

Scent Marketing: Subliminal Advertising Messages

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Abstract: Store chains and service providers beguile customers with a pleasant shopping atmosphere often realized by installing scent diffusers to evaporate overwhelming fragrances. Such systems named as olfactory technology are becoming a standard interior of commercial locations as well as public places and are more and more gain importance in human-computer interaction. This paper delivers insight into current air design technology, the psychological background of scent marketing and gives a basis of discussing the relevance of olfactory communication for pervasive advertising and human-computer interaction.

1 Introduction

Like other media-based business advertising industry is increasingly confronted with the problem of information overload. Penetrating this *bead of information* and reaching customers with advertising messages appreciably becomes difficult. An important issue for advertisers is finding new methods to persuade consumers of their goods and services. First impressions coming up with the word *advertising* are posters, newspaper ads, commercials on TV or radio, etc., actually visual and auditory media. But the advertising industry also uses consumption raising instruments like scents which can manipulate consumer behavior by unconsciously raising emotions and consequently manipulating purchase decisions. Experts defined this type of advertising as *scent marketing* or *air design*. The olfactory perception is an interface which allows a very subliminal communication between human beings and their environment because of a direct connection of the olfactory system to our emotional center. In the mid nineties psychologist examined the effect of scents on purchase behavior and confirmed that perfumed sales rooms would contribute to increase sales [Stö98]. Therefore marketing experts did not hesitate to use the olfactory channel as medium for subliminal messages.

2 Psychological background of olfactory perception

Olfactory perception takes an exceptional position in the neurological processing of sensory stimuli. The sense of smell differs from other forms of perception in the direct con-

nection between the olfactory and the limbic system, our emotional center. The perception of odors nearly always causes emotional reactions - there is no way to avoid smelling odors or filtering olfactory information. As a result the olfactory channel offers high potential to send advertising messages to the consumer without any loss of data. Nevertheless, the interpretation of odors is subjective and related to individual emotions. The recognition of odors is based on a learning process which starts in the embryonic phase and is composed by perceiving odors and saving them in combination with memories, incidents and emotions forever in the long-term memory. Perceiving a known odor is comparable with an odor-combined memory recall, a process which is known as *proust phenomena*, according to the French writer Marcel Proust, who worked with descriptions of sensory experiences [CD00]. According to this, the sense of smell should be a perfect interface to the human brain to eternally deposit information and recall it by re-perception.

An additional effect to the proust phenomena are color-odor associations, which are constant companions in our everyday life. The food industry is reliant on these associations informing the consumer about taste and smell of products. Heinrich Frieling, a color psychologist and expert for color associations, explains how colors influence consumerism and why different sensory stimuli can complement another [Fri05]. Table 1 shows colors and the connoted odors or tastes as they are used for food packaging and advertising. The tasting process is actually a smelling process because the olfactory epithelium determines flavors through the internal channel to the pharynx. Tasting and smelling are nearly the same perception process, an important fact for food producers. Color-taste and color-odor associations are derived from natural experiences as they are evolutionary fixed in our genes. Therefore it would be contraproductive to produce e.g. blue gummy bears with orange flavor. But comparing different cultures such connotation can diverge, what forces producers to adapt their products for various markets.

Color	Fragrance
PINK	sweet, mild
LAVENDER	sweet, unerotic
MAGENTA	heavy, narcotic, charmingly, sweet
INDIGO	scentless
BLUE	scentless
MINT	juciy, fresh to salty
GREEN	fresh, fragrant, parfume with green fragrance
OLIVE	musty
LIME GREEN	sour, dry, fresh, bitter
YELLOW	parfume, flower
ORANGE	hearty
RED	sweet hefty, hot
GOLD	sweet, good, stunning
OCHER	sourly, neutral
BROWN	aroma, musty
WHITE	scentless
GREY	bad

Table 1: Color-odor associations by Heinrich Frieling [Fri05]

Another exceptional quality of olfactory perception is a direct connection between our smelling system and the hypothalamus, a neurologic area which controls amongst others the autonomic nervous system. This connection allows influencing the viscera by perceiving odors and is responsible that aromatherapy works. Air designers are geared to color-odor associations and the aromatherapeutic effect of fragrances when they are developing perfumes for scent marketing purpose.

For biologists olfactory communication stands for the exchange of pheromones within one species. Pheromones are volatile components causing instinctive reactions within one particular species. They are detected by the *vermonasal* or *jacobson organ*, a part of the nasal septum [Sch06]. The pheromonal communication was only identifiable at animals, but since 2006 it has been proved that also humans communicate via pheromones. For instance, women can identify if a man genetically correlates to the own DNA by checking his body odor including pheromonal information. Pheromones also plays a role when mothers recognize their babys through smelling the baby's body odor [Wat01]. But it is also known that pheromones of other species can influence humans. Parfume components like ciber or musk are animal scents which contain sexual pheromones of the male ciber cat and musk deer. Women find a little bit of such animal scents charming but do not instinctively react on them [Wat01]. Using human pheromones for scent marketing purpose would maybe allow controlling consumers' instincts – a method of persuasive advertising, which isn't without controversy.

