

Memorizing Contemporary Music: strategies and memory types

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ABSTRACT

It is commonly assumed that memorizing contemporary music is harder than with other repertoire. But is it indeed so? The aim of this study is to cast light on this topic. In a pilot study, three advanced guitar students were asked to learn two short pieces, one traditional, the other contemporary, within a restricted time frame and subsequently perform them from memory. The sessions were audio and video recorded in presence of the first author who, while observing the process, engaged in direct dialogue with the participants. Informed by the results, a main study was performed, using the same methods but involving only one, longer, more complex contemporary piece. Results from the pilot study showed that the participants found it easier to memorize the contemporary piece, in spite of its considerably greater rhythmic and musical complexity. All three were successful at memorizing the work in the main study but memorization was harder in sections where the musical material was similar and more tonal/familiar. It seems that the novelty of the contemporary material and the strategies needed for deciphering the complex rhythms made it easier to memorize the contemporary pieces than the traditional work. The development of meta-cognition through reflecting upon their own practicing and learning, functioned as a self-teaching method. Inspired by the study, two participants have applied their new-found skills by memorizing longer contemporary works for public performances.

1. INTRODUCTION

There has been growing interest in professional musicians researching and documenting their own practice¹ and applying their findings from expert practice to teaching.² This current investigation contributes to this field, portraying how Higher Education students may benefit from participating in a project led by experienced performers who also engage as musicians in the data collection and analysis.

¹ Ginsborg, J. & Chaffin, R. "Preparation and spontaneity in performance: a singer's thought while singing Schoenberg", *Psychomusicology: Music, Mind and Brain*, 2, 1 (2011); Lisboa, T., Chaffin, R. & Logan, T. "A self-study practice: Words versus action in music problem solving", in A. Williamon, D. Edwards, and L. Bartel (Eds.), *Proceedings of the International Symposium on Performance Science 2011* (European Association of Conservatoires, 2011)

² Lisboa, T., Chaffin, R. & Demos, A.P. "Recording thoughts while memorizing music: a case study", *Frontiers in Psychology*, 5, 1561 (2015), doi: 10.3389/fpsyg.2014.01561

Audiences prefer memorized performances to non-memorized ones and musicians seem to be freer to express themselves without the score.³ Soloists, therefore, usually perform from memory, and are in fact expected to. However, this is different with contemporary music.⁴ Perhaps the view that memorizing contemporary music is a more complex task has led to such performance approaches? But is contemporary music more difficult to memorize, or is it a case of finding different, more appropriate strategies from those employed in traditional repertoire?

According to Williamon⁵ and Mishra (2004), four types of memory are used for music: the *aural*, *visual*, *kinesthetic* and *conceptual* memories. Performing involves complex interactions of all these, but the importance of each varies between individuals. In addition, Chaffin *et al.* (2009), have noted that *emotional* memory contributes to the process as well.

Mishra (2004) also defines four memory processing strategies. These are: *segmented* (fragments are practiced separately, then linked), *additive* (the same, but continually lengthening the segment), *holistic* (the whole piece is performed repeatedly, allowing for minor regressions) and *serial* (the same, but returning to the beginning when errors occur). Different combinations are used, the segmented being preferred by experts.⁶

As mentioned above, professional musicians have also studied their own memorization processes.⁷ Results point to the use of *performance cues*; a series of *landmarks* which function as retrieval schemes.⁸ Finally, mental practice has been shown to be effective for memorizing.⁹

Interestingly, none of the above-mentioned studies deal with memorization of contemporary music. Clarke & Doffman (2014) state that “there is only a tiny amount of empirical research on any kind of twentieth or twenty-first century music”.¹⁰ Palmer¹¹ refers to unfamiliar music, suggesting that mental practice may help memorization and one study by Tsintzou &

³ Williamon, A. “The value of performing by memory”, *Psychology of Music*, 27 (1999)

⁴ Aiello, R. & Williamon, A. Memory. In R. Parncutt and G. E. McPherson (Eds.) *The Science and Psychology of Music Performance: Creative Strategies for Teaching and Learning* (USA: OUP 2002); Williamon, A. “Memorizing Music”, in J. Rink (Ed.), *Musical Performance: A Guide to Understanding* (UK: Cambridge University Press, 2002)

⁵ Williamon, A. “Memorizing Music”, in J. Rink (Ed.), *Musical Performance: A Guide to Understanding* (UK: Cambridge University Press, 2002)

