

Juggling Juggles the Brain

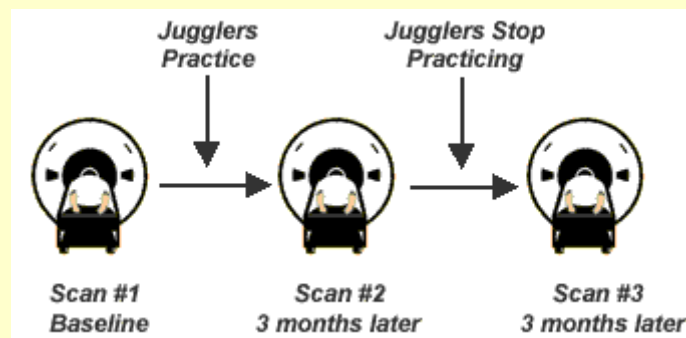
Street performers, circus entertainers and clowns: they can all juggle. **Neuroscientists** are now getting into the juggling act. Brain researchers at the University of Regensburg (Germany) have found that learning to juggle can change brain structure.

The researchers divided 24 people into two groups:

- **Juggling Group:** 12 subjects learned a three-ball cascade juggling routine. They were considered to be skilled jugglers when they could juggle for 60 seconds.
- **Non-Juggling Group:** 12 subjects had no juggling practice.

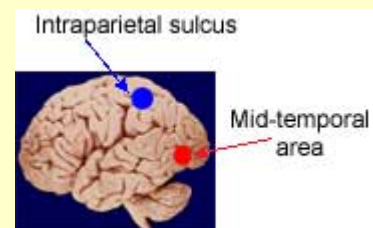
Magnetic resonance imaging was used to measure the size of different areas within the brains of the subjects. Brain scans were taken before anyone practiced juggling, three months after the jugglers practiced and three months after the jugglers stopped practicing.

Experiment Timeline



Results

At the first brain scan, there were no differences in the brains of the study participants. However, at the second brain scan, a significant expansion was found in two areas (the mid-temporal area and left posterior intraparietal sulcus) within the brains of jugglers. These two areas of the brain are important for processing information related to moving objects. No changes were seen in the brains of non-jugglers at the second scan. At brain scan #3, after the jugglers stopped juggling, the brain expansion seen earlier was reduced.



These data suggest that learning new skills can alter brain structure. However, it is unclear what exactly caused the brain changes. The expansion in the two brain areas may have been caused by an increase in the number of nerve cells, glial cells or synapses.