. The behaviorist approach is deterministic: people's behaviour is assumed to be entirely controlled by their environment and their prior learning, so they do not play any part in choosing their own actions. The approach takes the nurture side of the nature-nurture debate, believing that part from a few innate reflexes and the capacity for learning, all complex behaviour is learned from the environment. The determinism approach assumes that every physical event is caused, and, since human behaviour is a physical event, it follows that it too caused by preceding factors. If all events are caused and perfect knowledge is gained of the current state of the universe, it follows that future events are entirely predictable. Determinism, with its emphasis on casual laws is , therefore the basis of science, which aims to reveal those laws to provide predication and control of the future.

When it comes to behaviorism it has taken a more extreme environmental determinism approach , stating that learning from the environment ' writes <https://assignbuster.com/has-neuroscience-replaced-psychology-in-explaining-behavior-flashcard/>

upon the blank slate of our mind at birth' to cause behaviour. Watson's belief that the deterministic laws of learning could predict and control the future were reflected in his claim that he could take any infant at random and turn them into any type of specialist he might select. Psychoanalysis took the view of unconscious determinism, that our behaviour is controlled by forces of which we are unaware.

The reasons for our actions are merely rationalized by our conscious minds. Determinism is one of the key assumptions of science, whose cause and effect laws have explained, predicted and controlled behaviour above the levels achieved by common sense. Many psychologists, even those who are sympathetic to the idea of free will, do accept determinism to some degree. However it is argued that determinism is inconsistent with society's ideas of self-control and responsibility that underlie all our moral and legal assumptions.

The most common alternative approach to determinism in looking at human behaviour is the attempt to explain behaviour in terms of the intentions of the individual undertaking the actions. However many theorists would argue that it does not really provide a genuine explanation of the behaviour at all. Instead, what it actually does is describe the purpose which the action is intended to achieve. The nature vs nurture debate is another example of determinism in psychology. To conclude both neuroscience and psychology play a vital role when it comes to explaining behaviour both human and animals.

Within psychology the behaviorists assume that we can understand people by observing their behavior. They argue that behavior can be observed in terms of responses to certain stimuli. For example, a person being asked to hold a book (stimulus) would respond by holding the book. This stimulus-response forms the basis of conditioning, which suggests learning in humans and animals can take place through the association of a response with particular stimuli. In addition it assumes that we are born as a blank slate, or *tabula rasa*, and so all humans are equal at birth.

It is environmental factors rather than genetic or biological differences that make us behave differently. Behaviorism very much represents the nurture aspect of the nature-nurture debate. However behavioral neuroscientists study all behavioral phenomena that can be observed in nonhuman animals. They attempt to understand the physiology of behavior: the role of the nervous system, interacting with the rest of the body (especially the endocrine system, which secretes hormones), in controlling behavior.

They study such topics as sensory processes, sleep, emotional behavior, ingestive behavior, aggressive behavior, sexual behavior, parental behavior, and learning and memory. They also study animal models of disorders that afflict humans, such as anxiety, depression, obsessions and compulsions, phobias, psychosomatic illnesses, and schizophrenia. Neuroscientists concern themselves with all aspects of the nervous system; the anatomy, chemistry, physiology, development and functioning. The research of neuroscientists has ranged from the study of molecular genetics to the study of social behavior.