⁶ Mishra, J. “A qualitative analysis of strategies employed in efficient and inefficient memorization”, *Bulletin of the Council for Research in Music Education*, 152 (2002)

⁷ Ginsborg and Chaffin, 2011; Lisboa *et al.*, 2011

⁸ Chaffin, R. & Logan, T. “Practicing perfection: how concert soloists prepare for performance”, *Advances in Cognitive Psychology*, 2, 2-3 (2006); Chaffin, R., Lisboa, T., Logan, T. & Begosh, K.T “Preparing for memorized cello performance: the role of performance cues”, *Psychology of Music*, 38 (2010) doi:10.1177/0305735608100377

⁹ Bernardi, N.F., Schories, A., Jabusch, H.C., Colombo, B. & Altenmüller, E. “Mental practice in music memorization: an ecological, empirical study”, *Music Perception*, 30, 3 (2012) doi: 10.1525/mp2012.30.3.275

¹⁰ Clarke, E. & Doffman, M. Expressive performance in contemporary concert music. In D. Fabian, R. Timmers and E. Schubert (Eds.), *Expressiveness in Music Performance, Empirical Approaches Across Styles and Cultures* (UK: OUP, 2014), p. 98

¹¹ Palmer, C. “The nature of memory for music performance skills”, in E. Altenmüller, M. Wiesendanger and J. Kesselring (Eds.), *Music, Motor Control and the Brain* (New York: OUP, 2006)

Theodorakis¹² looked into strategies for memorizing contemporary music, but the sole emphasis was on how pianists apply segmentation.

This present investigation focuses on the *strategies* and *memory types* that selected Higher Education guitar students use when memorizing contemporary music, also comparing the results with the memorization of traditional music.

2. METHOD

This study differs from previous ones in four ways. First, instead of studying oneself¹³, the first author, an experienced performer, was an active observer, engaging in dialogue with the participants during data collection. This called for a qualitative, phenomenologically informed research design. Second, unlike the above-mentioned collaborations between musicians and psychologists, this study relied on the sole expertise of the musicians as researchers. Thirdly, the authors took part in composing the works for the project, manipulating the material to best answer the research questions. Finally, no research of the kind had been performed focusing on the classical guitar.

2.1 PARTICIPANTS

Three guitar students at a major UK conservatoire were selected: Participant A (PA), a 25 year old female finishing her Masters degree; Participant B (PB), a 23 year old male attending a first year of a Masters degree; and Participant C (PC), a 21 year old male, finishing his first year of a Bachelor program. None had significant experience of memorizing contemporary music.

Both authors are experienced musicians and conservatoire teachers, interested in applied research. The first author, a classical guitarist, performs regularly as a soloist and with a contemporary music ensemble. The second author, an experienced cellist and researcher, has engaged in several memorization studies.

2.2 MATERIALS

Three pieces were composed in collaboration with the composer Kjartan Ólafsson, aided by the computer composition program CALMUS. First, a tonal piece with regular rhythms, referred to here as *traditional*; and an atonal piece with more irregular and complex rhythms, referred to as *contemporary* (Figure 1). Both contain the same number of notes, are in similar tempo and of comparable technical difficulty. Their compositional structure is *static*, i.e. no development takes place.

¹² Tzintou, T. & Theodorakis, E. "Memorization strategies of atonal music", *Proceedings of the Fourth Conference on Interdisciplinary Musicology (CIM08, 2008)*, <http://web.auth.gr/CIM08/>

¹³ Chaffin, R., Logan, T.R. & Begosh, K.T. "Performing from memory", In S. Hallam, I. Cross and M. Thaut (Eds.), *The Oxford Handbook of Music Psychology* (UK: OUP, 2009); Lisboa, T., Chaffin, R. & Logan, T. "How memory fades: very long-term recall of Bach", in A. Williamon, S. Pretty and R. Buck (Eds.), *Proceedings of the International Symposium on Performance Science 2009* (European Association of Conservatoires, 2009); Chaffin, R. & Imreh, G. "Pulling teeth and torture: musical memory and problem solving", *Thinking and Reasoning*, 3, 4 (1997); Ginsborg, J. & Chaffin, R. "Preparation and spontaneity in performance: a singer's thought while singing Schoenberg", *Psychomusicology: Music, Mind and Brain*, 2, 1 (2011)

Pilot study - traditional piece

Two staves of musical notation in 4/4 time, key of B-flat major. The first staff contains a melodic line with a triplet of eighth notes. The second staff contains a bass line with a triplet of eighth notes.

