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# A THEORETICAL INVESTIGATION INTO THE POTENTIAL APPLICATIONS OF OLFACTORY CUES TO THE MARKETING OF NEW PRODUCTS

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## Abstract

Olfactory cues are proposed as an economical means of increasing new product success rates. An investigation was conducted into the capability of ambient olfactory cues to improve new product adoption where scent was not a primary driver of purchase. The methodology consisted of secondary research analysis of relevant scent literature. Studies of innovation and new product marketing were also included in the analysis. It was found that it is theoretically possible to increase new product adoption through the use of olfactory cues. Consequently, four potential applications were proposed, suggesting ways in which this might be achieved. These applications are intended to provoke interest and further research into this new paradigm.

**Key words:** Olfactory cues; Scents; New products.

## Introduction

Innovation is the lifeblood of any major consumer goods company. It is the difference between sustainable long-term growth and ultimate failure. Consumers expect new products from companies, and those firms that 'decide to live on last year's products are courting bankruptcy' (Crawford, 2002). New product development is a very risky business however; the 'New Product Showcase and Learning Centre' in New York is filled with over US$4 billion worth of failed new products (Joshi, 2003). Estimates by marketing analysts state that as few as 2 of 10 new products will be successful, in some cases the number is as low as 1 of 10 (Keller, 2003). The marketing of new products looks set to become increasingly difficult in the future, as the escalating fragmentation of markets requires firms to target smaller market segments resulting in smaller profits and thus reduced launch budgets (Kotler, 2002). It is therefore increasingly important to find cost effective techniques for the successful launch and commercialization of new offerings. At the same time fragmentation of the media and the ubiquity of marketing programs means that launches must be increasingly creative to be effective amidst this 'background noise'. Most launch tactics are easily recognized by the modern consumer, who is increasingly marketing-literate, adding to the need for innovative marketing tactics (Donald, 2002). This paper puts forth the proposition that scent – in the form of olfactory cues – may be effectively utilized in the marketing of new products.

Olfactory cues are increasingly being used in retail and other marketing situations, but this avenue remains unexplored as an innovative means of marketing new products. Scents represent an economical method of affecting consumer behaviour in a unique fashion. Articles in the popular press document some of the cutting-edge organizations that already utilize scents in a variety of areas. The UK shirt-maker Thomas Pink suffuses its London stores with the smell of 'freshly washed linen', and British Airways scent their business class lounges with fresh cut grass and the smell of the sea (Butler et al., 1999). Rolls Royce adopted a similar tactic when they perfumed their car advertisements in the US publication 'Architectural Digest' with leather-scented fragrance strips (Ellen and Bone, 1998). These are situations in which scent is not a primary driver of purchase – scent is a primary driver in products such as perfumes or air fresheners – rather scent is used in the above instances as an ambient cue in order to affect behaviour.

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As opposed to the business practitioners' world, the academic community in marketing has been slower to validate the notion that scent can influence consumer behaviour in general, not to mention consumer response to launch of new products specifically.

This paper therefore endeavours to examine existing olfaction research from a range of disciplines (not limited to business and marketing disciplines), and apply it to the marketing of new products.

## Methodology

The methodology involves a comprehensive search of available literature that could contribute to our understanding of the potential application of olfactory cues in new product marketing, as well as literature on innovation and new product marketing deemed relevant to the potential usefulness of olfactory cues. The study of olfactory cues involved the collection of empirical research on olfactory effects from marketing perspectives and other fields of study such as cognitive neuroscience, behavioural psychology, environmental psychology, and cognitive psychology. Within the olfaction literature, studies regarding olfaction as a primary driver of purchase (such as in perfumes) were excluded from the analysis.

Relevant literature within the timeframe of 1970 to the present date was included in the study, though certain key texts from before this period have also been referred to.

No primary research was involved for a number of reasons. Preliminary study revealed that the specific association of olfactory cues with the marketing of new products is an unexplored paradigm in current marketing, psychology and olfaction literature. Therefore, it was felt that a thorough theoretical grounding was required before empirical testing of this paradigm could be effectively conducted.

