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From Magic Curriculums to the Interplay of the Workbench: Some Insights about Learning and the Brain for Rethinking Confirmation Work

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More than a Curriculum Problem

"Can you tell me what would be a great curriculum for confirmation?" On several occasions, I have had this question posed to me by church educators and youth leaders when they discover that I teach Christian education in a theological

Those interested in reconceiving confirmation theory and practice must take seriously recent developments in understanding the dynamics of learning. New insights about the brain and the dynamics of learning lead to a reframing of curriculum theory and practice that focuses less on finding a magic curriculum that will fix confirmation and more on managing the complex interplay of the church's memory and the contemporary experiences and cultural contexts of learners in confirmation.

school and that I am part of the steering committee for The Confirmation Project.[1] Those who pose the question have a sense that confirmation does not work the way it once did, and they quite understandably diagnose the problem as one of curricular inadequacy. I usually respond first by telling them that there is no such thing as a magic curriculum—for confirmation or anything else—that will solve their problems with motivation, learning effectiveness, and retention. I go on to suggest that the problems they face with respect to confirmation involve much more than developing snappy content or finding zippy methods of instruction—though, to be sure, these can help to some extent. I usually end by urging that we address the challenges of confirmation today by reframing the whole way we approach confirmation, beginning with thinking about effective learning. I maintain that we can only begin to effectively reconceive of confirmation theory and practice in relation to the dynamics of learning and the instructional methods and environments that support effective learning that have come to light in recent decades. This is not the whole answer, but it has to be a key part of contemporary efforts to rethink confirmation.

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Educational theorists and researchers know a lot more today about learning than was the case five, ten, or thirty years ago. Interdisciplinary research in the emerging field of "learning sciences," which brings together neuroscientists, educational psychologists, artificial intelligence theorists, philosophers, and teachers, provides perspectives and principles that can stimulate the educational imagination of those involved in the various aspects of the theory and practice of confirmation. Some of the complexities of learning in relation to the multidimensional aspects of the memory system have emerged in recent years. The whole subject of the brain and learning is vast and ever expanding. Several books appear every year about ways to connect neuroscience research and pedagogy (some helpful titles can be found in the citations for this article). In what follows, I do not in any way attempt to be comprehensive either in scope of depth. I only provide a digest of a few key themes that may have relevance for rethinking the theory and practice of confirmation. Much, much more work needs to be done on this subject. Here I provide only what amounts to a few hors d'oeuvres in order to whet appetites for something more fulsome at a later point.

[1]The Confirmation Project, directed by Richard Osmer and Katherine Douglass, is funded by Lilly Endowment, Inc., and includes five denominations: Evangelical Lutheran Church in America, United Methodist Church, Presbyterian Church (USA), Episcopal Church, and African Methodist Episcopal Church. For more information see theconfirmationproject.com.

Learning Brains Are Active and Connected

"The brain is not a static entity."[2] The learner's brain is not a blank slate and does not receive information passively. Nor can knowledge simply be transferred from one person's brain to another's. The brain of each learner works continuously to construct knowledge. The learner's brain works even when they are asleep to make sense, to find patterns, and to develop frameworks of meaning out of the signals that come to it through sensory pathways. The brain constructs knowledge through the establishment, reinforcement, reconstruction, and sometimes pruning of electrochemical networks that link together several specialized areas of the brain.

Moreover, the brain is not isolated; it is connected both to the body and to other brains through social interactions. According to researcher and therapist Daniel Siegel, "Mind, brain, and relationships are three aspects of one system: regulations, embodied mechanism, and sharing of energy and information flow."[3] Contrary to assumptions about thinking and learning from the period of the Enlightenment, which focused on isolated thinking individuals, current research on the brain and learning emphasizes the central importance of relationships with others across the life cycle. This means that learning is a social activity from beginning to end. Interaction with other people in the learning situation plays a constitutive role in the learning process. The relational character of the brain and learning finds additional support in paleoanthropologist Michael Tomasello's work on the evolution of distinctively human forms of cognition. Tomasello argues from the fossil record and from comparative analyses of cognitive capacities of humans and our great ape cousins (orangutans, gorillas, chimpanzees, and bonobos) that social or collective cognition—as manifest through language, symbols, moral systems, cross-generational transmission of culture, and complex social institutions—distinguishes us from our closest relatives in the animal world.[4] In other words, we are the socially cognitive animal.

