

**MEMORY IN THE RELIGIOUS EDUCATION CLASSROOM  
(PART 2: THE ARTS AND THE TESTING EFFECT)**

**Abstract**

This is the second part (of a two-part paper) about memory, its place in the religious education classroom and the way it might inform the practice of religious education. The argument is put forward that memory and rote learning are under-utilised in the religious education classroom. Engagement with memory may offer ways to improve student knowledge of foundational content in religious education. Part two offers the arts, namely music performance, as a source of inspiration to religious educators for embracing memory. In piano performance and in other disciplines that utilise motor skills, memory is applauded and approved. Memory should be similarly approved in the religious education classroom. Finally, drawing on cognitive and educational psychology, consideration is given to the testing effect as evidence that memorisation may be under-utilised in the religious education classroom.

*Great is the power of memory, an awe-inspiring mystery, my God, a power of profound and infinite multiplicity. And this is mind, this is myself.* (Augustine of Hippo, 1991, Book X, xvii (26), originally written circa 400CE)

This is the second of two papers about memory, its place in the religious education classroom and the way it might inform the practice of religious education. The first paper (Chambers, 2010, pp. 58-64) considered the historical context of memory and rote learning in religious education and their application in constructivist educational models. It argued that engagement with memory may offer ways to improve student knowledge of foundational content in religious education. This second paper offers the arts, namely music performance, as a source of inspiration to religious educators for embracing memory. In piano performance and in other disciplines that utilise motor skills, memory is applauded and approved. Memory should be met with similar approval in the religious education classroom. Finally, consideration is given to the testing effect as evidence that memorisation may be under-utilised in the religious education classroom. The testing effect is a phenomenon well known in psychology but it has not yet been embraced in classroom religious education. Regular testing not only improves student memory, it also improves student learning.

**Memory and Motor Skills**

The prompt for this article was a developing awareness of the importance and value of memory in the performing arts, namely piano performance. In piano performance and other musical arts memory is an esteemed skill. Admittedly, it has not always been so. In Europe it became a prized skill particularly after Liszt and Clara Schumann began performing concerts from memory in the second half of the nineteenth century (Chaffin & Imreh, 1997, p. 315; Williamon, 2002, p. 113). It is now an expected part of the concert performer's skill-set (Williamon, 2004, p. 123). Daniel Barenboim plays all 32 of Beethoven's piano sonatas (over 11 hours of performance) from memory and Angela Hewitt plays Bach's *The Well-Tempered Clavier* (over 4 hours) without printed music (Prendergast, 2009, p. 22). Memory is an aspect of music that impacts performance. It can personalise performance (Blanchard, 2007, p. 170) and there is evidence to suggest that memorised performance is preferred to that of non-memorised performance (Aiello & Williamon, 2002, p. 169).

The use of memory and motor skills is evident in stories of legend and inspiration as well. Most Australians are familiar with the story of the young Don Bradman repeatedly hitting a golf ball with a cricket stump against the curved brick base of the family water tank. This solitary game is often cited as formational to the Bradman legend. The smaller ball, the thinner 'bat', the quick and variable bounce all contributed to a hand-eye coordination to this day not seen again on a cricket field (Bradman Foundation Australia, n.d., "Sir Donald Bradman" link).

In *Mao's Last Dancer*, Li Cunxin (2003) tells the story of his rise from impoverished childhood to acclaimed ballet dancer; from training in China, to defection and eventual settlement in Australia. His autobiography was re-written as a children's book in 2008 and adapted for film in 2009. Li was named Australian Father of the Year in 2009. After a number of years at the Beijing Dance Academy, he saw for the first time, a vision of Mikhail Baryshnikov dancing the *Nutcracker Suite*. This was to become his inspiration to achieve greater heights in ballet. Desperate to improve his turns, Li says:

One night I had an idea. When everybody was asleep I went to the studio, with a candle and a box of matches. I put the lighted candle at one end of the studio and started to practise my turns. The candle threw only a faint light in front of me. It was hard, but I thought if I could turn in the dark, then turning in the light would be easy. I couldn't take the risk of turning the light on, of my teachers catching me staying up late, but I continued, night after night, relentlessly. By the end of the term I had left shallow indentations in the studio floor where I had endlessly, repeatedly, turned. (Li, 2003, p. 242)

Memory and rote learning clearly have a place in the arts and sport. In these disciplines they are regarded as valuable and important for the development of skills. Their use in these domains can serve as an encouragement and reminder that they may have a place in religious education as well. To that end, Squire and Kandel (2000) suggest that the use of memory is not limited to the development of motor skills. It also has application in the development of perceptual and cognitive skills:

There are also examples of skilful behaviour that are not based on learned movements but that nevertheless involve acquiring skilful ways of interacting with the world. When we learn to read our native language, for example, we initially move haltingly from word to word, but after practice we read quickly, moving the eyes to a new location about four times a second and taking meaning from more than 300 words in one minute...These skills are the result of gradual improvement in the perceptual and cognitive procedures that we all use when we perceive, think, and solve problems. (p. 181)

The relationship between the use of motor skills in arts and sport and cognitive skills in the religious education classroom can be easily dismissed citing irreconcilable processes: repetitive practise on the piano or in sport is nothing like the daily tasks in the classroom. However, such an argument ignores three claims of relevance and application.