## Literature review

### *Cognitive neuroscience*

Outside the discipline of business and marketing, a considerable amount of research has been conducted into the effect of scents on human behaviour. In 1953, Jim Olds made the discovery that stimulation of the rhinencephalic nerve produced a reward system, such that by introducing small shocks to this nerve, experimenters could manipulate the behaviour of rats[1]. Based on these early neurological studies there has been much interest in the possible links between olfaction, emotions, and behaviour. Could manipulating the sense of smell produce emotional and even behavioural effects in human beings?

Results of further neurological research asserted that of all the senses, smell is the most closely linked to the emotional centre of the brain. The nose and olfactory system is connected by abundant neuronal pathways to the periform cortex, amygdala and hippocampus (Castellucci, 1985). These are all part of the limbic system and have been linked to emotion and emotional behaviour, as well as memory.

On the other hand, the link between smell and behaviour was tested by Lorig and Schwartz (1988), who found that scents produced physiological responses in subjects. Variations in electroencephalograph (EEG) readings and respiratory patterns were caused by presenting subjects with different scents. Along the same line of study, Ehrlichman et al. (1997) found that the introduction of a pleasant odour reduced subjects' startle reflex to an auditory cue. Both studies show that olfactory cues could produce involuntary behavioural responses. However, generalizing these findings

[1] Jim Olds conducted an experiment in which a rat – with electrodes implanted on the rhinencephalic nerve – was placed in a box. Results show that 'the animal could be directed to almost any spot in the box at the will of the experimenter'. The rhinencephalic nerve extends from the rhinencephalon, a region that translates literally as 'smell-brain' because it reacts primarily to odour signals. This forms part of the limbic system, which is responsible for emotions and basic involuntary drives.

which are only about physiological and involuntary behavioural responses to much more complex consumer behaviour would be making a large suppositional leap.

Current understanding of olfaction suggests that the human olfactory system is capable of distinguishing between up to 10,000 different scents (Goldstein, 1999). Just a few molecules of odorant can produce recognition and awareness of an odour which in turn triggers memory and mental associations (Lee, 2000). Could these mechanisms be capable of engendering a range of learned responses desired by new product marketers? There is some empirical support for this tentative idea, as Spangenberg et al. (1996) report a 1987 study by Kirk-Smith and Booth in which the introduction of a scent improved subjects' evaluations of people in photographs. If scent can be used similarly in marketing to improve product evaluations it would prove invaluable.

***Behavioural psychology***

The optimal arousal theory, developed within the discipline of behavioural psychology, is based on the idea that hedonic tone (i.e. pleasant or unpleasant responses) is directly related to arousal levels (e.g. excitement, alertness) and these can be manipulated through stimulus intensity. The intensity effect is coined 'Wundt's curve' (Eysenck, 1973). Complete lack of a stimulus can cause a negative hedonic tone (unpleasantness), but as the intensity of the stimulus increases, the arousal levels also increase, and the hedonic tone raises above the indifference level to one of positive hedonic tone (pleasantness). Once a certain level of hedonic tone has been reached, however, further increase in the level of stimulation will result in a decrease in hedonic tone. It means that the scent will have an optimum level of intensity before it starts to be perceived as unpleasant. This notion is to some extent supported in the empirical literature, as Henion (1971) found that initially pleasant scents, when increased in intensity, led to a decrease in pleasantness rating.

The optimal arousal theory also asserts the importance of stimulus novelty to arousal and hedonic tone (Berlyne, 1973). Crowley and Hoyer (1994) explain that 'stimulus that are moderately novel, surprising, or complex will be preferred over stimuli that offer too much or too little novelty'. A stimulus should therefore aim at having an optimum level of novelty as well as intensity to achieve the optimal hedonic tone in the subject. The combined properties of intensity and novelty are termed the stimulus' arousal potential. The stimuli covered by the optimal arousal theory can be any stimulus including olfactory cues. It is theoretically possible to choose an appropriately novel scent and decide on an appropriate level of intensity of the scent so as to achieve the optimal hedonic tone in the consumer contributing to positive response to new product marketing campaign.

