Non-Attentive Smelling and Perfumery Practices

The key function of scent in subconsciously shaping all aspects of consumer perception

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Odor scientists have claimed that when humans smell things, it usually happens without their giving any conscious attention to the odor (see sidebar — Scientists on Awareness of Odors). Recent research has confirmed this assumption; it has, moreover, thrown light on the conditions under which smelling tends to become attentive.

T. Lorig, a leading American investigator of the electrical changes occurring in surface layers of the human brain upon exposure to odors by measuring the so-called "chemosensory event-related potential" (CSERP),[i] surmised that "odor is a part of multi-dimensional stimuli such as food but is only recognized when […] a discrepancy is present or until an active search for an odor is initiated."[4] B.M. Pause, K. Krauel and others have substantiated this in more recent CSERP research.[6] These authors showed that discrepancies from expected odors were detected even under non-attentive conditions, but, when detected, set the stage for the allocation of attention.[7] Other stimulus features contributing to attention triggering, depending upon their magnitude, were the odor's intensity and the degree to which it was liked or disliked. The authors found, moreover, that brain responses to odors were enhanced by attention to the odors, which in turn depends on the odors' relevance to the specific task at hand.[6,8]

In light of these criteria, it is reasonable to assume that in the daily use of personal, household and laundry products, consumers' attention to their odor is not triggered.

[i] We speak of 'chemosensory' rather than of olfactory potentials because the majority of odorous stimuli are accompanied by stimulation of the trigeminal nerve, which causes a more or less pronounced stinging or burning sensation. We speak of 'event-related' potentials because similar patterns of response can be induced by imagining an odor as by actually smelling it.

Scientists on Awareness of Odors

The zoologist Mykytowycz concluded an extensive survey on the communicative role of odors by stating that "in many behavioral situations, [...] *consciously or subconsciously*, our activities are still to a large extent modulated by information acquired through our sense of smell."[1]

The phenomenological psychologist Tellenbach remarked upon "how rarely smelling and tasting occur in comparison to seeing and hearing" and described the attitude in which smell and taste "are expressly and consciously employed and assessed" as an "unmasking and theoretical attitude" that "can dominate in a case of schizophrenic psychosis."[2]

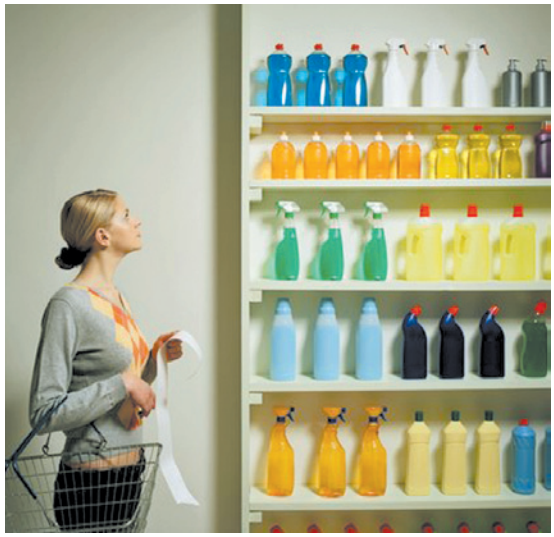
A pioneer of odor psychology, Trygg Engen, asserted that "the sense of smell continues to function without constantly intruding on consciousness; it is always ready to arouse attention."[3]

The brain electrophysiologist Tyler Lorig observed that "one of the most remarkable and interesting characteristics of odor perception is the singular inattention to odor information which humans display."[4]

And a leading European odor and taste psychologist, E. P. Köster, recently summarized his experience in decades of research by stating: "In olfaction awareness of odor is exception rather than rule."[5]

Except in cases of brand switching, product spoilage or lapses in quality control, the odor is highly unlikely to deviate from the user's expectations. The expectation that all will be as usual makes a conscious examination of the scent irrelevant, nor does the scent usually draw attention to itself by high intensity or by pronounced attractiveness or unpleasantness.