These insights about the unique features of human learning have significant implications for rethinking the theory and practice of confirmation today. Among other things, the insights about learning and the brain as constructive process mean that learners have to engage subject matter actively in order for deep and lasting learning to take place. Educational approaches that require learners to sit quietly and passively absorb information will likely not produce learning that changes the learner's outlook or behavior in any significant way. Stated positively, learners need to regularly do things with new concepts and skills. Such activities can range from restatement to artistic expression to working on a relevant case study to a staged debate. This does not mean, however, that direct instructional

[2]Diane L. Williams, "The Speaking Brain" in *Mind, Brain, and Education: Neuroscience Implications for the Classroom*, ed. David A. Sousa (Bloomington, IN: Solution Tree, 2010), 97.

[3]Daniel J. Siegel, *The Developing Mind: How Relationships and the Brain Interact to Shape Who We Are*, 2nd ed. (New York: Guildford, 2012), 7.

[4]Michael Tomasello, *A Natural History of Human Thinking* (Cambridge, MA: Harvard University Press, 2014).

methods like lecture or watching a video have no place in effective confirmation work. It does mean that learners have to be either equipped to engage the presented material in an active fashion (for example, through guiding questions) or respond to it through writing, discussion, or some other activity immediately after the new material is presented if they are to integrate the new learning into their existing knowledge base.

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The insights about learning as a social and collaborative endeavor also have important implications for confirmation work. Learning tends to increase when learners have to work together to understand, use, and communicate the new concepts. Learning activities that call for learners to listen together, engage in reflective discussion in pairs or small groups, or even to work together to teach each other tend to reinforce and deepen learning. Instructional methods like the "Jigsaw Model" or the "Structured Academic Controversy Model" call for groups of learners to collaborate and actively engage subject matter.[5] Such methods call upon learners to learn new concepts or skills by jointly doing something creatively with the unfamiliar material.

Learning as Engaging the Memory System

In many ways, learning has to do with establishing, strengthening, using, and reframing memories. Things that are not remembered simply pass out of consciousness and become unavailable for use in both the present and the future. Things that are remembered, on the other hand, form the basis of all knowledge, self-perception, and skill. Understanding the basics of how memory works in the brain can have a revolutionary impact on educational work in a wide range of settings, including confirmation.

In broad terms, the brain uses three interrelated kinds of memory. *Sensory memory* processes raw sensory input and lasts for only five to eight seconds. Most of what we take in through our senses passes out of memory and evaporates. The brain's screening mechanisms only mark certain kinds of sensory data as significant and worth further processing.

Some screened and coded experiences make it from sensory to *working memory* (sometimes also called "workbench memory" or "short-term memory"). Working memory is the series of processes in which learning takes place. Items

[5]Mary Alice Gunter, Thomas H. Estes, and Susan L. Mintz, *Instruction: A Models Approach*, 5th ed. (Boston: Pearson, 2007), 262–281.

that make it into working memory last only for twenty to thirty seconds before dissipating or receiving further processing. They can remain in play longer, however, if they are actively used or engaged in ways that rehearse or elaborate the information. With such rehearsal or elaboration activities, items in working memory can remain in play for up to thirty minutes. If the items in working memory make sense and are meaningful in some way to the learner, then they get moved into the longer-term memory (third kind of memory). Effective learning takes place when new information combines with existing memories called up from long-term memory (more on that below).

A curious fact about the workbench of learning is that it can only handle five to seven items at a time. If the three kinds of memory are like an hourglass (with sensory and long-term memory having very broad, nearly limitless capacities), working memory is like the narrow place in the middle where the top and bottom of the hourglass meet. If working memory gets overloaded, it will simply ignore or filter out what it deems to be the least significant information. Working memory's capacity can, however, be expanded through a process referred to as "chunking." In chunking, bits of information are linked together into a large chunk of information (for example, referring to our country as the USA instead of naming and adding together each of the fifty states).

Another important fact about working memory is called the "primacy-recency effect."[6] This refers to the fact that learners remember most what comes first and what is most recent. In fact, the key learning times in any session of learning are the first 20 percent and last 20 percent. Most of what occurs in the middle of a session of learning passes out of sensory and short-term memory and is simply forgotten. In order to maximize learning in light of the "primacy-recency effect," it is best to break up long sessions of learning into shorter segments with breaks. Sessions of learning should have a structure comprised of, for example, four twenty-minute blocks rather than one large block of eighty minutes.

