

# **THE USE OF AMBIENT SCENT TO IMPROVE CHILDRENS' HOSPITAL EXPERIENCE**

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### **Abstract**

This paper addresses whether or not the diffusion of scents will positively change evaluations of a service experience and perceptions of personal wellness in a health service environment. Qualitative data was collected in a pediatric department and three situations were examined: no scent situation, relaxing scent situation; and stimulating scent situation. The study revealed that both a relaxant and a stimulating odour improved the evaluation of the service experience in the pediatric service. It showed that the use of scent is helpful in creating an experiential context, allowing the children to be more positive about their hospital stay.

**Key words:** Olfactory stimulation- Health care industry-Children-Ambient scent

## INTRODUCTION

Odours have long been known to be capable of altering the emotional state of humans (Schifferstein and Blok 2002). The smell of fresh mown grass, lilacs in the spring air, or the wafting odour of fresh baked bread on a Sunday morning...chances are they all involve memories or associations from the past. The odours are especially powerful reminders of autobiographical experience, an effect which has become known as the Proust phenomenon (Jönsson, Olsson and Olsson 2005). Consumers themselves seem to attach more importance to their own olfactive environment. Air-fresheners are used to scent the interior of houses or to remove unpleasant odours. Knowing that bad smells increase the feeling of insecurity for many passengers, Air France is diffusing scent by micro-capsules on its aircraft, not only for diffusing passenger anxiety, but also to develop a long-term olfactory signature (Guichard, Lehu and Vanheems 1998). At the Walt Disney World in Florida, the Magic House at the Epcot Center includes a room with the fresh-baked smell of chocolate-chip cookies to instigate feelings of relaxation and comfort (Butcher 1998).

This use of ambient olfactory cues by business has attracted attention from scholars attempting to determine the psychological and behavioural effects of such cues on the shopper (Spangenberg et al. 2006). While the use of odours in a commercial context has become commonplace, several academic studies have attempted to understand the influence of odours on the behaviour of consumers. Odours are hypothesized to affect consumers by changing approach/avoidance behaviours, altering mood states and affecting decision deliberations (Maille 1999). Researchers have investigated the impact of atmospherics as they relate to the customer service experience (Hoffman and Turley 2002). Atmospherics can impact both employee and consumer behaviour and the degree to which a service transaction is successfully conducted (Bitner 1992).

There are a few studies which have introduced sensory factors into health care situations, such as music and temperature manipulation in a dental office (Andrus 1986) and music in a hospital waiting room (Routhieaux and Tansik 1999). Because health care service is high in contact, the physical environment and the way in which operations are conducted by staff are essential to create a specific image of the institute and to develop the experience of the patient, whether he or she is a child or an adult.

The purpose of this research is to investigate if introducing an ambient scent to the health care facility will enhance patient experience. In order to broaden and develop the focus on previous research, this paper investigates the impact of the fragrances on children in a

public hospital by applying a qualitative methodology. Hospitalization is a stressful and painful experience for the child, the family, as well as for the hospital staff. Researchers advocate the humanization of the pediatric service to limit the negative effects of the hospitalization on children (Poutot 1991). As of today steps taken in hospitals to improve the child's stay include adjusting the sensory factors by using bright colours in the decoration; diffusing music in corridors; installing televisions in each room; and organizing play activities by staff members, but no studies have investigated the addition of ambient scent.

The contribution of this research is the investigation of the use of scents within the context of medical services. The introduction of fragrances in a medical environment, such as a pediatric department may have a valuable role to play. It offers cues to health care professionals wishing to improve their environment and enhance the experience of the patients. The study aims to provide evidence indicating the effectiveness of using ambient scents in a hospital to enhance the experience.

## **LITERATURE REVIEW**

### ***The service encounter***

During a stay in a hospital, the patient interacts with physicians and nurses, as well as family and friends who visit (Brand, Cronin and Routledge 1997). Individual patient and various medical and administrative staff encounters are the basic units of medical care and therefore the affective or expressive component of the physician's behaviour toward the patient is a major factor in the assessment of the instrumental component of the physician's care (Singh 1990). The concepts of satisfaction and/or perceived quality are attached to identify the evaluation of the service experience by the patient. The different aspects of the service include the technical and the quality of medical care, which are initially determined by the competence of physicians, nurses and other relevant sources. The patient generally has no ability to process the medical information given the complexity of care provided (Fitzpatrick 1993). However, given the access of information by the internet, the vision of patients has changed; they are more and better informed (Castel 2005).

### *The role of atmospherics within a service encounter*

Atmospherics are composed of both tangible elements (the building, carpeting, fixtures, point of purchase decoration) and intangible elements (colours, music, temperature, scents) that comprise service experiences (Hoffman and Turley 2002). The integration of marketing actions in a health care institution projects a positive image of the hospital to the various users. According to Wayne (1984), non-verbal signs transmitted by the physical environment may imply welcoming messages and encourage the patients to return into the hospital or the clinic. Thus, various environmental factors must be controlled and manipulated in a health institute in order to attract the users, to encourage them to return, and to spread positive word of mouth about the facility. Many dimensions can be controlled in the aim to bring wellness and peace to the different users. These are 1) the aesthetic dimension that allows the user to appreciate the physical aspects; 2) the functional dimension is the way in which the objects are organized within the space in an effective manner (a well organized space facilitates the movements of the users inside the space); and 3) the psychological dimension which procures wellness to the users.

Routhieaux and Tansik (1999) examined the influence of the music on the relatives of patients who are in a waiting room of a surgical service. Relatives are considered as users because they are legally brought to authorize the medical care on the patients who undergo surgical operations and they are attentive and are in a position to evaluate the services provided by the hospital more than the patients themselves. The authors underline the anxiety experienced by the family members and the relatives of the patient. They showed that the diffusion of a soft music reduced the state of anxiety of the users present in a waiting room. However, the hypothesis that the evaluation of the quality of the services provided by the hospital would be improved by a diffusion of music was not validated. But, the researchers speculate that the diffusion of music could improve the evaluation of the service through emotions.