Perfumes for personal, household, laundry and other "functional" products (as distinct from products which are used primarily for the sake of their fragrance) account for a large portion of the sales of the perfumery industry. The contention that the consumer, in the daily use of such products, pays little or no attention to their odor may appear to be a blow to the standing of the industry. In this paper, I will argue that this is not the case: even without paying attention to the odor of functional products, the consumer is influenced by it in his or her attitudes and actions with respect to these products. What's more, I will try to show that some apparently diverse time-honored practices in industries that create fragrances and that employ them in their products can actually be explained on the basis of consumers' tendency to smell without attention.[ii]



If consumers prefer, say, a certain car in blue to the same model in green, people are well aware of the reason for their choice; in the case of preference based on odor, things are different.

How Fragrance Affects Consumer Expectations About a Product

Nearly all personal, home and laundry care products are scented; a host of other consumer products not used primarily for the sake of their fragrance are scented as well. The reason for this is obvious: consumers prefer pleasantly scented products to products with a less attractive scent. In this context, perfume has been called "the ever-present persuader."[9] The author of a German treatise on cosmetics was pronouncing a platitude when he remarked: "It is well known that soaps, skin and body care products are always judged first and bought because of their *scent*. What smells good is preferred."[10]

This phenomenon is commonly considered to be simply a case of aesthetic preference. Aesthetic preferences are a widespread phenomenon, by no means restricted to odor. People will, for example, prefer a car in their favorite color over the same model in a color they like less. There is, however, an essential difference between consumer preferences based on visual features and preferences based on olfaction. If some people prefer, say, a certain car in blue to the same model in green, they are well aware of the reason for their choice. They don't think that the blue car will be better on acceleration or gas mileage — they just like the color better. In the case of preference based on odor, things are different.

In scented products, the so-called halo effect of fragrance is often observed.[11,12] This term designates people's tendency to generalize a positive or negative attitude toward a person or an object, produced by one attribute of that person (or object), to any other attribute they are asked to judge. Halo effects have been thoroughly studied in social psychology following their discovery in 1920; much of this research has centered on the effect of physical attractiveness on the evaluative judgments about people on a host of other dimensions.[13,14] In personal products, a pleasing scent can serve a function similar to a person's pleasing appearance. Although well known among perfumers, the halo effect of scent is represented in the technical literature by only a few scattered reports. In these, scent was shown to affect the judgment on women's stockings with respect to texture and looks and the evaluation of shampoos with respect to rinsing, foaming and giving luster to hair.[15-17]

A good explanation of this curious phenomenon rests upon the hypothesis that the scent of perfumed functional products is usually perceived non-attentively, and consumers typically are not aware of perceiving an odor at all. Consequently they attribute their odor-induced attitude to other product features of which they are aware. This view is in line with a leading social psychologist's definition of implicit cognition, of which the halo effect is considered to be a typical manifestation.[18]

Although the halo-effect constitutes evidence in support of the non-attentive smelling theory, it

[ii] This paper is based on essentially the same information as my earlier publication, *Implicit olfaction: Effect on use of fragrance in functional products.* Cosmetics & Toiletries, **118**(6), 47-64 (2003), but uses it within a different perspective.

cannot be considered proof of the theory, because halo effects could also occur if consumers are aware of the product's scent. This would be the case if the consumer thinks of fragrance not as an *additive* to fragrant products but as an *inherent feature* of them, indicative of the product's essential nature, "belonging as much to its character as the color or smoothness of skin belong to [an] apple."[19] Such a view requires a person to think of personal or household products not as the end result of a complex manufacturing process and containing many diverse ingredients, but as something organic, like a natural product whose attributes and sensory properties are interdependent. There would then be awareness of the presence of scent, but not of its "separateness" from the product in the development and manufacturing processes.

> "Ask the man on the street if he likes to use perfumed soap, and he will probably look at you a little queerly. Give him two bars of soap, one containing a pleasant though not too strong aroma,[iii] and the other no odorous substances, and there is no question about his choice. He likes the pleasant smell on his hands, face, body. He does not know that all toilet soap is perfumed." [20]

This remark was published 60 years ago. Even if this seems unlikely in an age when fragrance is commonly listed as an ingredient on product labels, and frequently discussed in the consumerist press, there may still be truth in it today.[iv] If so, it is due to a lack of attention not at the level of perception but of cognition, of giving thought to how everyday products are actually produced.

The phenomenon of reacting to a stimulus, made up of independent features, as if some of these features were related to each other is well known in psychological research. It has been studied particularly in connection with human faces and is referred to as "holistic representation."[21,22] (See F-1 for two cognitive internal representations of fragranced products.)

