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| **Split-Brain Research into Hemispheric Lateralisation** | | | |
| **Split-Brain Research into Hemispheric Lateralisation AO1** | | | |
| **Hemispheric Lateralisation**  Production and understanding of language is controlled by the left hemisphere. Therefore for most of us language is subject to hemispheric lateralisation i.e. specialised areas associated with language are only found in one hemisphere rather than both. Sperry et al used split-brain research to investigate whether this was true of other neural processes.  **Split-Brain Studies**  Sperry’s (1968) studies involved a unique group of individuals who had all had the same surgical procedure; a commissurotomy where the corpus callosum and other major connective tissues were cut down the middle to separate the 2 hemispheres to control frequent and severe epileptic seizures. Therefore the main communication line of the 2 hemispheres in these patients was removed. Sperry could then see the extent of specialisation in the 2 hemispheres, if any.  **Procedure**  An image or word is projected to a patient’s right visual field (processed by the left side of the brain) and the same, or different, image could be projected to the left visual field (processed by the right side of the brain). In the ‘normal’ brain, the corpus collosum would immediately share the information between both hemispheres giving a complete picture of the visual world. However, in a split-brain patient the info could not be conveyed from that hemisphere to the other.  **Key Findings**  ***Describing what you see:*** If displayed in the right visual field, the patient could accurately describe what they have seen, but not in the left. Language is processed in the left, thus the inability to describe objects in the left visual field (processed in the right hemisphere) was because of the lack of language centres in the right hemisphere.  ***Recognition by touch:*** patients could not attach verbal labels to things seen in the left visual field, but they could select a matching object from a ‘grab bag’ of different objects using their left hand (linked to the right hemisphere). The obejcts were behind a screen so they couldn’t be seen. The left hand was also able to select an object that was most closely associated with an object presented in the left visual field (e.g. an ashtray selected when shown a picture of a cigarette). In each case, the patient could not verbally identify what they had seen but could nevertheless ‘understand’ what the object was using the right hemisphere and select the corresponding object accordingly.  ***Composite words:*** if 2 words were presented at the same time, one of either side of the visual field (e.g. a ‘key’ on the left and ‘ring’ on the right) the patient would write with their left hand the word ‘key’ (left hand goes to right hemisphere linked to left visual field) and say the word ‘ring’. The right hemisphere (connected to the left hand) was far superior in drawing skills than the left.  ***Matching faces:*** the right hemisphere is also better at matching faces. When asked to match a face from a series of other faces, the picture processed by the right hemisphere (left visual field) was consistently selected, whilst the picture presented to the left hemisphere (right visual field) was consistently ignored. When a composite picture made up of the two halves of a face was presented (one half to each hemisphere) the left hemisphere dominated in terms of verbal description (right visual field), but the right hemisphere (left visual field) dominated in terms of selecting a matching picture. | | | |
| **Split-Brain Research into Hemispheric Lateralisation AO3** | | | |
| **Contribution to Understanding of Lateralisation**  P: One key strength of Sperry’s research into the split-brain phenomena is that it developed our understanding of lateralisation and function.  E: For example, there was a sizeable body of findings from the research (no less than 4 key findings) from which re-tested conclusions have been formed.  E: These findings led to the conclusion that the left hemisphere is more geared towards analytical and verbal tasks whilst the right is more adept at performing spatial tasks and music: a fact previously unknown. We now know that the right hemisphere can only produce rudimentary words and phrases but contributes to emotional and holistic content to language. Research therefore suggests that the left hemisphere is the *analyser* whilst the right is the *synthesiser.*  L: As a result, the importance of Sperry’s research is unquestionable due to these contributions to our understanding. | **Standardised Procedures**  P: One strength of Sperry’s research into the split-brain phenomena is that it has methodological strength.  E: For example, the experiments involving split-brain patients were highly specialised and used standardised procedures.  E: This is a strength because the standardisation of presenting visual info to one hemisphere at a time could be controlled so well that Sperry was able to vary aspects of the basic procedure very easily (ensuring only one hemisphere was receiving info), but still maintaining a high level of control.  L: As a result, Sperry’s research into the split-brain phenomena has high internal validity and therefore has high credibility. | **Population Validity**  P: One weakness of Sperry’s research into the split-brain phenomena is that it has low population validity, therefore low external validity.  E: For example, there were only 11 who took part in all variations of the basic procedure, all of whom had a history of epileptic seizures.  E: This is a weakness because these split-brain patients were such an unusual sample of people, that it is argued that the disorder of epilepsy itself may have caused changes in the brain that influenced the findings. It is also the case that some PPs had experienced more disconnection of the two hemispheres. All of these facts mean that it is incredibly difficult to generalise these findings to a wider population.  L: As a result, Sperry’s research into the split-brain phenomena lacks credibility. | **Differences in Function May Be Overstated**  P: One weakness of Sperry’s research into the split-brain phenomena is that the differences in function of the two hemispheres may be overstated.  E: For example, Sperry simply labels the two hemispheres ‘verbal’ and ‘non-verbal’.  E: This is an issue because modern neuroscientists would contend that the actual distinction is less clear-cut and much messier than this. In the normal brain the two hemispheres are in constant communication when performing everyday tasks, and many of the behaviours typically associated with one hemisphere can be effectively performed by the other when the situation requires it (like the theory of plasticity explains).  L: As a result, the credibility of Sperry’s research into the split-brain phenomena is questioned. |