

Modelling And the structure of Musical Talent

NLP is an accelerated learning strategy for the detection and utilisation of patterns in the world.

John Grinder

Modelling is the basis of NLP. Modelling is the process that created all the existing NLP techniques. Modelling a skill means finding out how someone does a skill so that it can be taught to others and they can get the same sort of results.

Modelling has one basic principle:

If one person can do something then it is possible to model it and teach it to others.

The first NLP model was the Meta Model (modelled from Virginia Satir and Fritz Perls and refined using ideas from Chomsky's Transformational Grammar).

The second model was representational systems and the third was the Milton Model (modelled from Milton Erickson).

A model is a deleted, distorted and generalised copy of the original and therefore there can never be such a thing as a complete model. A model is not true. A model can only work – or not. If it works, it allows another person to get the same class of results as the original person from whom the model was taken.

You can never get exactly the same results as the person you model, because everyone is different, they will assemble the elements in their own unique way. Modelling does not create clones – it gives you the opportunity to go beyond your present limitations.

Modelling outstanding people created the basic patterns of NLP. For NLP to survive as a discipline, body of knowledge and methodology, it needs to continue to create more models from every field – sport, business, sales, education, consultancy, training, law, relationships parenting and health. The possibilities are limitless.

For example, you can model:

- How a person stays in good health or overcomes an illness
- Excellent sales skills
- Leadership skills
- Outstanding athletic achievements
- Excellent teachers
- Strategic thinking

An NLP model normally consists of:

The mental strategies.

The beliefs and values.

The physiology. (External behaviour)

The context in which the person being modelled is operating.

The full process of modelling involves:

Elicitation - discovering patterns of experience.

Coding - describing those patterns in terms of NLP distinctions, creating new distinctions or using the distinctions taken from the person being modelled.
Utilisation - exploring ways to use those patterns.
Propagation - creating a teaching method to transfer the model to others.

The following is an example of a modelling project carried out in 1989 into listening skills in Music. It was published in 1989 as the structure of musical talent and was accompanied by a video of the modelling process.

The Structure of Musical Talent

Listening Skills in Music

by Joseph O'Connor

This is a research project I carried out into musical listening skills in 1988. The project directly follows up some of the ideas in my book *Not Pulling Strings* (1987). Aural skills are invisible and intangible and only the audible results seem accessible to study. How the musician thinks: the process that gives rise to the sounds, is not so easy to know. I believe there is a parallel between aural skills and instrumental technique. Instrumental technique is visible; it can be analysed in detail and taught. An instrumental student learns a basic set of procedures: for example, the piano student learns how to sit, and how to place their hands on the piano. He or she learns the most efficient and effective way to co-ordinate their body and mind to produce the music they want to play. Excellent players share certain basic patterns and a distillation of these patterns makes up the technique for the instrument: the most visibly efficient and effective way of playing. One way of thinking about instrumental technique is as a behavioural model of what good players do.

There is no equivalent model for aural skills and aural training. Repetition and practice with feedback and encouragement from the teacher can lead to improvement, but like practising and instrument, the improvement is dependent on the process that is being repeated. The only way of knowing whether students can hear accurately internally is to ask them to sing, write down or otherwise identify what they have heard. If what they do is inaccurate and incomplete, it is difficult to know what has gone wrong, and so difficult to know how to correct it.

Instrumental teachers give detailed instructions on physical technique; this research is a step towards building a model of their thought process behind the aural skills. Talent implies a natural ability. The 'talented;' individual must be naturally using a very effective mental process. If we can discover it, we can teach it to others, who may not naturally use such a good way. The acid test is whether learning this process gives a student demonstrably better aural skills than before.