Long-term memory refers to the brain's seemingly infinite capacity for storing bits of information that the learner has found useful or significant in some way. The more ways in which items are coded, the more times that the items are encountered, and the more significant they are to the learner, the more likely the items are to make it into longer-term memory. This kind of memory has two subdivisions—explicit and implicit—with subcategories under each of them. Without going into further detail here, suffice it to say that long-term memory is not a single thing; it is, rather, several kinds of component matrices that are linked together. Learning in general has to do with fostering, coding, and linking long-term memories.

Learning involves, though, not only helping learners to make long-term memories that are significant and useful; it also involves bringing long-term memories into dynamic interaction with new information. In other words, most effective learning involves calling up what the learner already knows and bringing it back into working memory so that those established memories can enter into

[6]David A. Sousa, *How the Brain Learns*, 4th ed. (Thousand Oaks, CA: Corwin, 2011), 95.

dynamic interplay with new input. The results of such interaction between the new and old in working memory can add to, extend, or reframe the prior knowledge.

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Insights about the memory system can prove invaluable when rethinking approaches to confirmation. Perhaps the most important implication concerns the activation of prior knowledge on the part of the learner. Without calling up what the learner already knows about a subject of study or a skill, any new information encountered will likely dissipate rather quickly and never make it into long-term memory. Related to this, there is a certain range or capacity that the learner has to process the existing knowledge in relation to new information or stimulation. Generally, that range extends beyond the known a few steps into the unknown. According to Russian psychologist Lev Vygotsky, each learner has a "Zone of Proximal Development" (ZPD) within which new learning can take place.[7] If the new information is close to but at the edge of the learner's grasp, the learner can assimilate the new data with scaffolding and support provided by a teacher or more experienced learner. If the new material goes too far beyond the base of existing knowledge on the part of the learner, then the new information will have nothing to hang onto and will likely be lost or processed as unmeaningful or irrelevant. The art of teaching confirmation—as with all teaching—involves identifying each learner's ZPD and working within it. Learning in confirmation will be effective to the degree that the new material will connect with what the learner already knows and will stretch the learner to a productive degree.

Brain Plasticity and Sensitive Periods

Recent neuroscience research has brought to light the fact that the brains of learners possess an amazing ability to adapt and change across the entire course of the life cycle. While having certain specified functions associated with identifiable structures, the learning brain has an amazing ability to change and adapt as a result of interaction with the environment. The brain perpetually rewires itself in order to incorporate new information. According to one researcher, "neural networks . . . extend, reorganize, correct, or strengthen themselves based on acquiring new information, obtaining corrective feedback, and recognizing associations between new and prior knowledge."[8] The brain can even adapt to trauma or damage by

[7]L. S. Vygotsky, *Mind in Society: The Development of Higher Psychological Processes* (Cambridge, MA: Harvard University Press, 1978), 84–91.

[8]Judy Willis, "The Current Impact of Neuroscience on Teaching and Learning," in Sousa, *Mind, Brain, and Education*, 55.

having some of its parts take over the functions of parts that have sustained damage or may be missing. As long as a person lives, the brain engages in the process of rewiring and reshaping itself.

The amazing plasticity of the brain across the life cycle has helped people who study learning and the brain to use the language of "sensitive periods" rather than the outmoded notion of "critical periods." Victoria Knowland and Chris Donlan observe: "A sensitive period is a point in development when behavioral change can be maximally influenced by environmental input; in neural terms, this means that functional plasticity is at its height and brain structure and function are most malleable, although this does not preclude further change later in development. Sensitive periods confer considerable advantage to an individual as they ensure that neural processing systems are optimally adapted for the species-typical and individual environment."[9] In other words, even though a particularly "sensitive period" for learning a second language arises in early childhood, it is possible to learn a new language at any age—though it may take a bit more effort and persistence than it might have at age five.

New insights about brain plasticity have at least a couple of key implications for promoting learning in confirmation work. First, insights about brain plasticity suggest that confirmation work ought not to be thought about as a "one and done" pedagogical phenomenon. That is, the brain's potential to learn new things and to rewire itself across the entire span of the life cycle suggests that crucial elements of Christian belief and practice should be encountered at several points along the course of a learner's life and should not be confined to a concentrated pedagogical effort in early or mid-adolescence. Perhaps confirmation work itself ought to be reframed as a multiphased process that occurs in three or more phases: in late elementary school, in adolescence, and in the early twenties.