Alongside the generalized positive effect of pleasing scents, product marketers often additionally use fragrances to raise consumer expectations with respect to specific product attributes — for example, natural, trendy or soft.[11,23,24] The effectiveness of fragrance in this sense has been

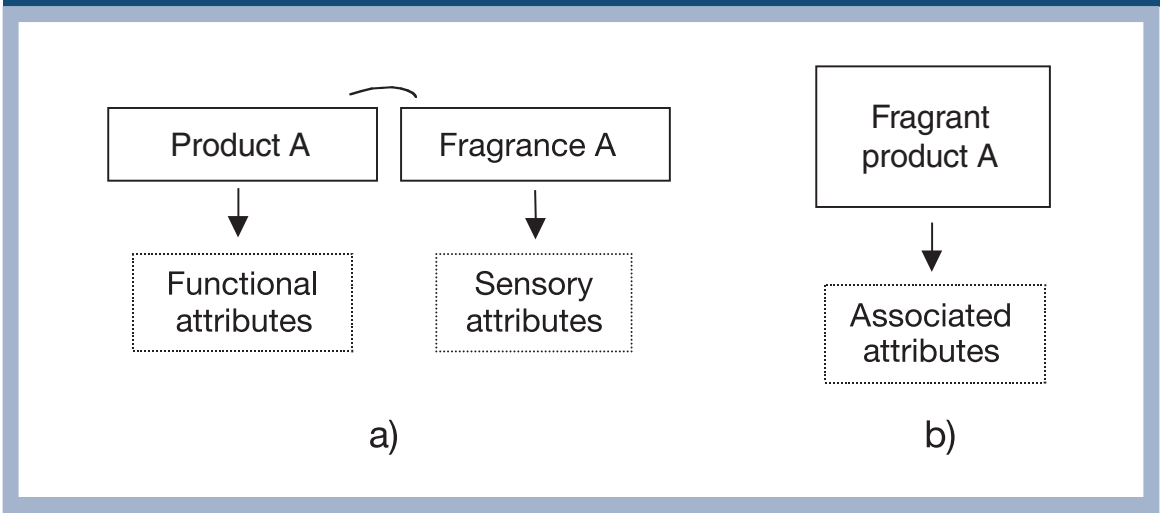
[iii] This restriction is important: an unusually strong odor would create awareness of itself. Moreover, a decisive rejection of too-strong stimuli (as opposed to indifference to too weak ones) seems to be a universal feature of human olfaction. It is as though we resent being aroused out of our non-attentiveness.

[iv] In the case of products that are homogeneous and, in themselves, shapeless — liquids, creams etc. — the illusion of non-separateness may also apply to color. In consumer tests, pink creams tend to be judged as more cosmetic than white ones, off-white ones as more natural than totally white ones.

Two cognitive internal representations of fragrant products **F-1**

a) In the analytical (perfumer's, product formulator's and manufacturer's) representation, the fragrance is recognized as such; it is considered to have no relation with the product's functional attributes

b) In the holistic (consumer's) representation, the fragrance (A) is either not consciously perceived and not cognitively represented at all, or it is cognitively represented as an integral aspect of the product, organically linked to its functional attributes; all attributes of the fragrant product become associated with the product and its scent alike



Unique Odor Perception

An early authority on the chemistry of odor materials, M.T. Bogert stated: "The description of a perfume will vary with the describer."[58] Trygg Engen noted that "the way people describe odors is quite idiosyncratic compared with their description of colors, because description of odors is influenced more by individual experiences than by inherent neurophysiological processes."[3] In a study of reactions to verbal vs. olfactory cues, L. Bonfigli and her coworkers found olfaction to be "a less conforming modality."[32]

repeatedly confirmed in consumer research. Even the small number of relevant studies that have been published show that fragrance can substantially affect consumer expectations regarding functional attributes such as gentleness in toilet soaps and cosmetic emulsions or therapeutic action in cosmetics, as well as social attributes such as the appropriateness of soaps for women, for men or for the whole family.[25-27] Again, the efficacy of fragrance in these contexts depends on the transfer of features of the fragrance onto the product as a whole, be it as a result of non-attentive smelling or of the "integral feature of an organic product" assumption.