The concept of classical conditioning, whereby a conditioned stimulus is repeatedly paired with the product so that over time the product alone provokes the same response, was supported within the field of behavioural psychology (Pavlov, 1957). The potential implications of classical conditioning in new product marketing can be evident; if a scent (e.g. home baked cookies) that already provokes a certain reaction (e.g. feelings of familiarity and love) is associated with a certain product (e.g. a completely new brand), over time consumers would experience feelings of familiarity and love towards the product itself.

However, finding a scent that provokes the same conditioned response in different consumers may be difficult. In this case a marketer could employ 'higher order conditioning', in which a previously unconditioned stimulus is associated with a conditioned stimulus (that provokes a response in the consumer) so that, over time, the unconditioned stimulus evokes the same response that the conditioned stimulus does. The previously unconditioned stimulus can then be paired with a new unconditioned stimulus, to elicit the same response as the initial conditioned stimulus.

***Environmental psychology***

One of the most useful early frameworks within the field of environmental psychology is the Mehrabian-Russell model (1974), which adapts the Stimulus-Organism-Response (S-O-R) paradigm. The model purports that environmental stimuli (S), such as a scent, affect a subject's emotional responses (O), which in turn affect their behavioural responses (R). The emotional responses (O) to the stimuli are represented by three basic emotional states: Pleasure – Displeasure (hedonic

tone), Arousal – Nonarousal, and Dominance – Submissiveness. For example, a scent may cause feelings of happiness (Pleasure – Displeasure), alertness (Arousal – Nonarousal), and of being in control (Dominance – Submissiveness). The behavioural responses, according to Mehrabian and Russell, could be different depending on whether the subject is a 'screener' or 'non-screener'. Screeners automatically screen out less important environmental stimuli, while non-screeners are much more affected by high load stimuli. This screeners versus non-screeners concept, according to this study, can have important implications for the use of olfactory cues – identifying 'non-screener' consumers could significantly improve the effectiveness of scent in the marketing of new products. As olfactory cues are often processed implicitly (Lorig and Schwartz, 1988), consumers usually should not be able to screen out scents and are therefore by default susceptible to the influence of olfactory cues to varying degrees.

Coincidently, at a similar time when the Mehrabian-Russell model was publicized, Kotler (1973) suggested a theoretical concept that can be applied to the retail sector and that apparently coincides with the S-O-R paradigm. He noted that retail purchase environment (atmospherics[1]) is perceived through the senses and can thus be manipulated in sensory terms. He identifies four sensory channels that are of relevance to atmospherics, namely sight, touch, sound, and olfaction. Any of these sensory channels could affect consumer behaviour in three different ways. It can serve as an 'attention-creating medium' making displays or establishments stand out. Secondly, these sensory channels may communicate a message about the vendor's establishment as a 'message-creating medium'. Finally, the sensory channels may serve as an 'affect-creating medium', producing certain affective reactions in the customer.

Since Kotler's suggestion of the theoretical applications of senses in the retail sector, a number of empirical research studies have been carried out to investigate the actual effects of separate sensory variables on consumer behaviour, including colour (sight; Crowley, 1993) and background music (sound; Milliman, 1982). Apparently olfaction looks to be an under-empirically-researched sensory variable in the academic arena of marketing[2].

***Cognitive psychology***

Cognitive psychology which includes the research on memory suggests that scents need to be used carefully. Retroactive Interference (RI), first proposed by Keppel and Underwood (1962), suggests that information recall within the memory can be affected by irrelevant information. Subjects were less able to recall consonant trigrams if they had to learn another trigram before recalling the first. It follows that environmental stimuli that interfere with information recall, such as a scent that is irrelevant to the product, may produce avoidance behaviour. Conversely, odours that are relevant provide more information about the product, assisting in the consumers' information search process. This has been termed 'cognitive enrichment' (Mitchell et al., 1995). These concepts of retroactive interference and cognitive enrichment had been used to explain the results of experiments on scent and consumer behaviour as noted in the following section.

