

CHAPTER 8

From marketing differentiation to household poisoning: are commercial practices on cleansing products a public health issue?

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“These products look like drinks beverages. They smell like beverages. And they have no child-resistant cap. A child might be tempted to drink them and that could be harmful,” said Don Mays, the Director of Product Safety of Consumer Reports, an American association formed in 1936 to inform consumers, speaking in 2006 about the serious problems posed by certain household products⁵.

And KFOX El Paso adds, given the poisonings with Fabuloso reported on the Internet by consumers that: *“The bottles do carry warnings: “Keep out of reach of children” and “Do not drink.” But the warnings are small and no help for children who can not read. [...] One poison Control center received calls from adults who have mistaken these cleaners as well. [...] Consumer Reports said government standards do not prohibit cleaners from being packaged in this fashion. The safest bet they said is to not buy them”*⁶. Faced with increasing media awareness, the manufacturer of *Fabuloso*, Colgate-Palmolive, was forced to react, as Consumer Reports is pleased to point out on its web site: *“Although the bottle still resembles an energy drink, we are happy Colgate-Palmolive has redesigned Fabuloso’s cap to make it safer for children, and hope other manufacturers will follow their lead”*⁷.

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⁵ This chapter is based on current research conducted by Frédéric Basso, Philippe Robert-Demontrond, Olivier Oullier, Dr Maryvonne Hayek-Lanthois and her team from the Marseille poison control centre. Frédéric Basso presented this research at the Centre for Strategic Analysis during the seminar “Neuroscience et prévention en santé publique” (Neuroscience and prevention in public health), on 16 June 2009.

⁶ “Consumer watch: Dangerous household cleaners look Like sports drinks”, - KFOX El Paso, www.kfoxtv.com/money/9486211/detail.html.

⁷ Consumer reports on safety, “Fabuloso's better bottle - thanks to you”, 27 November 2006, http://blogs.consumerreports.org/safety/2006/11/fabulosos_bette.html.

A number of studies have been conducted by American poison control centres on this product. The retrospective review of cases of poisonings over three years by the Denver poison control centre¹ totals 21 unintentional ingestions of *Fabuloso*. The problem is said to be due to the fact that “*some manufacturers have resorted to ultra-modern designs of liquid cleaning agents in order to make them more attractive*”. The conclusion is that these designs “*may be a source of unintentional exposures in children and adults*”, the risk increasing as the population ages. Even more, the team at the Texas poison control centre has identified 104 poisonings, 94 unintentional, with *Fabuloso* during the first four months of 2006. What is most surprising is that 41 people over 20 were among the victims². Once again, doctors outline the problem: **an appealing cleaning product which smells good enough to drink.**

It would be a mistake to think that this is an isolated case. A number of products implicated in unintentional poisonings challenge the aesthetic rationale at work in the area of toxic agents. *Mistolin* has been in the spotlight. The press also reports poisonings involving torch oil and, more recently, windshield wiper fluid. The former, mistaken for apple juice and accidentally ingested, led to six people being hospitalized in New Jersey, in June 2008. One of them, aged 84, died³. Around one hundred cases of accidental poisonings occur every year caused by torch oil and generally involve children and the elderly. According to Dr. Michael Wahl, a poison centre's medical director, “*Many lamp oils are colourful and fragranced, which makes it appealing to small children. The problem is, most containers are not child-resistant.*” Plus the fact that this oil comes in plastic bottles which look like fruit juice bottles, which increases the possibility of accidental ingestion. More recently, a case has been reported of ten children aged between 2 and 7 who drank windshield wiper fluid which was given to them because it was put in the refrigerator by accident⁴.

Making cleaning products appealing for marketing purposes somewhat changes the structure of calls involving cleaning product ingestions: reports are that unintentional poisonings with certain products no longer concern only children but also a not insignificant percentage of adults.

All these cases of poisoning raise the same question: why not prohibit toxic products from being confused with food?

1. Marketing versus health

The contradictions between marketing and health obviously lead to tensions⁵. Comments by Rick Kingston, an American toxicologist and consultant for a number of

¹ Caraccio T. *et al.* (2006), Designs of Liquid Cleaning Agents (LCA) Resembling Food Supplement Drinks (FSD) May Lead to Unintentional Exposures, *Abstracts of the 2006 North American Congress of Clinical Toxicology Annual Meeting*, p.121.

