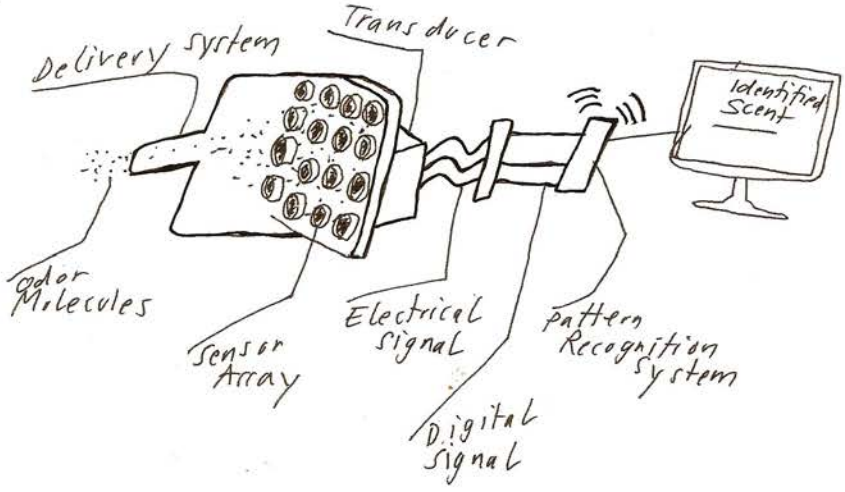
*

odor molecule

Components of an electronic nose



elektronische Nasen

"The first studies involving aroma measurements were done in the 1920s by H. Zwaardemaker and F. Hogewind who focused on measuring the elecricity of a fine spray of water."

Reference: H. Zwaardemaker and F. Hogewind: "On spray-electricity and waterfall-electricity", Proc. Acad. Sci, Amsterdam, 1920

"The first tool for measuring aromas was developed by Hartman in 1954. The sensing element was a microelectrode, a simple platinum wire of 0.8mm in diameter, which measured the flow of current by a sensitive milivoltmeter."

[...] 1982 the idea of an electronic-nose instrument with an intelligent, chemical array sensor system for aroma classification resulted from studies of Persaud and Dodd.

→ erstes, als "elektronische Nase" bezeichnete System

Andere Bezeichnungen: "e-nose" "artificial nose" und "artificial sniffer" als Sammelbezeichnung für die Hard- und Software zur Detektion von Geruchsmolekülen.

Definition von Gardner und Bartlett: (1988) "an instrument which comprises an array of electronic chemical sensors with partial specificity and appropriate pattern recognition system, capable of recognizing simple or complex odors."

Table 2.5 Examples of electronic noses in some industry-based applications

Industry sector	Application area	Specific use types and examples
Agriculture	a. crop protection b. harvest timing & storage c. meat, seafood & fish products d. plant production e. pre & post-harvest diseases	homeland security, safe food supply crop ripeness, preservation treatments freshness, contamination, spoilage cultivar selection, variety characteristics plant disease diagnoses, pest identification, detect non-indigenous pests of food crops
Airline Transportation	a. public safety & welfare b. passenger & personnel security	explosive & flammable materials detection
Cosmetics	a. personal application products b. fragrance additives	perfume & cologne development product enhancement, consumer appeal
Environmental	a. air & water quality monitoring b. indoor air quality control c. pollution abatement regulations	pollution detection, effluents, toxic spills malodor emissions, toxic/hazardous gases control of point-source pollution releases
Food & Beverage	a. consumer fraud prevention b. quality control assessments c. ripeness, food contamination d. taste, smell characteristics	ingredient confirmation, content standards brand recognition, product consistency marketable condition, spoilage, shelf life off-flavors, product variety assessments
Manufacturing	a. processing controls b. product uniformity c. safety, security, work conditions	product characteristics & consistency aroma and flavor characteristics fire alarms, toxic gas leak detection
Medical & Clinical	a. pathogen identification b. pathogen or disease detection c. physiological conditions	patient treatment selection, prognoses disease diagnoses, metabolic disorders nutritional status, organ failures
Military	a. personnel & population security b. civilian & military	biological & chemical weapons safety explosive materials detection
Pharmaceutical	a. contamination, product purity b. variations in product mixtures	quality control of drug purity formulation consistency & uniformity
Regulatory	a. consumer protection b. environmental protection	product safety, hazardous characteristics air, water, and soil contamination tests
Scientific Research	a. botany, ecological studies b. engineering, material properties c. microbiology, pathology	chemotaxonomy, ecosystem functions machine design, chemical processes microbe and metabolite identifications