3 Scent Marketing

Scent marketing relies on the neuropsychological processing of olfactory stimuli in the human brain. The area of research which analyses neuropsychological effects of advertising and commercial activities on the consumer is called *neuroeconomics*. The term *scent marketing* came up in 2002, defines a subarea of the neuroeconomic research and describes the usage of scents for marketing purpose [Bar08].

The main target of scent marketing is the creation of a pleasant atmosphere for clients. They should stay in stores as long as possible and should enjoy the ambience to accordingly buy more products or raise consumption [MKC95] [Hir09]. In former days bakeries, coffee houses and restaurants often unintentionally worked with scents as attractant. Their chimneys and ventilation systems released enough food aromas that people's mouth watered. Today such shops systematically works with synthetic fragrances to effect similar reactions.

Furthermore costumers should treasure these shopping scenarios as pleasant and relaxed which is due to the already mentioned Proust phenomena. This effect gives store, hotel and service chains an idea of using fragrances as part of their corporate identity. Every time a client perceives the unique parfume of the chain, he or she should recall the shop, the situation and this pleasant atmosphere [MS00]. In 2006 hotel chains like Westin, Sheraton, Omni, Four Points or Hyatt incorporated special fragrances as part of their brand image [Hig06].

Another form of scent marketing is the improvement of the ambience in negatively afflicted locations like hospitals or dental practices. It is a social impact of the western world that people get scared when they are smelling chlorine-camphor and phenol, which give disinfection agents the typical smell. To cope with this issue, dentists tried to improve the atmosphere of their practice by gilding this “doctor’s fragrance” to put the patients at ease [LML⁺05].

The scent of food and goods plays also a relevant role in selling products. Not only food aroma have to meet one’s expectations, also other products are liable to associations and connotations. As an example new cars do not smell like plastic and metal. They are sprayed with a oil or leather fragrance to let drivers feel more familiar with them. As the RAC Foundation found out this can lead to overestimation of driver’s own capabilities and accordingly to a higher accident risk [NFD05]. But some producers experiment with such associations and perfume their products with unexpected aromas getting a unique selling proposition or jollying their costumers along. Products like scented writing utensils, socks, CDs, USB sticks, papers, etc. have been introduced to market (www.everythingsmells.com, Figure 1). EPAMEDIA, an Austrian public space advertising company has also a controversial approaches and uses unusual advertising forms like smelling posters and illuminated panels [Epa08].

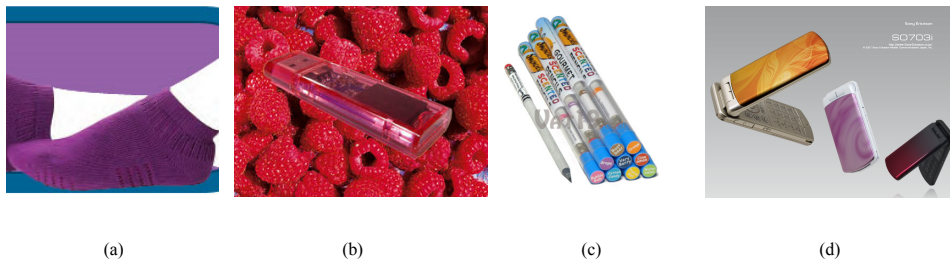


Figure 1: (a) AromaSocks®, (b) Cocos® flavored USB sticks, (c) Smencils®, (d) Sony Ericsson SO700i

Marketing strategies often includes promotion events as advertising platform and presentation of provider’s individuality. Event managers use the latest entertainment forms to compete for visitors and publicity. So scents also became interesting for event managements and nobody wonders that there is a new occupation called *scent DJ* lifting the audience’s spirit with fragrance compositions [Emo08]. Affecting ones mood by evaporating special fragrances is also used during social interchange like meetings or class room situations [Hig06]. Researchers noted that some fragrances could contribute to improved cogitation and retentivity [HSB04].

4 Olfactory Technology and Interaction within Pervasive Environments

Information overload is a well known problem of the advertising industry and leads to find other modalities of transmitting information to various target groups. Odors are a new possibility to persuasively present consumers products if they like them. The very subjective interpretation of olfactory stimuli require an adaption of olfactory messages to individual preferences. Therefore scent marketing systems needs to become “smart”. General scent diffusers like scent candles, fragrance lights or other kinds of air fresheners work mechanically, without any electricity. But in the last view years more and more electric scent gadgets were developed and trend to replace their analog pendant (Figure 2).