The dominance of citrus fragrances in all types of household cleaners is related to the associations of freshness, cleanliness and compatibility with kitchens that this note has acquired.

How Scents Used in Products Acquire Meanings

There is widespread agreement among odor psychologists today that people's reactions to an odor, including the odor's degree of appeal or rejection, are related to the *associations* that it triggers in the mind of the perceiver, and that these associations are largely learned from earlier experience. In the concluding chapter of his first book on olfaction, Trygg Engen stated: "The central idea of this book is that the sense of smell is shaped by experience; that is, odors become meaningful through association with other events."[28] E. P. Köster described the links-by-association between odors and emotions as "simply the result of contingencies."[5]

L. Bonfigli and her coworkers noted that "odorants exhibit associative links only with events actually experienced in the presence of odors."[32] If odor meanings and the emotions triggered by odors can be attributed to the vagaries of individual life experiences, it follows that they must be subject to great and unpredictable variation between people (see sidebar — Unique Odor Perception).

There is a conflict between such notions of odors acquiring meaning through individually experienced incidents, and the practice of using fragrance in products for the mass market. Mass marketing, after all, requires predictability of odor meanings and odor preferences, if not for an entire target population then at least for sizeable segments of that population. An essential skill of a good perfumer and of a good fragrance evaluator is the ability to provide educated guesses as to how the intended users will respond to the fragrances they create or evaluate. This implies that responses to fragrances are to a certain extent predictable.

The French odor psychologist Jean-Noel Jaubert, while also postulating that olfactory sensations are interpreted on the basis of associative memory, provided a way out of this conflict by distinguishing between different "registers" of associations.[31] Along with associations with specific significant events or people in the individual's life, Jaubert recognized associations with odor sources such as fruits, flowers or perfumes. The latter, he said, are "among the most frequent ones." They are formed in the course of repeated encounters with the odorous objects during which these are seen and touched (and, one might add, named) as well as smelled.[v]

Consumers' associations with the scents of products they use belong to the "odor carriers" or "odor sources" register, not to the highly personal significant events or people registers, which odor psychologists have tended to give most of their attention.

The strongest and most widely shared associations attached to functional products' scents are likely to be those with the products in which they are incorporated and with the situations in which such products

[v] This view is supported by experimental evidence suggesting that the memory code for odors may incorporate semantic information [H.A. Walk and E.E. Johns, *Interference and facilitation in short-term memory for odors*. Perception & Psychophysics, **36**, 508-514 (1984)]. Recent findings that 'odor sources' (semantic) memories appear to override 'significant events' (episodic) memories (ref. 49) offer further evidence of the importance of the associations formed in frequent casual encounters with odorous objects.

are commonly used. With every use of a product, the scent and the product's other attributes are perceived together — their "going together" is confirmed and reinforced. These associations thus constitute the "meaning" of these scents. In this way, the scents, say, of familiar shampoos, with their associated meanings (gentle, effective against dandruff, glamorous, etc.), become the points of reference for consumers sniffing at any new shampoo.

This contention, although never tested directly, has found incidental support in scattered consumer research. In a US study from the early 1990s, respondents showed their awareness of the odor of popular products of the day by rating a laboratory sample of a household cleanser significantly higher ($p < 0.1$) if it was lemon scented than if it was unscented or coconut-scented, and by rating a sample of a sunscreen lotion significantly higher ($p < .01$) if coconut-scented than if lemon- or unscented.[30] In a German investigation, free associations were elicited to 12 odors, presented without identification.[31] The most frequently used category of responses (excluding three odors that were rated as distinctly unpleasant) referred to scented consumer products: household cleansers in response to terpineol; cold remedies, creams or bath products in response to lavender oil; personal products such as soap, deodorant or foam bath in response to a blend designed for a "neutral" effect and to a blend designed to be "cosmetic." In a recent Italian study, free associations to six odor samples (rose, lavender, mandarin, vanilla, cinnamon, mint), presented unidentified, included references to room deodorant, soap and sun care for rose, detergent and laundry for lavender, and various flavored products for the other stimuli.[32,vi]