AUG 2017

PRESS RELEASE: Electric Smell Machine for Internet & Virtual Smell

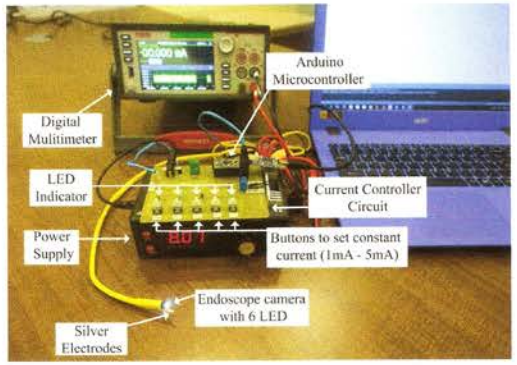
Date: August 7, 2017

Email: contact@imagineeringinstitute.org
Phone: +607 509 6568
Fax: +607 509 6713

Here we are excited to introduce the world's first computer controlled digital device developed to stimulate olfactory receptor neurons with the aim of producing smell sensations purely using electrical pulses. Using this device, now we can easily stimulate the various areas of nasal cavity with different kinds of electric pulses. During the initial user experiments, some participants experienced smell sensations including floral, fruity, chemical, and woody. In addition, we have observed a dif- ference in the ability of smelling odorants before and after the electrical stimulation. These results suggest that this technology could be enhanced to artificially create and modify smell sensations. By conducting more experiments with human subjects, we are expecting to uncover the patterns of electrical stimulations, that can effectively generate, modify, and recall smell sensations. This invention can lead to internet and virtual reality digital smell.

http://adriancheok.info/category-research/press-release-electric-smell-machine-internet-virtual-smell/

This image shows the user study setup and stimulating the nasal cavity targeting the middle and superior concha regions using the device



The digital olfactory receptor stimulation device: It has a current controller circuit, endoscope camera, a pair of silver electrodes, a microcontroller, a power supply, a low current multimeter, and a laptop.

sensorama

Duftkino

In "Brave New World" besuchen die Protagonisten ein "feelie", ein Fühlkino. Aldous Huxley beschreibt eine Duftorgel: "Die Duftorgel spielte ein köstlich erfrischendes Kräuterkapriccio-Arpeggio wellchen von Thymian und Lavendel, Rosmarin, Basilikum, Myrte, und Schlangenkraut, eine Folge kühner Modulationen durch die Gewürzrucharten bis nach Ambra, dann langsam zurück über Sandelholz, Kampfer, Zedernholz und frischgemähtes Heu (mit gelegentlichen, zart angedeuteten Dissonanzen - einer Naserull Sauerkraut und einem leisen Rüchlein Roßäpfel) zu den schlichten Duft weisen, mit denen das Stück begonnen hatte." (1932)

1940: Im Schweizer Pavillon der Weltausstellung in New York wird das "Odorated Talking Pictures"- Verfahren, entwickelt von Hans E. Laube vorgestellt. (Ende 19. Jahrhundert):

Vor beidem: In "Traumkristalle" von Kurd Laßwitz spielt die Duftorgel "Ododion" (dt. Geruchsklavier) im Jahr 2371 als Ersatz für Musik, die so vollkommen ist, dass sie für Ohren unerträglich wird.