The first claim is that memory development and repetition are absorbing and engaging processes. Ironically, the popular argument against rote learning seems to be that it is tedious and boring. But who is to say that this is the case? To the contrary, it is feasible that Barenboim, Hewitt, Bradman and Li all found their repetitive skill development activities engaging and absorbing. Li suggests as much when he describes the feeling of finally mastering the double cabriole:

A few days before the exam I made the breakthrough. I had to dramatically change my weight distribution in the air and bend my body backwards as far as my flexibility allowed. When I finally got it right the feeling was sensational. (Li, 2003, p. 252)

It is possible, if not highly likely, that rote learning of important and relevant content could be equally absorbing and engaging for students in religious education classrooms. This is supported by Joyce, Weil and Calhoun (2009) who argue “mnemonics can be used to help people master interesting concepts, and in addition, they are a great deal of fun” (p. 27). Roediger and Karpicke (2006a) also believe that testing need not be seen as “inimical to creative uses of knowledge” (p. 205). Teaching activities that require students to utilise their memories may be well-received and interesting.

Secondly, these stories of repetitive skill development all hint at a sense of delayed gratification. Hard work now and an ability to wait can lead to greater, desirous results later on. This idea is easily translated to the religious education classroom. School children are all too aware of upcoming reports, graduation certificates, formative and summative assessment and the like. Most children at least know that if they work hard they will be rewarded in some way in the future. Shoda, Mischel and Peake (1990) argue that a sense of delayed gratification is “an essential achievement of human development” (p. 978). Rote learning and memory development in the religious education classroom can play a role in this essential development.

Thirdly, rote learning and engagement with memory are not ends in themselves. They are processes that can lead to mastery, power and dominion. It is impressive to see school students demonstrate their religious literacy with efficiency, accuracy and precision. Traditionally and all too often, mastery has been and continues to be equated with some kind of inherent ability or innate talent (Ericsson & Charness, 1994, pp. 726-728). This traditional stereotype, however, has been challenged by the idea that mastery has more to do with practice and discipline. Terry (2000) suggests that:

the difference between most participants in some activity and those who attain expert status is the amount of deliberate training and instruction. Individuals on their way to expert status maintain schedules of intense and prolonged deliberate practice...Expertise can be acquired through training by otherwise unremarkable individuals. (p. 359)

Also, Hart (2002) argues that a mastery of knowledge has benefits for the self-esteem of children: “The heart of self-esteem is a combination of self-efficacy born of mastery and a sense of communion and community; both involve making deep contact with the world” (p. 78).

### **Memory, Testing and Enhanced Knowledge**

There is significant evidence to suggest that regular testing enhances memory (Butler & Roediger III, 2007, pp. 514-517; Karpicke & Roediger III, 2010, p. 123; Pyc & Rawson, 2009, p. 437; Roediger III & Karpicke, 2006a, p. 181; Squire & Kandel, 2000, pp. 130-131). This phenomenon is known as the testing effect. Evidence of the testing effect dates back to the seminal studies of Gates (1917, pp. 99-104) and Jones (1923, pp. 67-69) in the first quarter of the twentieth century and continues to be revealed in contemporary times (see references above). This evidence, though, has greater cognisance amongst psychologists than it does amongst educators. Roediger and Karpicke (2006a) note that “this phenomenon of improved performance from taking a test is known as the testing effect, and though it has been the subject of many studies by experimental psychologists, it is not widely known or appreciated in education” (p. 181). McDaniel, Anderson, Derbish and Morrisette (2007) agree, saying “the implications of the testing effect literature for educational practice have been virtually ignored by the educational community and educational research” (p. 495). Specifically, it seems too that the testing effect has had little impact in the contemporary religious education classroom. The degree to which it is appreciated in that environment can be questioned. It may be that in religious education testing is seen as antiquated with no place in education’s current order of “rich tasks”, “constructed meaning” and “facilitated learning”.