² Miller M., Levsky M., Masneri M. and Borys D. (2006a), “Fabuloso: A cleaning product that tastes and smells good enough to drink”, *Annals of Emergency Medicine*, 48, 4, p. 81-81; Miller M., Levsky M., Masneri M. and Borys D. (2006b), “Fabuloso: A cleaning product that tastes and smells good enough to drink”, *Pediatrics*, 118, 2, p. 848-849.

³ Thomas M. (2008), *Torch Oil Looks Like Apple Juice - But it's Toxic*, Safety archives; <http://list.uvm.edu/cgi-bin/wa?A2=ind0807a&L=SAFETY&P=42822>.

⁴ Gambrell J. (2009), “10 children sickened after drinking windshield fluid”, WREG, 13 March, www.wreg.com/wreg-ar-windshieldfluid-sickness-story,0,727092.story.

⁵ Wogalter M. S. et Cox E. P. (1998), “Guest editorial - Psychology, marketing and warnings research: Bridging the gap between consumer theory and warning practice”, *Psychology &*

cosmetic companies, leave no doubt on this point. Recognizing that child-resistant caps save lives, he nevertheless considers that this solution also poses a problem. He says that products given a top like this could be perceived as excessively toxic, while they are not necessarily so¹.

From a marketing point of view, this argument is counterbalanced by the negative publicity arising from a consumer product which causes repeated poisonings, particularly if this information covered in the media leads to boycotts.

However, it must be recognized it is likely that this protection will be a restriction on use which consumers will find a way around. By making it more complicated to open products, the tamper-proof cap has the negative effect of making users deliberately not close products properly, or even to remove them from their bottles², i.e. pour them into another container, generally a drink bottle. In this case, there is no longer anything to prevent accidental ingestion. Despite its good points, **the child-resistant cap is therefore not an ideal solution**. In addition, this system is not suitable for all products liable to cause poisoning because of their appealing appearance.

Warning research in ergonomics aims to optimize the perception of risk related to the use of a potentially hazardous product by combining the colours, shapes, sizes and letters recommended to catch the user's attention, notably, on preventive messages, labels and logos³. The studies carried out in this area have listed other limits, mainly cognitive and conative:

- **Problems of understanding labels and the message** conveyed;
- the negative impact of the **reduction in packaging size** on the transmission of customary information;
- **familiarity with the product** which reduces vigilance;
- the **cost of conforming to the recommendations** given.

These studies show that the implementation of prevention solutions may sometimes increase exposure to danger. It was through this finding that the Children's Hospital of Pittsburgh created the "Mr. Yuk" logo (a green smiley expressing disgust), in 1971, to replace the traditional skull and crossbones on toxic products, which has the disadvantage of appealing to children by its association with the imaginary world of pirates.

Stemming the rise of unintentional ingestions is ultimately dependent only on the determination of sector professionals: as Consumer reports puts it, nothing in American law prevents them from making domestic cleaning products appealing. In France, the application of a statutory text covers a limited scope, only relating to

Marketing, 15, 7, p. 615-619; Cox III E. P. (2006), "Marketing versus Warning", in M. S. Wogalter (coord.), *Handbook of Warnings*, London, Lawrence Erlbaum Associates Publishers.

¹ Levy S. (2001), "CPSC to require child-resistant packaging on some household products", *Drug Topics*, 22.

² Schneider K. C. (1977), "Prevention of accidental poisoning through package and label design", *Journal of Consumer Research*, 4, September, p. 67-74; Sherrard J. *et al.* (2005), *Barriers to Child Poisoning: Why does Child Resistant Packaging Fail?*, Accident Research Centre, Monash University, August, 84 p.

³ Wogalter M. S. (2006) (coord.), *Handbook of Warnings*, London, Lawrence Erlbaum Associates Publishers.

products which are dangerous for the health (*Box n°10*). A reminder is merely given in a circular that “*receptacles containing dangerous preparations offered or sold to the public must not have a shape or graphic decoration such as to attract or encourage children’s active curiosity or mislead consumers, nor a presentation and/or denomination used for foodstuffs, animal food or medical products or cosmetics*”¹.

Box n°10

Statutory and institutional positions

Point 2.2 of DRT circular number 13 of 24 May 2006 ensues from various provisions of EC law and national law.