1960: Charles Weiss stellt das "AromaRama"- Verfahren vor: Gerüche werden durch die Klimaanlage des Kinos freigegeben

auch 1960: Der ~~Enkel~~ Sohn von Hans Laube entwickelt das Gerät des Vaters weiter und entwickelt mit Filmproduzent Mike Todd das "Glorious-Smell-O-Vision System"

Sensorama: Morton L. Heilig entwickelt 1962 ein Kinetoskop in der man multisensorisch eine Motorradfahrt durch New York erlebt.

1980/81 John Waters nutzt in der Vorführung seines Films "Polyester" Geruchsrubbelkarten: Wurde auf der Leinwand eine Ziffer angezeigt sollten die Zuschauer*innen die entsprechende Zahl auf ihrer Karte freirubbeln

Ode is a fragrance-release system designed to stimulate appetite among people with dementia.

Launched in 2011, Living Well with Dementia was a Design Challenge run in partnership with the Department of Health to improve the lives of those affected by dementia. One of the five innovative solutions created through the challenge, Ode is a fragrance-release system designed to stimulate appetite among people with dementia.

The problem

Weight loss is common to most people with late-stage dementia and can be an early indicator of the condition's onset. Malnutrition costs the NHS around £13 billion a year, compared to £5.1 billion for obesity.

The solution

Ode releases three food fragrances a day, adjustable to coincide with the user's mealtimes. This discreet system is less stigmatising and more inspiring than an alarm or constant reminders from carers to eat. Research suggests it can stimulate real hunger subliminally.

Pleasant and evocative, the scents aim to improve mood as an additional effect. They have been developed specially for Ode, in conjunction with a leading fragrance laboratory and in response to workshop feedback. Users can choose their preferred scents at installation.

Fragrances are released in short sharp bursts, acting as a strong appetite trigger and then dissipating rapidly so users won't become inured to the effect. A subtle light indicates the device is working and also communicates when fragrances need refilling.

The results

- 52% of participants in a trial gained weight after Ode was installed.
- Ode is now a limited company selling in the UK, Norway and the Netherlands.
- The product has attracted media coverage and generated interest from care homes, community NHS dieticians, commissioners and home carers.

https://www.designcouncil.org.uk/resources/case-study/ode

CREATIVITY

'Wake Up and Smell the Bacon' With Free Alarm Gadget From Oscar Mayer

Brand giving out 4,700 smartphone attachments
By David Griner
March 6, 2014

In case you haven't experienced the surreal delight of being guided from slumber by the smoky allure of "the nostril's north star," then Oscar Mayer might have the alarm clock for you.

The brand's "Wake Up and Smell the Bacon" promotion will give out 4,700 bacon-scented smartphone attachments over the next month. Winners can use the gadget with a branded alarm app that wakes you with the aroma of sizzling bacon.

Oscar Mayer and agency 360i deserve bonus points for the self-indulgent and rather hilarious video below announcing the giveaway. "When imagination blossoms," the Scandinavian narrator intones, "only this scent will guide you to your greatest awakening."

Giving out 4,700 devices might sound generous, but it's a crafty long-term play for profitability. If you're going to wake up daily to the smell of bacon, you're going to make damn sure you always have bacon in the house.

Werbespot zu "Wake up and smell bacon":

Eine Frau brät Bacon in einer Pfanne, Material aus den 1950er Jahren; eine Frau schwebt und ein riesen Bacon fliegt auf sie zu; eine Frau liegt in einer Rose aus Bacon.

Sleep. 2004 May 1;27(3):402-5.

Minimal olfactory perception during sleep: why odor alarms will not work for humans.

Carskadon MA[1], Herz RS.
Author information

Abstract

STUDY OBJECTIVES:

To examine olfactory arousal threshold during sleep in comparison to an auditory tone.

DESIGN:

On night 1, participants rated odor intensity when awake and experienced olfactory stimuli during stage 1 sleep. Night 2 involved stage 2, stage 4, and rapid-eye-movement (REM) sleep trials using the "staircase" threshold-detection method. Electroencephalogram, electrooculogram, electromyogram, electrocardiogram, and respiration were recorded along with behavioral response. An 800-Hz tone was given on trials when odors failed to arouse.