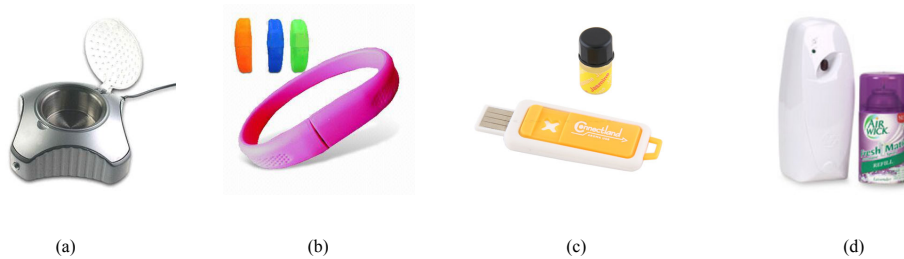


Figure 2: (a) Kinlan USB fragrance oil burner, (b) Shenzhen scented USB bracelet, (c) AromaUSB® fragrance diffuser, (d) AIR WICK® FreshMatic

Digital olfactory devices evaporating odors or detecting volatile components can be defined as *olfactory technology* and act as *olfactory displays* or odor sensors. Such technology increasingly implements more interfaces to allow integrating it in and controlling it by pervasive environments. So olfactory technology is becoming “intelligent” and dynamic adjustable for individual purpose.

4.1 Sending Olfactory Information

Most scent systems in salesrooms are integrated in the air condition, but there are also heat-based standalone devices. First commercially available air design systems could not adjust running time, fragrance or scent volume, they continuously run and lead to a flood of fragrancy. Modern systems offer an adjustment of time and volume as well as changing between various fragrances (Figure 3).

Not only advertising takes advantage of odors, olfactory communication receives more and more attention in human-computer interaction. Today digitally controlled odor diffusers are not only applied for advertising purpose, they are increasingly used as ambient indicator like an olfactory display in HCI-systems (Figure 4). For instance, Keye reported on an ambient olfactory reminder system [Key01]. An integration of an augmented reality



Figure 3: (a)(b)(c)(d) heat-based systems of Aromea, (e) ventilation-based aroma cubes of Sensarama, (f)(g) EnviroScent

application with an odor machine to improve on the the reality experience is presented in [Ems06]. NTT Communications have developed a smell machine called *Aroma Geur*, laying the path to the first olfactory emails in 2004 [Com07]. This device was also used to create an ambient smell when listening to Tokio FM. In 2005 TriSenx launched their *ScentDome* to enable websites emitting scents [Tri05]. In the meantime, telecommunication industries have also found the olfactory information channel as useful medium and market the first scenting mobile phones [Sof07][Mot07]. The special smoothness of olfactory interaction spaces was the central subject of the *Space-of-Scent*-project realized by Haque Design & Research in 2002.

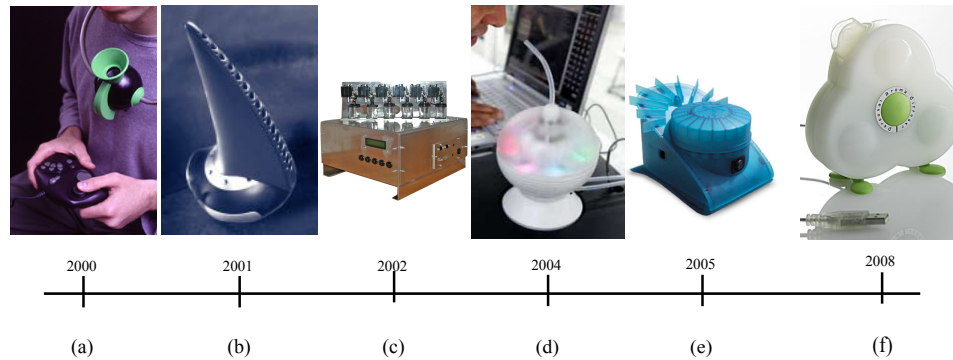


Figure 4: (a) AromaJet Pinoke, (b) DigiScent iSmell, (c) FH Hagenberg SmellBox, (d) NTT Com Aroma Geur, (e) TriSenx Scent Dome, (f) Osmooze Personal Diffuser

For the telecommunication industry smell has been successfully introduced as new sensory modality for interactions between human and mobile devies. The first “smelling” mobile phones were placed on market in 2008 (Figure 5). The Sony Ericsson SO701i is scented with an aroma therapy fragrance to support relaxing during stressful phone calls. To satisfy different preferences the mobile phone is available with 8 different fragrances, which can also be useful for advertising purpose and tagging personal things like mobile phones with

corporate scents. The Hyundai MP280 integrates an individual refillable scent diffuser which acts as “smelling tone”. Samsung and Motorola holds also patents for smell phones [Sam06] [Mot07]. German inventors have already patented a mobile phone with a smell chip which allows sending and receiving *smell messages* [IH08]. These mobile devices could be the future of mobile advertising – they are offering a new method to send not only informative but also emotional advertising messages.

