

The Musical Brain Conference 2014

Mozart and the Power of Music: Memory, Myth & Magic

Friday 24 October 2014, Senate House

TRANSCRIPT

Memorising Music – Chaired by Prof. Jessica Grahn

JOHN COX: My name is John Cox. I'm a trustee of the Musical Brain charity, Professor of Psychiatry and Emeritus Professor. I suppose my interest in the subject is linked to perinatal health and aspects of psychological contribution to the field. The next session on memorising music I look forward to very much, especially because we have such distinguished panelists, led by Jessica Grahn. They include Jane Ginsburg, the director of the Research Institute, Kirsteen Davidson-Kelly and then James Gilchrist, Anna Tilbrook and Ian Brown, who really need no further introductions and I have great pleasure in handing over to Jessica Grahn to mastermind this session.

JANE GINSBORG: I'm Jane Ginsborg. I'm delighted to be here, and very pleased to have been invited. I have been following the progress of this conference for some years now and so it is a real privilege to be a member of this panel and in such distinguished company. I have been fascinated by the topic of singers' memorising strategies and the recall of songs, ever since my earliest performances as a teenage singer. In the very first concert I gave with the pianist who subsequently became my life, as well as my duo partner, George Nicholson, I was persuaded to sing a work by the Belgian composer Henri Pousseur, *Miroir de Votre Faust*. The first movement is piano, *Le Tarot d'Henri* and the second one for piano and voice, and consists of music that ranges in style from Mozart to Boulez. I'm going to play you the first minute and a little bit and then we will jump to further on down the piece to the fourth and fifth minutes and so you will get a sense of how it works. Now this clip is actually taken from a version that was a stage version and so there is a lot of audience noise, but I have tried to keep to the bits that have as little as possible.

[Video played.]

JANE GINSBORG: Here is the next little bit.

[Video played.]

JANE GINSBORG: That gives you a taste of it. Now, the third movement combines the first movement and the second movement. It is printed on separate sheets of manuscript with windows in them to reveal the page below. These are shuffled at the beginning of the performance so that neither the pianist nor the singer knows what is going to happen next! I therefore had to learn each line of the song with its cue and start singing as soon as I recognised it. The instructions for this are in the book of words at the beginning of the score and there is some lovely phrase in French, which I have now forgotten. It is "catching on the wing," - the pianist plays and the singer catches on the wing, sings what they can remember, and as soon as the pianist goes on to the next bit, the singer stops singing. Now, at the age of 19, I didn't understand the process by which I was able to do this and give a successful

performance. But five years ago in a concert in memory to Pousseur, we performed this work again. By then I had been carrying out research into musicians memorising strategies for 15 years. I knew two processes were involved. First, associating each cue from the piano part with the appropriate entry for the singer, with the appropriate words and melody. That is something that can be usually be achieved just by repeating the cue and entry over and over again until the cue functions as a trigger. Second is deliberately developing contact addressable memory. That is a term introduced by Roger Chaffin. I could practice jumping from the music of one section to another and it was relatively easy in this piece, because I could think, ah, that's the bit that's like Wagner, it follows the Tristan chord, this is the bit like Schubert and Webern, and I could do that with the right words. Now, in some ways, difficult though the task sounds, and don't get me wrong, it was a very difficult task, it was actually made easier because the different sections are so easily distinguishable from each other, and because the words don't repeat.

Now, another inspiration for my turning to the study of cognitive psychology, at the point where I no longer wanted to pursue a career as a professional musician or singer myself, was trying to explain other musicians' memory lapses. This had gone back ten years before I started studying psychology. I watched the gala performance from the Metropolitan Opera, to celebrate their centennial, it was 1983 and I watched Kiri te Kanawa getting lost in *Dove Sono*. I'm going to play you just over a minute, this is the last section of the piece.

[\[CLICK HERE to watch video\]](#)

Did you see what happened? Okay, so well done. Now, let's just go to here again. All right, so, in this section, she has to sing the same section twice and the music is almost exactly the same, except the first time, the word cor, heart, jumps up a fourth from a G to a C and the second time it stays on the same note. Now Kiri sings the second phrase as though it were the first, and that cues her to continue singing the second time music again even though the orchestra is playing the second time music. Actually we have to congratulate the recording team because they faded the orchestra down at that point! So instead of jumping forward when she hears her cue for the next phrase, she jumps backwards to the phrase before, ending up with just a bit of a scramble to get back together with the orchestra again. Now the whole thing actually took less than a minute, and unless you knew the aria well the only sign you might pick up from Kiri that something had gone wrong is she looks down briefly at the crucial moment. I can play the video again.

[Video played.]

Di cangiar l'ingrato cor!

Di cangiar l'ingrato cor!

[End of video.]

JANE GINSBORG: I'll take you through to the end because the looks on their faces are so delicious!

[Video played.]

Ah! se almen la mia costanza

Nel languire amando ognor

Mi portasse una speranza

Di cangiar l'ingrato cor!

Di cangiar l'ingrato cor!

Mia costanza

Ah! l'ingrato cor!

Di cangiar l'ingrato cor!

Di cangiar l'ingrato cor!

Di cangiar l'ingrato cor!

L'ingrato cor! L'ingrato cor!

[End of video.]

