Maze-Brightness in Rats
Two strains of Rats - Maze-Bright and Maze-Dull
Offspring also showed Maze-Bright or Maze-Dull even under Cross-fostering conditions
Genetic Component to “Brightness”

What About the Environment??

Environment’s Effect on Memory
"Of Mice and Memory"
Behavior = Genes + Environment

The Proustian Connection: Popping a Madeleine

It is no surprise that smell triggers what are sometimes described as the most powerful memories: the olfactory nerve is just two synapses away from the amygdala, the center of human emotions, and just those from the hippocampus, headquarters of at least some forms of memory. Many researchers have been intrigued by this proximity, among them Rachel S. Herz of the Maxell Chemical Senses Center in Philadelphia.

Herz recently examined whether smell could serve as a form of cognitive enhancer in emotional situations. She asked students who were about to take an exam and who were, as a consequence, exceedingly anxious. One set of anxious students was given a list of words to remember at the same time that they were exposed to a smell; the other group saw the same words, but their room remained odorless. A week later Herz found that those exposed to the smell had 30 percent better recall than the control subjects did.

In another experiment, Herz tried to determine whether memory aided by smell was more accurate than memory aided by other cues, such as images. She found that odor did not increase accuracy but rather the emotional intensity of the recollection. So if your cognitive enhancer of choice proves to be perfume or whatever spice you have on the shelf, beware: your emotions may get the better of you.

PEPPERMINT is among the scents used in experiments to evoke emotional memory.

Those exposed to the smell had 50 percent better recall.
PROSPECTS FOR ENHANCERS

Researchers have identified several promising areas for enhancing cognitive function. These areas include:

1. **Neuroplasticity Enhancement**
   - **Method:** Targeting neuroplasticity markers and neural repair mechanisms to improve cognitive function.
   - **Outcome:** Potential for long-term cognitive improvement.

2. **Neurogenesis Enhancement**
   - **Method:** Stimulation of neurogenesis in the adult brain to promote new neuron formation.
   - **Outcome:** Potential for long-term cognitive improvement.

3. **Neuromodulation**
   - **Method:** Using techniques such as transcranial direct current stimulation (tDCS) to enhance neural activity.
   - **Outcome:** Potential for short-term cognitive improvement.

4. **Pharmacological Approaches**
   - **Method:** Utilizing drugs that target specific cognitive functions.
   - **Outcome:** Potential for short-term cognitive improvement.

**DRUGS TO REMEMBER**

Researchers have identified several drugs that may enhance cognitive function. These drugs include:

1. **Modafinil**
   - **Action:** Stimulates the brain to enhance alertness and focus.
   - **Uses:** Treatment of narcolepsy and shift work sleep disorder.

2. **Ritalin (Methylphenidate)**
   - **Action:** Stimulates the release of dopamine and norepinephrine in the brain.
   - **Uses:** Treatment of ADHD.

3. **Donepezil**
   - **Action:** Inhibits the breakdown of acetylcholine, a neurotransmitter involved in memory and learning.
   - **Uses:** Treatment of Alzheimer's disease.

4. **Forskolin**
   - **Action:** Stimulates the release of cAMP, which can enhance cognitive function.
   - **Uses:** Promising for cognitive enhancement, though more research is needed.

**Attention**

- **Immediate Memory**
  - **Working Memory**
  - **Long-term Memory**

**Sensory Input**

- **Attention**
- **Neutral**
- **No Meaning**
- **Not Understand**