New insights about brain plasticity have at least a couple of key implications for promoting learning in confirmation work.

Some Unique Features of Adolescent Brains and Learning

Adolescent brains have some unique features relevant to learning that should be taken into account when designing educational experiences. Changes to circadian rhythms take place in adolescence such that teens need, on average, one more hour of sleep per night (from eight to nine hours) than do children. Adolescents also develop a heightened sensitivity to risk and challenge. According to Alice Jones:

[9]Victoria Knowland and Chris Donlan, "Language Development" in *Educational Neuroscience*, ed. Denis Mareschal, Brian Butterworth, and Andy Tolmie (Malden, MA: Wiley Blackwell, 2014), 156–157.

"The adolescent brain is characterized by maturation of the limbic system with heightened reward sensitivity in conjunction with the protracted development of the prefrontal cortex and developing cognitive control. It is this disparity between the development of these two systems which may be the underpinning of risk-taking behaviors often observed in adolescents."[10] In fact, a fully adult form of integration between the limbic system (emotional reward system) and the prefrontal cortex (executive control system) does not develop until around age twenty-four.[11]

Relationships with others take on much greater significance for adolescents. In fact, the traditional timing for offering confirmation coincides with a "sensitive period" for the development of social cognition and the renegotiation of social relationships. Sarah-Jayne Blakemore and her colleagues observe that, "compared with children, adolescents are more sociable, form more complex and hierarchical peer relationships, and are more sensitive to acceptance and rejection by peers."[12] These same researchers point out that "research suggests that adolescence is a key time for the development of regions of the brain involved in social cognition and self-awareness."[13]

Daniel Siegel summarizes the qualities of cognition that change in adolescence as novelty seeking, increased social engagement, increased emotional intensity, and creative exploration.[14] Each of these factors contribute to the emergence of adolescents into competent adults who can respond creatively to the unique challenges posed by the world for which they will have responsibility.

These unique features of adolescent brains should be taken into account when designing and leading educational experiences related to confirmation work.

These unique features of adolescent brains should be taken into account when designing and leading educational experiences related to confirmation work. For starters, this means that provision should be made on retreats for adequate sleep. The combination of massive brain development with the fact that the consolidation of new learning in long-term memory takes place largely during sleep strongly suggests that well-rested confirmands will likely learn a great deal more than those operating on four hours of sleep and large doses of caffeine. The research on brain plasticity and rewiring also points to rethinking confirmation as a learning experience concentrated in a single intensive period of time. Siegel's work on the unique features of the adolescent brain suggests, among other things, that confirmation

[10]Alice Jones "Emotional Development," in Mareschal, Butterworth, and Tolmie, *Educational Neuroscience*, 312.

[11]Daniel J. Siegel, *Brainstorm: The Power and Purpose of the Teenage Brain* (New York: Penguin, 2013) 6.

[12]Sarah-Jayne Blakemore, Kathrin Cohen Kadosh, Catherine L. Sebastian, Tobias Grossmann, and Mark H. Johnson, "Social Development" in Mareschal, Butterworth, and Tolmie, *Educational Neuroscience*, 278.

[13]Ibid., 290.

[14]Siegel, *Brainstorm*, 7–9.

work ought to make room for creativity, problem solving, and collaborative learning activities. Said negatively, Siegel's work strongly cautions against setting up confirmation programs that involve having learners sit and listen to lectures or presentations about boring old stuff that is irrelevant to their lives and that has little to no risk or challenge associated with it. In other words, confirmation work should involve risk, adventure, creative thinking, and collaboration in dynamic interaction with biblical teachings and the traditions of the church.

Some Brief Theological Musings on Brain, Learning, and Confirmation

Rethinking the theory and practice of education in relation to new insights about learning and the brain has resonance with themes relevant to a theology of education as brought to bear on the theory and practice of confirmation. For instance, the emphasis on the importance of active engagement with subject matter by various parts of the brain sheds some light on the instructional methods used by Jesus. While one can find instances in the Gospels in which Jesus used direct methods of instruction, one can just as readily find examples of Jesus using pedagogical methods that stimulated the active construction of knowledge on the part of learners. Jesus' use of parables as teaching devices—perhaps his preferred method of instruction—evoked active responses on the part of learners. That is to say, Jesus did not always provide clear and direct teaching in the form of lectures or sermons; sometimes, he told pithy stories that evoked or provoked active engagement. Similarly, Jesus often posed generative questions without providing easy answers in order to help learners to reflect and construct responses. New research on learning and the brain can actually help shed light retrospectively on the instructional methods of Jesus as depicted in the Gospels and, in turn, can help Christian educators and confirmation leaders to rethink their pedagogical strategies.