So you really have a sense of, oh, we got away with it that time! I used to call lapses like this "junction errors." When I first started studying psychology I had small children and I was living just outside a small town with a ring road and I did a lot of driving in those days. At the roundabout near my home, I had to take one exit to get to the supermarket, another one to the swimming pool and another one to the children's playgroup. Unless I was thinking about where exactly I wanted to go, it was very easy to find myself on the way to the wrong place. So places in songs and arias where it is very easy to go the wrong way, because the words repeat, or because the music repeats, or because both repeat as in this case, function as what we now call "switches." They could take the singer, and it doesn't have to be a singer, it could be any musician, in one of several directions. Now if the singer has identified these and deliberately memorised them then there is less chance of making an error in performance. So how can singers prepare most effectively to perform from memory? I have worked with and done dozens of studies now with singers, including research on my own practicing memorising and performing, and I have done it with instrumentalists. I'm familiar with great deal of research in this area, so I'm not even going to try to tell you all about it in the time that I have got, but I will summarise as much as I can and some of this will be revision.

There are two broad approaches to memorising, and the first is to learn the material as thoroughly as possible by which time the musician very often finds that they know it off by heart and they don't have to worry about memorising deliberately. In the language of psychology this is, as Jessica said, procedural memory, "how to" memory, motor memory, like tying a shoelace or riding a bicycle. The fingers and the body know what to do automatically, so the mind may be free to focus on how the performer wants to convey the music to the audience, or maybe what they are going to have for dinner. I'm going to come back to the second approach shortly, but I want to explore the idea of procedural memory just a bit more. When I first started studying singers' memorisation strategies and recall from memory I was particularly interested in the interaction of words, melody and memory. Specifically for singers, there is the question of whether it is better, and by better I just mean in the sense of being more useful to the singer, to memorise the words and the melodies

separately or together. Now the expert singers whom I interviewed varied in their strategies, from starting with the text of the song and becoming completely familiar with it, to the extent that they would insist on being able to recite the words as though we were a poem, before learning them again with the music, to always memorising the words and the melody together, or doing a kind of hybrid, memorising the words to the rhythm of the melody. But, one of the downsides of interview research is that people don't always tell you what they actually do – in fact, they don't even always know what they actually do in practice.

I carried out an observational study in which 15 singers, amateur, professionals and students learned and memorised the same new song over the course of six 15 minute practice sessions and they performed it from memory. When I analysed their behaviours singing the melody and words separately and together, with and without the score, I found that the people who memorised the song most quickly, and the people that had memorised in the shortest amount of time from having started. These were two professionals, one student and one amateur. It wasn't that the professional singers were quicker or better memorisers than the others, but they were the ones who always sang the words and melody together. I went on to do an experiment in which there were 60 singers all together and they were more and less expert singers. They memorised a short unaccompanied folk song in a single 20 minute session. John Cox just told me earlier on that he took part in this study and he still remembers the folk song that I made him learn in this 20 minute session. It was a long time ago!

Anyway, I divided my singers into three groups. The first memorised the poem first and then the melody and then both of them together, the second group memorised the melody first and then the poem and then both of them together, and the third group memorised the whole song for the whole of the session, always the words and melody together. I'm tempted to ask John if he remembers which group he was in. No, he's looking blankly at me, he has forgotten. So of this group, the expert singers had more accurate and more fluent recall when they learned both together, they were the ones who were the most successful memorisers, so it looked at this point as though melody provides a framework for recalling the words of a song. I wondered if this would explain how it is that singers can learn to perform songs, and indeed roles, in languages they neither speak nor understand. In this last experiment of the series, I asked 20 expert singers to memorise two songs in two sessions two weeks apart. One song had semantically meaningful words in English, and the other one had nonsense words. Actually, those nonsense words were strings of digits, of numbers, with the odd familiar word thrown in, so as to mimic a foreign language in which you come to recognise the words for "I" and "love" and "you," for example. I'm not going to sing it to you, but the first line of the nonsense song went "the fifty six one four eleven." Although the singers were quicker to learn the songs in English, their recall for the nonsense songs was the same or even better when tested in different ways and that suggests that the hypothesis that the melody provides a framework for recalling text may well be right, which is why now I recommend to singers that they always try to memorise them together.

However, there is a big caveat here, and what I would say is that I am only talking about memorising for the purposes of security. Obviously, to give a good, truthful, convincing performance, the singer has got to have engaged with the meaning of the text and how they interpret it in the context of the melody and the accompaniment. I'm not advocating memorising words and melody together without caring what the words mean, by rote, as it were, for the purposes of giving a performance in public. I wouldn't go anywhere near as far as that. I would just say it's a useful strategy to get the words and the melody into your head

before you start thinking about how you want to put them over. I just said rote memorising, and that's the other strategy, the acknowledgement that rote repetition is just one strategy that is available to musicians.

So, let's look at some of the other ones, which I know that Kirsteen is going to take up in more detail in a moment. We can use visual strategies for the score. As the pedagogue Anfossi wrote: "The singer must memorise at least the turn of the page" because in those days very few musicians were expected to memorise and it wasn't considered a great feat to be able to. It wasn't important. Musicians weren't expected to perform from memory. We can rely on visual cues from the conductor or from our collaborative pianist. We can use auditory strategies to monitor the sound of our performance and to imagine what comes next. We need our kinaesthetic strategies, our motor and physical memories, to be able to produce and reproduce the feeling of a big leap, of the breath we are going to need to hold a long note. But above all, we need to develop a mental representation of the compositional structure of the music or its narrative journey as a framework for all of these, which will depend on the genre, the kind of music, the composer's intentions and our own intentions. We may think in terms of sections or phrases and switches like the roundabout I described, or we might think of the character, the story, the emotional content of the text and the way it is set to music. Then, both in rehearsal and in performance, we can draw on each of these strategies as necessary. If one fails, if you suddenly can't hear in your mind what comes next, you can often see the score, or you can't see it, but you know what you want to say, so you can sing it.

