

## Career in the Fragrance and Flavour Industry

**S**ir, can we join the fragrance and flavour (F&F) industry? Do we need to have a superior nose? Who should join this industry? What are our prospects? How should we achieve a successful career in this field? These are some typical questions that college students ask me, especially at the beginning and end of their university academic term. A simple 'Yes' or 'No' for an answer, without proper justification or reasoning, will rarely suffice. This paper is the outcome of my personal experiences and opinions proffered in addressing these and many similar questions to students over the past many years.

People exhibiting superior athletic, artistic or academic abilities have always been the subject of intense interest and speculation. Right from Dhyanchand through Sachin to Anand, we have had considerable attention and focus on understanding the conditions that led to the development of their exceptional expertise among the select few. Media

experts & psychologists, for years, have been studying the nature and development of expertise, the significant advances made by such individuals. On analysis, the insights gained are good enough to apply in understanding the reason of artistic creative success in the F&F field. In line with this perspective, let us try to understand individuals having expertise in this industry in comparison, with novices strictly in the context of odour perception.

### Gaining expertise in odour perception

We believe that to join the F&F industry the first pre-requisite required is the olfactory ability of the individual. This includes, importantly, odour sensitivity, odour discrimination and odour memory. However, let me also clarify that the disparity between an expert and a novice is not large enough to overcome by an individual. Many say that a successful expert in this industry is god gifted and possesses an exceptional degree of olfactory sensitivity. This is far from the truth. It is no doubt true that

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people working in the F&F industry are capable of exquisite sensitivity and have unique odour discrimination powers, but it is also a fact that many individuals not strictly belonging to this industry also possess such powers in equal measure, if not more.

So what does this indicate? It clearly means that anyone can develop increased sensitivity, simply by practice and gaining good experience.

Simple, repeated exposure to a particular test odour increases an individual's sensitivity to these odorants. Repeated observations prove that novices are also able to detect odour equally well as an expert, when the odour detection thresholds increase from the first to the sixth assessment. However, novices differ from experts in their ability to discriminate between similar

odorants, especially when they have to analyse a constituent component in a complex fragrance. To a novice's nose, all the odours are similar, but to an expert they are distinct. This ability is critical to this industry and obviously, experts take the lead here. Nonetheless, one can achieve and learn this discriminating ability if one puts in sufficient effort. Experience plays a very important role in honing the skills of olfactory discrimination, especially in analysing olfactive mixtures. Repeated exposure to an odorant enhances an



individual's ability to describe the sensory quality of the odorant and this conceivably produces better discriminating ability.

### Expert v/s novices

In all aspects, experts are distinguishable from novices. This is actually a by-product of the development of the expertise, rather than the source or nature of the expertise itself. The fundamental difference between a novice and an expert are the cognitive differences between their odour memories. Expertise consists of the differences in the way task relevant information, namely, 'odour memory' is stored and organised, the way the expert evaluates the information, and then subsequently uses it in analysing smell. To an industry expert this training of the cognitive process provides the association between perception of an odour and the ability to recognise, name and compose with it. Generally, this cognitive process and subsequent associations manifests differently in a novice and an expert.

Novices are usually very good at recognising previously encountered odours, but they are not good at identifying them. This task of recognising and identifying the odour profile is central and routine to people employed in the perfumery industry. Many times, novices do recognise odours. They can also typically retrieve associative information like where they have encountered the smell, but are not able to give its exact identity or name. An expert in the perfumery industry will smell ethyl vanillin and say it is so, along with its classification, unlike a novice who will at the most, is likely to say that it smells like vanilla ice cream.

### Odour perception — sensory & cognitive aspects

A novice and an expert differ in both sensory and cognitive aspects of odour perception and this produces differences in their responses with respect to an odour or fragrance. Consider a situation

wherein a person becomes an expert due to repeated exposure to the same odour. In this case we will observe that the odour perception of novices are more likely to be biased or determined by the context in which it is perceived, whereas experts who are exposed more often are likely to process the odorant independent of the context in which it occurs or any biasing information about. Likewise, the perception of both strength and irritancy of fragrance components depends on biases of respondents about the nature of the odorant substances.