Pilot study - contemporary piece

Two staves of musical notation in 4/4 time, key of B-flat major. The first staff contains a melodic line with a triplet of eighth notes. The second staff contains a bass line with a triplet of eighth notes.

Main study - contemporary piece

Five staves of musical notation in 4/4 time, key of B-flat major. The first staff contains a melodic line with a triplet of eighth notes. The second staff contains a bass line with a triplet of eighth notes. The third staff is labeled 'A' and contains a complex rhythmic pattern. The fourth staff is labeled 'B' and contains a complex rhythmic pattern. The fifth staff is labeled 'C' and contains a complex rhythmic pattern. The sixth staff is labeled 'D' and contains a complex rhythmic pattern.

Figure 1: Material used in the study.

Subsequently, a longer, more rhythmically and musically complex contemporary piece was composed (Figure 1). Having no bar lines nor time signature, the melody is formed of two cells of differing characteristics. As the piece progresses, it gradually *metamorphoses* from the first cell to the second.

2.3 PROCEDURE

Two studies were performed. First, a pilot study, with the purpose to:

- a) Ensure the methods' efficacy and validity.
- b) Observe whether one piece was more difficult to memorize than the other.
- c) Note whether different memorization strategies and memory types were used between participants and genres.

This served as a baseline for the subsequent main study. One hour was given to learn and memorize both pieces in the pilot study. While marking the scores, they commented on the process and finally performed the pieces from memory. The sessions were audio and video recorded in presence of the researcher.

The main study, employing the same procedure, aimed at delving deeper into the process of memorizing contemporary music. The time frame was longer, i.e. 1h 45min.

Given the greater complexity of this piece, the following questions were raised:

- a) Would the participants memorize the piece successfully?
- b) Would they use the same strategies as in the pilot study or any musical aspects to facilitate memorization (e.g. bar marks, dynamics, phrases?)
- c) Were the same memory types used as in the pilot study and was their conceptual memory used to a greater extent?

To answer the latter, participants were asked whether they had analyzed the following compositional elements: rhythms, intervals, pitch, note durations, chord tension, phrases, important notes (as in Schenkerian analysis, see Temperley¹⁴) and the metamorphosis of the melody.

Questions were also raised as to whether memorization would be more difficult in two places (see Figure 1):

- a) Between A and B, a section characterized by consonant intervals, regular rhythms and similarity of the musical material.
- b) Between C and D, where the two above-mentioned cells meet and the musical ideas become more complex.

Finally, the marked scores were kept as part of the data collection procedure.

For the pilot study, a thematic analysis was performed on the practice data³/i.e. the complete verbal and observation transcripts. For more in-depth analysis, an Interpretative

¹⁴ Temperley, D. "Composition, perception and Schenkerian Theory", *Music Theory Spectrum*, 33 (2011)

Phenomenological Analysis (Smith & Osborn¹⁵) was also performed on the main study data.

3. RESULTS

3.1 PILOT STUDY

The pilot study ascertained the validity of the method and provided relevant material for exploring the differences between memorizing the two pieces. A large amount of data derived both from the participants' comments and the practice data, providing scope for exploring the research questions.

Two of the participants found the contemporary piece easier to memorize. All participants spent considerable time deciphering the rhythms of the contemporary piece, but no differences were noted in use of memorization strategies between the two pieces. The segmented practice strategy was predominant in all participants.¹⁶ However, memory types differed between participants, but not between pieces. PA relied on aural, kinesthetic and emotional memory, PB on aural and kinesthetic memory and PC on visual memory. Examples of the individual approaches for each participant are given below.

PA

PA memorized both pieces well within the time limit, making no mistakes while performing. She considered the contemporary piece easier to memorize: "[it] was easier because it's weirder, so it sticks in my mind more". However, its rhythmic complexity was an obstacle: "deciphering [the rhythm]...that's hard". PA employed the segmented strategy: "[I] divide into phrases or shapes that I can remember" and described her use of kinesthetic memory as: "If I don't play it...just do that [moves hand from one position to another] then it will go into my automatic memory". The similarity of the material in the traditional piece was confusing to her: "there are lots of notes the same...whereas...things [in the contemporary piece] are more distinct".