Ultimately, however, even with overlearning, automatisisation and the deliberate use of the strategies I have outlined, memory lapses are pretty well inevitable, although in my experience most audiences don't notice or don't care. I have never actually come across anybody, or at least any adult, who can honestly say that they have never had a moment in performance when they didn't experience at least a passing flicker, just a glimmer of uncertainty. More often, the singer has a way of coping with a memory lapse. The more confident they can be, the better they perform, and the more they and their audience can enjoy the music. Thank you very much for your attention. I think I am right in saying we'll move on to questions later on.

KIRSTEEN DAVIDSON-KELLY: Good morning. I'm going to talk about whether or not learning and memorising are different processes or whether in fact they can more usefully be viewed as part of the same process of internalization. I'm going to look at this from a very practical point of view, and with reference to two studies that I've undertaken in which I explored learning and memorising processes amongst advanced pianists. So for fluent performance, whether or not we need to use a score, multidimensional mental representations or mental images of the musical text need to be securely encoded in the memory in order to be recalled under performance conditions. We need to understand the intention of the text, remember its salient features, know what the music sounds like and how we want to shape that sound, know where the note patterns occur on the instrument, and know how it feels to execute these patterns. Yet, although for many musicians, memorising a large and complex repertoire is obviously almost a prerequisite for a successful career, there is actually a surprising lack of memorisation pedagogy and memorisation is rarely taught as a deliberate skill. From a practical point of view, what we often mean by learning is we reach a point where we can play a piece of music fluently, and memorising means we can recall what it is that we have learnt without reference to a written score. The most commonly documented approach to preparing for memorised performance involves working at the instrument during

initial learning and then memorising once the performance is reasonably secure.

Some years ago I encountered an alternative approach which led me to question the extent to which learning and memorising should be viewed as separate and sequential processes. I carried out a participant observation study of a course for advanced pianists given by Nelly Ben-Or, in which I took part. Nelly Ben-Or is a pianist and a teacher of Alexander Technique whose own practice can be traced back to Karl Leimer and his famous pupil Walter Giesecking. Anyway, she runs courses for advanced pianists and she argues that the getting to know of the music is the most important aspect and then the mechanics of playing are the last bit that has to be dealt with. She teaches pianists to learn unfamiliar music away from the instrument, citing the work of Giesecking and Leimer who describe a similar process. So what happens is that the pianist memorises and rehearses the material via score study and mental imagery and they only play the music on the instrument once they are really able to successfully recall that in their mind. I won't go into great detail about the actual imagery techniques that she uses to teach this but it's important to say that the aim is to develop what she calls total inner memory. In other words, it's not just understanding the text in an analytical point of view, it functions as a way of really pre-experiencing all the aspects of the performance on the instrument. So here I'm just giving a quick summary of what Nelly teaches people to do, only a very brief overview at the instrument, so you don't inadvertently teach your body how to play, and then you spend a lot of time explaining or analysing the material. While you do that, you memorise it away from the instrument, so you might be looking at the structure, thinking about the sound, and also very particularly imagining where the music is played on the instrument. Then, as I said, you only rehearse on the instrument once your recall is fluent mentally.

One aspect of this pedagogy that really interested me was it seemed learning and memorisation were very integrated and took place specifically before the procedural learning or the learning to play happens. To follow on from this observational study, I conducted a questionnaire survey of piano students at six UK conservatoires. I had 36 pianists who completed the survey in full and part of the questionnaire that I want to talk about examined the processes that students adopted for learning and memorising, and I explored here whether their underlying conceptions about what learning and memorising entailed might relate to ways in which they chose to practise. So first of all, I asked the questionnaire respondents to identify which of three potential frameworks they had adopted in their most recent learning. They might firstly have adopted an integrated approach in which they memorised the material while learning to play it. Secondly, they might have adopted a two-stage approach, whereby they learnt the material and then memorised what they had learnt. Thirdly, they might adopt the kind of process that I have called "prior memorization," which Nelly advocates, in which they memorised the material and then learned to play it.

When I asked the pianists to just simply select one of these three approaches they had most recently adopted, 61% reported adopting the integrated approach. Later in the same questionnaire, I asked them to describe the same recent learning process in their own words and I categorised these responses according to these three frameworks. In both sets of questions only one pianist seemed to have adopted the prior memorisation approach, but this time, when they wrote about it in their own words, the majority reported adopting the two-stage process. Here, I also found that there are actually two sub categories of my integrated approach. There were some pianists who seemed to describe a really deliberate attempt to memorise right from the outset and some for whom the memorisation occurred

rather automatically and inadvertently as they went through the learning process. One student said they “practiced hands together, section by section, from extremely slow to as fast as possible with the metronome marking the maximum tempo achieved from each section. They did this hands separately, same again, hands together.” Another pianist said “it was a Ligeti étude and they played faster and faster, because the music is complicated.” You can see from these descriptions what a lot of effort goes into this first stage of performance. This is one of the statements I categorised as deliberately integrated. This student “played through to find the structure and found the most difficult places to play and memorise and divided these sections into phrases and motif.” They then “played each one slowly and memorised the left hand, right hand, hands together, without it up to speed, not moving on to the next phrase until satisfied, memorising with everything on the score, tried to never play mechanically.” Another student seemed to automatically integrate the learning and memorising, “tried to play through the piece to understand its overall structure, practiced slowly in sections, hands separately where appropriate, and by this stage 90% of the memorisation is usually completed for me. I am aware of the sections in which my memory is not perfectly secure and go to that section and memorise using several methods.”