In stating that the product in which a given scent is used is the main source of that scent's "meaning," we assume that this meaning arises from the main benefits of the product category involved, the common situations of product use, and the marketing mix for a specific brand which includes product and packaging design as well as advertising claims. This assumption is supported by experimental evidence. Consumer tests have demonstrated differences in the ratings of fine fragrances on preference, sweetness, intensity and other attributes depending on whether they were presented unidentified or with their packaging, as well as the effect of label color on the rating of fragrances with respect to various attributes.[33-35] Shifts of the meaning and acceptance ratings of odors, explicitly presented, caused by varying the verbal descriptions provided with them, have been demonstrated recently.[36,37]

The most compelling evidence for the "products as meaning-givers" hypothesis comes from the fact that it justifies and explains a time honored practice in the fragrance creation and scented products industries: the practice of analyzing the fragrances used in a given market, together with the positioning of the product in which each occurs, before creating and evaluating fragrances for a new product intended for this market.[vii]

[vi] As is common in most academic olfaction research, the test subjects in all three studies were university students, with test population sizes ranging from 20 to 50 and 53 (refs. 32-34).

Can Non-Attentive Smelling Create Scent Associations?

Engen stated that "the odor per se may only be an incidental and non-functional attribute" of situations in which meaning-creating associations are formed; he spoke of "incidental associations."[28] Referring to the links-by-association between odors and emotions, Köster remarked: "many, if not most of these links are created without learning intention and are simply the result of contingencies in which the subject may be unaware of the presence of the odor."[5] The development of links in the course of repeated inputs perceived without con-

[vii] Such systematic analyses of fragrance landscapes become necessary once perfumers are asked to create fragrances for markets with which they are not familiar by personal experience. It was not by accident that fragrance companies instituted evaluation boards when their customers' business became multi-national or global.

scious awareness is in line with Jaubert's "odor sources" register of associations.[29] It is also compatible with the connectionist model of learning and cognition that has today become widely accepted among cognitive psychologists.[38] This model provides a powerful rationale for the existence of two complementary learning systems in the human brain. The two are necessary because of

> "a fundamental tradeoff in learning. On the one hand, successful adaptation requires organisms to extract and represent the general properties of the environment. On the other hand, it also requires that organisms learn and remember many of the important specifics of the world — where you parked your car today, the name of the person you just met, where food or predators were encountered, and so on. These objectives are incompatible because one representation cannot simultaneously capture generalities and specifics. Furthermore, the learning mechanisms required to form these different kinds of representations have contradictory properties. Acquiring the generalities requires slow, incremental learning that integrates over specific instances, whereas acquiring specifics often requires fast learning that keeps the specific instances separate."[39]

Cognitive psychologists usually refer to the slow, incremental process as "implicit" or "non-declarative," indicating that I, as a subject, am unaware of what I am learning and cannot express it in words, and later use the acquired knowledge without knowing how I acquired it. Implicit learning typically takes place under conditions of low attention and has been demonstrated in a wide variety of mental processes.[40] Thus, social psychologists have found implicit processes to be involved in the formation of attitudes, stereotypes, self-image and other aspects of social cognition including non-verbal communication, emotional appraisal, intuition, and the halo effect.[18,41,42] Cognitive psychologists have demonstrated effects of non-attentively processed cues on the attentive processing of words.[43,44] Experiments on visual perception have shown that implicitly perceived contextual features affect performance in spatial orientation tasks.[45] A brain imaging study provided evidence that odors affected the learning of words differently, depending on whether these odors were consciously or unconsciously perceived.[46]

A growing number of experiments demonstrate that in the case of odors as well, associations can be formed, and meanings learned, by implicit processes. Associations between an odor and the physical or emotional context in which they were first experienced have been shown to be formed non-attentively or without awareness of the odor's presence.[47-51] Such associations can be formed at a very early age when there can be no question of conscious learning intentions.[52,53] They may persist over some time, even for many years.[51-53] It appears then that non-attentive smelling could well be part of the explanation of the time-honored practice of perfuming functional products in order to enhance consumer expectations and attitudes about them.

Product-to-Product Association Transfer

If product scents are associated with well-known products in which they are used, and if consumers transform associations with a product's scent into expectations about that product, then a scent that evokes associations with a successful, well-established product — in other words, a scent that reminds one of that product — could be used to generate positive expectations in another product of the same or a related category.