Ambient conditions such as room temperature, air quality, noise, music, odour, as well as the rational organization for room space, signage, cleanliness, and furniture are all cues used by the patient to assess the quality of service (Brand, Cronin and Routledge 1997). These physical elements, implemented in a hospital, refer to an environment described as "elaborate" by Bitner (1992). This perceived complexity is due to the number of floors, rooms, sophisticated equipment, and complex variability in functions performed within the

physical facility. Researchers advise, therefore, to give special consideration to the physical and sensory environment within health care facilities (Andrus 1986; Brand, Cronin and Routledge 1997; Routhieaux and Tansik 1999; Wayne 1984).

### *Review of the relevant olfactory literature*

Olfaction has always been and remains the most neglected sense in studies concerning child development and behaviour. The main reasons being the poor knowledge of the role of olfaction in human development and behaviour, and the lack of available tools for investigating olfaction, particularly in children (Chalouhi et al. 2005; Greer 1992). As underlined by Lorig (1992), odour and the sense of smell are very important in the direction of human behaviour, and several studies have revealed effects of odours on cognition, emotion, mood and memory (Ehrlichman and Bsatone 1992; Van toller 1988)

Many factors influence the sense of smell. For example, culture plays an important role in determining how a person reacts to a scent. In France, the aroma of some cheeses (Munster, reblochon, fermented cheese) is not considered as a repulsive smell, while quite the opposite in Japan. Similarly, in Southeast Asia the durian's smell, a fruit shaped like a rugby ball, is considered nauseating for the French, while for the Vietnamese the smell is well appreciated (Chrea and Valentin 2007). Additionally, life experiences can alter the perception of certain odours (Nallet 1985). For instance, Hirsch (1995) found that people older than 62 years of age associate their childhood with smells of nature; sea air, pine horses and hay while younger people associated artificial smells like plastic and fuel with childhood memories. Those with artificial odour recollections reported a higher degree of unhappy childhood memories (Gutfeld, Rao and Sangiorgio 1992). Köster (1991) found that the ability to smell, identify and recollect odours declines with age.

Gender also affects how people react to aromas. Studies of groups of babies, who had been given toys scented and unscented, showed different behaviours depending on whether they were boys or girls. The results showed that the baby girls gave more attention to the scented toys than baby boys (Barbet et al. 1999). For adults, Knoblich and Schubert (1989) found that women are more susceptible than men to the smell of shampoo. It is clear that women have a better sense of smell than men and that the smell evokes more memories for them than for men (Maille 1999).

*Odour and emotional responses.* Researchers have proposed an inventory of relaxing and stimulating scents (Daucé 2006) and aromatherapy has taken this idea in order to treat patients through the dissemination of anti-stress odours (Butcher 1998; Guichard, Lehu and Vanheems 1998). Generally lavender, orange, jasmine, and mimosa are thought to be relaxant and grapefruit, lemon, pepper mint and eucalyptus are thought to be more stimulating. However, the researchers do not always agree on the nature of the same essence (Lovelock, Wirtz and Lapert 2004).

Warm, Dember and Parasuraman (1990) found no significant differences in performance, stress, drowsiness or irritability in the presence of odours called stimulating or relaxing (mint versus lily of the valley). The authors concluded that any effects were due to the attractiveness of the smell, and not to the nature of the selected odours. Leenders, Smidts and Langereld (1999) found a positive influence of lemon (versus no odour) on the emotional states of the individual. Moreover, Chebat and Michon (2003) found a positive impact of pleasant scents on emotion. It also seems that the context of the exposure to odours is important as people preferred light floral fragrances in the morning and more heady oriental fragrances in the evening. Also, some sweet smells were found to cause nausea after meals (Blanc-Mouchet, 1987).

A study of unpleasant (versus neutral) environmental smells on mood found individuals exposed to an unpleasant odour noted a bad mood, a high level of anxiety, tiredness and sadness than those left in an odourless condition (Rotton 1983). An experiment conducted by Ehrlichman and Halpern (1988) indicated that the mood is better when the odour is pleasant. Similar results were found with Knasko, Gilbert and Sabini (1990) and Kanskó (1995) as they noted higher scores for the pleasure dimension in the condition of the pleasant fragrance. However, other researchers have obtained insignificant results for the presence of a pleasant odour (Baron 1994; Mitchell, Kahn and Knasko 1995).

*Impact of odours on behaviour and perceptions.* Knasko, Gilbert and Sabini (1990) reported that a room is positively evaluated in pleasant odour (vs control situation) and two experiments conducted by Baron (1994) found that people exposed to a scented room judged the place warmer, more comfortable, nicer, and cleaner. Spangenberg, Crowley and Henderson (1996) showed different evaluations and behaviours, whether a store was perfumed or not and the respondents did not mention of the presence of the perfume. It is interesting to note that the impact of the fragrances on the evaluation of products appears

limited to goods for which the prior attitude is unfavorable (Spangenberg, Crowley and Henderson 1996). Daucé (2000) examined the influence of two pleasant odours (tea and lavender) on the behaviour of women's customers within a store. The research found the lavender had a more positive evaluation of the atmosphere of the store. Chebat and Michon (2003) found positive and direct impact of odours on improved perception of the atmosphere of a mall, and indirectly on the perceived quality of products.