## Experiments on scent and consumer behaviour

A number of experiments were carried out in the last two decades to investigate the possible effect of scent on consumer behaviour. Hirsch and Gay's study in 1991 (cited in Spangenberg et al., 1996) examined the effect of an odorized room on subjects' purchase intentions of Nike athletic

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[1] Atmospherics in Kotler (1973) is referred to retail environment, i.e. place of purchase or consumption.

[2] There have been some theoretical studies specifically related to olfaction. For example, Gulas and Bloch (1995; cited in Davies et al., 2003) suggested that olfaction can be an environmental variable in marketing. They noted that choosing a scent which is pleasant and congruent to the product being promoted can help improve consumers' evaluation of the product.

There have also been some psychological or psycho-biological experiments using scent as a hypothetical variable. For example, Lorig and Schwartz (1988) found that scents may be processed either consciously or implicitly, while Aggleton and Waskett (1999) discovered that a distinctive scent significantly improved subjects' recall of a past experience, and therefore suggested that scents can trigger memories and remembered emotions which can last over a very long period of time.

shoes. The study found that subjects were more likely to purchase in an odorized room than in the identical but unodourized environment of the control condition. Hirsch (1995) later conducted another experiment by choosing slot-machine gambling as the context. Three separate areas of the Las Vegas Hilton were chosen for the three experimental conditions. Two areas were odourized with two different pleasant scents, while the third area was left unscented as a control condition. Hirsch found that the amount of money gambled in the area of the first odorant was increased by a significant 45.11% ($p<0.0001$) during the experimental period. However, spending in the area of the second odorant was not significantly different to spending in the control area. So while both odours were rated as pleasant in a separate preference survey, the study suggests that not all pleasant odours will increase consumer spending.

Though the above two studies seem promising for the potential use of olfactory cues, both have been strongly criticized. The experiment involving Nike shoes – while excitedly reported by the popular press – was found to not actually be statistically significant, and therefore must be empirically disregarded. The latter Hirsch experiment involving Las Vegas slot machines also has limited reliability as it was not conducted in a controlled environment. There exist many contaminating factors such as crowding – a well documented affecter of consumer behaviour (e.g. Hui and Bateson, 1991). The experiment was conducted over only 48 hours with no repetitions, and therefore the reliability of the result is questionable.

Spangenberg et al. (1996) then conducted an experiment to determine whether ambient scents (that is, an enveloping scent that does not emanate from a specific product) affect store and product evaluations or shopping behaviours. The main procedure tested the effects of scent affect (neutral versus pleasing) and scent intensity (low, medium and high) on the shopping behaviour of subjects in a simulated store environment. Spangenberg et al. found significant differences between the evaluations of and behaviours in a scented store environment versus the unscented condition. There are two other significant results arising from this experiment. First, scented store environment made subjects perceive that they had spent less time in the store than subjects in the unscented condition. The authors propose that the subjects in the scented condition enter into a 'state of flow' – a pleasurable state in which the perception of time is distorted. Second, evaluations of products that were already rated positively were not improved by the addition of an ambient scent. This finding has important implications for the use of olfactory cues. One weakness of the study is its limited applicability to the real world, as it was conducted in a simulated environment using 'virtual' products on a computer.

At a similar time, Mitchell et al. (1995) conducted a study on the congruity of a scent and its effects on consumer behaviour. The authors conducted two experiments. The first experiment tested subjects' choice between four varieties of product, using a computer interface in three experimental conditions (congruent odour, incongruent odour and no odour). The subjects' recall of product information was also measured. Results indicated that subjects spent more time processing product information when the scent was congruent as opposed to incongruent. Processing was also found to be more holistic: subjects considered all product attributes more evenly. This suggests that the subjects were engaging a more complex decision making process. The experiment failed, however, to find a significant effect for scent versus no scent: the addition of a congruent scent did not positively affect consumer behaviour, rather behaviour was negatively affected by the addition of an incongruent scent.

