



SCANNING TECHNIQUES AS RESEARCH METHODS

Using MRI and PET scans to investigate brain activity

Biological Approach

A wide variety of scanning techniques exist. These are used to provide *biological* data, rather than psychological. Scanning techniques include PET, MRI, fMRI, CAT and MEG scans. Only **PET scans** and **MRI scans** are studied as part of the methodology for the Biological Approach.

Scans have scientific purposes. They are commonly used to investigate for possible tumours, strokes or other abnormalities. However, they can be used as research methods too, such as aiding psychologists into understanding of how information is processed. Psychologists and scientists are also using brain scans as research methods, to investigate both **normal differences** between brains (such as differences between a male and female brain) and **abnormal differences** (such as differences between the brain of a murderer and a non-murderer).

Possibly the main drawback of these scans is that they are expensive and fairly hard to access. Scanning machines costs tens of thousands of pounds and using them is not cheap. For this reason, they tend to be reserved for hospital needs primarily. However, when used, the main strength is that they offer scientific, reliable and valid findings.

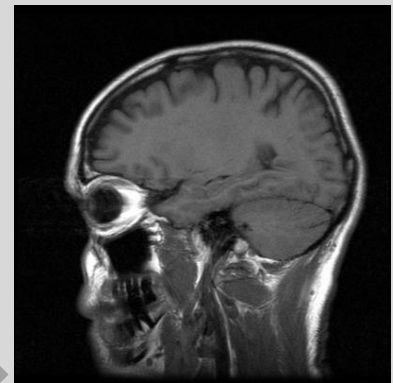
Before brain scanning was made possible, **corpses** were the only brains available for scientific research.

MRI scans

An MRI scan (**magnetic resonance imaging**) is used to look at **structure**. It studies the tissues, looks for abnormalities and can measure the blood flow. It involves injecting a dye into the body to help show organs and relevant areas. A strong magnetic field is passed over the body to pick up radio waves from hydrogen atoms in water molecules, to build up a detailed image of the brain

Different areas of the brain emit differing amounts of radio waves, producing different densities on the image produced of the cross-sectional views of the body

The MRI scan allows the comparison of the structure of brains that are performing normally versus abnormally; belonging to males versus females; and belonging to the younger versus the older people



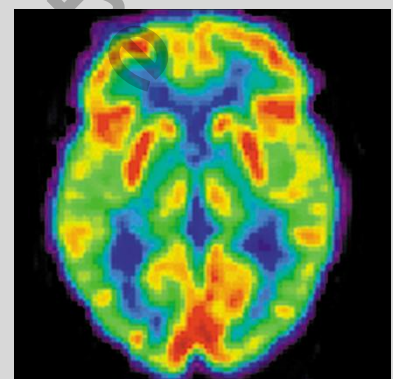
PET scans

A PET scan (**positron emission tomography**) is used to look at **function**. It studies brain activity levels and can be used to look for evidence of a stroke. It involves injecting a radioactive tracer into the bloodstream with a chemical used by the body, such as glucose, to see where most of the blood is flowing

The radioactive particle emissions (**positrons**) from the tracer give signals which are recorded so levels of activity in different parts of the brain can be detected. Greater levels of brain activity appear on the scan as different colours

Participants are scanned in two conditions – when inactive (to provide a **baseline measure**) and when performing an activity. The difference between the two scans shows which part of the brain is being used

The PET scan allows the study of areas of activity within the brain when stimuli such as faces or names are shown; but also the study of memory and looking at sufferers of schizophrenia or epilepsy



You do not need to know strengths and weaknesses of each scan as part of the course.

[youtube.com/c/MegaLecture/](https://www.youtube.com/c/MegaLecture/)

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