An American perfumer's description of a specific case of such product-to-product association transfers will illustrate the practical power of such transfers:

> "...one famous example — the Johnson & Johnson Baby Powder fragrance, a powdery rose accord — [...] [has] probably become the most overdone fragrance type of the past three decades. This fragrance implies — on the very first whiff — softness and babies. All perfumers [...] know how difficult, if not impossible, it is to change the mind-set of marketers and formulation chemists away from the J&J type when discussing fragrancing baby products, bathroom deodorants or any other product which might demand a powdery fragrance type. The marketing request is usually for something new and different, but which smells like J&J Baby Powder. There is fear of limited product acceptance by the consumer if it does not have familiar notes which can always be related back to the Baby Powder note."[54]

As long as branded and advertised scented consumer products have existed — that is, from the late 19th century onward — such scent-based association transfers have been ubiquitous. They may happen within a given product category, between related categories or, more recently, even between quite unrelated categories. Within a given category, the direction of such transfers is always from established to new products (from "trend-setters" to "me-too" products), from advertised to non-advertised, and usually from more to less expensive brands. In markets where both imported or global brands as well as products from local manufacturers are present, the fragrances of international brands often serve as models for the local ones. The psychological basis here is related to the halo effect: the similarity of scent between the original and the copy is intended to suggest similarity in other, not-so-noticeable quality-related attributes.

In transfers between related categories, the fragrance serves to transfer associations with a particular desired quality from one product to another; in the example of the Johnson & Johnson's fragrance, to transfer the impression of "softness" from the famous baby product to bathroom deodorants. The dominance of citrus fragrances in all types of household cleaners is related to the associations of freshness, cleanliness and compatibility with kitchens that this scent has acquired.[30] (For an illustration of fragrance as expectation carrier, see F-2.)

Transfers of fragrance types from high prestige fine fragrances to beauty and personal care products and even to laundry care are often referred to as the "trickle-down" phenomenon; by analogy, we could call the transfers within a given category as "trickle-within" and between related categories as "trickle-across." Cases of trickle-down have sometimes been explained on purely aesthetic grounds: "Fine fragrances have in recent years been a source of ideas which inspire the creation of a functional-product perfume."[55] There have also been suggestions that the transfer of specific desirable associations such as fashion, "lifestyle," "the

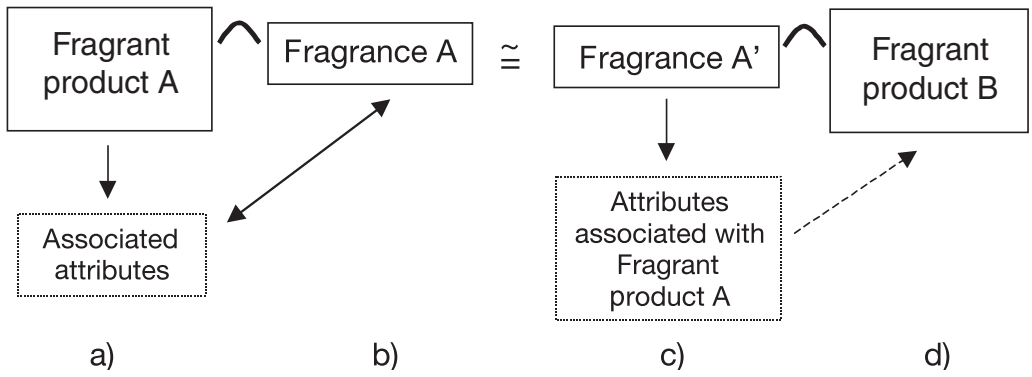
Fragrance as a carrier of expectations from one product to another (as an agent of trickle-down, trickle-across or trickle-within) **F-2**

a) **Using Product A, the consumer comes to associate specific attributes with it and with its scent which is due to Fragrance A**

b) **To the consumer familiar with Product A, the scent of Fragrance A alone can evoke the associations (s)he has with Product A**

c) **A different Fragrance A' can then evoke similar associations provided its scent is sufficiently similar to that of Fragrance A**

d) **When Fragrance A' is incorporated in Product B, the consumer familiar with Product A will expect B to have similar attributes as A, to the extent that these are compatible with the category to which B belongs**



