Critically assess the claim that the two cerebral hemispheres constitute two minds

During the 1960s, before drug-based treatment programs were perfected, one method of treating severe epilepsy was brain surgery. Patients would have their corpus callosum severed, in the hope that this would confine the epileptic seizures to one hemisphere of the brain. While this surgery successfully relived their epilepsy, it had a major side effect: the two hemispheres become functionally separate, acting as two separate, independent brains. Sperry & Ornstein (1975) believe that split-brain studies reveal the 'true' nature of the two hemispheres, and that each hemisphere embodies a different kind of consciousness.

A typical split-brain experiment conducted by Sperry involved participants sitting in front of a screen that obscured their hands from sight, while at the same time leaving their hands free to handle objects. The participants were then requested to focus on a fixation spot in the centre of the screen, while a word (for example, 'key') was flashed onto the left side of the screen for a tenth of a second, thus ensuring that the word is 'seen' only by the right hemisphere. The participant was then required to select the key from a pile of objects with the left hand, which is also under the control of the right hemisphere. The participants achieved this task quite easily, however they were unable to say the word which had appeared on the screen, as the information could not pass to the language centre in the left hemisphere because the corpus collosum had been cut. This left the person confused as to why they had chosen the key.

This example does, however, show that the right hemisphere isn't completely without language ability – otherwise participants couldn't have successfully selected the key. However, it clearly lacks the left hemisphere's ability to name and articulate what's been experienced.

A variation on this experiment involves a word (for example, 'heart') being flashed on the screen, with 'he' to the left and 'art' to the right of the fixation point. If asked to name the word, participants will say 'art', because this is the portion of the word projected to the left hemisphere. However, when asked to point with the left hand to one of two cards on which 'he' and 'art' are written, the left hand will point to 'he', because this is the portion projected to the right hemisphere.

This experiment indicates that both hemispheres are handicapped if information isn't conveyed from one to the other; the whole word ('heart') isn't perceived by either. This highlights some of the problems for an individual functioning with a split-brain.

These and further experiments involving the presentation of photographs made up of two different halves of faces pasted together, have led Sperry, Ornstein and others to conclude that each of the separated hemispheres has its own private sensations, perceptions, thoughts, feelings and memories. In short, they constitute two separate minds, two separate spheres of consciousness.

Ornstein (1986) then went on to summaries the function of the left and the right hemispheres. He suggested that the left hemisphere is specialised for analytic and logical thinking, particularly verbal and mathematical functions. It processes information sequentially, with its mode of operation being primarily linear. The right hemisphere is thought to be specialised for synthetic thinking, particularly in the area of spatial tasks,

artistic activities, crafts, body image and face recognition. It processes information more diffusely, and its mode of operation is much less linear.

Should we generalise hemisphere function from studies of split-brain patients? Cohen (1975) argues that pre-surgical pathology (that of the patient's epilepsy) might have caused an abnormal reorganisation of the brains of these split-brain patients, and therefore generalisations to normal people may be invalid. Several attempts have been made to move beyond the simplistic left hemisphere–right hemisphere, verbal–non-verbal distinction, both in normal participants and in split-brain patients. In a review of research, Annett (1991) says that '…it is evident that each hemisphere has some role in the functions assigned to the other'. For example, the right hemisphere has a considerable understanding of language, as was in fact evident in Sperry's own investigations. Similarly, the left hemisphere is almost certainly responsible for the production of imagery, 'which is likely to be required in much spatial thinking'.

According to Gazzaniga (1985), the brain is organised in a modular fashion; that is, relatively independent functioning units working in parallel. However, Sternberg (1990) believes that Gazzaniga's view isn't widely accepted by neuropsychologists, however many would also reject the degree of separation between the hemispheres suggested by Sperry.

An alternative view is that of integration; the two hemispheres should be seen as playing different parts in an integrated performance (Broadbent, 1985; cited in Sternberg, 1990). Cohen (1975) agrees that, when normal participants are studied, the two sides of the brain don't function in isolation, but form a highly integrated system. Most everyday tasks involve a mixture of 'left' and 'right' hemisphere skills. For example, in listening to speech, we analyse both the words and the intonation pattern. Cohen (1975) states that far from functioning independently the two hemispheres work very much together.

McCrone (1999) supported this view and concluded that the distinction between the two hemispheres should be seen as a subtle one of processing style, with every mental faculty shared across the brain, and each side contributing in a complementary, not exclusive, fashion. This notion is backed by evidence from imaging studies, which suggest that the left hemisphere 'prefers' detail within language (such as grammar and specific word production), while the right prefers the overall meaning of what's being said (as conveyed by intonation and emphasis).

Therefore, rather than being seen as two distinct and separate brains, minds or consciousnesses, it is the view that these two hemisphere need to work in partnership to enable us to enjoy our everyday experiences.