Let us suppose we expose two groups of respondents to the same fragrance, but are told differently about the odour. One group is told that the fragrance is a pure natural good quality essential oil and the other group is told that it is a cheap industrial by-product chemical. The group with negative information will rate the smell as having a very high intensity and irritating in nature, unlike the positively informed group. So what does this indicate to us? The result clearly demonstrates the power of cognitive processes, namely expectations, on the perceptions of odour. This unique feature of odour perception is utilised effectively by marketing and advertising department colleagues who create an ambience for a fragrance product, especially in promoting it with a natural brand halo, instead of selling it as only plain synthetics.

### Expertise in the F&F industry

What determines expertise in creative or intellectual domains? In light of the above argument on the differences between experts and novices, let us try to understand the development of perfumery expertise and try to answer.

Although we have insufficient knowledge on the cognitive nature of development of this expertise in the perfumery industry, we can always use the understanding available from studies of the development of expertise in other

artistic and creative domains. To acquire expertise in any field the basic requirement is the same, namely, innate talent, motivation, perseverance and, above all, deliberate constant repetitive practice, practice, practice and practice.

Traditionally, people believe that innate talent is a pre-requisite for achieving expertise. Moreover, if any person or persons are innately talented they can easily achieve an exceptional level of performance and expertise, once they have acquired the basic skills and knowledge. However, various studies and analysis have clearly shown that skill learning and expertise is not directly related to innate talent alone. Expert athletes, musicians, chess players, etc., have acquired virtually all the distinguishing characteristics of an expert performer only through deliberate practice of the chosen activity. In short, the only difference between an expert and a novice in improving their performance is the life long deliberate effort to practice, practice, practice and more practice.

### Cognitive aspects of creativity

Cognitive activities are a means of handling or processing information. It is same also in the case of odour perception. Any individual has to perceive, remember, acquire and retrieve from memory or transform information about odour. It is customary to classify a novice to be having poor cognitive processing abilities. However, it is important to note that experts have a unique way to organise, store and access relevant information so that when necessary it is amazingly easy and efficient for them to use it at short notice. In this respect, we can say that experts do not necessarily have superior odour memory per-se, but they do have simply better memory for the task relevant material. Experts by deliberate practice with the various elements of their craft have learnt to overcome the normal limitations of memory about these domain specific fields. To understand, let us all glance at the fol-

lowing list of letters for say about five seconds and then try to remember them. Now this will test our memory.

**NITSBISFDACGSIMSMEISDTAC**

If you now try to recall the letters in the same order, you will find it difficult. Now glance at the following list for the same amount of time and try remembering them.

**NITS BIS FDA CGSIMSMEI SDTAC**

Compared to the first list, the organisation and placement of letters in the second list makes it much easier to recall. Am I right? In the first case, difficulty arose due to the processing limits in human memory. Scientists believe that the maximum amount of unrelated information humans can process in working memory at one time is about seven to eight letters. When we try to rehearse and remember more than seven or eight unrelated letters, we fill our incoming memory buffer and this displaces items that are already memorised and stored earlier. However, familiar items such as letters can be meaningfully organised into groups that are larger in number, but each one individually having smaller items that are by themselves related. This process of dividing larger number of disjointed unrelated information into smaller related sets of associated information for the easy remembrance and recall is what we call as 'Chunking'.

**Chunking as a strategy in the F&F industry**

Experts in the creative field make effective use of this cognitive organising principle of chunking. Chunking helps one to remember more individual components as it is organised into 'chunks' or 'larger groups' of lesser information. Information that an expert uses repeatedly is often organised into larger groups that are more meaningful so that one is able to supersede the limits of human information memory processing. Let us

now look into and understand a practical example as to how the strategy of 'Chunking' works for an expert in the F&F industry.