The second experiment investigated the effect of incongruent versus congruent scents on variety-seeking behaviour. The results indicated that when the odour is congruent with the product class, subjects were more likely to seek variety in their choices. They were also more likely to spread their choices evenly over the choice range, whereas those in the incongruent condition polarized their choices around their favourite option. Mitchell et al. proposed that when the scent is congruent with the product, 'cognitive enrichment' occurs, in which recall of memories relevant to the decision task is facilitated. In the incongruent condition, recall of the relevant memories is inhibited by memories relevant to the odour. This is supported by research on memory and the aforementioned theory of retroactive interference (Keppel and Underwood, 1962).

The initial studies of Hirsch and Gay, though largely criticized, did serve the purpose of stimulating a great deal of interest in the potential effects of olfactory cues. A profusion of experiments occurred in the 1990s that examined this paradigm, particularly in the fields of social and applied psychology. A study by Bone and Ellen (1999) endeavoured to correlate the results of all recent experiments on olfactory effects in the retail environment. Their analysis of twenty-two experiments includes a range of scent manipulations on cognitive, attitudinal and behavioural variables. They particularly examined three dimensions of scent: its presence/absence, its pleasantness and its congruity.

Of the experiments which examined the presence/absence of a scent, 55.6% found that scent significantly increased the liking/disliking of a product or environment. Intentions to visit or return to the store were positively affected by scent in only 43% of the experiments. As around about or less than half of the experiments found significant effects for the presence of a scent, Bone and Ellen conclude that 'evidence is stacked against the proposition that the simple presence of an odour affects consumer behaviour'. This does not seem to bode well for potential use of scents in marketing. However, the present study would argue that the Bone and Ellen analysis does not accurately reflect the findings of scent-effect experiments. Experiments such as the aforementioned Spangenberg et al. (1996) were empirically sound and did find significant effects for the presence of a scent. The correlation tests conducted by Bone and Ellen dilute the significance of this experiment and others like it by including experiments in which 'there was no information on the degree of pleasantness or congruity of the odour …'. In addition, the strength of the olfactory effect can be weakened by the differing methodologies of the experiments Bone and Ellen correlated. For example, some of the experiments directed the attention of the subjects to the presence of the odour while others did not.

On the other hand, the experiments of scent pleasantness were largely found (60% were statistically significant) to support the notion that greater pleasantness leads to more positive mood valence. Bone and Ellen also found limited evidence that scent pleasantness affects evaluative responses to an environment or product. These findings confirm that pleasantness plays an important role in the effectiveness of a scent.

The experiments on the effect of congruity indicated that this too had some relation to the effectiveness of an odour. They collectively supported the finding of Mitchell et al. (1995) that an incongruent scent seems to be detrimental to consumers' involvement and ensuring evaluations. This, like the findings for scent pleasantness, supports the notion that Bone and Ellen's earlier dismissal of the presence of scent effects in general seems to be too hasty.

In general the experiments and analysis discussed above contain their own methodological drawbacks, and the results are not totally consistent with each other. However, the trends exhibited in these results overall have demonstrated the potential of using olfactory cues, in the correct manner, to affect consumer behaviour in a way beneficial to the marketers. Along this line of thought, it is deemed theoretically beneficial for companies to consider the identification and manipulation of olfactory cues for increasing the effectiveness of marketing new products.

## Innovation and the marketing of new products

Innovation and the marketing of new products is a difficult challenge to marketers. As high as 94% of all new products fail (Crawford, 2002). Joshi (2003) noted that in the past ten years, four to five of every ten new products failed during their first 18 months to two years of launch. Hopefully, promotion can play a vital role in the success of the marketing program for a new product (Im and Workman, 2004). Martinez et al. (1998) also found that product promotion plays an especially important role in the first year of a product's launch.

New products differ in their degree of innovation. Michael et al. (2003) noted that highly innovative products[1] are harder to adopt because of their discontinuity with potential adopter's socio-cultural values and beliefs. The paradox is that despite the potential adoption problem, highly innovative products perform better on market share and return on investment than moderately innovative products. If olfactory cues can be used to overcome the discontinuities between consumer and product it would be of great potential benefit.