At EC level, directive number 87-357 of the European Community Council was aimed at reconciling member state legislations on products which, appearing to be other than they are, endanger consumers’ health or safety. The aim of this directive is to prohibit marketing practices which give the appearance, smell or packaging of foodstuffs to products which in fact are not edible and which therefore lead to poisonings. If a member state forbids such a product from being sold on its territory, it must inform the European Commission and provide sufficient details for the other member states to identify it and take appropriate measures to prevent any risk of poisoning. This directive has already been applied to a number of products (soap, candles, etc.²) on the domestic market, since they entail a risk of poisoning or perforation of the digestive tract.

Under national law, decree number 92-985 of 9 September 1992 on food imitating products transposed the provisions of directive number 87-357 into the French internal legal system. According to Article 1 of decree number 92-985 (which repeats in substance paragraph 2 of Article 1 of directive 87-357): products “*which, although not foodstuffs, possess a form, odour, colour, appearance, packaging, labelling, volume or size, such that it is likely that consumers, especially children, will confuse them with foodstuffs, should not entail any risks for their safety or health such as suffocation, poisoning, or the perforation or obstruction of the digestive tract*”.

Despite these provisions, cases continue of unintentional poisoning due to inedible food imitating products. This is demonstrated by the call by the European Commission’s Directorate General for Health and Consumers in June 2009 and the proceedings of the Scientific Committee on Consumer Safety (SCCS) for additional data on the potential risks caused by consumer chemical products imitating the appearance of foodstuffs or appealing to children³. These products include shampoos and body lotions, as well as liquid soap, which by their colour, shape, consistency or packaging could lead consumers, especially children or the elderly, to ingest them and cause poisonings.

2. From appeal to poisoning

The aim here is not to blow the whistle on all the brands involved in unintentional poisonings but to identify a marketing approach which is increasingly dominating the market. To do this, we will emphasize not only the relations at a commercial level between foodstuffs and detergents, but also those between domestic cleaning products and cosmetics. For, while the question of hygiene is involved in both cases, personal hygiene on the one hand and environmental hygiene on the other, very often

¹ DRT circular 13 of 24 May 2006, point 2.2.

² For illustrations see: www.dolceta.eu/united-kingdom/Mod3/spip.php?article183.

³ See: http://ec.europa.eu/health/ph_risk/committees/04_sccs/sccs_call_info_01_en.print.htm.

cosmetics enable us to identify future domestic cleaning trends. In this approach, the realms of aesthetics and play are therefore sometimes added to the world of foodstuffs. If the design of these products is becoming constantly more attractive, it is in order to more effectively differentiate the product from the competition on the shelf.

To make products more appealing, manufacturers now use differentiation techniques based on generating positive emotions through “emotional design”, a concept introduced in 2004 with the publication of Donald Norman’s book¹. Since then, washing up liquid containers have been designed by fashion designers or based on toys in order to brighten up consumers’ homes. In the past, form followed function. Nowadays, form follows the emotions. The design has to be empathic to attract consumers. Products have to be made appealing to arouse positive emotions in consumers. Of course, this does not mean strong emotions. Be that as it may, the evident aim of creating a positive valence in product evaluation² just by the sight of it, is frequently achieved.

Among the spheres which inspire marketing specialists is that of aesthetics. For example, a brand launched a competition on the internet for fashion designers to personalize and individualize its cleaning products. In 2008, they were identified according to the hobbies, age, level of education and backgrounds of the players which are represented on them. Storytelling and dramatization seem to be the new way of thinking product in point of sale³. **Through the positive emotions generated, the product on the shelf must be distinguished – differentiated –from the hundred others and the consumption experience memorized. Users must become attached to it as it is displayed at home and finally purchase it again because it has become familiar.**

Reading the comments of a marketing manager in the professional literature who praises the commercial advantages of products from the realm of play is enough to convince us of this: *“We always start with a consumer situation where there is an advantage in having a designer or “better looking” product. We found that female consumers were hiding their washing up liquid, although the proper place for it is on the sink. They wanted something different (...) This was a product visible to everyone, family or guests. A nice, original design comes into its own here, but it has to be in addition to the expected performance (here, cleaning and perfume)”⁴. Nowadays, a cleaning product must be attractive and on display within the home. All in all, contrary to common health sense; for commercial reasons, there is no longer anything to dissuade a child from investigating a hazardous product. Nothing to discourage the brand Alessi, the player in the world of design which considerably influenced Donald Norman’s work on emotional design, from taking part in the creation of a toilet block resembling a toy... In 2001, already, a washing product had been designed to look like a bath gel pearl, the sign of a trend towards “cosmetization”, destined to incorporate the cosmetic aspect with cleaning products.*

¹ Norman D. A. (2005), *Emotional Design - Why we love (or hate) everyday things*, New York, Basic Books.