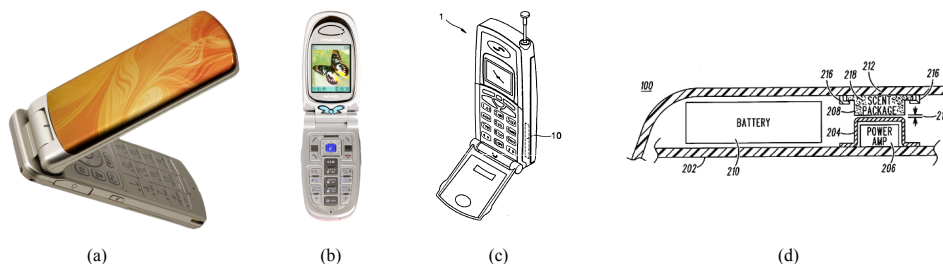


Figure 5: (a) Sony Ericsson SO701i, (b) Hyundai MP280, (c) Samsung, (d) Motorola Smell-o-Phone

Mentioned odor diffusing facilities provide using odors for static as well as mobile smart installations. Current scent marketing systems treat each customer like the others and don’t care about their individual preferences. Making such systems intelligent allows to respond to these preferences as well as the consumers’s psychological state like aroma therapist do. The combination of emotion recognition, referring to *emotional computing* [Pic97], and the usage of smart olfactory technology can be a powerful instrument for pervasive advertising.

4.2 Sensing Olfactory Information

Not only the output of olfactory information is an increasing subject for information technology research, but also using volatile substances as input for digital communication increasingly becomes useful. Gas sensor arrays and electronic noses are especially used in forensic investigation for the detection of explosives and medical science to diagnose diseases like cancer. Today they are increasingly used to control digital systems. For instance the Japanese *Hanahana*-installation allows manipulating flower-animations by ten different perfumes. In 2005 Wyszynski, Yamanaka and Nakamoto already sent an recorded odor by email and reproduced it at the receiver [WYN05].

Researchers of the Austrian Konrad-Lorenz-Institute are currently developing a system to recognize individuals by their body odor which represents the individual DNA like a volatile fingerprint [Pea07]. Body odor is the volatile state of sweat whose components are genetically influenced. Emotions like fear can also manipulate the sweat composition and contribute to the production of cold sweat [CKL06]. According to this, body odor has the potential to become a new data source for intelligent systems to recognize individuals as well as their emotions.

Recognizing and manipulating emotions are basic instruments of advertising. The olfactory information channel allows both detecting emotions by body odor analysis and causing emotions by aroma therapeutic scents. Maybe in the near future smart advertising systems will be able to react to individual emotional states and manipulate them at the same time. Such bidirectional communication via odor acts within unconventional zones of interaction. Each odor-emitting human or thing is surrounded by a definite waft of scent like an olfactory aura defined as *Olfactory Interaction Zone (OIZ)* in [EF09]. This zone can be dynamically extended from square meter size to spare kilometer scale. Consumers often are able to smell aromas of near bakeries or restaurants over many meters leading them from the street in their salesroom like an *olfactory direction sign* [Ems09].

Sensing odors could be a useful instrument for advertisers to find out more information about their clients, especially emotional states. Another valuable data are individual odor preferences which could be examined by identify their body odor or personal perfume. Furthermore such preferences would refer to color preferences which could be useful for e.g. fashion style suggestions.

5 Conclusion and Discussion

Evolutionary we are used to communicate via odor, but digital communication still does not allow this. With scent marketing advertisers have initiated the integration of olfactory interaction in modern communication facilities. Today scent advertising is still a simple form of perfuming rooms and flavoring goods to make them more pleasant for costumers, but odor is more than that. It is a medium for unconscious messages, manipulates mood and behavior and recalls often forgotten memories. But the disability of avoid smelling can rapidly lead to olfactory information overload. Therefore current issues of air designers and also computer scientists include the improvement of evaporation and intensity control, advancing psychological investigation of the olfactory perception and being responsive to consumer's individual preferences.

The detection of body odors will enable identifying and tracking of human beings as well as recognizing their emotional state by one input data stream. But computer scientists still avoid using the olfactory communication channel, probably because olfactory technology is not sophisticated yet. But people suffer from visual and auditory information overload, so the olfactory communication channel gets more and more important for interaction between human and human as well as human and things.

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