

# Colour Association in Three Stages: the Synaesthetic Experiences of a Practising Musician

Joseph Long  
19th July 2005

“Doh re mi fah soh la ti doh!”

The gentle singing was accompanied by attractive sounds as my grandfather touched the keys of the battered old upright. A desire to discover the rules of this new game took root in the mind of the four-year-old boy sitting on the stool and watching every move with curiosity.

“Now, this tune is called the Blue Danube,” my grandfather went on.

I become absorbed in an intriguing new toy: in the shininess of its keyboard, in the shapes of its keys, in the bits sticking out at the right-hand sides of the dohs and fahs, in the exploration of all these wonderful new notes and sounds. Every discovery evoked a vibrant colour in my mind. I knew that the piano keys themselves were black and white, but other colours suggested themselves too: doh was blue, re was green, mi was red and green, higher dohs were lighter blues, lower dohs were darker blues. The colours were like references or pointers, and the whole system was as orderly and precise as a table of contents at the beginning of a book.

-----

Synaesthesia, a phenomenon in which certain well-defined sets of categories can acquire strong, idiosyncratic and durable associations, has been a part of my life since I was very young. Unlike those synaesthetes who come, by means of a few chance conversational remarks, to discover the uniqueness of their experiences relatively late in life, I have talked with others about my colours for as long as I have been aware of them. I was able to share my feelings about colour and pitch with supportive parents, and even before I was five I can remember my mother describing her own lifelong associations between letters of the alphabet and colours, an experience that I also share. I can recall my father constructing a beautiful wooden xylophone, carefully and rigorously tested for correct sounding pitch, and subsequently deciding to paint the bars according to my suggested colours. Much to both his and my consternation, the painting ruined the xylophone's previously impeccable sound quality, and the entire instrument was discarded as junk a day or so after the aesthetic improvements had been undertaken. But he and I continued to talk about the colours of musical notes, and although it was clear that he did not have any such experiences himself, he lent a sympathetic ear to the descriptions I gave of mine.

My coloured notes fall into the classification of what has often, somewhat misleadingly, been termed ‘pitch-colour synaesthesia’. Experiences of this nature are not amenable to convenient or casual docketing. Synaesthesia literally means ‘coming-together of the senses’, but trying to ascertain how much of my synaesthesia is genuinely based on sensory perception can be difficult. There has always been a strong labelling component to the experience, and in early childhood this component predominated over all else. It was not

sounds that produced colours in my mind; it was, if anything, thoughts such as ‘this key on the piano keyboard is middle C’ that acted as triggers. My earliest memories are not of a glorious fusion of sound and colour; they are of a precise colour-coded learning method whose apparent purpose, at least initially, was to help me think about specific piano-playing concepts in a direct and unambiguous way. Whereas most people might use names to label keys on a piano keyboard, I used colours. Apart from the unusual nature of my labels, there was no logical distinction between this system and any more conventional learning approach.

The first hint that my colours might turn out to have more scope than that of an internal filing system came shortly after I had started formal piano lessons. My parents, mindful both of the approach of my fifth birthday and of the fascination with piano playing that I was clearly showing, bought me a second-hand piano of my own. They started me on lessons with a local teacher, and during the first steps of my musical education I became aware of a curious discrepancy between the sound of my own piano and the sound of my teacher’s. I had already noticed that my piano was a little higher in pitch than my grandparents’ piano, but I now found my teacher’s piano so markedly high compared to either instrument that I was forced to make a mental adjustment every time I played it. Perhaps a middle C on one instrument might not necessarily sound the same as a middle C on another. (I was saying ‘middle C’ by then rather than ‘doh’, because that was what my teacher said – it was all the same to me, and just as blue as ever). The striking of the middle C key was, it seemed, all that mattered, and calling the note C and continuing to associate it with the colour blue would, I reasoned, probably be of greater use to me than thinking about whatever its sounding pitch might happen to be on a given piano. So it was on the basis of my keystrokes that I continued to operate for the next few months, and middle C remained blue regardless of its sounding pitch on different pianos.