SETTING:

Participants slept in individual rooms. Stimulus-delivery systems were operated from a separate room, where an experimenter observed physiologic recordings and behavioral responses.

PARTICIPANTS:

Three healthy men and 3 women aged 20 to 25 years (mean, 22 years).

INTERVENTIONS:

Two odorants, peppermint and pyridine, at 4 concentrations were presented through nasal cannulas using an air-dilution olfactometer. Tones were played over a speaker.

MEASUREMENTS:

Behavioral (button press and oral) responses, electroencephalographic activation, and changes in breathing and heart rate were assessed.

RESULTS:

Participants responded to odors on 92% of stage 1 sleep trials. Peppermint was ineffective in stages 2, 4, and REM sleep. Pyridine produced behavioral threshold on 45% of stage 2 trials, none in stage 4, and one third of REM sleep trials. Tones were effective on at least 75% of trials. Heart rate increased significantly only following behavioral responses to odors or tones across sleep stages.

CONCLUSIONS:

The data indicate that human olfaction is not reliably capable of alerting a sleeper.

Geruch als sozialer Code

"[...] olfactory codes can and often do serve to divine and oppress human beings rather than unite them."

Genereller:

"Every domain of sensory experience is also an arena for structuring social roles and interactions. We learn social divisions distinctions of gender, class and race through our senses... [In essence], sensual relations are also social relations"

Bild:

"While groups in the centre – politicians, business man – are characterized by a symbolic lack of scent, those on the periphery are classified as odorous."

Aspekt Geruch als politisches Mittel

Marieke Borren beschreibt in "Human Rights Activism and the Politics of Smell and Noise" folgende 2 Situationen, in denen Geruch politisches Werkzeug wurde:

2015 übergießt Chumami Maxwele die Statue des britischen Kolonialisten Cecil Rhodes während der #MUSTFALL Proteste in Südafrika mit menschlichen Extrementen und verschärfte so die Resonanz (#Rhodesmustfall)

Gleichzeitig streiken in Südafrika v.a. Kapstadt die Arbeiter* innen der Müllabfuhr und verteilen als Methode des Protest den Inhalt herausgestellter Müllsäcke auf den Straßen

über Gerüche sprechen

" smells are usually not known in isolation but as 'appropriate' and 'inappropriate' accompaniments to human activities in certain cultural, social and physical settings."

auch:

"scents function as symbolic representation [...] we continue to ascribe meanings to particular objects [...] to specific smells."

Es gibt kaum Adjektive für die Beschreibung von Gerüchen (deutsch & englisch) man behilft sich mit Beschreibungen der Quelle (riecht nach...) oder Geschmacks- Empfindungen (süßlich)

" [...] smell does not form an object on its own"

Eine wissenschaftliche Klassifizierung wie z.B. bei Geschmack (süß, bitter, saver, salzig, umami) gibt es nicht.

US 20190101501A1

(19) United States

(12) Patent Application Publication

SAHU et al.

(10) Pub. No.: US 2019/0101501 A1

(43) Pub. Date: Apr. 4, 2019

(54) **SYSTEMS AND METHODS FOR ENVIRONMENT SENSING**

(71) Applicant: **Apple Inc.**, Cupertino, CA (US)

(72) Inventors: **Saroj K. SAHU**, Fremont, CA (US); **Karthik KADIRVEL**, San Jose, CA (US)