Consumers differ in the rate of adoption of an innovation. Rogers (1983) categorized a population by this rate of adoption, ranging from innovators (2.5% of the population), through early adopters (13.5%), early majority (34%), late majority (34%), to laggards (16% of the population)[2]. Rogers proposed that adoption of a new product filtered through these categories in a process of 'consumer diffusion'. The speed of the diffusion process is determined by the transmission and reception of product information between potential adopters in different categories (Martinez et al., 1998). There are two theories explaining what causes high innovativeness (innovators and to a lesser degree, early adopters) of an individual. The innate theory suggests that there is a distinct trait (a genetic predisposition) that determines how much a person indulges in novelty-seeking behaviour (Foxall, 1990). The behaviourist theory, on the other hand, claims that innovativeness is learned rather than innate. An innovator is someone whose early experiences of adoption have been reinforced, leading to this behaviour being exhibited more frequently (Foxall, 1990)[3]. Unlike the innate theory, the behaviourist theory appears promosing for the use olfactory cues. If scent could reinforce innovative behaviour then it may be used to expand the size of the innovator category, thereby speeding up the diffusion process of the new product.

The attraction of the potential of olfactory cues in the marketing of new products is enhanced by the fact that companies execute launches that differentiate their products while at the same time trimming the cost of those launches (Donald, 2002). Profits in the early launch stage are usually minimal or even negative, as low sales don't cover the high production and promotion costs. There is definitely a role for scent to play in the promotion process as 'many, perhaps most, buying decisions these days are more influenced by packaging, in-store signage, samples and other point-of-purchase tactics than by traditional media coverage' (Crawford, 2002, p. 15). A study by Im and Workman (2004) found that the creativity – consisting of novelty and meaningfulness – of marketing programs should be considered as well as the creativity of new products themselves. Olfactory cues can add a differentiated and creative element to marketing programs through meaningfully novel promotion.

Differentiated and creative marketing programs also serve the purpose of providing an innovative image association to a corporate or family brand. If a new product is released as a brand extension, then an innovative image association can significantly affect consumer acceptance. A study by Keller and Aaker (1992) revealed that an innovative corporate image strategy increased consumer perceptions of corporate likeability, trustworthiness and expertise. These consumer perceptions resulted in consumers also perceiving that the new brand extension was of better fit and quality, leading to higher acceptance of the new product. If scents can be used in a genuinely innovative fashion, it could contribute to an innovative corporate image, a valuable asset for a new brand extension. Releasing new products as an extension of a corporate/family brand has also been shown to reduce consumers' perceived risk of adoption. Keller (2003) cites a study by Claycamp and Liddy, which found that the most powerful predictor of new product trial was the extent to which a

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[1] A highly innovative product is one that is unrelated to consumers' current needs and usage systems. A lowly innovative product would not differ from current norms or systems.

[2] Though Roger's model is a good illustration of the range of individual adoption differences within a population, the size of each category can vary greatly depending on the complexity of the product, its cost, and possibly cultural factors as well (Solomon et al., 2002).

[3] The behaviourist theory has been supported by Foxall's (1990) study, which found that subjects who were reinforced for original behaviour in one situation have been shown to be more likely to emit original behavioural responses in other contexts. Despite these findings, it should be noted that innovators tend to be category-specific. An individual who is an innovator in one area (e.g. fashion) is not anymore likely to be an innovator in a different product category (e.g. hi-fi equipment) (Solomon et al., 2002).

corporate/family brand was involved. Keller suggests that this is due to consumers' association of the corporate/family brand name with quality and being able to stand behind any new product extension. Launching a product as a brand extension, accompanied by the use of appropriate scents, can be very beneficial to new product trial and acceptance.

## Managerial applications and directions for future research

New product marketing must be increasingly creative while at the same time ever more cost effective as smaller target markets result in smaller profits (Kotler, 2002). Olfactory cues, which are economical and under-used, represent a veritable 'holy grail' to the marketer.