The challenge is to construct a model of aural skills. If I wanted to study a good guitar technique, I would closely watch several excellent guitarists to see what procedures they have in common. By the same token, the best way to construct a model of a good aural strategy is to find musicians who have excellent aural skills and discover exactly what they do, by providing them with a context to use their aural skills, observing how they respond, and asking them to describe their thought process as clearly as possible. The musical context has to be difficult enough to challenge them, but simple enough to administer and analyse afterwards. A 'musical ear' is often assumed to be an inborn talent, rather than a strategy you can learn.

This model can be compared with the strategies of students who are less good aurally, to find the difference that makes the difference.

Method

In the project I focused on three areas of musical skill:

- a) *Memory for rhythm.* The ability to listen to a short piece of music and clap back the rhythm.
- b) *Memory for pitch.* The ability to sing back a short piece of music.
- c) *The ability to identify the two basic chords in Western music: the major chord, and the minor chord.*

Although this is a limited context for aural skills, the same skills of memory and discrimination are used in all areas of musical expertise: performing, teaching, arranging, improvising and composing.

I interviewed 12 music students at:

St Paul's School,
Lonsdale Road,
Barnes SW13 9JT

I did a similar series of five interviews at:

The Menuhin School
Stoke D'Abernon
Surrey

All interviews lasted about 40 minutes, and were recorded on videotape.

I began each interview by explaining the purpose of my research and asking for co-operation. I also assured the students that they were not under test; I was interested in how they arrived at their responses, not whether they were right or wrong. I established rapport, so they had no reservations or anxieties about the interview. The purpose of doing many interviews was to find the patterns shared by successful students; with these, I could build a general model of listening skills. Not all the students were equally good at

these tests, and by contrasting the effective strategies with the less effective ones I could find the difference that made the difference.

I had prepared a tape with several short pieces for the students to listen to and to clap back the rhythm. I also recorded several tunes to be sung rather than clapped, some examples of both types of tune are given later. Students were only asked to sing tunes that were comfortably within their vocal range. I recorded a series of major and minor chords. All material was played on the piano.

All the students I interviewed were given the opportunity to clap or sing two or three of the tunes and identify most of the triads. I began from the idea that when we remember something we have seen, heard or felt, we recreate the sight, sound or feeling in our imagination. We remember what we have seen by seeing it again in our "mind's eye". We recall sounds by rehearsing them in our "inner ear", and we remember physical and emotional feelings by sensing them again. We also use our senses internally to imagine and plan for the future, to create new sounds and to experience what it would feel like if we were to do some action.

Although people differ in their ability to remember different sorts of sense experiences, it is generally accepted that anybody who can use their senses in the outside world, can use them internally to "re-present" their experience. These inner senses do not work in isolation, they are linked. Our memories consist of sights, sounds and feelings bound together, in the same way as our experience of the world is a rich combination of different sense impressions.

The strongest and most reliable memories consist of a picture, sound and feeling of the experience. Memorising a piece of music for a performance involves forming a mental picture of the music, developing a fast, error-free muscle memory of the piece (the feeling memory), and being able to hear it mentally without the score. It seemed likely that to accurately remember music after just one or two playings there would need to be some feeling and picture of the music, as well as an auditory memory.

I assumed that musicians would be good at mentally organising what they heard. Short-term memory is limited to about seven pieces of information. (Miller 1957), but the size of the piece of information is not fixed. Good musicians would be able to find patterns and organise the music more efficiently. Memory is partly how efficiently you organise the information and partly how you represent it.

In general, the more practised a skill becomes, the less aware we are of exactly how we do it. Very few of the students I interviewed could account for what they did. However, those students who were most aware made the best responses to the tests. No student claimed to have been taught their aural strategy, most had never examined it. Aural responses happen in an instant, they are difficult to analyse in 'slow motion'. For these reasons, I did not rely completely on their conscious verbal explanations; I also used two other ways of gathering information at the interviews.

1) *Eye movements.*

The way people move their eyes is an indication of how they are thinking. Neurological research has shown that lateral and horizontal eye movements are connected with activation of the left or right brain hemispheres. (Ornstein 1974, Kinsbourne 1976).

