Part Two: Enhancing Your Music Memory by Using the Chunk Theory and the Think Method!

In the first part of this article (in the November journal), I presented some of the benefits of memorizing music, and gave some “tips” for how to improve memorization. In this part, I will briefly discuss some of our current knowledge of the science and psychology of memory, and how it can relate to learning music.

People have been interested in the “art of memory” or *Ars Memorativa* since the Greeks, or even earlier. Later, in the 16th century, the Jesuit missionary Matteo Ricci described his system of mnemonics, relating separate memories to different rooms in a palace. More recently there has been much research into how the brain works, and in particular the mechanisms of learning and memory. We know about myelination, short-term memory, the “magical number 7±2”, neurotransmitters, cognitive neuroscience etc. But, how can this help us as musicians on a practical level with memorizing more effectively and more efficiently?

One of the recent discoveries about memory is called the “chunk theory.” This involves grouping information together in order to retain more information. Research has shown that the average person can hold about five to seven bits of information in their short-term memory. For example, take a few seconds and memorize the following letters:

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ncdoaioehdcp
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You can probably do it – but wouldn’t it have been easier to memorize these letters if they were in the following order: d o c e c a p h o n i c? By grouping these 12 letters into a recognizable “chunk” you can remember all these individual bits of information very quickly, and still have room in your short-term memory for other words or letters.

Try an experiment, â la the film “The Rain Man”: if you have access to some “pick-up-sticks,” drop them on the floor and then count how many are there. If you are efficient, instead of counting one stick at a time, you will probably see several groups of two or three sticks together. If you recognize these groupings your calculations will be much quicker.

While an expert chess player can look at a chessboard for just a few seconds and recall as many as 25 pieces, a novice can remember only five or so pieces. This is because the expert player groups the chess pieces together, while the novice sees individual pieces. The difference between a novice and an expert in any field is his/her ability to “chunk” information. What is interesting is that if the pieces are arranged randomly on the board, chess masters have only average short-term memory, just like the rest of us.

According to Geoff Colvin in *Talent is Overrated“, “It is also easy to see why experts’ superior memory doesn’t extend beyond their field of expertise: It is a central element of their expertise and can’t be separated from it. Far from being a general ability, it is ultimately a skill that is acquired through many years of deliberate practice… Researchers have called it “expert working memory”… it is clear that the superior memory of great performers doesn’t just happen. Since it is built on a deep understanding of the field, it can be achieved only through years of intensive study.”

For musicians, “chunk theory” has some important implications. Instead of memorizing single note after single note in a passage of music, it is more efficient to recognize patterns of notes that form recognizable groups. The most important of these recognizable groups are scales and arpeggios. That is one of the main reasons we emphasize that our students should study, learn, and memorize scales and arpeggios in all keys, and in various systems. They are the “building blocks” of music. We must know a variety of scale and arpeggio systems so we can quickly pick the best one for a particular passage of music. This will help with sight-reading, the ability to learn new music easier, playing faster, and memorization of music. Instead of “re-inventing the wheel” for every new piece, we can build on the foundations that we have already studied and learned.

The more easily we can recognize patterns that are deeply embedded in our memory, the easier we can learn new music.

Another important and valuable piece of information for teachers and musicians is the differences between the left and right brains. Most people are aware that our brain is bicameral, meaning it has a left and right hemisphere. The left brain is the center of analytical, logical, mathematical and objective thinking. The right brain is the center of creative, “artistic,” holistic and intuitive thinking. The left brain perceives time in a sequential manner: 60 seconds in a minute, 60 minutes in an hour. The right brain feels time differently. If you have ever participated in a performance in which you go out on stage and then come off after having played for an hour, but it feels like just a few minutes – then you know what it is to have been “in” your right brain.

When we learn a new technical task, we learn it through the left brain. Then as we become comfortable with that task the right brain takes over. In other words when we study a new piece of music and are learning the notes, rhythms, fingerings, and bowings, we are using the left brain to process all the information. Once we have absorbed this information we transfer it to the right brain, which is capable of doing many things at one time.