Four potential applications of olfactory cues are suggested in the area of new product marketing. These applications are only general, and are theoretical proposals based on the findings of this study. The applications are not meant as specific directions for managers, but hopefully they will generate some ideas for the use of olfactory cues as well as reveal gaps for future research.

### *Application 1: Olfactory cues at an explicit level in new product launch events*

This application may be utilized at launch events for potential customers, channel members, the press, etc. As observed by the Lorig and Schwartz (1988), olfactory cues may be processed either explicitly (consciously) or implicitly. The first application utilizes the conscious processing of cues, therefore attention should be drawn to the presence of the odour. According to optimal arousal theory, an ideal level of scent intensity as well as scent novelty should be found, in order to achieve optimum hedonic tone. Environmental psychology models imply that this hedonic tone can result in improved product evaluations. Retrograde interference (RI) suggests that scents should not be incongruent with the product class. This study suggests the use of a pleasantly and appropriately unusual scent. If a scent is different enough that it triggers no associations, then RI will not occur and the consumer will merely benefit from the high novelty of the scent. The fact that the scent is processed consciously means that it is a 'visible' part of the marketing program, contributing to its creativity. This is using scent as an 'attention-creating medium' as well as a 'message-creating medium'. The creativity of the launch would be transferred to the new product itself. This should result in an increase in product trial and adoption. The application would have an added effect of including a state of flow in guests to the launch. This application is only theoretical: specific empirical testing needs to be carried out.

### *Application 2: Olfactory cues at an explicit level in new products themselves*

An optimally hedonic tone should be achieved as in Application 1. Likewise, attention should be drawn to the existence of the scent. Unlike Application 1, this application requires the marketing of scent to potential consumers of the product. The olfactory cues could be incorporated into the packaging of the product, utilizing 'micro-capsules' which release a scent upon being burst. Like Application 1, the olfactory cues in this application would serve as a 'message-creating medium', and increase product evaluations, and also serve to differentiate the product from competition, thus serving as an 'attention-creating medium'. As above this notion requires empirical testing.

### *Application 3: Olfactory cues at an implicit level, associated with certain memories*

Olfactory cues in this application should be implicit, kept at low levels, but still be effective. Attention should not be drawn to the existence of the cues, which means that screeners should not be able to ignore the cues. The application is based on the findings by Aggleton and Waskett (1999) that olfactory cues may provide subtle associations with the new product. The cues can serve as an 'affect-creating mechanism', stimulating certain emotional responses, as well as more concrete brand associations. Though the implications for this usage of scent can be many, it requires much further empirical research. Could using a scent that triggers associations of home and familiarity overcome the discrepancies between potential adopters' socio-cultural values and the new product?

***Application 4: Olfactory cues at an implicit level, associated with a certain corporate or family brand***

Olfactory cues should be kept implicit, as above. A very novel scent should be consistently used and associated with a corporate or family brand. This may be achieved through a variety of means, such as scenting print advertisements or scenting retail outlets. Upon the release of a new product that is launched as a corporate or family brand extension, the same olfactory cues should be presented to consumers. As stated by Keller (2003), the most powerful predictor of new product trial is the extent to which a corporate or family brand has been involved. Therefore the existence of the corporate/family brand scent would elicit feelings of quality and trustworthiness originally associated with previous products under the same brand name. This application has a sound theoretical grounding, but again specific empirical research is needed to determine its true viability.

As well as the aforementioned indications for future research, this study also suggests that empirical investigations should be undertaken on the novelty of odour and its possibly increased effectiveness. Little empirical work has tested the hypothesis that increasing the novelty of a scent can increase its effect on consumer behaviour up to a threshold, though theoretically this is assumed (Berlyne, 1973; Davies et al., 2003).

This study also suggests that future research examining the effects of olfactory cues on consumer behaviour should choose from a much greater variety of novel scents. Previous work (e.g. Aggleton and Waskett, 1999) has shown that if a common scent is used in a study, it will trigger a range of associations which are different between subjects, and thus the purpose of the study cannot be met.

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