Just one thing that I found interesting about using these two different questions, one with forced choice and one much more open, is it revealed some discrepancies in the responses. This is a slide of a bar chart comparing how students responded when asked a forced choice question or when they described the same process in their own words. When they were given the forced choice, 61% adopted the integrated approach, and fewer, the 36%, adopted the two-stage approach. It was exactly the reverse when I categorised their own, more full descriptions of what they had done. 61% had adopted the two-stage, according to my analysis, and 36% had adopted the integrated approach. So nine pianists, a quarter of the whole sample, reported using an integrated approach when given the forced choice, but described a two-stage process when they wrote about the process in their own words. This just suggests to me that perhaps some students felt that they ought to be adopting the integrated approach but they weren't really doing it in their own practice, or perhaps not as often as they thought they ought to.

Now I'm going to move on to the part of the questionnaire in which I asked respondents to reflect on their conceptions of learning and memorising. Here, I found quite a wide variation in what they thought. Some respondents clearly differentiated between the two processes, while for others no distinction existed. The majority, 81%, stated that there was a distinction between learning and memorising, but there was no consistent agreement about what distinguishes each process. In some cases, learning and memorising were experienced as one and the same thing, and what some pianists considered an essential component of learning was considered by others to be an essential component of memorising. Pianists were asked to describe in their own words what each process entailed and I identified a number of themes in their responses and categorised their responses according to the themes. I will show you what some of them said about learning. Learning was often described, in fact by 12 pianists, as developing the ability to play the notes and often with specific reference with reading from the score, being able to play fluently while glancing at the music for frequent reminders, reading the notes and playing it. Six pianists described learning as a process of understanding: understanding what you play, what is behind the notes and how to convey this, understanding the piece, perhaps through theory. Five gave just very general descriptions of what learning meant, such as becoming familiar with the music. Three pianists described

learning actually as a process integrating both understanding the content and being able to play it. Very interestingly, two pianists specifically described learning as memorising.

When they were asked to write about what memorising is, nine pianists described memorising simply and obviously as the process of not having to rely on the printed page any more, playing the notes without the score, the next step or subset of learning. Two distinct or not mutually exclusive views were apparent. Eight of the respondents described memorising as internalising or automating the music, doing it without really thinking about it or paying much attention to what you were doing, almost becoming the piece itself. But five pianists, somewhat in contrast, specified that memorisation was about a clarity of mental imagery, in particular auditory and structural imagery, and being able to hear the music in your head from start to finish, knowing in your mind and your ear where your fingers should go, knowing how the piece is built to have the plan in your head. Again, four pianists emphasised that memorisation required a combination of mental and physical knowledge. This group described memorisation in similar terms to those used by other ones to describe learning, like knowing the score well enough to be able to review the work in your mind without the score, and being able to play it at the instrument without the score.

To probe this even further I asked respondents to reflect on what the two processes might entail. I presented them with a list of eight ways of knowing and asked them to state whether each item was essential, desirable or not necessary for them to feel that a piece of music had been learned or memorised. This slide shows a bar chart giving the percentage of respondents who felt that each way of knowing was essential to their sense that they had either learnt or memorised a piece of music. The eight ways of knowing that I listed were: notational imagery, visualising the score from memory, playing with tempo, without errors, playing under tempo, structural imagery, meaning being able to imagine the structure of the piece from memory, motor imagery, being able to imagine how it feels to make and auditory imagery, imagining the sound from memory, and playing from memory. I won't go into all the results in detail but I want to make two particular comments. Firstly, nearly half the respondents considered playing from memory was essential to their sense of having learned a piece. Again, there is this overlap. Secondly, being able to imagine the sound from memory was considered essential for learning almost as often as for memorising. 80% said essential for learning and 89% for memorising.

Overall this questionnaire found that learning and memorising were often considered the same ways of knowing a piece. I characterised the responses as existing on a continuum, at the opposite ends of which, learning is felt to involve aspects of knowing that might be characterised as more external, so understanding the content through analysis and/or knowing physically how to play the notes, and memorising is felt to involve internal aspects. At the centre of the continuum, learning and memorising are indistinguishable, and include a procedural knowledge of how to play, a mental imagery and a sense of mental connection or ownership. It is a multidimensional internalised knowledge of the material that can be expressed through playing. I kind of want to reiterate here the idea that whether we are going to play with a score or without a score, this is the type of internalised knowledge that we require for any fluent performance. I haven't tested if any of the strategies lead to faster or better learning than any of the others, or whether different musicians benefit from one strategy or another, or whether different approaches might suit different types of music.

According to my analysis of the two data sets, there were hints that an integrated approach

may be considered preferable to a two-stage approach and that adopting at least some aspects of the prior memorisation strategy might help to avoid inadvertently encoding inefficient motor programming, or teaching your fingers to play without thinking about what you are doing. We might be able to reduce physical rehearsal time or avoid overuse issues. I also found in my study of Nelly Ben-Or's approach and my own approach that the prior approach is difficult and not as much fun as learning by playing. One participant on the course was already using the types of strategies she talked about but not in the same order. She was a brilliant memoriser, which begs the question of whether her approach was superior to a mixed approach in which she interspersed mental rehearsal during learning. Over time it is clear that a wide variety of strategies can and do lead to effective memorization. The majority of the participants in these two studies that I have talked about had not been taught to memorise, but the lack of explicit training hadn't prevented them from being able to perform from memory, and many reaching international standards of excellence.