Research in marketing has focused on several dimensions related to the behavioural reactions: time spent within the store, purchases, intentions to visit and to purchase, and number of products handled. Several studies confirm that the diffusion of a scent has an impact on the time spent by a person in the place (Teerling, Nixdorf and Köster 1992). In the presence of certain odours, people tend to spend more time and to underestimate the actual time spent (Daucé 2000; Spangenberg, Crowley and Henderson 1996). This result was also found in a jewelry store (Knasko 1989) and museum (Knasko 1993). Kasko (1995) found that individuals exposed to the smell of chocolate and baby powder stay longer in stores than people in the control situation. Maille (2005) used five different odours in a post office and found that certain smells increase the time spent into the perfumed space.

Spangenberg, Crowley and Henderson (1996) explored the link between the presence of a pleasant odour (vs the absence of odour) on the intention to return, to purchase and the number of products handled. The results showed that the presence of smell influences the desire to return. However, there was no influence of odour on buying intentions for specific products (except for backpacks), but the authors found scent to influence the number of products handled, especially for sports products.

### *Summary*

In summary, the role of atmospherics in surrounding the service encounter has an important role to play. The manipulation of atmospherics cues can be constructed as an attempt at communicating a particular message to consumers. Transferring this information to the medical context, the quality of the service encounter is affected by the quality of the medical care received from physicians and nurses, the individual patient-physician relationship and the physical environment. Cues that allow patients to assess the quality of the medical service include: a rational organization of the spaces; an easy orientation to the living



arrangement; cleanliness; temperature; noise; and the smell. Among these several cues, this research explores the effects of the smells.

The affective dimension is commonly found in odour perceptions. As mentioned, it is proposed that fragrances are associated with emotionally significant events and past experience. Indeed, the odours stimulate the limbic system, the part of the brain responsible for emotional responses. However, the influence of scents varies, and it is suggested that this variation is the result of both individual and contextual effects. For example, men and women differ in their sensitivity to smells and odour identification performance. Moreover, certain odours have been shown to create relaxed mood states while others evoke stimulated or activated mood. Thus, smells can influence consumers in relation to affective and evaluative responses and this context will now be explored to a medical environment.

## METHODOLOGY

### *Scent selection*

In order to select two types of odours, pleasant stimulating odour versus a pleasant relaxing odour, interviews were conducted with sixty non hospitalised children. Seven odours were selected to determine the best scent for the experiment (Sensorys <http://www.sensorys.com> Paris, France). The odours were 1) Citrus fruit; 2) Mix of pineapple and kiwi; 3) Beach and sea (the smell of flower and lightly marine); 4) Smell of the Sea; 5) Exotic fruit; 6) Apple; and 7) Mint.

*Pleasant scents.* Three odours chosen from above were randomly presented to each child, who was asked a series of questions: the odour which he/she prefers more, the odour that he/she prefers moderately and lastly the odour that he/she prefers less. Four odours were selected from this method: exotic fruit; Pineapple and Kiwi; Sea and Beach and Citrus Fruit.

*The nature of the odour: relaxing vs. stimulating.* For selecting the odours according to the second attribute, a questionnaire was distributed to 120 students, average age 23 years. Out of the four odours chosen by the children, the interviewees gave a mark (one to seven) for the stimulating and relaxing characteristics. For the relaxing character, exotic fruits received the highest mark for relaxing (3.67 sd=1.28) and citrus fruit was selected as a stimulating odour (3.95, sd=1.5).

### *Data collection*

An interpretative paradigm was adopted in order to investigate individual experiences. Given that the issue concerns a new phenomenon (the evaluation of a perfumed service experience), applied to a particular user (the child) in a specific situation (the hospital), the grounded theory approach proposed by Glaser and Strauss (1967) was followed. To reflect the situational context of the observed phenomenon, three cases were investigated. The first corresponds to the situation without induced scent. The second case was the diffusion of a relaxing scent and the third one was the infusion of a stimulating odour. Since the goal was to understand how the children evaluate their environment when scented, a qualitative methodology was adopted. Miles and Huberman (1994), suggest that a field-based interview approach is well suited to circumstances where the research objective is to understand complex interactions, beliefs and processes.

The qualitative interviews allow for some personal contact between the interviewer and the respondents. They also provide a sensible way to improve our understanding of the children's hospitalization experience. However, the inherent limitations of the interviews lead us to consider an observation to supplement our data (Perrien 1984). This method is particularly relevant to exploratory research as it offers the possibility to understand a new phenomenon and it often acts as a useful complement to other methods of data collection. Observation offers the possibility of understanding the behavioural responses of individuals without the intermediary of a document or testimony (Groleau 2003; Quivy and Campenhoudt 1995). At the hospital, our role was revealed to all involved and thus we were able to freely observe the children in their daily life in hospital. The observation was used to determine the nature of the relationship the child has with the staff and the other patients and the various episodes were recorded in a notebook.

### *The sample*

Children interviewed in this study were between eight and 12 years and a convenience sampling method was adopted. A triangulation method was used to try and collect the same facts from the three relevant sources: the hospitalized children, their parents, and the nurses involved in giving care to the patients. In total, 61 interviews with 39 hospitalized children

were carried out: 20 interviews with the no scent situation; 20 interviews with the relaxing odour; and 21 interviews with the stimulating odour. The scented treatments each had 10 children and they were interviewed before and after the diffusion of scent. For the second interview in the scented treatment, the same questions were asked but in another manner and order, so the child did not get the feeling that he/she is submitted to repeat questioning. In the case that some changes are noticed in the children's answers, new questions are introduced to look into any modification and to understand the reason of this change.

Parents who spend more time with their children can be an important source of information as the children's reaction is largely influenced by the parents. They can also inform us about the changes observed in the child following the release of the scent. Therefore six interviews were done with some parents over each case resulting in a total 18 interviews with parents. Finally, 10 interviews were conducted with several nurses over each situation.

### *Questions*

The main research questions of the in-depth interviews were 1) How the child evaluates his/her hospitalization experience within a pediatric department and 2) How the sense of smell impacts the evaluation of that service. For all the interviews, it was necessary to get the parents' approval before interviewing the children, especially in the cases related to the addition of scent. The environment was scented using electric diffusers for area coverage up to 323 square feet per diffuser. One diffuser was placed in the room of the hospitalized child.