The technician who came to service my fifth birthday present did not mean to be critical of it. He was an exacting professional who had received training in the rapid diagnosis and cure of common piano problems, and he could see at once that the large upright with which he had been presented on this occasion was in a state of mild disrepair. He played several notes, looked inside, paused to consider the options available to him, and at last told us that the piano was a tone flat throughout its entire compass. He said that it had probably not been tuned for many years, but that, since it seemed otherwise to be in reasonable condition, he would be able to do a special kind of tuning job that would, he said, bring the piano up to concert pitch and make it sound much better. Even as he was describing the nature of the work he was about to carry out, I had an inkling that I was becoming involved in some sort of intellectual double-take. Was he going to do something to the piano that would, contrary to my earlier guesses about pitch and pianos, make its middle C sound like the much higher C on my teacher’s instrument? As soon as he had finished his job I sat down at the piano and played a chord, and my hunches were confirmed at a stroke. It now sounded identical to my teacher’s piano. There was, it was clear, such a thing as a normal middle C after all.

This first acquaintance of mine with the concept of absolute pitch did not feel like a moment of self-discovery. It was certainly clear to everybody that I was able to identify the pitch or frequency of any given sound without first being given an external reference point, but I did not conclude from my discovery of this ability that I might have some sort of special gift. Indeed, if pressed on the point I would probably have replied that surely everyone must eventually learn, as I had done, about this particular attribute of musical sound. The process felt more like the unearthing of a universal truth, the principle that, in standard tuning, pitch does not vary from one instrument to another. I began to drop the

phrase ‘concert pitch’ into almost every musical conversation, and although this mystified and irritated some of my friends, it was at least a clear indication of my continued interest in music.

I started to listen to music of all kinds, on the radio, on the television and on records, and to memorise and play excerpts from the pieces that I heard. My father’s record collection was not enormous, but it contained a sufficient number of recordings for me to be kept educated and stimulated for many months. When it had eventually been exhausted my father was able to borrow additional records and cassettes from the local university library. There was never a shortage of music to discover, and we would both go upstairs in the evenings to listen to the symphonies of Beethoven, Brahms and Sibelius, as well as to some of the great works of Bach, Mozart, Tchaikovsky, Delius, Holst and Vaughan Williams.

They were long works and I was unsophisticated as a listener. But I was able to derive enjoyment from attending carefully to the most important features in a piece, and one technique that considerably enhanced this enjoyment was concentration on notes and keys. The connection between an internal set of colours on the one hand and the keys on a piano keyboard on the other was now changing into a far more direct link between colour and pitch itself. This was a new stage in the development of my synaesthesia. Pitch was becoming immutable in my mind, and my previously unwavering ability to adjust to different pitch standards soon began to fade. Most of the music I heard on record was performed at standard concert pitch, and my own piano was receiving regular maintenance to ensure that it was kept at that level too. So it was natural that I should start to use for reference to sounding pitch a system that I had originally devised for reference to keys on a keyboard.

Absolute pitch began to assume a ubiquity in my musical thinking, and this brought with it a new collection of mysteries. Once, for example, when we were listening to Brahms’s First Symphony, my father had forgotten to change the speed of the turntable to the correct setting, and the piece came out sounding as though it were in F minor. On discovering the reason for the discrepancy between the key of C minor given on the record sleeve and the key of the actual music that I was hearing, I insisted on listening to the whole recording again at the correct speed in order to establish in my mind the composer’s intended keys with their corresponding colour associations. I was also confused every so often by historic-pitch recordings, and on one memorable occasion I maintained that a particular Bach three-part invention that was being played on a harpsichord was actually in B flat minor and not in B minor as the sleeve-notes appeared to suggest. I did not learn until some time later that a pitch appropriate to the authentic rendition of early music is usually somewhat lower than the standard we use for modern performances.