(21) Appl. No.: **16/147,510**

(22) Filed: **Sep. 28, 2018**

Related U.S. Application Data

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Publication Classification

(51) **Int. Cl.**

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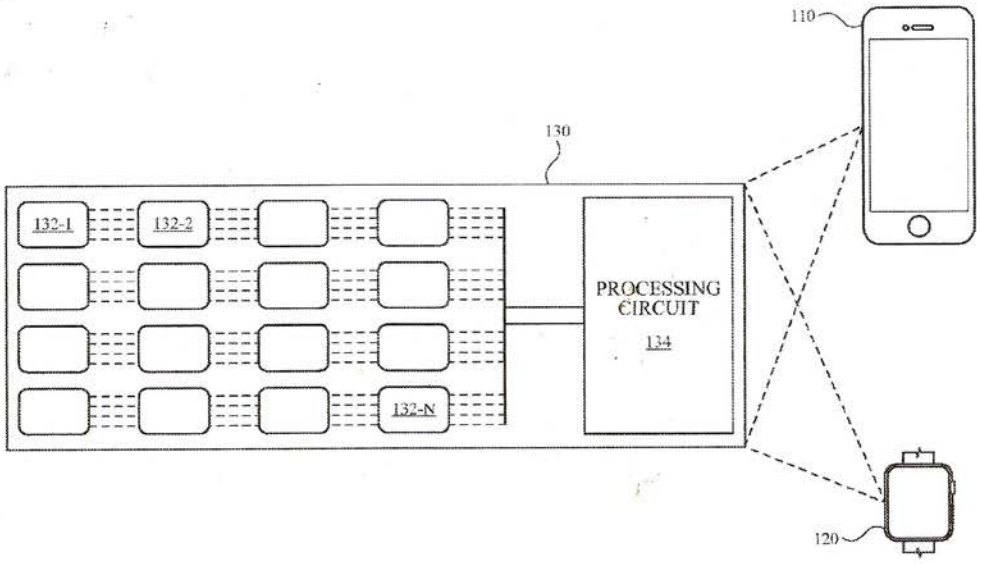
G06N 5/02	(2006.01)
G01N 33/00	(2006.01)
G01N 27/04	(2006.01)

(52) **U.S. Cl.**

CPC ***G01N 27/06*** (2013.01); ***G06N 5/022*** (2013.01); ***G01N 33/0073*** (2013.01); ***G01N 27/045*** (2013.01); ***G01N 33/0031*** (2013.01)

(57) **ABSTRACT**

A portable communication device includes one or more sensors, a pair of electrodes associated with each sensor, and a processing circuit configured to apply a bias supply voltage to the pair of electrodes and to process output signals from the sensors. Each sensor is an ionic liquid sensor tuned for sensing a smell associated with a chemical species. The processing circuit further includes an artificial intelligence engine to enhance smell recognition capabilities of the device.



Es ist Zeit, zu duschen

SMELL DATING

The first mail odor dating service.

1 We send you a t-shirt

2 You wear the shirt for three days and three nights without deodorant.

3 You return the shirt to us in a prepaid envelope.

4 We send you swatches of t-shirts worn by a selection of other individuals.

5 You smell the samples and tell us who you like.

6 If someone whose smell you like likes the smell of you too, we'll facilitate an exchange of contact information.

7 The rest is up to you

Q: Why should I chose matches via smell?

A: At Smell Dating we understand the metrics of compatibility are chemical; connection is a matter of intercourse not interface. The Internet has replaced fleshy experience with flat apparitions, avatars and painstakingly curated profile pics. Smell Dating closes digital distance by restoring your molecular intuition. Our members make connections via deeply intuitive cues, perfected in the ancient laboratory of human evolution. Surrender yourself to a poignant experience of body odor.

http://smell.dating/

Gender Aspekte

"While men are allowed to smell sweaty and unpleasant without losing any of their masculine identify, women who don't smell sweet are traitors to the ideal of femininity and objects of disgust."

"There are more references to the odour of women in ancient literature than there are of that of men. The basic olfactory classification made of women was to associate desirable women with fragrance and undesirable women with stench."