### *Data analysis*

Once the interviews were completed, they were transcribed verbatim from the tape recordings. Following an inductive codification process, a thematic analysis which seeks to discover, analyze and characterize phenomena or processes that are based on meaning unit was carried out (Allard-Poesi 2003). To encode the data, we choose the sentence or even the paragraph that we believe are most meaningful and productive units. A label or a short phrase to name the new code, in which the unit of analysis is assigned, was created. The same operation is performed for other units of meaning. Other text segments are integrated into the codes already "tagged" (Blais and Martineau 2006). In general, the units identified are

compared and then grouped into codes according to their similarity. Within each code, sub-codes, including opposing views and new perspectives are created.

The qualitative analysis software NUD \* IST was used to facilitate and to accelerate the coding process. This software allows the adjustments of the list of codes, in other words it facilitates the systematic recoding of the interviews once the coding grid is changed. Finally, this software is helpful to structure the data into a hierarchical tree code. Table 1 contains the categories that emerged from all the collected data.

(insert table 1)

## FINDINGS AND DISCUSSION

Before studying the impact of the two scented cases on the evaluation of the experience by the children, we identified the attributes that the children use to judge their environment using the unscented group. Grönroos (1984, 1999) suggests that service quality consists of two dimensions: technical and functional. The first one refers to *What* the consumer receives or the technical outcome of the process, and the second one refers to *How* the consumer receives the technical outcome, what Grönroos calls the "expressive performance of a service". Grönroos (1984) suggested that, in the context of services, functional quality is generally perceived to be more important than technical quality, assuming that the service is provided at a technically satisfactory level. He also points out that the functional quality dimension can be perceived in a very subjective manner.

In our case, the technical or outcome dimension is related to diagnostics, treatment, medical care, prescriptions and results. The functional aspect or process refers to non-clinical aspects and covers aspects relating to the physical environment (innkeeper aspects), respect of the privacy (Carman 2000) or aspects referring to interpersonal relationships (Bowers, Swan and Koehler 1994). Ware et al. (1983) identified several dimensions of the patient satisfaction such as: interpersonal aspects, the technical competence, access to care and the physical environment. Our study reveals many of these dimensions identified by the hospitalized children and they are listed in table 2.

(Insert table 2)

The results indicate the primary role of the relational and playful dimensions in different facets of the service experience. Several criteria were identified and classified into two categories: 1) the environment and 2) the results of medical practices. To analyze our case studies, we counted the quotes of the interviewees (children, parents and medical staff).

The percentage of comments related to each dimension of the service experience whether it was scented or not is presented in table 3.

(insert table 3)

### *No Scent Situation.*

Sick children perceive the environment through the physical, architectural, social and playful dimensions. The importance of the aesthetic aspect of the physical support is highlighted in the literature (Bitner 1992; Bonnin 2006; Eiglier 2004; Eiglier and Langeard 1987). The architectural environment, as perceived by the hospitalized child, refers to the functional dimensions such as the surface and the layout of the hospital room and the available material. Hospitalized children share common experiences and create groups where they share moments. Group formation is favoured firstly by the activities proposed by the staff and courses required by the school of the hospital, and secondly by the arrangement of furniture and other physical elements that promote these interactions.

Interactions among children are not enough: in fact, the young patients insist on the importance of interacting with the staff. Previous research highlights the importance of interpersonal relationships between patients and hospital staff (Castel 2005; Merdinger-Rumpler 2005; Nguyen Thi et al. 2002; Pourin et al. 1999). Our contribution is the identification of interactions among hospitalized children as an essential attribute of a hospital experience. The environment seems incomplete without incorporating the playful dimension. This dimension refers to the activities proposed within the children's room and the in-room television. This new dimension allows social interactions among young patients eager to play and to have fun together. The children also assess the service experience based on the medical practices, in other words the effectiveness of care and the utility of assistance.

As shown in table 3, the children evaluated their hospitalization experience focusing on two aspects: 34% of the responses were a technical or clinical aspect directly related to the care, such as the operational dimension, the nature of the care, the pain and the established rules and 65% of the responses were a functional aspect which referred to the criteria of the peripheral elements of the service (relational, functional and aesthetic dimensions of physical surrounding, playful dimension, and inn-keeping dimensions).

### *Relaxing ambient scent*

Two interviews are conducted with the same child before and after the diffusion of the relaxing ambient scent and comparison are made between these two situations. Before the diffusion of the fragrance, the results obtained are similar to those noticed in the unscented situation. Even after the releasing of the exotic fruit selected as a relaxant fragrance, we still find the playful, relational, the physical and functional dimensions of the atmosphere. However, the order of importance of dimensions was changed. Thus, the physical aspects become important in judging the evaluation of the scented service experience. Children focused on the sensory aspect of the environment after the scent (40.4%) compared to (11.9%) in the no-scent condition (see Table 3).

Moreover, the quality of the assessment was improved after the diffusion of odours. A careful examination of responses shows that they generate emotional responses. According to Herz et al. (1999) in olfactory perception, the primary response one has to an odour is an evaluation of how pleasant or unpleasant it smells. Thus, the fundamental reaction one has to an odour is emotional, and personal as not all children felt the same about the odours. Examples of responses from the children were positive: *I love it (Ma')* ; *-It scents better, I like it (J'I)*; and negative - *I don't like the odour of chewing gum, it disgusts me a little bit (Lu')*; *-it is the odour of chewing gum and candy and I don't like at all (N')*. Corroborating comments from parents were also found: *-She liked it immediately (PT)*.