When I analysed the questionnaire data from the second study I couldn't find any consistent relationship between the type of process adopted during students' practice and the ways they thought about learning and memorizing, which suggests they might not always have been particularly clear about the purposes and outcomes of their practice behaviours. When participants in the first study with Nelly Ben-Or were taught techniques for memorising, there were reports that the rehearsal process and memory security was enhanced. I would suggest one benefit of the approach, as one participant said, was that the teaching made many subconscious aspects of playing easier to understand and that was very helpful.

So, to conclude, the type of memory that we need for performance of precomposed musical text is memory, as Nelly Ben-Or put it nicely in an interview, "not as a text on the stage, but a text translated into the happening of the music on the piano." I'm interested in how this translation is best and most effectively achieved. I will be interested to hear from musicians here today about the processes they use and how they think about learning and memorising in their own work. Thank you.

JESSICA GRAHN: All right, I would like to invite the panel on up. I don't know if you guys have things you want to jump right in on and things that were triggered by listening to these presentations? If you do, I would say go first. I have questions but I'll save those if you have thoughts.

NEW SPEAKER: The only thing I would say about watching Dame Kiri is that it shows what a consummate artist she is to have quite a major memory lapse in a very public place and to come off smiling. You hardly noticed. We have all been there! It is horrible but I think the trick with memory is to realise that you are going to forget things, and what is important is how to rescue yourself.

JESSICA GRAHN: Thoughts on that?

IAN BROWN: Maybe I could say. For me, the most important thing is actually analysis of the music, especially for a pianist, because you have the harmony. More nowadays I memorise orchestral scores and I have a system where, right through the whole movement, I have a harmonic analysis, long phrase lengths, short phrase lengths. Hopefully I get it so in my mind I just do it eventually but at the beginning I'm thinking, this is a short phrase, this is a two note phrase, or a two bar, four bar, whatever, and also I analyse it. You mentioned this business of what you're doing with the music, that if you're very clear where the music is

going and where it's coming away from, again, you're remembering that shape, which is much easier to remember the notes. Notes themselves are actually very difficult to memorise.

ANNA TILBROOK: I am quite different, I think. I do very little memorising now because I do far less solo playing than I used to, but I can remember really from when I started playing, it just went in. I never tried and I found that I could memorise things very, very quickly. I hated having to read the music, I like not to have anything there, so that once I knew it, I could just concentrate on the musical side of things. Since then, whenever I have tried to memorise something, I've felt really, really sort of insecure. I hate having to try to learn something, it just doesn't feel comfortable for me. It's always just gone in, and that's so very different. It's interesting what you were talking about earlier, with phone numbers, and registration plates. It's different now, because we have mobile phones and it's all programmed in, but I used to be a bit of a walking telephone directory, and I think it is all connected. Numbers and patterns and things like that just go in very, very quickly, with me, and it's just there. I've had some strange experiences, one example is Beethoven's first piano concerto. I learnt it when I was quite young, and it went in very quickly, and I can still remember it now, even though I've not looked at the music for 30 years, I think. I was on the bus on the way here today and I was just playing through in my mind the first movement, and I can remember it all. But when I try and learn things now, I have to really work at it, and it doesn't feel secure.

JANE GINSBORG: When I first started my research, and this is a long, long time ago, I made a lot of phone calls and I talked to a lot of people. One of the singers that I talked to said, "I just don't really understand why it is that I remember everything that I learned when I was young, but now I'm in my..." I think she was probably in her 50s. She said, "I am singing too much, there is simply too much," She did a lot of contemporary music and she said, "I just don't bother anymore, I've got all of that stuff from my teens and twenties." I figure that this is to do with, and I often say this to aging relatives, worrying about their memory. I say, it's not a question of you're losing your memory, you've got more to remember! There is more to interfere with what you already know. That's one thing. The other thing is this question of whether you actually even want to know how it works. One of the singers that I talked to was a very, very well known singer. I am not going to give the name, but you would know it if I told you. I had been told, this is a singer who very often has memory lapses, but deals with them in very amusing ways. They would be worth talking to. I rang them up and explained what I was doing and what they said was, "I really don't want to think about it. If I knew how I memorised, I wouldn't be able to do it anymore." I think that's a very common attitude but I think it's wrong. I've never found that my pleasure in listening to music or making music has been spoiled by knowing more about the processes that underlie it, but I can understand that feeling of it being magic. Let's not look at it too closely! It might go.

JAMES GILCHRIST: I am much more like Ian, I think. I have a very specific way of memorising and it is very structural, structural in terms of the view on the page. In fact, there's a piece Anna and I are going to be doing this afternoon, where it's the same edition but Anna has the page turns in another place, so her left pages are my right and while we're performing it, I often find it a bit confusing, when I see her turning the page in the wrong place. I'm thinking, no, that's not where it is. So it's that physical structural thing, but also I'm very well aware that when I come to a new song that I need to memorise, I actually spend the beginning of my time not singing at all, but on the piano, because I basically try and

remember the harmonic structure of the piece. That, of course, is why I find classical music, in its broadest terms, much easier to remember than atonal music, because those sort of cues are much clearer for me. Until I've really got a harmonic structure in my mind, I won't move away from the piano. I need to have that, and then I start learning the words basically, and start learning the tune. It's very definitely quite a rigid structure that I employ to learn my songs.

NEW SPEAKER: I think Nelly Ben-Or's approach of learning the music first is fantastic, but I think especially if you don't have absolute pitch, when you get into the late Romantic and beyond early 20th, it's very hard to memorise some of those pieces completely, and then play them. I'm not sure - it would also take an incredibly long time, which is a practical element.