The key to this process for learning and memorizing music is to know that the left brain can do only one thing at a time. That means if you are trying to learn a new fingering and a new bowing at the same time it may overload the left brain and result in frustration. It is much better first to learn one new task (say, the new fingering) and then another new task (the bowing) in succession. Once each task is learned you can add on something new. After a few more repetitions or some additional time, these new tasks are moved into the holistic right brain.

As you read this article, you are processing the information with your left brain. However at the same time, you are probably aware of lots of other things going on: the temperature of the room, the fact that you have an appointment in 10 minutes, or that you are hungry and can’t wait to be finished reading. This is the right brain observing, feeling, digesting, and thinking.

Understanding how we learn has
implications for how we memorize. In order to insure that your music memory is deep and secure it is important to memorize slowly and carefully, and to be very detail-oriented. Don’t bite off more than you can chew at one sitting. When I ask my younger students every week how much of their piece is memorized, I often ask them to show me on the music exactly how far they have learned accurately and securely during that week. They should be able to point to an exact spot on the music, whether it is one line or half a page. If they say, “I sort of have the whole thing memorized” I know from experience that it is highly likely that it has been poorly learned, with stutters and “blips” already built in. If so, I explain to them that it is better to memorize less music, but to do it accurately, and then give them a reasonable goal for the following week. Once they understand this process they can begin to memorize larger sections more accurately for each lesson, by giving themselves their own reasonable “chunk” to learn.

One of the most important techniques for memorization is what is called “mental imagery” or “visualization” This involves imagining a task or an activity without actually moving a muscle or completing the action. I like to call this “mentalization”, since much more is involved than just a visual picture. When you “mentalize” a passage of music you hear the music, feel the phrasing, and “play” every note in your imagination. You go through the music in your mind, imagining every step of the way. Your fingers do not actually move and your arms do not actually bow, but you can feel these physical motions. You go through the process in real time, or perhaps even under tempo. If you can do this accurately, you will feel confidence in knowing the piece deeply and securely. Many athletes use mental imagery to enhance performance. The great golfer Jack Nicklaus referred to this:

“I never hit a shot even in practice without having a sharp in-focus picture of it in my head. It’s like a colour movie. First, I “see” the ball where I want it to finish, nice and white and sitting up high on the bright green grass. Then the scene quickly changes, and I “see” the ball going there: its path, trajectory, and shape, even its behaviour on landing. Then there’s a sort of fade-out, and the next scene shows me making the kind of swing that will turn the previous images into reality only at the end of this short private Hollywood spectacular do I select a club and step up to the ball.”

So, sit in a quiet place and take a few deep breaths to relax. Then imagine the beginning of a piece you are working on. Hear, feel and see the music. Do not actually move your fingers, but imagine the coordination between the left hand and the bow arm. Feel the shape of the first phrase, and what you need to do with the bow to achieve the musical line that you are imagining. You may find that you can only do a few measures this way, even in a piece that you “know” very well. That’s fine – just take a look at the music, and then try it again. After a few days of this kind of work you will find that you will have built up the concentration and endurance that you need to get through larger and larger sections of the piece.

With “mental imagery” it turns out that neurons are actually firing in the same part of your brain as if you were physically moving. Mentalization builds the same neural pathways as actual physical activity, but even more efficiently because there are no wasted motions involved.

One summer at Aspen, cellist and teacher Alan Harris had me learn the Bach Fifth Suite completely away from the cello. I had never played it before, and the assignment was to decide my fingerings and bowings completely away from the cello. I had to figure out the phrase shapes and memorize the piece before I could play a single note on the cello. I could play it at the piano or sing it, or use any other technique I wanted. But I was not allowed to play it on the cello until it was learned and memorized. It was a very difficult assignment, but I ended up learning it faster and more securely than I had ever learned anything before.

So it seems that Meredith Wilson was correct in the "Music Man": you can learn to play an instrument by using the “think method”!

References:

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