On the whole, the positive features of my system of colours and absolute pitches outweighed the negative ones. My colours contributed vividly to an awareness of the tonal construction of pieces. Beethoven’s Fifth Symphony was, and is, a mass of rich, deep blues overlaid with the warm yellows, greens and other colours of its secondary material. As I listened to it and other works, I began to understand that pieces of music could tell stories that were based on key contrast, and it was not long before I was applying this understanding to my own interpretations. When, at the age of ten, I listened for the first time to Debussy’s *The Girl With The Flaxen Hair*, I saw in my mind’s eye a gentle sea green that immediately set the scene for a piece in G flat major. At the end of the second phrase, a sudden flash of the much more metallic green of E flat major made a vivid impression, and the eventual discovery that the middle section was also in the unexpected E flat seemed like an explanation for the earlier appearance of that key. By the age of

fourteen I had become interested in more extended compositions and, in particular, in the idea of sonata form. I learned the entire first movement of Beethoven's *Waldstein*, and as I studied the piece I found that my colours contributed to an awareness of that movement's essential conflict, one between an energetic opening section full of blue C major and a lyrical section decked out in the warm autumnal red and green of E major. Listening to other sonatas quickly taught me that the fundamental drama of sonata form consists in the setting up of tension between an opening block of music in one key and a subsequent block in another, and whenever I studied a sonata or symphony I found that paying attention to my colours could always be relied on as a means of confirming and amplifying that duality.

The more one becomes attuned to perceiving things in a specific way, the greater is the danger of closing oneself to other methods. I never became so obsessed with coloured associations that I was unable to concentrate on anything else, but there were periods during which I remained convinced that the colour associations themselves must have some kind of intrinsic value. The limitations of this position seem obvious to me now: it over-emphasises simple musical building-blocks to such an extent that a piece of music can be seen to progress only if self-contained areas, themselves static, are different enough in pitch (and colour) profile to make a clear contrast. Perhaps, according to this way of thinking, a piece of music that achieved its effect through changes of texture or timbre while remaining in the same key throughout might leave a repetitive colour impression despite the actual diversity of the material. Further, a particular work might make expressive or cogent use of distinctive melodic intervals and shapes, features whose appreciation depends on good relative, rather than absolute, pitch. Such a work might give rise to a colour profile that failed to reflect many of the significant aspects of the true meaning of the music.

I ran into such problems whenever I became excessively fascinated by the colours of individual notes, chords or keys. It is possible that such fascination was at the root of some of the criticisms that teachers levelled at me. My playing, they would sometimes say, was too vertical, by which they meant that there was an emphasis on trying to make individual events beautiful at the expense of giving the music a sense of momentum. Occasionally my tendency to focus on the predominantly static aspects led to over-dramatisation of the more dynamic ones. A few months after having learned Chopin's Fourth Ballade I suddenly noticed that the work's opening theme was contained in a particular bass passage, something from which concentration on static pitches and keys had previously diverted my attention, and I decided to bring out this bass rendition of the theme in order to show off my discovery to listeners. This was a naïve and crude treatment of one of the many subtle features that Chopin had quietly woven into his conception.

My coloured pitch perceptions have never been involuntary, and it would have been very easy for me at this stage to conclude that the whole experience was not worth my continued attention. My synaesthesia, even in its pitch-based second stage, has always been triggered by labelling and not by direct sensory experience, and there has never, of course, been any obligation for me to label anything, whether through the use of colours or by any more conventional means. The fact that the colour system still has a place in my musical thinking is the result of a third property, something that I see as the final stage in its development. Whereas I had first used colours as a means of labelling the keys on a keyboard, and whereas I had then come to use them as a means of labelling precise pitches, I finally began to associate any given sound with a distinctive and memorable colour profile. Pitch was still the determining factor, but there was now a sense in which the complexity of any sound, no matter how many different pitches it might contain, could be captured in a single visualisation. The term "A flat", which had previously been no more than the name of a pitch with a corresponding colour, could now be seen as a property of any given sound.

Deciding whether or not a sound could be described as ‘A flat’ was no longer a simple all-or-nothing choice; there was now a sense in which certain sounds could be said to have a greater amount of A-flat-ness than others (since A flat is pale yellow, it seems just as reasonable for me to speak of A-flat-ness as it does of yellowness).