² Creusen M. E. H. and Schoormans J. P. L. (2005), “The different roles of product appearance in consumer choice”, *The Journal of Product Innovation Management*, no. 22, p. 63-81.

³ Filser M. (2002), “Marketing of experience production: theoretical framework and managerial implications”, *Décisions Marketing*, 28, Oct.-Dec., p. 13-22.

⁴ Quoted by Cristofari J.-F. (2008), “Packaging et produits d’entretien font bon ménage”, *Marketing magazine*, no. 122, p. 61-66.

Food codes, which convey “generosity” and “supreme indulgence”, to refer to a vocabulary once again borrowed from the professional literature, are also extensively copied on all sides. This is demonstrated by the creation of soap shaped like macaroons, with the help of a well-known Parisian producer. Will someone one day perhaps try to eat them? Maybe this has already happened and we do not know. And maybe they will once again say that it is an accident, a mistake for which the poisoned person and not the producer is responsible.

Despite the statutory provisions we mentioned above, these elements are not hidden from the general public. On 15 June 2009, the magazine “*A nous Paris*” contained a feature with a full page collection of food-inspired cosmetics. Certainly, precautions are taken: on one product, it is clearly mentioned that the product is not for eating; on another (on the toilet block just referred to), it is expressly written “*this is not a toy*” although everything about its appearance is designed to make one think so.

A web site devoted to packaging recently mentioned, in the presentation of a cosmetic: “*Beware. Ladies who usually put some of their beauty products in the refrigerator should be careful at desert time. X exhilarating cleansing foam is not chantilly cream*”. A strange launch for a cosmetic... Any marketing specialist knows that “Beware” should under no circumstances be used on a new product. However, it is still possible to confuse it with cream. The front of the pump bottle claims nothing other than a “chantilly texture”.

3. From poison control centre to experimentation

Generally speaking, people who poison themselves with household products and call the emergency services (including poison control centres) feel guilty, blaming it on their carelessness rather than the product packaging.

It is not always those who create household products imitating the presentation of foodstuffs who are accused by patients. **However, research shows to what extent human error is generally caused by an object’s poor design².** Are these products which are crying out to be eaten really likely to be eaten? As for the nine other French centres, the emergency telephone hotline of the Marseille poison control centre connects a patient with a doctor. All the information collected on these poisonings is then compiled in a national database, which gives access to the patient’s name, their medical file, the incriminated product and the context of the poisoning.

As children have poor risk perception, of the calls received at the Marseilles poison control centre, only cases of poisoning involving adults are examined. It can be assumed that poisoning of adults by a particular product will invariably be repeated with children (and the elderly, who likewise have poorer risk perception).

The Marseille poison control centre treats some 25,000 cases every year. Analysis of the cases selected is based on their encoding as an everyday accident and their description in the medical file. Cases involving children and the very elderly and cases of defective risk perception affecting people with dementia or suffering from

¹ Emballagedigest.fr (2005), “L’hygiène beauté se fait mouser”, 30 June; www.emballagedigest.fr/blog.php?2005/06/30/1181-hygiene

² Norman D. A. (2002), *The Design of Everyday Things*, New York, Basic Books.

psychiatric problems are excluded. Cases where a hazardous product is removed from its container and poured into another one (generally a drink bottle) are not used either.

The most relevant calls (around 1 file out of 100) are also listened to, transcribed and analysed in linguistic terms based on the analysis of FAKE in conceptual metaphor theory. In line with George Lakoff and Mark Johnson¹ work in the early 1980s, our approach examines whether domestic products or cosmetics, ingested or not, are considered as FAKE foodstuffs².

Let us take the example of the man who, according to the description in the medical file, bought a new fluorescent green shower gel with extracts of orange at the supermarket. His wife confused the product with orange juice and drank a mouthful of it. It remains to be determined whether the confusion is the result of the context or the packaging. If the product was ingested for the simple reason that it was inadvertently placed in the refrigerator, this would certainly reveal a problem of categorisation but the poisoning is perhaps due, above all, to a mistake when putting the product away. If it had been put somewhere else, the product would perhaps not have led to a poisoning.

Brain sciences prove useful in **trying to identify what is due to a fault in categorization and contextualization**. This involves firstly analysing consumers' emotional reactions³, when they are shown products which may or may not have caused poisonings, through a series of experiments. These products were chosen precisely because they were involved in actual cases of ingestion resulting in the creation of a medical file by the Marseilles poison control centre. It is thus a matter of **identifying what, in consumers' behavioural reactions, distinguishes them from products with more neutral packaging, in particular, when it is not inspired by the realm of food**.