The testing effect is a phenomenon that recognises that one way to improve one’s memory of material is to be tested on that material. It also contends that regular testing is more effective than regular study for longer-term recall of that material. Further, the construction of test questions and the quality of feedback further enhances the phenomenon of the testing effect. Difficult but successfully answered

questions tend to lead to better long term retention of information. Elaborate and detailed feedback about student work (that includes ways that students can improve their work) also lends itself to the testing effect phenomenon, albeit in a mediated way<sup>i</sup>. Finally, practicing the same skills during learning that are required during retrieval will also enhance student recall and learning (Roediger III & Karpicke, 2006b, p. 254).

Roediger and Karpicke (2006a, p. 182) suggest that the educational community's ignorance of the testing effect is perhaps the result of its counterintuitive nature: who would guess that regular testing after once-off exposure to material is better for students' long-term knowledge than regular exposure and study? In part 1 of this paper (Chambers, 2010, pp. 60-61) I discussed constructivism and schooling and suggested that the constructivist paradigm does not always best suit the task of improving student knowledge. The testing effect is counterintuitive to the constructivist approach. This may be another reason why the educational community is ignorant of its value.

Significant for religious education (and education, more generally), McDaniel et al. (2007) state that "taking a test is almost always a more potent learning device than additional study of the target material" (p. 495). Pyc and Rawson (2009, p. 444) have also found that difficult but successful retrievals are better for students' memories than are easier retrievals. This suggests that classroom religious educators should first give consideration to including tests in the religious education classroom as a way of developing students' memory and their mastery of curriculum content. As Roediger and Karpicke (2006b) state, "judicious use of testing may improve performance in educational settings at all levels...Frequent testing leads students to space their study efforts, permits them and their instructors to assess their knowledge on an ongoing basis, and - most important for present purposes - serves as a powerful mnemonic aid for future retention" (p. 254). Second, religious educators should develop their ability to design and administer tests to students in their classes. A refined ability to design these tests - so that the tests are difficult but completed successfully - should maximise the development of students' declarative memory. This in turn, should assist students to demonstrate mastery over foundational content. Then they will be in a better position to engage gainfully and constructively with the higher order processes: "If students have not mastered basic knowledge of the subject matter, they have no chance of thinking critically and creatively about the subject, and testing can help students acquire this body of knowledge" (Roediger III & Karpicke, 2006a, p. 205).

The testing effect is a neglected phenomenon in the religious education classroom. It manifests itself most obviously in a paradigm of teaching and learning that is too frequently dismissed in contemporary schools. This dismissal may be unwise. Regular testing and engagement with memory (including rote learning) may be useful to the contemporary religious educator because, together, they may lead to improved demonstration of student knowledge and understanding of foundational content. At the very least this paper supports further research into the ways that an understanding of memory and the testing effect might inform religious education in the school. More specific is the possibility for further research, in the Australian religious education context, about the extent of engagement with memory in the classrooms of dioceses that engage in internal or external tests as part of their religious education assessment procedure.

## **Conclusion**

Contemporary religious education is disinclined, and in places wholly averse to the use of memory and rote learning in the classroom program. Memory and rote learning tend to be overlooked in constructivist approaches to education. However, they may be effective tools for enhancing student knowledge and understanding of foundational content. This second part (of a two-part paper) has evoked the performing arts as a discipline where memory is applauded and approved. It has also offered the performing arts as an inspiration for religious education to reclaim a balanced use of memory and rote learning in the classroom context. Finally, this paper has considered the testing effect as evidence that memory and rote learning might be useful for improving student learning. The testing effect phenomenon

needs to enter the discourse of classroom religious education. It warrants attention from religious educators and the wider educational community.

Religious educators might also be inspired by John Paul II (1979) who called for an intelligent use of memory in catechesis.

At a time when, in non-religious teaching in certain countries, more and more complaints are being made about the unfortunate consequences of disregarding the human faculty of memory, should we not attempt to put this faculty back into use in an intelligent and even an original way in catechesis, all the more since the celebration or "memorial" of the great events of the history of salvation require a precise knowledge of them? A certain memorisation of the words of Jesus, of important Bible passages, of the Ten Commandments, of the formulas of profession of faith, of the liturgical texts, of the essential prayers, of key doctrinal ideas, etc., far from being opposed to the dignity of young Christians, or constituting an obstacle to personal dialogue with the Lord, is a real need... We must be realists. The blossoms, if we may call them that, of faith and piety do not grow in the desert places of a memory-less catechesis. What is essential is that the texts that are memorised must at the same time be taken in and gradually understood in depth, in order to become a source of Christian life on the personal level and the community level. (para. 55)

Perhaps memory could be returned, in equally intelligent ways, to the religious education classroom.