At another level, new perspectives from neuroscience and the learning sciences on the brain's memory system offer a kind of metaphor for thinking theologically about the confirmation process as a whole. Analogous, perhaps, to the way learning works as the interplay between long-term memory and workbench memory, the confirmation process as a whole involves calling up and activating already existing knowledge and skill (i.e., church traditions) and putting that knowledge and skill into dynamic interplay with new input in new contexts (i.e., the experiences and cultural contexts of contemporary confirmands). The interplay between the already existing tradition and the new experiences and challenges of confirmation learners gets worked out ideally on the workbench of confirmation. If Christianity is a living tradition and not simply an exercise in transmission of dead facts or nostalgia, it can happen in no other way. Merely bringing up the settled inheritance of the past without new input and experience leads to ossification and irrelevance. Conversely, solely focusing on new input from the surrounding culture

or life experience of the learners without constructive interplay and enrichment by the cultural inheritance of the church's past quickly dissipates. The dialectical interplay of tradition and current experience makes it possible for Christian faith to remain vital for each new generation in a continually changing world. We would do better to think about the challenge of confirmation as managing the dynamics of a workbench in which long-term memory and new experience come together than as searching for the magic curriculum that will solve all problems.

Finally—at least for now—I would suggest that recent thinking about the brain and learning in relation to the importance of relationships has important theological resonance with the overall aims of confirmation work. If what Siegel says is true about the human brain being wired for relationships and that adolescence is a sensitive period for the development of relationships, we should frame confirmation as an apprenticeship in the theory and practice of love. From a theological point of view shaped by Augustine's interpretation of 1 John 4:7–12, we can say that not only relationships per se but love as right-relatedness in relationships is the goal of human life. That right-relatedness arises from the amazing love of God for the human family in Jesus Christ by the power of the Holy Spirit. The love of God, in turn, makes possible a response of love for God and neighbor. Confirmation as a pedagogical process that is about relationships and relational learning and knowing has, therefore, to be about helping confirmands to experience love and to learn how to love.

Recent thinking about the brain and learning in relation to the importance of relationships has important theological resonance with the overall aims of confirmation work.

Some Concluding Thoughts

I offer here only a few pedagogical conclusions as but a couple of hors d'oeuvres to the feast of insights that continually emerge from research about learning and the brain. First, effective confirmation work should be learning-centered. That is, it should focus not on either the teacher or the learner but on the complex and multidimensional processes of learning. To be sure, subject matter, tradition, and authoritative consensus continue to have crucial roles in the process along with the prior knowledge, experiences, and cultural context of confirmation learners. Bringing both together and doing so in an educational, productive way calls for an approach that focuses as much on the learning process as on the curricular substance to be learned. Methods of instruction matter as much as does curricular content because effective learning is work that has to be done by the learner as an active constructor of meaning. Use of the Jigsaw Method, Socratic

seminar, simulation games, problem-based learning, and collaborative projects and inquiries, as well as artistic expression (music, literature, poetry, dance, visual arts, sculpture, performance, etc.) will promote deep and lasting learning in confirmation work more than an exclusive reliance on direct instructional methods like lecture.

Second, effective learning in confirmation work will not assume that learners are blank slates but will actively call up and engage what learners already know about key confirmation topics and build on or reconstruct that prior knowledge. The human brain is a meaning-making factory. Unless the learner actively constructs and reconstructs knowledge, even the best confirmation materials and programs will make little long-term difference for the learner.

Third, confirmation programs need to attend the needs of the learner in a holistic manner. Healthy bodies (with adequate sleep and healthy food) and positive social relationships matter a great deal in the learning process. The embodied character of learners and their social relations with everyone involved in the process have to play a focal role in reimagining and reshaping the confirmation experience for contemporary confirmands. New research about learning and the brain points to a future in which confirmation is designed as a holistically structured experience in an intentional learning community.

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