Thanks to functional Magnetic Resonance Imaging (fMRI) **any activation of gustatory processing areas** at the sight of these products⁴ is brought to light (in the insula and the orbito-frontal cortex). It can thus be determined if individuals **have made inferences on a product's taste from the mere sight of its packaging**. fMRI results are not always "consistent" with what people say and their comments are often a retrospective rationalization of their behaviour. But fMRI can identify activation of the gustatory cortices, showing congruence between an individual's subjective experiences in the field, i.e. social science data, and laboratory data. This gives information on the cerebral correlates activated on presentation of a product implicated in a household poisoning.

¹ Lakoff G. and Johnson M. (1985), *Les Métaphores dans la vie quotidienne*, Paris, Éditions de Minuit.

² Basso F., Robert-Demontrond P. and Oullier O. (2009), "De la théâtralisation du point de vente à la dramatisation du lieu de vie: une analyse métaphorique de l'expérience de consommation de produits d'hygiène", in Filser M. (coord.), *Actes des 14^e Journées de recherche en marketing de Bourgogne*.

³ These reactions are measured using the electrodermal response which measures changes in skin conductivity and represents a peripheral manifestation of the brain's "emotional" activity.

⁴ Simmons W. K., Martin A. and Barsalou L. W. (2005), "Pictures of appetizing foods activate gustatory cortices for taste and Reward", *Cerebral Cortex*, 15(10), p. 1602-1608.

4. From the circumstances of an unintentional ingestion to a prevention solution

This approach corresponds to the definition of the emotional design of products implicated in accidental poisonings. According to Norman, there are three dimensions to emotional design: **visceral, behavioural and reflective**. The first is automatic and unconscious at the mere sight of the product. The second is also automatic and unconscious but it comes from interaction with the object, not just the sight of it. The last is, on the other hand, conscious and its judgement is subjective, that is, mainly dependent on the experience of each individual.

The behavioural manifestations of the emotional design of these products have been observed **retrospectively** by the study of the cases collected by the Marseille poison control centre. Electrodermal reactions and fMRI respectively complete this analysis from the point of view of visceral design and reflective design.

At visceral level, the analysis is confined to a statement by the individual on the positive or negative valence elicited immediately when the object is presented and lends itself, according to Norman, only to physiological measurement. Consequently, if subjects are exposed to photos of products implicated in poisonings, **electrodermal measurements**, under certain time conditions, **combined with a statement on the valence of items perceived**, are a means of identifying **subjects' visceral emotional reactions**.

Analysis of the reflective level, related to the subject's real life and conscious experience, is **based on cerebral imaging (fMRI) to observe whether the presentation of photographs of cleaning products implicated in poisonings activates subjects' sense of taste**. For a cleaning product ingested in a laboratory context, there may be an additional index of its categorization as a foodstuff.

After these experiments, it could be maintained that the aesthetic rationales of emotional design used in the commercial differentiation of cleaning products at the point of sale, are involved in unintentional ingestions.

And then what? What solution can be proposed? Try to **suggest, in children and adults, an intuitive perception of risk, not based on a purely "cognitive"** (or educative) **approach**, as a code to be learnt. The aim is not to put up a barrier against the marketing of appealing cleaning products but to know how to identify them and extend the practices used for hazardous chemicals to products which can potentially lead to poisoning. It is compulsory for there to be a little triangle, identifiable by touch, on the bottles of certain powerful detergents.

In ergonomic terms, touch would appear to be the appropriate solution, suggested by prevention ergonomics research¹. This is also true in social terms, given the ageing population.

In the light of these points, this is an original solution using the role of multi-sensory coordination¹ in risk perception by the consumer, through a bimodal warning. It is in

¹ Kalsher M. J., Cote M. B., Champagne M. V. and Wogalter M. S. (1997), "The effects of a raised label border on warning effectiveness measures", *Proceedings of the Human Factors and Ergonomics Society 41st Annual Meeting*.

fact specified in DRT circular number 13 of 24 May 2006 that “*containers holding very toxic, toxic, corrosive or harmful preparations [...] must have a danger warning detectable by touch*”.