1770 wird in England, aus Angst vor der "betörenden", "hexenartigen" Kraft von Geruch erlassen:

> "That all women, of whatever age, rank, profession or degree, whatever ~~wa~~ virgins, maids or widows, that ~~[illegible]~~ shall from and after this act impose upon, seduce and betray into matrimony any of His Majesty's subjects by the use of scents, paints, cosmetic washes [...] shall incur the penalty of the law now in force again witchcraft"

Umformuliert: Es stand Strafe auf eine Verwendung von Gerüchen, die als "verführend getragen" ausgelegt werden konnten.

Das offenbart einen Widerspruch: Frauen hatten / haben also gut zu riechen, die Verwendung des Produktes "Duft" in Form von Seife/Parfum darf aber nicht auffallen: "Here is the myth of women as dangerous seductress, using perfume to lure men as witches use black magic.

If using scent makes women witchlike, however, not using scent also renders them witchlike – for then they run the risk of being perceived as malodorous."

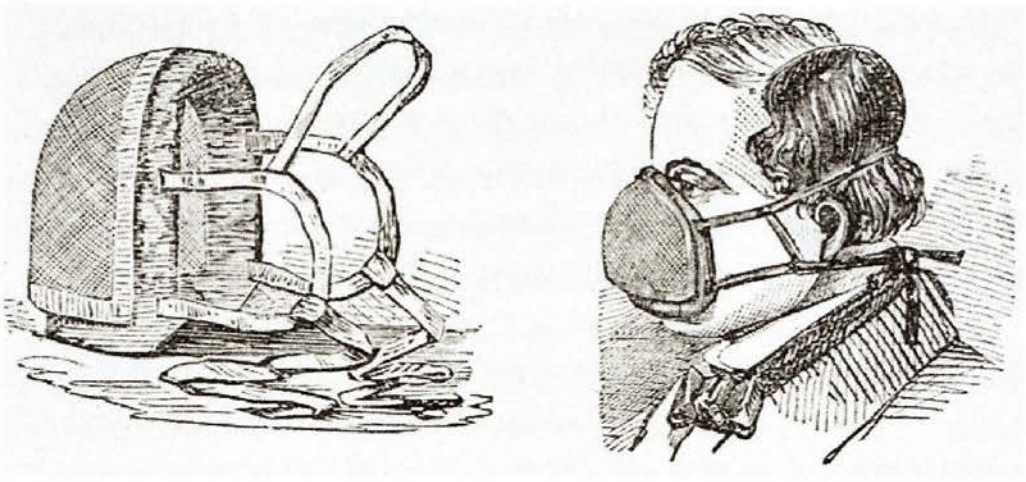


FIGURE 2.3. The charcoal respirator designed by Scottish chemist John Stenhouse offered individuals scientifically sound protection from foul odors. James F. Johnston, *The Chemistry of Common Life*, 8th ed. (New York: D. Appleton and Co., 1856), 2:312. Courtesy American Antiquarian Society.

Geruch und Rassismus

"Often however, a given ethnic or class odour is considered not just to be due to the consumption of particular foods or to perfume practices, but to be somehow intrinsic to the group, a characteristic trait as inalterable as skin colour.
Such 'ethnic' or 'racial' odours are commonly portrayed as both distinctive and disagreeable by those people who make an issue of them. The same people normally invoke such odours to justify avoidance behaviour."
"Exclusionary discourse [...] comes back to the idea of [olfactory] dirt as a signifier of imperfection and inferiority"

Scent of fear puts brain in emergency mode

LIFE 29 July 2009 By **Caroline Williams**

The smell of the sweat you produce when terrified is not only registered by the brains of others, but changes their behaviour too, according to new research. It adds to a growing body of evidence that humans may communicate using scent in a similar way to how other animals use pheromones.

Lilianne Mujica-Parodi, a cognitive neuroscientist at Stony Brook University in New York and colleagues collected sweat from the armpits of first-time tandem skydivers as they hurtled towards the earth.

The smell of their sweat was wafted under the noses of volunteers as they lay in an fMRI scanner. Even though they had no idea what they were inhaling, two separate sets of volunteers showed activation of the amygdala – the area of the brain responsible for emotion-processing, plus areas involved in vision, motor control and goal-directed behaviour. Sweat produced under non-stressed conditions didn't produce this reaction.