The ambient odour may allow the stimulation of the hospitalized child's imagination. The release of the fragrance permits the child to develop an experiential context. It allows him/her to escape from reality for few moments and be a part of another experience. Here all the statements are rather positive:

*-We forget that we are at the hospital [...] That has changed, it becomes warm in my room and when a nurse come, she says " it finally feels good" ... I think that it feels good; a friend of mine, she came and she said "it does not smell hospital in your room," ... I think it's a good idea to put a smell in my room because I felt good (S')*

*- We have the impression that we are not in a hospital (Sa'1)*

*- Before we felt like alcohol I do not know how to say it was a bad smell but now I feel in my room like a flower and I like it, it smells a bit like lavender. I think it makes things prettier. We no longer feel confined, but rather we are out maybe in a garden (L')*

*- It really changed my mood (...)I don't have the impression that I am in the hospital it made me even forget that there are little ones who cry all the time (T')*

The emotional responses produced by diffusion of the smells tend to act as "medium" in the process of evaluating the service experience. We noticed a transmission of these emotional reactions to the evaluation of the unit service and particularly the room of the children:

*-Before I didn't like the hospital but now I think it is better...I don't know it smells better...I don't know maybe it is the odour, but now the hospital is better (Ma')*

*- I think that the hospital smells good (A')*

*- It changes because when i visit the other children in their rooms I don't feel anything and even it smells bad like some gas it is not good at all, but here in my room, it is very good...I like to be in my room because it smells good (M')*

*- It smells better, I have the impression that I am not at the hospital...I mean that it is changed because the odour before was not so good (Sa'I)*

Also we noticed that the sensory evocations can be a source of rejection, as well as a source of anchoring in this environment. The rejection by some children in this study was due to a high intensity of odour:

*- I felt better, I like it but then it smelled too much, I requested to stop the diffusion 15 minutes after and even now I do not like it (J'I)*

*- She asked us to unplug the equipment because she said she had a headache. She asked us between 10.30am and 11am, and since she did not want to reconnect the materiel (Nurse)*

For other children the same level of ambient odour tends to encourage them to invest in the experience. Thus, Sa did not want us to remove the machine "it's good but I do not want you to remove it". Wanting to know the reason for her desire to keep the diffuser in the room she says: "Because I feel that it smelled like strawberries and I like it."

### ***Stimulating Odour.***

The same procedure used in the case of the relaxing odour was used for the stimulating case. We interviewed the same child twice: before and after the diffusion of fragrances. Before the diffusion of the citrus, the same criteria determined in the unscented situation are found. As in the relaxing situation, the order of importance changed after the release of the scent. Before the diffusion of the scents, we notice that the hospitalized children assess their service experience upon functional aspects (relational aspects, aesthetic and functional dimensions of the physical surrounding, playful and inn-keeping aspects), and technical aspects (the operational dimension, the nature of the care, the pain and the established rules).

After the release of the stimulating odour, some criteria gained importance compared to others. The social aspect was still the most important criteria when the children evaluated their experience. However, the physical environment increased in importance. The quotes by the hospitalized children give us an idea about the impact of the diffusion of the stimulating fragrances. Ellen and Bone (1998) and Daucé (2000) claim that odours affect a person emotionally before affecting him or her cognitively. The children highlight in their speech the transfer of emotional reactions to the context of the scent. We also note an improvement in the assessment of the physical environment in particular and the experience in general:

*- I think that there is a change, the hospital smells better (Am')*

*-It the same, but with this new smell, i don't feel a musty smell in my room (G')*

*- I don't like the hospital especially with the new smell when we go nearby this material it feels worst then before i don't like it (Ti'1)*

To some children, the global evaluation of the surroundings that received the new smell changed. The nature of the evaluation is due to the positive or negative appreciation of the odour.

Some researchers defend the idea of the automatic transfer of the smell's emotional response to the object or the atmosphere it perfumes (Daucé 2000; Mattila and Wirtz 2001; Spangenberg, Crowley and Henderson 1996). The negative or the positive evaluation of the context in particular and the lived experience in general is not due only to the transfer of the emotional response to the smell. We also notice the imaginary evocation that the smell might generate. As a matter of fact, an odour can impact the judgment of the children through the mental image it creates. Thus, some children associate the smell to some familiar situation as the « nature », « store », or even a familiar smell. The fragrance involves memories or associations from the past and is considered a powerful reminder of autobiographical experience. Some examples of this are:

*- I have the impression that it scents like flowers or roses something like that...when I pass by the material I feel the odour of the rose [...] (Di')*

*-Sometimes the hospital it is not good...but now it smells really good et it is really better, it is the smell of...I like it because it changes from the odour's hospital (Mi')*

*-The hospital scents very weird I don't know how to describe it. But now, sometimes it fells very strong but it is good ...I don't know how to describe it but when we feel it we don't have the impression that we are at the hospital surrounded by the crying of the others (Mr')*



*- It reminds me some stores of candles. When I close my eyes, I don't have the impression that i am at the hospital, I feel that I am in a store (Y')*

*- It really changed... since we are lock in here and you can not go out, we feel the nature, we feel the smell of the fruits something like that [...] We have the impression that we breathe easier...really I am here in the same room since four days and I find that it smells the nature, the trees, the grass, I have the impression that I am outside rather than in a hospital, even if we are stuck here...[Am']*

### **Conclusion**

In both the relaxing scent and the stimulating scent environment the children placed a greater emphasis on their physical surroundings. We conclude that this effect is due to the perceived attractiveness of the smell by the child, and not to the specific nature of the selected odours. Similar results were obtained by Warm, Dember and Parasuraman (1990), whom did not find the stimulating effect of mint, nor the relaxing effect of lavender. Given the limitations of qualitative research and a small sample, the changes noted in the experience evaluation may not be attributed only to odours: other criteria such as colours, the relational dimension or even play activities, are very important in the evaluation process following the dissemination of the odour. Although the results tend to support that the addition of a pleasant scent could improve the overall evaluation of service experience, some prudence must be taken into consideration. While definite conclusions cannot be drawn from this analysis, new ways to research are obtained in this study.