KIRSTEEN DAVIDSON-KELLY: Yes, it does. I'm working on the two piano version of the *Rite of Spring* at the moment. I work very much from an aural memory so if I can imagine what it sounds like, I'm likely to be able to play it, but there are parts of that piece, I really can't hear clearly, because the patterns are so dense. I can't conjure it up in my mind clearly enough, so then I have to use a multi-pronged strategy, when in fact a lot of what I'm doing is imagining where the patterns are on the piano. I'm not going to play it from memory as such, but it's just too complex to read some of the patterns in real-time.

NEW SPEAKER: Yes, as you say, you're not going to play it from memory.

KIRSTEEN DAVIDSON-KELLY: But I have to memorise it -

NEW SPEAKER: Yes, we're memorising the whole time, even when you're using the music, you're memorising as well.

JANE GINSBORG: If I can pick up what you said about multi-strategies - I give a lecture every year on memory just after the Labour Party Conference, and the first and second years I talked about Ed Miliband's feat of speaking for an hour or an hour plus without notes, but, of course, this year he missed out these two very vital things, and that changed my lecture rather! But I was able to say, if he had used a multi-prong strategy, the chances are he would have devised a mnemonic and he could well have said, "I'll begin by talking about something beginning with A, B and C, then D is for the deficit and E is for the economy," and that would have been another strategy beside the kind of narrative journey. I thought it was very interesting, you know, how he dealt with it, and then how his team dealt with it, and the kind of spin doctoring that went on afterwards - "It wasn't that important," and so on and so forth. It seemed very clear to me that you need a range of strategies that you draw on at different times. I wondered if you had any examples of those? Or maybe I'm off beam, and I'm not right about that, and you just have the one that you use?

NEW SPEAKER: I would entirely agree about the multi-strategy, but you have to find what works for you. When I was younger, I would memorise a lot on the piano, but I was very reliant on physical memory, touch memory, and it was inadequate. I found it was very unreliable. So I had to try something else and the more analytical I got, for me, worked much better, but other people are completely different, as Anna was saying.

ANNA TILBROOK: Yes, I think I am completely different actually, because sometimes when I have tried to make myself memorise something I will split the music up into sections and think, okay, this does this, this does that, so it's A, B, and blah blah blah and then I forget

that plan. That's the trouble! So that doesn't work for me at all. Talking about the physical muscle memory thing, I think that's exactly what does work for me. I had a very sort of out of body experience once, I was playing Chopin's *Fantasia Impromptu*, a piece I have played many, many times, and this was only a few years ago, I was busy playing away and then suddenly thought, "I have no idea how the next section starts, absolutely no idea," and it was getting closer and closer, and I thought, I simply don't know what to do. It got to it and my fingers started doing it and I would say for about eight or twelve bars, my mind, my brain, my whatever, was nowhere. It wasn't coming back and my fingers were just playing it, so it's obviously just muscle memory and then eventually it all came back and I thought, okay, now I know where I am, but it was a very horrible experience although my fingers knew where to go.

JAMES GILCHRIST: Of course, singing almost always has words and often a story and so, almost by definition, you have a multi-layered approach even before you have begun. You have got the tune, you have got the story and you have got where it lies on the page. There are lots of different clues. This is why, of course, some of the hardest things to remember are strophic songs, where you have lots and lots of verses all to the same tune, because one of your crutches has been removed. For this evening's recital I rather foolishly thought it would be interesting to put together a list of songs that I find rather difficult to remember! I've put down two strophic songs because one of them doesn't really have a story, it's simply a series of images. You could perfectly well have them in any order you liked, whereas the other one tells much more of a tale, and I'll probably cock them both up this evening now! But I generally find the second one easier to learn.

JANE GINSBORG: I used to collect memory lapse stories, but I do have -

JAMES GILCHRIST: You beast!

JANE GINSBORG: No, it's okay. Actually, Anna, it's lovely to hear your description, because it's very difficult to get musicians to talk about those moments, though they are familiar to us. It's kind of fessing up - we're not supposed to have these moments - but it's absolutely normal. I think, especially for musicians who have started young and who are fearless, there comes a point very often with adolescence and with self-consciousness, a perfectly ordinary part of adolescence, where it begins to go. I work in a conservatoire and very often our younger students, the 18, 19, 20, 21-year olds, are still in that stage of their lives where it just comes. It's the older ones and the staff who are really thinking about the strategies they need for secure memorising. Just thinking about ways of dealing with it, I remember a wonderful performance at the Edinburgh Festival once of the Copland song, *I Got Me a Cat*, and the singer got lost in the animals and produced from his pocket a series of little plastic animals which he lined up and shot one by one until he got to "I got me a wife" and he got through it that time.

JAMES GILCHRIST: It reminds me of a story from King's Cambridge. There is a line in the carol *In The Bleak Mid-Winter*, "Enough for him, whom cherubim." The guy sang it with "Cherubim worship day and night," and you could hear him thinking, a breast of milk, oh what a sight!

JANE GINSBORG: But you have made exactly the point, that we are all improvisers and this is why it is so important for students to learn to improvise.