## References

- Aiello, R., & Williamon, A. (2002). Memory. In R. Parncutt & G. E. McPherson (Eds.), *The science and psychology of music performance*. (pp. 167-182). New York: Oxford University Press.
- Augustine of Hippo. (1991). *Confessions* (H. Chadwick, Trans.). Oxford: Oxford University Press.
- Blanchard, B. (2007). *Making music and enriching lives: A guide for all music teachers*. Bloomington, IN.: Indiana University Press.
- Bradman Foundation Australia. (n.d.). Don Bradman, the early years: 1908-1926. Retrieved 22 January, 2010, from [http://www.bradman.com.au/library\\_library\\_detail.aspx?view=7](http://www.bradman.com.au/library_library_detail.aspx?view=7)
- Butler, A. C., & Roediger III, H. L. (2007). Testing improves long-term retention in a simulated classroom setting. *European Journal of Cognitive Psychology*, 19(4), 514-527.
- Chaffin, R., & Imreh, G. (1997). "Pulling teeth and torture": Musical memory and problem solving. *Thinking and Reasoning*, 3(4), 315-336.
- Chambers, M. (2010). Memory in the religious education classroom: (Part 1: Historical perspectives, constructivism and foundational content). *Journal of Religious Education*, 58(2), 58-64.
- Ericsson, K. A., & Charness, N. (1994). Expert performance: Its structure and acquisition. *American Psychologist*, 49(8), 725-747.
- Gates, A. I. (1917). *Recitation as a factor in memorizing*. Columbia University, New York.
- Hart, T. (2002). From mediocrity to mastery: Finding the patterns of knowledge. *Educational Horizons*, 80(2), 77-82.
- John Paul II. (1979). Catechesi tradendae. Retrieved 18 January, 2010, from [http://www.vatican.va/holy\\_father/john\\_paul\\_ii/apost\\_exhortations/documents/hf\\_jp-ii\\_exh\\_16101979\\_catechesi-tradendae\\_en.html](http://www.vatican.va/holy_father/john_paul_ii/apost_exhortations/documents/hf_jp-ii_exh_16101979_catechesi-tradendae_en.html)
- Jones, H. E. (1923). Experimental studies of college teaching: The effect of examination on permanence of learning. *Archives of Psychology*, 68, 1-70.
- Joyce, B., Weil, M., & Calhoun, E. (2009). *Models of teaching*. Boston: Pearson.
- Karpicke, J. D., & Roediger III, H. L. (2010). Is expanding retrieval a superior method for learning text materials? *Memory & Cognition*, 38(1), 116-124.
- Li, C. (2003). *Mao's last dancer*. Camberwell: Penguin.
- McDaniel, M. A., Anderson, J. L., Derbish, M. H., & Morissette, N. (2007). Testing the testing effect in the classroom. *European Journal of Cognitive Psychology*, 19(4/5), 494-513.

- Prendergast, M. (2009, October-November). The big chill. *Pianist*, 50, 22.
- Pyc, M. A., & Rawson, K. A. (2009). Testing the retrieval effort hypothesis: Does greater difficulty correctly recalling information lead to higher levels of memory? *Journal of Memory and Language*, 60, 437-447.
- Roediger III, H. L., & Karpicke, J. D. (2006a). The power of testing memory: Basic research and implications for educational practice. *Perspectives on Psychological Science*, 1(3), 181-210.
- Roediger III, H. L., & Karpicke, J. D. (2006b). Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science*, 17(3), 249-255.
- Ryan, M., & Grajczonek, J. (2007). *An inspired tradition: Religious education in Catholic primary schools today*. Brisbane: Lumino Press.
- Shoda, Y., Mischel, W., & Peake, P. K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification: Identifying diagnostic conditions. *Developmental Psychology*, 26(6), 978-986.
- Squire, L. R., & Kandel, E. R. (2000). *Memory: From mind to molecules*. New York: Scientific American Library.
- Terry, W. S. (2000). *Learning and memory: Basic principles, processes and procedures*. Boston: Allyn and Bacon.
- Williamon, A. (2002). Memorising music. In J. Rink (Ed.), *Musical performance: A guide to understanding* (pp. 113-128). Cambridge: Cambridge University Press.
- Williamon, A. (2004). *Musical excellence: Strategies and techniques to enhance performance*. New York: Oxford University Press.

---

<sup>i</sup> This is an example of formative assessment, or a particular aspect of formative assessment known as *assessment for learning*. Formative assessment is very well known in education. Assessment for learning has entered educational discourse in recent years in response to education's more critical understanding of the complexity of assessment. For further information see Ryan and Grajczonek (2007, pp. 83-102).

\*Michael Chambers is a lecturer in the School of Religious Education (McAuley Campus, Brisbane), Australian Catholic University. He can be contacted at michael.chambers@acu.edu.au.