The non-musical sounds in my environment came to assume colours and even faintly discernible patterns. Most of these sounds contained identifiable pitches of some sort, but rather than having to go through each of these in turn in order to apply labels, I found that I could stand back and see a sound as a whole, with the predominant pitches showing up in appropriate colours. Sounds in between certain pitch categories developed washed-out intermediate hues. Where pitch was absent or difficult to ascertain, various shades of grey would suggest themselves: this would appear, for example, in the sound of an air-conditioning fan or of a running tap. Where an audible series of clicks made a strong impression as, for example, in the sound of a cat purring or a car engine idling, the colour of the note itself, usually very dark, would show up as part of a corduroy-stripped texture. Where the interference of two sounds close together in frequency produced beats, I would see this as a mottled effect. In general, then, it became possible for me to accommodate a certain amount of diffuseness in my visualisations, and this enabled me to conjure up a meaningful colour profile for any environmental sound.

This ability to embrace complexity in my visualisations quickly transferred itself to my appreciation of certain features of musical construction. Tonal diffuseness was soon represented by the grey that comes from an overload of different colours, so that, for example, to stand back and look at a dodecaphonic piece of Schoenberg might produce a general feeling of quasi-greyness, even if the individual notes were still associated with their specific colours. Detaching myself from the minutiae of a piece and surveying its pitch profile as a whole became an increasingly frequent activity for me as I put together interpretations. An insight that made the validity of this process easier to accept was that unresolved tension in a work of art does not necessarily lead to incoherence or lack of beauty.

I started to use my colours to appreciate the message rather than the medium associated with any given musical composition. My earlier view of *The Girl with the Flaxen Hair* began to seem more and more inappropriate; surely this is a beautifully crafted miniature whose collected events are homogeneous, not a piece in which the incongruity of early events demands eventual integration into the structure. The two appearances of E flat major began to seem consonant with the general greens and purples of the G-flat-E-flat-C-flat-ness of the piece, not dissonant with a more limited vision of mere sea-green G-flat-ness as a background. As in so many other situations, I found here that a collection of often-used keys began to take on the appearance of a single more complex home key. How much of the colour of a piece to take as a backdrop and how much to treat as alien to that backdrop became an increasingly important decision for me to make when putting together performances.

Nowadays, I find that there are still many situations in which conjuring up a precisely defined sense of the colour of every note or chord in a piece remains a useful and meaningful activity for me. But there is one circumstance in which precision of any kind has to be avoided at all costs. If I am ever asked to play a piano that has been allowed to fall significantly below standard concert pitch, the only way in which I can make the experience tolerable is by allowing the sounds of the piano to merge into each other and into the other noises in the room. Something that I managed to do with blithe ease as a five-year-old, at a time before my absolute pitch had become fully entrenched, has turned into a

disturbing and even mildly frightening experience. If I ever find myself in such a situation, I try to make all the sounds coalesce into an ill-defined dull grey. This is hard to accomplish because the sounds coming from the piano, although not those associated with standard concert tuning, are precise musical pitches in themselves. Years of conditioning have ensured that any clear colours seen during such an experience invariably follow the absolute pitches of the sounds themselves and not those associated with my keystrokes. Middle C is no longer always blue; it can now be any other colour if the pitch of the piano is not at the expected level.

Teasing apart the various components of my synaesthesia has always been difficult, but I hope that my attempt here has shown the potential versatility of the phenomenon. I was born with cataracts in both eyes, and perhaps my early lack of optic-nerve stimulation and resultant sight deficit might have led to a situation in which a tendency to label according to internally created systems might have come more readily to me than a tendency to use visible external cues. The development of my colour associations from a series of associations triggered by keys on a keyboard, through a precise pitch-based system, to an experience reflecting the complexity of sounds and musical structures, illustrates the adaptability of synaesthesia to varying personal learning needs. The fact that my synaesthesia has evolved in stages is perhaps unusual. Such evolution has had a profound effect on how much I concentrate on the phenomenon. I, perhaps more than other synaesthetes, have continued to find my colours both useful and beneficial, and I probably give them a greater amount of thought because of this.