### **IMPLICATIONS AND FURTHER RESEARCH**

Ambient scent can play an important role in the formation of emotional reactions of children, and subsequently impact their evaluation toward the service experience. Thus, diffusion of a pleasant and low intense odour helps to humanize the hospital by evoking emotional reactions and positively impacting the service experience of young patients. However, we should highlight the subjective responses to odours given the individual differences of children. As we have seen through various interviews, the reactions to the scents were varied by the patient. It may be important to personalize the scent of the hospital room. Samples of smell might be available upon the admission of the child and he or she

could select the smell that is most preferred. To conclude, the hospital atmosphere and the olfaction dimension particularly can be used as a marketing tool to consider the health care establishment as a space where original and unusual experiences can be lived. The consultant firms working in the sensorial field should take into consideration the atmosphere of the pediatric service.

This study, although relatively small, supports and further develops research on young people and their behaviour in a scented space. It would be interesting to expand investigations in other pediatric services to confirm the validity of our findings. It would be also interesting to conduct a quantitative study through an experimental procedure to operationalize the impact of odours on behaviour of young patients, despite the great difficulties of achieving such an approach.

This research provides hospital staff information on which attributes sick children use to evaluate their service experience. Taking these factors into consideration improve the living conditions of children in hospitals and increase their satisfaction. The implications of this research are that the environment of a pediatric service must be considered by designers as a tool to humanize the hospital. Thus, they can create a better atmosphere by acting on dimensions of physical, architectural, social and play activities, allowing the hospitalized children to live a positive experience.

## BIBLIOGRAPHY

- Allard-Poesi, Florence (2003), " Coder les données ", in conduire un projet de recherche : une perspective qualitative, ed. Yvonne Giordanno, Paris : EMS, 245-290
- Andrus, David (1986), "Office atmospherics and Dental Service Satisfaction", *Journal of professional services Marketing*, 1(4), 77-85.
- Barbet, Virginie., Pierre Breese., Nathalie Guichard., Caroline Lecoquierre., Jean Marc Lehu. and Régine Vanheems (1999), *Le marketing olfactif: une approche créative, commerciale et juridique du parfum et des odeurs*. Paris :Les Presses du Management
- Baron, Robert (1994), "Environmentally induced positive affect: its impact on self efficiency, task performance, negotiation and conflict", *Journal of Applied psychology*, 20(5), 368-384.
- Bitner, Mary Jo (1992), "Servicescapes: the impact of physical surroundings on customers and employees", *Journal of Marketing*, 56 (2), 57-71.
- Blais, Mireille and Stéphane Martineau (2006), " L'analyse inductive générale : description d'une démarche visant à donner un sens à des données brutes ", *Recherches qualitatives*, 26 (2), 1-18.
- Blanc-Mouchet, Jacqueline (1987), *Odeurs. L'essence d'un sens*. Paris : Autrement.
- Bonnin, Gaël (2006), "Physical environment and service experience: an appropriation based-model", *Journal of services research*, 6 (July), 45-66.
- Bowers, Michael, John Swan and William Koehler (1994), "What attributes determine quality and satisfaction with health care delivery?" *Health Care Mangement Review*, 19 (4), 49-55.
- Brand, Richard, Joseph Cronin and Jeffrey Routledge (1997), "Marketing to old patients: Perception of service quality", *Health Marketing Quarterly*, 15 (2), 1-30.
- Butcher, Dana (1998), "Aromatherapy, its past and future", *Drug and Cosmetic Industry*, 162(3), 22-24.
- Carman, James (2000), "Patient perceptions of service quality: combining the dimensions", *Journal of services marketing*, 14(4), 337-352
- Castel, Patrick (2005), "Le médecin son patient et ses pairs: une nouvelle approche de la relation thérapeutique ", *Revue française de sociologie*, 46 (3), 443-467.
- Chalouhi, Christel, Patrick Faulcon, Christine Le Bihan, Lucie Hertz-Pannier, Pierre Bonfils and Véronique Abadie (2005), "Olfactory evaluation in children : application to the charge syndrome ", *Pediatrics*, 116, 81-88.

- Chebat, Jean-Charles and Richard Michon, (2003), "Impact of ambient odours on mall shoppers' emotions, cognition, and spending: A test of competitive causal theories", *Journal of business research*, 56(7), 529-539.
- Chrea, Christelle and Dominique Valentin (2007), " Les odeurs : une question culturelle ", *Cerveau et psycho*, Dossier : le monde des odeurs, 21, 40-44.
- Daucé, Bruno (2000), " La diffusion de senteurs d'ambiance dans un lieu commercial : intérêts et tests des effets sur le comportement ", doctoral dissertation, University of Rennes1.
- Daucé, Bruno (2006), " Comment gérer les senteurs d'ambiance ? ", in *Le marketing sensoriel du point de vente*, ed. Sophie Rieunier, Paris :Dunod, 85-123.
- Ehrlichman, Howard and Linda Bastone (1992), "The use of odor in the study of emotion", in *Fragrance : The psychology and biology of perfume*, ed. Steve Van Toller and George Dodd, London: Elsevier applied science, 143-160.
- Ehrlichman Howard and Jack Halpern (1988), "Affect and memory: effects of pleasant and unpleasant odors on retrieval of happy and unhappy memories", *Journal of Personality and Social Psychology*, 55 (5), 769-779.
- Eiglier, Pierre (2004), *Marketing et stratégie des services*. Paris :Economica
- Eiglier, Pierre and Eric Langeard (1987), *Servuction : le marketing des services*. Paris : Ediscience international.
- Ellen, Pam and Paula Bone (1999), "Scents in the marketplace: Explaining a fraction of olfaction", *Journal of retailing*, 75 (2), 243- 262.
- Fitzpatrick, Ray (1993), "Scope and measurement of patient satisfaction", in *Measurement of patients' satisfaction with their care*, ed. Ray Fitzpatrick.and Anthony Hopkins, London: Royal College of Physicians of London, 1-17.
- Glaser, Barney and Anselm Strauss (1967), *The Discovery of Grounded Theory*. New York: Aldine Publishing Company.
- Greer, Charles (1992), "Anatomical organization of the human olfactory system", in *Compendium of olfactory research: Explorations in Aroma-Chology: investigating the sense of smell and human response to odors*, ed. Avery Gilbert, New York : Olfactory research fund, Ltd.
- Groleau, Carole (2003), " L'observation ", in *Conduire un projet de recherche : une perspective qualitative*, ed. Yvonne Giordanno, Paris : EMS, 210-243.
- Grönroos, Christian (1999), "Le marketing des services : consommation et marketing de processus ", *Revue française du marketing*, 1(171), 9-20.