1. Mandarin
2. Lemon
3. Bergamot
4. Pine
5. Rosemary
6. Basil
7. Vetiver
8. Sandal
9. Patchouli

The above list contains nine different fragrance materials used in the fragrance industry. A non-perfumer will process it as nine separate ingredients, whereas an expert in the industry would study this list into three distinct classes, 1 to 3 will form the Citrus group, 4 to 6 as Herbal and 7 to 9 as Woody accord. Extensive experience in the industry helps in recognising these chunks or patterns of aroma ingredients making individual components easy to remember for the expert than it is ever possible by a novice. In addition to above, novices have different mental representation of elements. A novice when asked to imagine the final perceptual outcome of the nine blended ingredients would probably attempt to evoke the sensory memory of each single odour and then blend the resulting elements. Knowing the processing limits of human working memory, this is nearly impossible. However, for an expert of the F&F industry these elements are already organised into distinct accords through extensive cognitive and physical experience that the expert mentally combines.

**Importance of cognitive skills**

Jean Carles, the noted perfumer, recognising the importance of cognitive skills said that the most important feature for an expert to succeed in the perfumery industry is to possess a good olfactory memory. Fragrance experts create compositions from memory, based not on sensations, but primarily on the

memory of the sensations. This is a cognitive process and not a sensory one. Is it not very similar to the expressions of creativity in other domains?

Painters have to know how a face will look from a multitude of angles, whether the colour will harmonise or clash. The painter performs these attempts on the canvas of the mind, much before the painter actually picks up the brush and starts painting the masterpiece. Similar is the case of a music composer, who should know the timbres of the musical instrument, the sound, look, feel of the chords and the key structures. The music composer gains this expertise only after considerable effort. However, the effort yields interesting benefits, as when the creative elements of one's craft and their potential combinations become entrenched mentally, then one can continue to create without additional inputs. Surprising, isn't it?

Remember Beethoven who could utilise his memory of notes, the various instruments and their myriad combinations to create new musical compositions after he had become completely deaf and could not receive any auditory responses of his created musical works. As a corollary to the above logic, a perfumer or flavourist, whose olfactory and sensory ability is lost, might still be able to create flavours and fragrances simply based on the memory of all those once experienced and now stored sensory combinations of odour and taste. Whatever may be the case in any creative field, expertise only results from years of deliberate practice, which produces a large inter-associated network of mental representations of the relevant compositions!

**'Ten Year Rule' of creative preparation**

In line with any field, to become an expert in the F&F industry, it requires a great deal of preparation and consider-

able effort. Researchers have stated after exclusive study and analysis that a minimum ten years of effort is necessary to develop creative expertise in any creative sphere. In the cognitive analysis of expertise, this is what we know as the 'Ten year rule'. This rule is applicable in most fields where cognitive processes are involved. A master chess player reaches the 'grand master' skill only after he spends thousands of hours of preparation, playing chess, reading and analysing games of other players, utilising an enormous amount of chess pattern knowledge. It is extremely rare to find a player who has achieved this level of expertise in less than ten years of practice. Similar is the case with writers, who produce their great work only after they have spent more than ten years of writing. Ditto in the field of music, where musicians achieve excellence only after putting over ten years of hard work. Even child prodigies are able to cre-

ate their masterpieces only after decade-long years of gruelling training and hard experience.

This 'Ten year rule' is also very much applicable for achieving success in the creative field of the F&F industry. Thus, a relatively long period of training is required for becoming an expert in perfumery. Any one who joins this industry has to take inspiration from other compatriots during their long years of preparation necessary to attain perfumery excellence. Expertise rests on a solid foundation of knowledge of the elements of the specific realm that will continue to flourish for person-years. Like all creative skills, the perfumery industry is also a cognitive science and requires a lengthy period of preparation to establish the necessary cognitive requisites for creative excellence. Once cognitive skills are established, it can be utilised to achieve success in the innovative field of flavours and fragrances indefinitely.

Any one joining the creative F&F industry for making a successful career should have ample patience and be prepared to put in considerable amount of effort.

Are you interested to join the creative F&F industry? Welcome & Best Wishes!

### Additional Reading

1. The sense that excites, Sitaram Dixit, *Chemical Weekly*; Dec. 23, 2003.
2. The incredible sense of smell, Sitaram Dixit; *Chemical Weekly*; Dec. 30, 2003.
3. The flavour and fragrance industry today – A perspective, Sitaram Dixit; *Chemical Weekly*; Nov. 14, 2006.
4. Increasing the Indian Fragrance Market – Random Reflections, Sitaram Dixit; *Chemical Weekly*; Feb. 6, 2007.