NEW SPEAKER: Talking of improvisation, I remember hearing André Previn play Mendelssohn's first piano concerto. It was a piece I played and knew it extremely well. In the first movement, he got into the cadenza and there was a tiny falter and I thought, oh, and then he just carried on. It sounded very beautiful but it wasn't what Mendelssohn wrote. He improvised a little in the style of Mendelssohn, almost more beautiful than the original cadenza, and just got himself out of trouble. That was a very good thing to be able to do. Can I just say one thing about memory in general, to do with the way we interpret or play music? We have managed to debunk Mozart this morning, so if I could debunk somebody else! The conductor Toscanini had a legendary memory. He said it was because he had very bad eyesight and couldn't read the score and famously he had a very serious lapse of memory and he walked off the stage and never conducted again. He was very criticised because he never looked at scores, it was all in his head. He was quite criticized, especially by the famous critic of the time Virgil Thomson, saying Toscanini ought to go back to the score and conduct a performance looking at the score. This is discussible of course, but maybe because he has always remembered the music, and always done it the same, his performances were so controlled, but actually he could have had much more freedom, perhaps if he had gone back to the music he would have varied it or done things differently as he matured and so on.

ANNA TILBROOK: This isn't quite the same subject, but I just wanted to mention that I know that having talked to quite a lot of colleagues at the moment they are feeling an immense pressure to perform from memory. I think it is becoming increasingly common that people are not doing so. Certainly, you go to the Wigmore Hall and song recitals are always from memory. I would say 80% of the time now people tend to have the score there and have the music there even just to glance at. More particularly, a violinist friend of mine who has a reputation, plays concertos all over the place is and wonderful player has, I believe, made the decision now not to play from memory anymore because they just find it too stressful. There is a kind of psychological pressure that we're all under when we perform, to not make one tiny mistake, things like that. They have found it is just not worth it. They are not going to put themselves under that pressure, they would far rather give a much, much better performance when they can focus on the music rather than spending the whole time thinking, am I going to remember it? I admire them for making that decision, because they are going to have a much greater longevity in their career and a much happier career as a result, I think. It is interesting.

JANE GINSBORG: My colleague Jennifer Mishra has written a very nice history of memorising. You remember I gave you a quotation from Anfossi from the beginning of the 19th century, memorisation was not considered the done thing at all, actually until the very end of the 19th century, for pianists. The first pianist to perform from memory was Clara Schumann, who was following the model of Paganini, and one of the first critics of Clara Schumann said, "The insufferable Miss Schumann, who had the audacity to perform from memory..." It then became prodigies who did this and the memory feats are written up. I'm interested now it is convention that, particularly pianists, solo pianists perform from memory, but it is because it is more impressive if there is just you and the piano on the stage, when there isn't a page-turner and you don't have to worry about getting the pages over yourself. I know a lot of pianists these days who just say the game is not worth the candle. I would defy anybody to say that, for example, Kathryn Stott gives worse performances now with the music than she used to without the music. I think this is really a kind of political thing. I have to say just very quickly, the most frightening song recital I ever went to, speaking as a

singer and as a memory researcher, was one where the pianist played from memory as well as the singer. There was no security blanket for the singer, you know.

JAMES GILCHRIST: We have absolutely discussed that, Anna and I, because there are pieces that definitely you would be happy to play from memory, but the truth is, if I go wrong, she has to fix it! Without the score that's jolly hard to do, I think. It is a bit like that. Another thing in opera that annoys me is when conductors conduct by heart, because singers do go wrong, and if they are just sort of, you know, washing away, they have got to fix it if it goes wrong. It is jolly hard to fix if you have not got the score. With song recitals, I would say that there is a merit to performing by heart because I think there is something about the communication between a vocalist and the audience that is very specific to that genre. I mind singers using the music much more than I mind any other musician.

NEW SPEAKER: I was going to make a very similar point, but I actually do think that applies to pianists as well, so I only partly agree with you on the pianist part. I say that not as a great memoriser but you wouldn't dream of an opera singer being seen with a score or an actor to read or not to read a script. I think it is a little bit similar that there is a feeling, as long as it is not with the stress involved that you were talking about, Anna. There is a feeling of freedom that you can feel.

JANE GINSBORG: It is a kind of game we play, isn't it, that as a performer, we are singing from the heart, that we are communicating our own thoughts and feelings and experiences to the audience. We aren't, we are conveying Schubert's or Goethe's.

NEW SPEAKER: I think that is not true, it is a big mixture. In singing is fascinating, the poet, composers and the audience, all these people reacting at the same time. You were talking about the difference between learning a memory. I know for myself that I say I'm cursed by being a relatively good sight reader. I know that if I have the score, I'm not going to learn it well enough. Well enough for me, that is, because I can get away with not learning it. I know that I actually have to do something mentally different to learn it by heart, and that forces me to basically do a little bit of practice.

NEW SPEAKER: I agree with that, definitely agree with that.

JESSICA GRAHN: I think we would like to have a few minutes for the audience to ask some questions now. I can see there is a lot of interest already. We have the microphone here, raise your hand and it will come around for you. We will take five or ten minutes for dialogue this way.

FLOOR: As a starting piano player at the age of 70, learning with great difficulty, one thing that I find is that there is a big distinction between playing the notes on the score and hearing the music. There comes a moment when you hear the music. It is not all notated; there are great subtleties in how a simple theme should be played. I wonder how that relates to a professional learning the music. Is there a moment when looking at a new piece, rather than a piece you are very familiar with, do you get to hear the music, and that makes it more memorable?

NEW SPEAKER: Well, I think I mentioned that I personally found this touch memory unreliable. I think the most reliable memory is the aural, when you do remember the music. Certainly I have always thought of the things we have been talking about, which I don't do.

