

SCENTS AND MOODS

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Scents have been used for centuries for pleasure and well-being. Ancient Egyptians kept aromatics used for medicine and perfume in beautiful bottles, which have been preserved in their tombs. The writings of ancient Greeks, Romans, Chinese and Hebrews all mention medicinal and aromatic scents. Many of the essences used thousands of years ago are still available today.

Despite the long history of the use of scents, our understanding of the sense of smell is still in its infancy. Physiologically, the olfactory system is comprised of neurons called olfactory sensors, which recognize odor molecules and then send signals to the olfactory bulb, located above the eyes. From there the signals reach the olfactory area of the cortex, the area of conscious thought.

In addition, the information travels to the limbic system, which is the primitive part of the brain that include areas that control emotions, memory and behavior. Memories of smells are stored in the hippocampus, and through relational memory certain smells trigger certain memories. Researchers continue to use brain-mapping to determine how the olfactory system works.

In the limbic system, odors activate the amygdala, which is also the brain's locus of emotion. The sense of smell is the only human sense that activates this area. Because of the close proximity of scent and emotion neural pathways, associations can readily be formed, and scents can affect our feelings in more ways than we are actually conscious of.

With the activation of the limbic system the connections between odors and emotions have an obvious survival value for our species. The smell of good food is appealing, while the smell of rotten food is not. We recognize either the "yecch" or the attraction of smells, without

always having cognitive awareness of the actual source of the aroma.

When humans create associations between scents and emotions scientist believe scents have the ability to trigger these emotions. In her book, *The Scent of Desire: Discovering Our Enigmatic Sense of Smell*, Rachel Herz comments on this interrelationship.

More than any other sensory experience, fragrances have the ability to trigger our emotions...have you ever experienced the wonderful feelings of comfort and serenity that the scent of fresh, damp earth and moss invites after the rain?...Every day, scents affect our emotional lives in exceptional ways, triggering moods and emotional memories. (p.11)

Scientists are studying how scents can affect physical indicators of emotions as well as self-reported mental state in humans. Animal studies of citrus oils bergamont (bergamia peel oil) and lemon (citrus limon fruit oil) found that inhalation in rats modulates the levels of serotonin and dopamine which are mood regulating hormones. Inhaling Citrus paradise peel oil (pink grapefruit essential oil) regulated the autonomic nervous system, affecting blood pressure and appetite. In humans, inhaling citrus scents reduced self-reported work-related stress in elementary school teachers, reduced anxiety in patients awaiting surgery, and reduced self-reported fatigue in healthy women. Citrus aurantium reduced anxiety in women in labor; citrus cinensus reduced anxiety in men and women awaiting a stressful dental procedure.

The effects of a pleasant fragrance on work-related behavior were also studied. Subjects were given a word construction task with both low and high stress, and the presence of a pleasant fragrance significantly enhanced performance under both conditions.

In addition to citrus scents, aromas such as vanilla, bergamot and lavender have been found to produce a calming effect, while those in the geranium family are considered invigorating. Vanilla, jasmine, rose and ylang-ylang are warming notes, while clary sage, cinnamon, and spearmint are known to stimulate alertness. Rose, jasmine, and ylang-ylang are thought to have aphrodisiac properties, spearmint and petitgrain are felt to provide mental stimulation.

The combination of various scents to produce a particular fragrance is both an art and a science. The perfume industry is using research tools such as post exposure questionnaires or motion-logger watches to substantiate claims that certain scents affect mood or enhance the quality of sleep. Physiological changes in the brain associated with the sense of smell are being identified. Researchers are working on scents to alleviate anxiety, scents to aid in sustaining attention, improve interpersonal relationships, and those that may make repetitive or dull tasks more pleasant.

The connection between scent and mood is endemic to our species, but we are just beginning to scratch the surface of the intricacies behind this relationship and learn how we can use this interrelationship to improve our quality of life.

Research Sources:

Ackerman, Diane. (1995) *A Natural History of the Senses*. Vintage Books.

Baron, Robert A. A whiff of reality; empirical evidence concerning the effects of pleasant fragrances on work-related behavior. *Journal of Applied Psychology*, July, 1994, pp.1179-203.

Brain Briefings. Smell and the olfactory system. *Society for Neuroscience*, Summer, 1995.

Brumfield, C. Russel. (2008) *Whiff! The Revolution of Scent Communication in the Information Age*. First Quimby Press.

Calvert, Gemma and Osterbauer, Robert. The scent of color. *Aroma-Chology Review*, Vol XI, No.1, pp. 1-6.

Damian, Peter and Kate. (1995) *Aromatherapy Scent and Psyche*. Healing Arts Press.

Evans, Mark. (1996) *Instant Aromatherapy for Stress Relief*. New Life Library.

Fox, Kate. The smell report. Social Issues Research Centre. http://www.sirc.org/publik/smell_human.html

Fischer-Rizzi, Susanne. (1990) *Complete Aromatherapy Handbook*. Sterling Publishing Company.

Hancock, Elsie. A primer on smell. *Johns Hopkins Magazine*, September 1996.

Haviland-Jones, Jeannette. An environmental approach to positive emotion: Flowers. *Evolutionary Psychology* 3, 2005, pp.104-132.

Herz, Rachel. (2009) *The Scent of Desire.: Discovering Our Enigmatic Sense of Smell*. Harper Collins Books.

Lavabre, Marcel. (1990) *Aromatherapy Workbook*. Healing Arts Press.

Pines, Maya. The mystery of smell: the vivid world of odors; finding the odorant receptors; How rats and mice – and probably humans – recognize odors; The memory of smell. Retrieved from: <http://www.hhmi.org/senses/d110.html>

Reinarz, Jonathan. (2014) *Past Scents: Historical Perspectives on Smell*. University of Illinois Press.

Samsung Develops ‘Smell Tones’ *Mobiledia*, March 24, 2006.

Tisserand, Robert B. (1977) *The Art of Aromatherapy*. Healing Arts Press.

Turin, Luca. (2006) *Secret of Scent*. Harper Collins Publishers.

Wormwood, Valerie Ann. (1996) *The Fragrant Mind*. New World Library.

Websites:

http://www.sfn.org/index.cfm?pagename=brainBriefings_smellAndTheOlfactorySystem

<http://www.news.harvard.edu/gazette/1999/04.08/smell.html>

<http://www.hhmi.org/senses/d110.html>