In general, right handed people look down to their right, when they are experiencing feelings. When they look down to their left, or move their eyes sideways they are hearing sounds internally. When they move their eyes upwards, or defocus, as if staring into the distance, they are seeing pictures internally. Some right-handed people and most left-handed people will look down to their left for feelings.

A person's eye movements are unconscious and will always be consistent and predictable, unless a conscious effort is made to change them. The same patterns seem to occur cross culturally. I watched the student's eye movements during the interviews, and used them to direct my questions. I did not mention what I was doing, to avoid making them feel self-conscious.

2) *Language patterns*

As well as taking what the students said at face value, I also paid attention to the way they said it. Language describes thoughts, and thoughts consist of feelings, pictures and sounds, so what we say will reflect how we are thinking and will indicate internal pictures, sounds or feelings. There were many such examples in my interviews. When students said things like, "I notice the patterns of the tune" or, "I look where it is going" or, "I see if the clapping corresponds to the tune", I would start to ask about the pictures they were making. Some students said, "I get an impression of a tune" or, "I get a feeling or mood of the tune," then I asked about feelings. Rehearing was always conscious, but students were often not aware of the pictures or feelings until I drew their attention to them.

Results

Musical Memory

First, two general observations that apply to any educational test situation. All the students believed they could do these tests. A belief in success gives self-confidence, which in turn makes success more likely. They also believed it was worthwhile; it engaged their curiosity and interest. I think these two beliefs are necessary for any good performance.

The video of this project shows parts of the interview with Justin Benn, a student at St Paul's school, to illustrate several patterns that were shared by the most successful students. The patterns were the same whether the tune was sung or clapped.

a) Listening to the music, they consistently adopted a particular posture, eye position and breathing pattern, usually with the head tilted to one side and the eyes looking downwards. It was as if they tuned their bodies to the music.

b) It was important to know in advance how long and difficult the tune would be. They had to clear their mind and allocate a certain amount of mental space to the task.

c) As the music was playing, they would gather an overall feeling of the music. This was often described as the 'mood' or 'imprint' of the piece. This feeling represented the piece as a whole, and their relationship to it.

d) The next step was to form some visual representation of the music. Most students visualised some sort of graph with the vertical axis representing the rise and fall of pitch, and the horizontal axis used to represent duration in time. This was variously described as 'music mapping', 'number patterns' or, 'making a graph'. The beat of the music was often used to organise the picture.

The longer, or more difficult the piece, the more the students relied on this image to guide them through. The image was always bright, clear, focussed, and at a comfortable distance to read. Some students visualised a stave with the exact note values just like a score, but such a detailed picture was not essential.

The feeling, sound and picture were built up together on the first listening. The feeling gave an overall frame for the detailed image. Subsequent hearings were used to fix parts of the tune that were still uncertain. To remember the music, the first bar was the cue or trigger to set off the whole sequence, in the same way that actors use verbal cues to key themselves into a long speech. Once started the cycle can continue almost by itself. The memory builds in the sequence: auditory to feeling to visual, but all elements are there simultaneously. The way a radio works is a good analogy. The current flows in a definite direction and sequence when it is switched on, yet all the parts operate at the same time.

e) Many students mentally reheard the tune immediately after they heard it, in its original tonality, but at a much faster speed.

f) All students reheard the tune, usually in its original tonality while singing or clapping it back. They also reviewed the picture, and kept the overall feeling in mind. This gave them three ways of storing and retrieving the piece and a greater flexibility and choice of methods for their response. The harder the tune, the more important the feeling and visual memories become.

g) They knew if they were wrong, but could not necessarily correct the mistake. Either the picture was unclear so they could not read it, or they could not rehear the sound, or the feeling they got from their replay did not match the original overall feeling.

h) The students broke the music down into smaller pieces. They noticed repetitive patterns in both pitch and rhythm. These were remembered visually, even after one hearing.

i) It was crucial to retain the first bar. It set the mood of the piece, created expectations, and was a reference point to generate what followed.