PB

PB dedicated most of his time to learning the traditional piece and hadn't memorized the contemporary piece when it came to performing. When asked which strategies he would use to memorize, if he were given a few more minutes, he said: "[get] it into my aural memory...[then] take a single bar or...phrase...meticulously fingering it...memorize that bit...and build them up block-wise". Having applied this segmented strategy he gave a remarkable performance of the contemporary piece. Most notes were correctly played, suggesting that had he dedicated the same time to it as did the others, his memory recall would have been correct. The performance of the traditional piece was however correct. PB relied on aural memory: "[I] try to...get a reasonable sound" but also kinesthetic memory: "when it comes to finger memory...I don't need to redo anything".

¹⁵ Smith, J.A. & Osborn, M. *Qualitative Psychology: A Practical Guide to Research Methods* (SAGE, 2007)

¹⁶ Mishra, J. "A model of musical memory", in Lipscomb, S.D., Ashley, R., Gjerdingen, R.O. and Webster, P. (Eds.), *ICMPC8 Proceedings of the 8th International Conference on Music Perception & Cognition*, Evanston, IL (Australia: Causal Productions, 2004)

PC

For PC, the familiarity of the traditional piece raised questions about interpretation. This interfered with memorization, and as a result he skipped a whole bar during performance. He found the contemporary piece easier to memorize, making no mistakes while performing. He used the *segmented* strategy, often together with musical imagery: “it’s...small segments of colours...that are...connected”. Mental practice also figured strongly: “If I can play through the piece in my head...I...can play it...from memory”. He distributed his time equally between the pieces: “[I’ll] determine how to play each...to have two [separate] chunks of work”, his visual memory clearly being dominant: “[it’s a] visual memorizing thing...to see the notes and the fingers...I think of shapes in the left hand...a clear image”.

3.2 MAIN STUDY

All participants memorized the second contemporary piece successfully. Strategies and memory types employed by each participant are reported below, combined with results of the IPA analysis of observations and practice data. Table 1 illustrates the main emerging themes.

Theme	Subtheme	Participant
rhythms	rhythmic complexity	A, B, C
	recognizing the rhythms	C
memory types	aural memory	A, B
	kinesthetic memory	A, B
	visual memory	A, B, C
	emotional memory	A
musical aspects	shapes and gestures	A
	feel	A
	internalizing	A
	colours and dynamics	C
strategies	segmented	A, B, C
	holistic	C
	mental practice	C
	memory cues	C
	musical imagery	C
	defining sections	A, B, C
sections	linking sections	A, B
	phrases	A, C
	preconceptions, illusions	A
contemporary music meta-cognition	working under pressure	A
	self-efficacy, self-assessment	A
	importance of taking a break	A
	fingerings and ringing	B
basic technique “modes”	performance mode	C
	memorization mode	C

Table 1. Emerging themes

EMERGING THEMES

PA

For PA, rhythms emerged as a major theme: “[They] look quite hard...I need to work [them] out first”.

She quickly began playing, using aural memory “to get the sound in my head” her visual memory lasting only a short time: “I can’t quite remember...how the rhythms look on the page...[it’s more] like a mechanical memory”. Kinesthetic memory was strongly engaged through expressive gestures and movements: “If you give something a shape or think about the gesture it makes it easy to memorize...”. She also referred to “feel” in terms of expression, indicating her use of emotional memory: “I’m trying to get it more...musical...I remember things...if I feel something”. She often used the word *internalize* for her kinesthetic, or “other” memory: “when you [don’t] remember what’s on the score...that’s ‘cause it’s...internalized in your other memory”.

PA’s practice strategy was based on segmentation, but defining and linking the sections seemed hard: “I’m not sure...what the sections should be...I can play it starting from [a new section] but...starting from the section before is harder”. She also had preconceptions of how it would be to memorize a contemporary piece: “I always have this...feeling that contemporary music takes way longer to learn than everything else”. However, describing a duo project involving new pieces she commented: “It was weird how quickly things did become familiar. I don’t know why it’s so scary...I think it might be...an illusion...I don’t know if it’s really that much harder”.

As with other expert performers¹⁷, PA recognized the importance of resting: “My brain gets tired quite easily...[taking a break is] more efficient”.

PB

PB’s main focus was on fingering and “ringing”, i.e. making notes sound for their designated time: “have to see...whether all the rings work...a very basic fingering idea first”. Nevertheless, much focus was set on rhythms: “No bar lines...no tempo marking?...I need to...rearrange my head”.