- Grönroos, Christian (1984), "A service quality model and its marketing implications", *European journal of marketing*, 18 (4), 36-44
- Guichard, Nathalie, Jean-Marc Lehu and Régine Vanheems (1998), " Marketing du Cinquième sens: l'aromachologie au service de la stratégie marketing? ", *Décisions marketing*, 14, 7-17.
- Gutfeld, Greg, Linda Rao and Maureen Sangiorgio (1992), "Inscentive", *Healthfront*, 44(5), 20-23.
- Herz, Rachel, Catherine McCall, Larry Cahill (1999), " Hemispheric lateralization in the processing of odor pleasantness versus odor names ", *Chemical Senses*, 24, 691-695.
- Hirsch, Alan (1995), "Scents of Childhood-Sense of the Past: How Odors Can Evoke Reminiscences," *Chicago Medicine*, 98 (10), 16-9.
- Hoffman, Douglas and L.W. Turley (2002), "Atmospherics, service encounters and consumer decision making: an integrative perspective", *Journal of marketing theory and practice*, 10 (3), 33-47.
- Jönsson, Frederik, Henrik Olsson and Mats Olsson (2005), "Odor emotionality affects the confidence in odor naming", *Chemical senses*, 30(1), 29-35.
- Knasko, Suzan (1989), "Ambient odor and shopping behavior", *Chemical senses*, 14 (5), 718.
- Knasko, Suzan (1995), "Pleasant odors and congruency: effects on approach behavior", *Chemical senses*, 20 (5), 479-487.
- Knasko, Suzan (1993), "Lingering time in a museum in the presence of congruent and incongruent odours", *Chemical senses*, 18 (October), 581
- Knasko, Suzan, Avery Gilbert and John Sabini (1990), "Emotional state, physical well-being, and performance in the presence of feigned ambient odor", *Journal of applied social psychology*, 20 (16), 1345-1357.
- Knoblich H. and Schubert B. (1989), "Le rôle des arômes dans le Marketing : une potentialité évidente, *fifth congress AFM*, France, April.
- Köster E.P. (1991), "Méthodes d'évaluation psychophysique dans l'étude de l'environnement", in Odeurs et désodorisant dans l'environnement, ed. Guy Martin and Paul Laffort, Paris : TEC & DOC Lavoisier.
- Leenders, Mark, Ale Smidts and M. Langeveld (1999), Effects of ambient scent in a supermarkets: A field experiment, 28th EMAC Conference, Berlin, Humboldt University, May 11-14.
- Lorig, Tyler (1992), "Cognitive and non cognitive alteration of the contingent negative variation", *Chemical senses*, 15(5), 537-545.
- Lovelock, Christopher, Jochen Wirtz and Denis Lapert (2004), *Marketing des services*. Paris : Pearson education.

- Maille, Virginie (1999), "L'incidence des stimuli olfactifs sur le comportement du consommateur: le processus d'évaluation et l'intention d'achat du produit parfumé", Doctoral dissertation, University of Montpellier.
- Maille, Virginie (2005), "Parfumer les points de vente d'un service public: suffit-il que "ça sente bon"?", *4<sup>th</sup> International Congress Marketing trends*, ESCP- EAP, Paris, January.
- Mattila Anna and Jochen Wirtz (2001), "Congruency of scent and music as a driver of in-store evaluations and behavior", *Journal of retailing*, 77 (2), 273-289.
- Merdinger-Rumpler, Caroline (2005), "La prise en compte de la satisfaction du patient hospitalisé par l'hôpital public français : études exploratoires ", Doctoral dissertation, University of Robert Schuman.
- Miles, Matthew and Michael Huberman (2003), *Analyse des données qualitatives*. Brussels : De Boeck.
- Mitchell, Deborah, Barbara Kahn, and Susan Knasko (1995), "There's something in the air : Effects of congruent or Incongruent Ambient Odor on consumer Decision Making", *Journal of Consumer Research*, 22 (2), 229-238.
- Nallet, Philippe (1985), " Rôle et importance des odeurs dans le comportement de l'homme ", Doctoral dissertation, University of Poitiers.
- Nguyen Thi P.L., T.G Lê., F.Empeur and S.Briançon (2002), "Satisfaction des patients hospitalisés à Hô Chi Minh- Ville, Viet Nam", *Santé publique*, 14(4), 345-360
- Perrien, Jean, Emmanuel Chéron and Michel Zins (1984), *Recherche en marketing : méthodes et décisions*. Canada : Gaëtan morin
- Pourin, Catherine, Sophie Tricaud, F. Thiessard and Pascale Barberger-Gateau (1999), "Elaboration et validation d'une méthode de mesure de la satisfaction des patients: L'expérience Saphora-MCO", *Gestions Hospitalières*, Août-Septembre, 480-491
- Poutot, Claire (1991), "L'enfant et l'hôpital : A travers des dessins d'enfants de 7 et 8 ans", Doctoral dissertation, University of Nancy I.
- Quivy, Raymond and Luc Van Campenhoudt (1995), *Manuel de recherche en sciences sociales*. Paris : Dunod.
- Rotton, James (1983), "Affective and cognitive consequences of malodorous pollution", *Basic and applied social psychology*, 4(21), 171-191
- Routhieaux, Robert and David Tansik (1999), "Customer stress-relaxation: the impact of music in a hospital waiting room", *International journal of service industry management*, 10(1), 68-81.