Of course, it would be ideal to never to play a note on the piano which doesn't have a musical context so that from the first time you read the music, you are already developing or putting in a musical content, and then you do get to the music much quicker, I think. Then if you do a lot of mechanical stuff and so on, that can keep you a little bit away from the music, even if you can do the mechanical stuff in a musical context.

ANNA TILBROOK: When I'm teaching, I don't believe at all in learning the notes and then you learn the dynamics and then what you want to do with it musically. It needs to be all done at the same time.

FLOOR: Andrew Wilton, I wonder if it is okay to change the subject, with a panel of performers. I'm very concerned about the role of memory in listening to music. It seems to me that one can't understand a piece of music unless one can relate a sequence to the following sequence. Bach is all about the relation of the sequences, although I am simplifying that, and it is the same with Beethoven and the relations of the melodies and the themes to the variants that are produced. All of that depends on a sequence of events in time between one set of musical ideas and a set of related musical ideas. It seems to me, in other words that the faculty of memory is absolutely central to the process of listening and appreciating music. What I want the answer to is how does the listener, let alone the performer, deal with that operation in the case of atonal music, where there are very often no clues? Even professional performers who have studied the music find it difficult to pick up clues as to where to go next in a piece of atonal music. Certainly for the listener, it is extremely hard, and what I want to know is what does the composer think, what does the performer think and how is the listener going to negotiate this experience in a meaningful way?

NEW SPEAKER: I think that is extremely good question, and I feel you are quite right to say that music, musical experience, or making music is a function of memory because tonality only makes sense with relationship to being able to remember the home key and dissonance only works because you can remember where the consonance was. The answer to your question about atonal music must be that, although it is less obvious to us all, almost all music has some sort of structure which is based upon relationships towards notes and that must, therefore, involve memory, but it is simply harder to remember. Let's talk about serial music, for instance, a run of 12 notes in a particular order. Until you have sort of remembered the series, it's very hard to make sense of the music. You're not new in complaining about this, because when Schoenberg was first making forays into this territory, he was told: this is all very well on paper, but it makes no sense in the real world. I don't think that criticism is entirely just. I think there is an aural memory that we can develop, but it's harder and as with any music, I think, you gain more understanding by repeated listening and we have all found that the better you know a piece of music, the more you have listened to it, the more sense it makes, and that must indeed be a function of memory. Ian has done a lot of contemporary music and I would love to hear his thoughts on this.

IAN BROWN: Well, I would wonder whether you want to make sense of it. In a sense, if you look at a painting of Jackson Pollock but wish you were looking at a painting of a virgin and child, it's not going to mean very much, so obviously you have to change what's in your mind and not have any expectations. You've got to try and forget tonality ever existed, and of course it's quite hard to do because that's what we were all brought up on, and it's what makes contemporary music quite unpopular, in a sense. I am a bit doubtful about saying this but it's almost as if the tonal is the sort of very conscious mind, and that maybe for atonal music, you

just have to let go of the conscious mind a little bit, and experience it on some other level. This is where you entirely accept everything that happens without any expectations, and not want to know where it's going, just follow it where it leads you, so your conscious brain isn't getting in the way, perhaps.

KIRSTEEN DAVIDSON-KELLY: I was going to say something along those lines. I have almost absolute pitch, if that is possible. I always had perfect pitch, and so, whatever I listened to, I would be listening, not deliberately, but sort of always labelling and always knowing where I was in terms of the notes and the keys. Recently it has started to slip, and I was particularly tired for a few months last year, and found that it was very, very confusing. I couldn't be sure that I was listening in the same way, but I actually tried. I thought, this is either very disturbing because it is changing how I remember things and how I listen to things, or it's very liberating. I chose to adopt that strategy! And try to listen to things in that way, just experience what is there in a different way, as you suggest with atonal music. It's great, and now my perfect pitch is almost back in place.

JESSICA GRAHN: Time for one more question from the audience.

FLOOR: Can I pick up this business of memory of atonal music? I would like to suggest that the problem is not that of memory but on the contrary, of prediction, as developed by people like Meyer and Hans Keller. The way we respond to music is by predicting what is going to come next, and then either being satisfied by it or moved by the fact that it does something different, and then you wait for it to return to something. The opening of Beethoven's fourth Piano Concerto is a wonderful example when you get a shock when the piano comes in with the chord of B and then Beethoven very carefully works back via a cycle of fifths until he gets back to G. That's what's so difficult in atonal music and I suspect that different processes of pattern completion and various things like that begin to function other than the traditional relationship to tonal procedures that we have heard before.

JANE GINSBORG: Michael, I am so glad you made that comment, because you're right, but so is the gentleman at the back, because prediction is a function of memory. We predict on the basis of what we remember. You've said all the things that I want to say, which are that you do need to unlearn and, for the purposes of engagement with atonal music, you do have to set aside, if not permanently to unlearn, your engagement with tonal music. Jessica, you gave the example of NP, who could play a piece of Grieg that he didn't know verbatim on one hearing, but struggled with a piece from the sixth book of Bartók's *Mikrokosmos* because he was unfamiliar with the genre, but if you have steeped yourself in the music of Schoenberg, Webern and Berg and you hear a piece of Leopold Spinner, you have a pretty good idea of what is going to come next because you are in that genre. But it takes time, if, like most of us, we spent our first 15, 16, 17, 18 years only hearing tonal music.

JESSICA GRAHN: I'll steal the microphone from you. Well, that is all the time we have for questions now but there are more opportunities throughout the day in some other sessions and a panel discussion at the very end, so we will have more opportunities to do that. In the meantime, thank you all very much for sharing your insights and experiences with us.