What's more, in behavioural tests, the "stress sweat" seemed to heighten people's awareness of threat, making them 43 per cent more accurate in judging whether a face was neutral or threatening.

Ethical issues

Because the study used sweat rather than its components, this is not definitive evidence that human pheromones exist, says Johan Lundstrom, a pheromone researcher at Monell Chemical Senses Center in Philadelphia, who was not involved in the research.

The researchers do, however, have suspicions about what the active chemical might be. The steroid androstadienone is the primary suspect, and Mujica-Parodi's team say it plans to synthesise it.

"I'm not naïve about the fact that some people will look at this study and say it was irresponsible," says Mujica-Parodi. There are obvious ethical issues about synthesising a chemical that could induce fear in other people, and the group's early research was funded by the US military (pdf).

But Mujica-Parodi insists that the chemical, if shown to have the same effects as full sweat, could be put to all manner of non-sinister uses, such as understanding the dynamics of fear in situations where people are thrown together in confined spaces, like aeroplanes, jails, or submarines.

Stress tool

It could also make training for stressful jobs – such as soldiers, pilots and surgeons – more realistic. And since it seems to heighten awareness and vigilance, it could be used as a stimulant: to maintain alertness on long car journeys, for example.

Simon Wessely, a psychiatrist at the King's Centre for Military Health Research at King's College London, says that even if the chemical was to be unleashed in a crowd, it would be highly unlikely to cause mass panic.

"Fear is biological, of course, but the important thing is the psychology and how you cognitively appraise the situation," he says. "I don't think you'd get terrified for no obvious reason."

Journal reference: *PLoS ONE* (DOI: 10.1371/journal.pone.0006415)

Angstschweiß bringt Menschen zum Fürchten

Geruch aktiviert unbewusst Angstzentrum im Gehirn

Riechen Menschen Angstschweiß, so führt dies dazu, dass sie selbst Furcht empfinden und sich vorsichtiger verhalten. Dieser Prozess läuft allerdings nicht bewusst ab, sondern im Unterbewusstsein. Jetzt haben Wissenschaftler die verborgene Reaktion des Gehirns sichtbar gemacht und gezeigt, dass das Angstzentrum durch den Angstschweiß eines anderen Menschen tatsächlich aktiviert wird.

Wir Menschen nehmen ständig Gerüche wahr. Obwohl dies oft unbewusst geschieht, beeinflussen uns diese Geruchsinformationen auch in unserem Denken, Fühlen und Handeln. Mediziner der Ludwig-Maximilians-Universität (LMU) München wollten nun herausfinden, wo im Unterbewusstsein diese Reaktionen stattfinden. Sie untersuchen mithilfe einer besonderen Form der Magnetresonanztomographie (MRT), der so genannten funktionellen MRT, in einem Experiment, welche Hirnregionen bei Versuchspersonen durch Gerüche aktiviert werden.

Unbewusste Reaktion sichtbar gemacht

Die Münchner Forscher haben dies jetzt an Probanden untersucht, indem sie ihnen entweder den Angstschweiß anderer Menschen unter die Nase hielten oder aber ein Placebo ohne Duftstoff. Das Ergebnis zeigte, dass die Versuchspersonen unbewusst beim Angstschweiß anders reagierten als beim Kontrollversuch. Ihr Gehirn zeigte andere Aktivitätsmuster.

„Dies sind aber keineswegs nur die Bereiche, die für die bewusste Identifizierung der Gerüche notwendig sind", erläutert Martin Wiesmann, Leiter des Bereichs Funktionelle Bildgebung der Abteilung Neuroradiologie an der LMU. „Es gibt zudem direkte Verbindungen zu Zentren des Gehirns, die für Emotionen oder unser Verhalten wichtig sind. Das macht den Geruchssinn einzigartig unter all unseren Sinnen." Gerüche, so der Neuroradiologe, werden auch vom Unterbewusstsein wahrgenommen und verarbeitet – jederzeit, auch wenn wir schlafen.