- Schifferstein, Hendrik and Sylvia Blok, (2002), "The signal function of thematically (In) congruent ambient scents in a retail environment", *Chemical Senses*, 27, 539-549
- Singh, Jagdip (1990), "A multifacet typology of patient satisfaction with a hospital stay", *Journal of health care marketing*, 10 (4), 8-21.
- Spangenberg, Eric, David Sprott, Bianca Grohmann and Daniel Tracy (2006) "Gender-congruent ambient scent influences on approach and avoidance behaviors in a retail store", *Journal of Business Research*, 59 (August), 1281-1287.
- Spangenberg, Eric, Ayn Crowley and Pamela Henderson (1996), "Improving the store environment: Do olfactory cues affect evaluations and behavior?", *Journal of Marketing*, 60(2), 67-80.
- Teerling, Anton, Ronald Nixdorf and E.P. Köster (1992), "The effects of ambient odors on shopping behavior", *Chemical Senses*, 17(6), 886.
- Van Toller, Steve (1988), "Emotion and the brain", in *Perfumery: the Psychology and Biology of fragrance*, ed. Van Toller Steve and Dodd George, London: Chapman & Hall, London, 121-143.
- Ware, John, Mary Snyder, Russel Wright and Allyson Ross Davies (1983), "Defining and measuring patient satisfaction with medical care", *Evaluation and program Planning*, 6, 247-263.
- Warm, Joel, William Dember and Raja Parasuraman (1990) "Effects of fragrances on vigilance performance and stress", *Perfumer and flavorist*, 15 (1), 15-18.
- Wayne, Ruga (1984), "Environmental design can strengthen a hospital's marketing campaign", *Health marketing quarterly*, 2(1), 43-61.

**Table 1**  
**Content of Interviews**

<b>Categories</b>	<b>Purpose</b>	<b>Type of question</b>
1-Children's features (Age, during of stay, etc.)	-Install trust between the interviewer and the child  -Identify links between the characteristics and the nature of the answers	Hello, what is your name? How old are you? Do you have sisters and brothers? Tell me about yourself? What do you do on the week end? Do you have friends? How do you spend your time? How long have you been here?
2-The hospital (before and after the release of the fragrances)	- Identify dimensions of the evaluation of the hospital  -Identify the nature of the judgment	What do you think about the hospital? How do you feel in the hospital? What do you think about the ambiance? How do you feel? why? What should we change in the hospital to please you more? How do you imagine a hospital? give me some details ...
3-The stay (before and after the release of the fragrances)	-Identify dimensions of the evaluation of the stay  - Describe the journey of the child	What do you think about your stay? Describe your day in the hospital?...What do you do in the morning, in the afternoon, and in the evening?
4-Physical surrounding (before and after the release of the fragrances)	-Identify how the child gauges his or her room  -Identify the principal dimensions of the judgment	What do you think about your room? How do you feel in your room?
5-Care staff	-Identify the dimensions of medical staff evaluation  - Identify the nature of the evaluation	What do you think about the nurses and the doctors? Do you have any complains?
6-Treatment	Describe the feeling of the children about the care he or she receives	What do you feel when you receive your treatment? What do you think about the care and the treatments?



**Table 2**

**Dimensions Identified by the Children to Evaluate their Service Experience**

<b>Dimensions</b>	<b>Definitions</b>	<b>Explored Aspects</b>
Sensorial	Aesthetic feature of the department	Colours and Design
Interpersonnal	The quality of the relations between the children and other young patients, and between the children and the care givers.	kindliness, respectfulness, and also roughness, disrespect and the authority of the care giver.  Observation of children's groups taking place in the department, sharing secrets, sharing lunches, and playing together.
Technical	Technical competence of the caregivers and the result of treatments.	Availability and helpfulness of the care giver, moral and physical assistance.
Playful	Amuse the hospitalized children	Playful activities proposed to the hospitalized children, television
Functional dimension of the physical surrounding	Physical characteristics.	Layout, equipment, sanitary facilities.
Rules	Established rules.	Visits, permits.
Inn-keeping	Quality of the reception	Quality and the quantity of the food and room type, (single or double)

**Table 3**  
**Percentage of Comments Relating to each Dimension of Service**

Criteria of the service evaluation	% Comments				
	No scent	Relaxing scent		Stimulating scent	
		Before	After	Before	After
Social Dimension	22,3%	22,6%	26%	24%	30,9%
Sensorial dimension	8,8%	11,9%	40,4%	18,3%	30,8%
Design (functional dimension of the environment)	12,2%	11,9%	7,7%	15,5%	8,5%
Playful dimension	14,9%	11,9%	8,7%	15,5%	13,8%
Inn-keeping	7,4%	9,5%	4,8%	7%	6,4%
Technical and competence of the staff	22,3%	21,4%	9,6%	12,7%	4,3%
Pain	10,1%	3,6%		4,2%	
Rules	2%	4,8%	2,9%	2,8%	5,3%
Privacy		2,4%			
<b>Technical aspects</b>	<b>34,4%</b>	<b>29,8%</b>	<b>12,5%</b>	<b>19,7%</b>	<b>9,6%</b>
<b>Functional aspects</b>	<b>65,6%</b>	<b>70,2%</b>	<b>87,5%</b>	<b>80,3%</b>	<b>93,4%</b>