PB used his implicit aural memory to mentally *hear* a correct, well-sounding performance, while engaging his kinesthetic memory through careful planning of fingerings and positions. Kinesthetic memory was dominating during his performance, his only memory slip being due to a recent change in fingering. And like PA, he used the segmented practice strategy related to phrasing and found it difficult to link sections together: “It’s the transition...I can’t get right”.

¹⁷ Ericsson, K.A., Krampe R. Th., & Tesch-Römer, C. “The role of deliberate practice in the acquisition of expert performance”, *Psychological Review*, 100 (1993)

PC

At first, PC focused on the rhythmical complexity and the absence of bar lines. But soon, he began recognizing the rhythms: “You...see the rhythmic motive clear enough”.

The position of his music stand allowed him to create a *picture* of the note-hand combination. He also employed mental practice, envisioning the score with closed eyes. During performance, his reliance on visual memory was obvious: “basically, [I] had a picture of the page in [my] head”.

Using both holistic and segmented practice strategies, he repeatedly played the piece through, while also “[grouping] it in smaller things and longer phrases” additionally finding places which served as memory cues: “points where you can...catch up...landmarks”.

While performing, there were memory slips, which, according to him were related to a shift from concentrating on memorization to focusing on delivering an expressive performance. Having stopped for a moment, he then performed again with success, later explaining that he had: “[kept] the ‘performance mode’ [while going] back to...‘memorization mode’”.

Common features

- a) All three participants were successful at memorizing the piece.
- b) The same strategies as in the pilot study were used, mainly segmentation, although one participant used the holistic approach. None annotated bar marks and the use of musical/expressive tools such as dynamics for memorization was limited. All defined phrases, differing noticeably only at one point, i.e. just before the second melody cell enters (see numbered points, line 4 of main study piece, Figure 1). Here, PA started a new phrase at point 1, PB at point 3 and PC at point 2. These results coincide with Lefkowitz & Tavola’s theory of segmentation¹⁸, where three possibilities for section markings are predicted: after the longest note (as PA), after the largest interval (as PC), or a purely musical decision is made (as PB).
- c) All participants used the same memory types for both studies. Greatest emphasis was set on deciphering the rhythms and compositional elements such as intervals, pitch, duration of notes and chord tensions were analyzed as well. However, they did not define important notes or notice the metamorphosis of the melody. Thus, compared to the pilot study, conceptual memory was used to an increased, albeit limited extent.

Difficulties in memorizing specific sections

- a) All participants had trouble memorizing between A and B (see Figure 1), where the rhythms become regular and the music similar and more tonal. This is concurrent with the results of the pilot study and earlier research findings.¹⁹

¹⁸ Lefkowitz, D.S. & Tavola, K. Segmentation in music: generalizing a piece-sensitive approach. *Journal of Music Theory*, 44, 1 (2000) stable url: <http://www.jstor.org/stable/3090673>

¹⁹ Hallam, S. “The Development of memorization strategies in musicians: implications for education”, *British Journal of Music Education* 14, 1 (1997) doi:10.1017/S0265051700003466

- b) Difficulties were also experienced between C and D (see Figure 1), where the two melody cells meet, the music becoming more complex.

4. CONCLUSIONS

Results showed that the participants used the same strategies for memorizing the contemporary pieces as have been reported in previous studies on traditional repertoire, i.e. mainly segmentation. However, their dominant memory types differed, which is concurrent with Hallam's (1997) study.

Two participants found it easier to memorize the contemporary work as compared to the traditional piece, where they experienced difficulties due to the similarity of the material and questions regarding interpretation. The conclusion may be drawn that the more unlike, or varied, the musical material, the easier it is to memorize even though the musical idiom is unfamiliar.

In summary, the question as to what strategies guitarists use to memorize contemporary music can now be answered to a certain extent: First, for these participants, in order to hear, see or "feel" the music, they needed to decipher the rhythms. Then, they turned to traditional methods of memorizing, such as segmenting and phrasing. There are indications that memorizing contemporary music may not be more time-consuming, nor more difficult than other types of music, and in some cases, easier. Three factors may be contributing to this:

1. The cognitive demand of having to focus on complex rhythms.
2. The slow, repeated playing of the musical material over a length of time.
3. The novelty of the musical material and the freedom from having to play according to set rules or conventions.

These assumptions, however, apply to the particular participants in this project. Further studies are still needed to fully explore how different types of musical material influence memorization processes.