With a **bimodal warning**, it could be possible to make use of visual-tactual incongruities² which indicate by touch the existence of a risk on products which could be considered as attractive to the eye and lead to confusion. In this way, attention is drawn to the product’s conditions of use while bringing into play a non-cognitive aspect, by generating an emotion of surprise. There is thus no code to be learnt. This primary emotion is by definition shared by everyone, whatever their age.

A tactile warning would be placed on the bottle (on the handle or the gripping area) of a product liable to be ingested. This solution could be extended to the problems of removal from the original container using a container designed to enable everyone to safely pour their cleaning products into other containers.

This system would have the other advantage of developing corporate social responsibility, while allowing them to continue to make cleaning products appealing. In this way, an “accommodation solution” would be developed, preserving corporate interests while preventing poisonings.

To sum up, **the results of our product experiential approach would be used to prevent poisonings at home through mix-ups**. If these approaches are effective at selling, they can also be effective at protecting the consumer. Ultimately, social use of preventive results will be more fully adopted by companies themselves, if it is based on tools they are already aware of. The solution put forward here should enable firms to reconsider their social responsibility by applying the theoretical concepts they use for other purposes in addition to their commercial rationale.

Given the rapid dissemination of information on the internet and the organization of consumer resistance practices on the web, this opportunity is far from insignificant. Not unrelated to this research, Julien Bouillé experimentally tested the effect that media coverage of an appeal enhanced personal cleansing or household cleaning product implicated in an unintentional ingestion recorded by a poison control centre could have on internet surfers’ boycott intentions³.

These efforts combined under the umbrella of a multi-disciplinary approach should help achieve better understanding of the causes of unintentional household poisonings and demonstrate the risk sometimes associated with marketing practices which dismiss health problems (*Box n°11*).

¹ Multi-sensory integration describes the fact that the result obtained from the stimulation of at least two sensory sources differs from the result of individual stimulation of each sense. The resulting hypothesis is that the product of the interaction of these multiple sources is integrated (it forms a specific whole). See the reference work by Calvert G., Spence C. and Stein B. E. (2004), *The Handbook of Multisensory Processes*, Cambridge, MIT Press.

² Schifferstein H. N. J. and Spence C. (2008), “Multisensory product experience”, in Schifferstein H. N. J. and Hekkert P. (coord.) (2008), *Product Experience*, Elsevier; Ludden G. D. S., Schifferstein H. N. J. and Hekkert P. (2009), “Visual - tactual incongruities in products as sources of surprise”, *Empirical Studies of the Arts*, 27(1), p. 61-87.

³ Bouillé J. and Robert-Demontrond P. (2009), “Meso-dynamiques de la résistance des consommateurs et Webactivisme: apports théoriques et méthodologiques de la psychologie sociale”, in Filser M. (coord.), *Actes des 14^e Journées de recherche en marketing de Bourgogne*.

Box n°11

Neuroscience, sensory congruence and household poisonings

During the “Neuroscience et prévention en santé publique” seminar, Gemma Calvert talked about other types of research linking the neuroscience, sensory congruence and household poisonings.

“During an experiment conducted with the members of my team, we worked on household cleaning or cosmetic products. We recorded the cerebral activity of consumers exposed to stimuli of different kinds (smell, colour and shapes) as well as to bimodal combinations, congruent or not, like the smell of strawberries associated with a red or blue object.

Our study, like several already carried out in different contexts, confirms that the orbito-frontal cortex is a region of the brain which encodes the pleasure associated with a stimulus in a linear manner. When people smelled only food odours, orbito-frontal cortex activation increased significantly, just like the degree of pleasure they stated that they felt). Combining one of these smells with congruent visual information (a strawberry smell and a red object, for example) caused an even higher level of activation of this region of the brain. On the other hand, we observed a decrease in activity when the colour did not correspond to the smell. In fact, cerebral activity in the orbito-frontal cortex under non-congruent visual-olfactory conditions was even below that recorded when the smell alone was present.

These results, published in the Journal of Neurophysiology, were the starting point for studies that we conducted in partnership with the perfume industry and consumers’ associations which wanted to understand how packaging could influence perception and what types of warning would be the most effective in avoiding ingestion of toxic products”.





PREMIER MINISTRE



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Improving public health prevention with behavioural, cognitive and neuroscience

Supervised by
Olivier Oullier and Sarah Sauneron

Rapports et documents

Improving public health prevention with behavioural, cognitive and neuroscience

Report handed to Nathalie Kosciusko-Morizet, Secretary of
State for Strategic Planning and the Development of the Digital
Economy

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