The adaptability of the coloured associations comes at a price, however. For the most part, all three layers of my synaesthesia communicate smoothly with one another, and the experience remains pleasant, useful and interesting to contemplate. But there is an implicit dependency involved in such an arrangement. Each process relies directly and unquestioningly on all the others, and the whole system can fail if any one part of it runs into problems. Some of the mental processes involved are less hard-wired than others, and the parts that are concerned with memory and conditioning are much more malleable than I would sometimes like to admit. If one of the layers of my synaesthetic system ceases to function properly, the whole experience can begin to show signs of fragility, and any prolonged period of such dysfunction can lead to the collapse of all that I have come to rely on as a musician.

-----

I was sitting upstairs, listening to the gentle tolling sound of a technician working on the tuning of my 5'10" Boston grand. How difficult it was these days, I reflected, to recognise problems developing in a piano, even one on which I was practising for six hours a day. I had been aware, during the past few months, that my hearing and sense of pitch were not as they had once been. Absolute pitch could, I had heard, decline with age, and although mine was not giving me incorrect impressions, its lack of clarity was causing me to pause for thought at the start of listening to any musical recording. Two possibilities a semitone apart would suggest themselves to me as probable keys for a given work. Usually it was easy enough to ascertain which of the two was the correct one, but I did not remember having had any such doubts in the past. Even after I had established in my mind the correct pitch of a recording, I found that my colours were lacklustre, as though I could no longer bring myself to focus on anything precise. Everything seemed to be moving little by little towards the dull greyness that I had once associated only with diffuse or complex sounds.

I was not distressed by what I perceived to be a natural deterioration in my former abilities. Everyone loses certain faculties with age, and although I was not yet thirty I felt that I had accumulated enough in the way of other musical talents to make this loss seem a trivial one. Perhaps I would soon be able to play historic keyboard instruments that were tuned to pitches other than the modern concert standard. Perhaps I would find myself enjoying a sense of the greater intricacies of music as a result of becoming less obsessed with one particular aspect of it. The prospect of a new aural world of untapped possibilities, one in which pitch and its offshoots played only a minor part, did not strike me as frightening. Maybe the whole phenomenon of synaesthesia would soon be lying dormant at the back of my mind. It had never been an indispensable part of my thinking, and there would be many other musical experiences on which to concentrate. My only regret was that music might seem somehow less colourful; my enjoyment of a particular kind of aesthetic pleasure might disappear for good.

I boiled the kettle for coffee as the technician was finishing the last notes in the treble. "How did it go?" I asked as I brought the cups through.

"Very well," he said. "You'll hear the difference in the sound now. Just listen to these chords."

He played, and I immediately noticed a striking alteration. The piano now sounded markedly cleaner and more beautiful. I sat down and played a piece of Satie, and as I did so I felt as though I were having a conversation with somebody who had just recovered from an illness. The piano's personality seemed to have taken on a friendliness and eagerness to please that had been lacking for months.

"It's all in the tuning," the technician was saying. "The centre had actually dropped a couple of hertz in places. I've set the musical pattern back to the way it should be. You've got good stability now and I'm sure if I come back in six months it won't have dropped back as far as it had. It's just about feeling how the pins react and doing a good, thorough job to make sure the tuning holds for as long as possible. Now, you enjoy playing that for the next little while. That'll bring the colour back into everything!"

If only, I thought, he could know the full significance of his last words. It was one thing to bring the colour back to a piano; it was quite another to bring it back to somebody's hearing. Sometimes there were things you couldn't put right with a simple repair. Things degenerated with age; everything gradually ran down or became more disordered. Entropy was such a familiar part of everyday experience that it was not even necessary to reconcile yourself to it. The process could be viewed positively if you so chose; things did not decline, they just increased in complexity, and being able to accept this was a sign of maturity.

It was only when I was listening to a broadcast of an orchestral concert four days after the technician's visit that I noticed that the brightness had suddenly returned to my colours, and that the haze that had surrounded my sense of pitch during the past few months had quietly, and completely, vanished.