In summary: All successful students had the same short strategy. They heard the tune, created a feeling to represent the piece as a whole, and used what they heard and felt to form a picture of the music. The music was now not simply an auditory memory but a synesthesia of sight, sound and feeling. They reviewed it at speed, and then clapped or sung it back while rehearsing, reviewing and keeping track of their initial feeling. Music and musical memory is not simply an auditory experience.

Aural Difficulties

I found working with these ideas that students with aural difficulties always have strategies that differ from the above. The main differences are:

- 1) Longer strategies involving more rehearsing or reviewing were less effective. The more steps there are, the more possibility for error. (The 'Chinese Whispers' effect.)
- 2) One common source of difficulty was trying to remember the first part while listening to the second part. This scrambles both parts.
- 3) The order of the steps is important. Students who derived the feeling from the image generally did less well.

4) Students who did not make an internal image had great difficulty with aural memory. This seems to be the single most important element.

Successful students had bright, close and sharply focussed images. The ability to manipulate internal images and sounds is at the heart of aural training and basic to musical expression and interpretation. If you are working with advanced students in aural training, you may find it sufficient to correct some of these possible errors and not install the strategy from the beginning.

Teaching the Strategy

The video shows some parts of a lesson with Rebecca Hickson to illustrate how this strategy could be taught. She had never received any aural or instrumental lessons before. These are the formal steps to teaching the strategy:

- 1) Ask the student to internally hear a tune that they enjoy. Ask how they hear it. (e.g. stereo or mono, how loud etc.) You provide them with a reference experience for easy, enjoyable listening. Nearly everyone, however poor they believe their musical abilities to be, will enjoy and remember some music. This is a resource they can use.
- 2) Ask the student to create a space for the music in the same place they hear their enjoyable tune, and to rehear it when the time comes, in the same way.
- 3) Ask the student to get an overall feeling for the music when you play it. There are no "right" or "wrong" answers here. Let the feeling be a guide to the shape of the tune, and some visual representation of it. Play the tune as many times as necessary. If this is difficult, the student may need to practise getting a feel for music, and making images of it over several lessons.
- 4) Find out what has stuck and what gaps (if any), there are in the tune. Play it again so that they can fill in the gaps. Break the piece down into chunks if necessary. Make the tune short and easy at first.
- 5) Ask the student to replay the tune at speed while rehearsing and reviewing, and getting the feeling again.
- 6) Ask them to clap or sing the tune back to you.

A point about singing. A student may have difficulty singing a tune back for two possible reasons. It may be that they are accurately singing what they are internally hearing, however this is unusual. It is more likely that they are going through the strategy rehearsing the tune clearly internally, but do not have sufficient control of their voice to accurately give out what they can hear internally. This is a totally different problem and needs work specifically on vocal control, which was not within the area of this project.

If you adopt this sequence of steps systematically, you will help your students build a demonstrably good strategy for remembering music. It is important the student succeeds as much as possible at first. Belief and confidence are prerequisites to any successful performance. The process of learning a skill is different to the process of performing a skill. Sometimes the two are confused and learning becomes a constant series of tests for the students to find out what they cannot do, rather than what they can. In the learning process, everything is feedback, especially the mistakes, which are not to be feared. Desperately trying to avoid mistakes makes students nervous and more likely to fail. It makes learning difficult. If learning builds gradually from success to success

using an effective strategy, the final performance, if there is one, is likely to be successful and of high quality.

Group Teaching

These aural skills do not depend on sophisticated concepts; they can be taught to group easily. First ask the group individually to remember their favourite sounds or tune, find out which direction it seems to come from, and whereabouts in space they would put a picture of it. Then ask them to listen to a sound, for example a gong, or birdsong, get a feeling for that sound and represent its size and shape in space in the same place that they put their favourite sounds. Then ask them to imagine what sort of image could represent it, again in the space they use for their favourite sounds.