spirit of the time" or "an aura of luxury and elegance" are involved here. [56] The relaunch of Procter & Gamble's Camay soap in the 1950s, in which a traditional medium-priced soap brand acquired new glamour and a dramatically increased share of market, offers a clear example of such a transfer. Along with a new formulation and color of the bar (feminine pink), the packaging was changed from plain to glossy paper, from multi-colored to pink, from a floral design to an elegant cameo decoration, and from a traditional floral note to a floral-woody-adehydic note with distinct resemblance to Arpège, one of the leading luxury perfumes of the day. The advertising claim "with perfume imported from France" ensured that nobody overlooked the message of the new fragrance. Chanel No. 5, the most widely known luxury perfume of all time, has been said to have "trickled down into almost every known cosmetic product and a few household ones too" and to have cast "almost a positive 'halo effect' over the product's acceptability."[55]

There exist cases where the mechanisms of the creative process or considerations of line extension, of chemical stability, of skin health or economic constraints have led to the use of similar fragrances in different products. The majority of cases, however, can be explained only on the basis of consumer psychology, on the alchemy of expectations. It is hard to imagine this alchemy functioning except by way of smelling that is non-attentive either at the perceptive or at the cognitive level.

The Imperative of Meticulous Odor Quality Management

One of the laws of fragrance production is that each batch of a given fragrance must be identical to the previous one. If a product manufacturer believes, rightly or wrongly, to detect a breach of this law, a strain in his relationship with the fragrance supplier usually arises, often leading to considerable expense to the supplier or permanent damage to the relationship. The question debated in such cases is never, whether the new batch is less good than the previous ones, but always whether it is different. Why is this so?

One of the key virtues of every frequently purchased branded product is its reliability. Being able to rely on the unchanging quality of the product greatly simplifies the consumer's shopping chore. The consumer therefore normally only buys brands he or she can trust, and continues to trust the brand unless, when picking the product from the store shelf or opening it, some feature of it deviates from expectation. Discrepancies from expectation have been shown, in many animals as well as in man and for different sensory

modalities, to lead to an arousing of attention. As we have seen (see the first section of this article), this also holds for odors.

Even in products where odor is a non-functional attribute and is normally given little attention, people are surprisingly quick to pick up odor deviations. This is probably related to the evolutionary importance of scent as a warning signal for abnormalities, such as the first signs of spoilage, in foods. And once a deviation in scent is detected, a negative halo effect is triggered: the aroused suspicion leads the consumer to expect, and perhaps to imagine, defects in other, more essential product features. [58] As in the case of positive halo, the effect may come about through implicit smelling or through the assumption of organic interdependence of product features.

Outlook

The model presented in this paper appears plausible on the grounds that it provides a coherent account of apparently disparate empirically observed phenomena that are so common as to be reflected in general industry practices. The model is compatible with recent findings in psychological and functional brain measurement research. It remains however, hypothetical until its premises have been directly experimentally verified.

For this purposed, it can be broken down into a set of testable hypotheses:

a) Consumers, in their daily dealings with perfumed functional products, pay little attention to their scent.
b) Having been repeatedly exposed to a functional product with a previously unfamiliar scent without becoming overtly aware of that scent, consumers will, when being exposed to that same scent some time later, associate it with the product category in which they had smelled it.
c) When comparing two unfamiliar samples of a functional product, identical except for their fragrance, under normal conditions of use, without having been prompted to pay attention to their scent, they will attribute better performance to the sample whose scent they prefer.
d) When exposed to scents identical with or similar to those used in popular brands of products which they regularly use, consumers tend to associate these scents with products of the category involved, with core benefits of this category and of this particular brand, and with typical use situations of products of this category.
e) When comparing a functional product sample similar in scent to their customary brand with an identical sample with a distinctly different scent, consumers expect the similarly

smelling sample to exhibit functional performance more similar to that of their customary brand.

f) In brands of functional products that they are currently using and have used over several purchasing cycles, consumers notice minor scent deviations in a newly acquired package.

g) Noticing deviant scent, consumers expect deviations in functional performance in the product batch concerned.

Experimental testing of these hypotheses would require a closer co-operation of perfumers and psychologists than has been customary in most past research on the psychology of olfaction. I suggest that such testing would be of considerable interest to odor psychologists and to the practitioners of perfumery alike.

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