Angstzentren aktiviert

„Es wurden genau die Teile des Gehirns aktiv, die sonst an der Entstehung von Angst beteiligt sind. Die Versuchsteilnehmer wurden ängstlicher, ohne dass sie sich bewusst waren warum. Zudem verhielten sie sich in bestimmten Situationen vorsichtiger", berichtet Wiesmann.

Der Experte vermutet, dass Menschen über ihren Körpergeruch miteinander kommunizieren, so wie dies auch von vielen Tierarten bekannt ist. Weitere Forschungsprojekte sollen nun zeigen, ob neben der Warnung vor Gefahren noch andere Botschaften übertragen werden und ob sich Frauen und Männer bei der Kommunikation über den Körpergeruch unterscheiden.

16. Oktober 2009

https://www.scinexx.de/news/biowissen/angstschweiss-bringt-menschen-zum-fuerchten/

Chemosensory Cues to Conspecific Emotional Stress Activate Amygdala in Humans

Lilianne R. Mujica-Parodi

[...]
To date, six studies worldwide have published reports on human stress signaling via sweat. Two studies found that individuals were able to identify, solely by smelling sweat collected on axillary pads, whether the sweat donor had been watching a frightening versus benign film. Using a similar collection paradigm with frightening and benign films, one study found that participants, when smelling the stress, but not neutral, sweat showed improved accuracy in completing a word-association task, while another found that stress sweat caused participants to interpret ambiguous expressions as more fearful. Two studies collected sweat from individuals preparing to take a difficult examination with exercise sweat as the control. In one study, females exposed to the stress odor were less likely to judge a face as positive when primed with a positive face, while in the other, auditory stimuli provoked an increased startle response when participants breathed sweat collected during the stress condition.

We set out to determine whether breathing the sweat of people who were emotionally stressed produced, in a group of unrelated individuals, neurobiological evidence of emotion-perception. The primary area associated with emotion-processing is the amygdala which has been reliably activated in human neuroimaging studies of emotion as well as animal studies using rat alarm substances.

[...]
While it is commonly known that information regarding the emotional stress of others is communicated in humans by visual and auditory cues, our findings suggest that humans—like other mammals—may complement this information with chemosensory cues as well. Sweat collected during an acute emotional stressor, and subsequently presented to an unrelated group of individuals, produced significant brain activation in regions responsible for emotional processing without conscious perception of distinct odor; behavioral data, our own as well as those from previous studies, suggest the emotional processing may be specific to enhancing vigilance and sharpening threat-discrimination.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0006415#s2

News

The iPhone 11 or Apple Watch 5 could monitor your body smells

By Tom Bedford 8 days ago

Something else to nag when you smell of garlic

Tech evolves to benefit our lives in new and unexpected ways, and Apple has come up with another way that its products could help you – by alerting you if you smell funny.
According to patents found by Cult of Mac, Apple has designed a system that would let sensors in its devices recognize chemicals in the air, and from that judge any noxious smells.

The point of the Systems and Methods for Environmental Sensing, as Apple calls it, is so that a device like the iPhone 11 or Apple Watch 5 could detect pollution or other toxins in the air and alert the user of danger. This could have many uses, such as a Carbon Monoxide detector or air pollution tracker in a wearable, that helps keep the user safe.

The most interesting part of the patent, however, is the "smell recognition capabilities" – perhaps this means the system could check if your breath stinks before a date, or if your body odor is overpowering after exercising.
Since the majority of the patent explains how the system could monitor chemicals to evaluate air quality, it's unlikely Apple is specifically designing a system to keep track of your personal hygiene. But wouldn't we all love our phone to check our breath before we inflict it on people?
The system is just in the patent stage at the moment, so there's no guarantee we'll see it in the iPhone 11 or Apple Watch 4, but keep checking back for all the latest Apple news, rumors and leaks to find out all the other things those devices might bring.