They can then replay the sound in their head and follow the same sequence: feeling, image and sound. This whole process could then be repeated with a whole series of different sounds or musical notes. The next step would be to go through the same process with a sequence of sounds, then with a sequence of 3 - 5 notes, perhaps from a familiar tune at first. New short musical phrases could then be used. The children could move around or clap when listening and also when replaying the sounds mentally, to help establish the beat of the music. This would teach children the basic skill of musical memory in a way that was easy and fun to do.

Chord Discrimination

We found the students in our study used a variety of methods to distinguish major and minor chords. Some associated different feelings with the chords. These were difficult to describe in words, but were not so simple as major being happy and minor being sad. In the example on video, Malcolm Alison, a student at The Menuhin School describes the difference between the two chords in terms of taste. This may seem unfamiliar, but he was not the only student we found who used this method. Some students sensed major chords as bright, and minor chords as darker. This worked less well because high-pitched notes tended also to be sensed as bright, so a high minor chord gave a confusing signal.

All the students had some immediate reaction to the chords, if there was some uncertainty, or if more information was needed, they analysed the chords by the intervals between the notes. These intervals were sensed spatially. There was a larger space between the first and third note of the major chord, than between the first and third notes of a minor chord. This spatial sense of note separation was often translated into an image of a piano keyboard with a hand pressing down the keys to make the chord. Students with perfect pitch saw the correct piano keys being depressed, and so were able to identify the chord precisely. I think this process of identifying chord types by feel, followed by a spatial and visual check can be used for any type of chord.

The process of giving students an immediate way of recognising major and minor chords is shown on the video.

1) Play a root position major triad and a root position minor triad and systematically go through the possible distinctions: feeling, taste, picture, brightness or colour, kind of

person. Do not suggest specific answers. The process that the teacher uses to distinguish the chords will not necessarily work for every student.

2) When you have made all the distinctions, go through a number of closed position paired major and minor triads saying which one is which and inviting the student to find the distinction that works best for them. After a number of these trials, you can try playing the two and inviting the student to distinguish which is which. Lastly play a single chord and ask them which it is. From there you can go into inversions. The spatial check comes later with the explanation of how the chords are formed.

This work needs time to be tested and evaluated by many teachers. I would invite you to try them as another choice in the ways you have for doing aural training and I welcome any feedback about where these ideas work, where they do not work, and how they might be refined. The method used to obtain these results is also important, and forms an integral part of the whole project. Take people who excel in the field you wish to study. Observe, question, and notice the ways their replies are phrased. Particularly notice the non-verbal signals such as eye movements. These are powerful tools to give a greater understanding of any thought process. I believe this method has great potential in education, it has already been used in such fields as psychotherapy, communication and business with excellent results.

" All this fires my soul, and provided I am not disturbed, my subject enlarges itself, becomes methodised and defined, and the whole, though it be long, stands almost complete and finished in my mind, so that I can survey it like a fine picture or a beautiful statue at a glance. Nor do I hear in my imagination the parts successively, but I hear them as it were, all at once. What a delight this is I cannot tell!" (From a letter Mozart wrote in 1789, quoted in E. Holmes 1878)

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References

D. Galin and R. Ornstein, *Individual Differences in Cognitive Style - Reflective Eye Movements*, *Neuropsychologia* 1974 Volume 12 pp. 376 - 397

M. Kinsbourne, *Eye and Head Turning Indicates Cerebral Lateralisation*, *Science* 179 1976 pp. 539 -541

George Miller, *The Magical Number Seven, Plus or Minus Two*, *Psychological Review* Volume 83 1957

E. Holmes, *The Life of Mozart, Including His Correspondence*, Chapman & Hall 1878

Joseph O'Connor, *Not Pulling Strings*, Lambent Books 1987

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