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# THE SOCIAL NEUROSCIENCE OF EDUCATION

JAN NEHYBA

## A BOOK REVIEW

Cozolino, Louis (2013). *The Social Neuroscience of Education: Optimizing Attachment and Learning in the Classroom*. New York: W.W. Norton & Company.

Today there are many disciplines of science in which it is not easy to maintain knowledge about the latest state of things. Neuroscience has undoubtedly become one of these chaotic “black mysteries” over the last couple of decades. Even core neuroscience branches into more than twenty identifiable independent disciplines (from affective neuroscience through behavioral to cognitive, computational, cultural and miscellaneous other kinds of neuroscience), while instructional publications which pretend to interpret the findings of these branches to non-professional readers are piling up.

In this tangle of all possible kinds of neuroscience and their interpretations and misinterpretations, three approaches with a lot in common have taken shape. They are called interpersonal neurobiology (Siegel, 2012), social and affective neuroscience (Panksepp, 1998) and sociophysiology (Adler, 2002). In general terms, all these three directions intend to integrate knowledge of neuroscience into the social sciences. The first of these approaches features in the main theoretical background of *The Social Neuroscience of Education* by Louis Cozolino, professor of psychology at Pepperdine University in California, who defines interpersonal neurobiology as “attempting to bridge the gap between the biological and social sciences [and] explores the way in which relationships and the brain interact to shape our mental lives” (Siegel<sup>1</sup>, 2012)” (Cozolino, 2013, pp. 21–22).

There are very few books which try to clarify a small part of the “black mysteries” of neuroscience, but Cozolino’s work may unequivocally be ranked as one of these. What is even more important, its main objective is

to apply more clearly whatever current neuroscience can offer to sciences of education and schooling. The fact that the work strives to summarise this knowledge is evidenced by the list of references, which takes up 120 of the 409 pages of the monograph. The book is the latest in a series on interpersonal neurobiology published by W. W. Norton & Company, New York.

At the beginning, Cozolino comments on the usefulness of neuroscience for education and schooling, highlighting three important questions he endeavors to answer: How has the brain evolved to learn? What conditions optimise; learning? Can teachers and administrators use these findings in our classrooms and schools? (Cozolino 2013, p. xxvi). The opening part is devoted to the evolution and development of what neuroscientists call the social brain. Cozolino refers to the basic points of evolution theory, neuroscience, epigenetics and the theory of attachment, aiming to support a concept which he has named attachment-based teaching. He points out that the brain has evolved as a social organ, the synaptic activity of which is shaped by relations people have around themselves. He sees the focal point of “attachment-based learning” in “interactions between positive relationships, stress, and learning” (Cozolino, 2013, p. 68). For him, this means a shift from feelings of fear and vulnerability to a sensation of safety, which results in “optimal learning.” According to Cozolino, those who are aware of neuroscientists’ findings on learning and memory can create such an environment.

In the second part of the book (How to Turn Brains Off) the author mainly deals with situations and conditions that impede successful learning. First he describes how stress blocks neuroplasticity, which plays a very important role in the process of learning. As Cozolino says, this term “refers to the ability of neurons and neural networks to be born, grow, and change the way they relate to one another in response to experience” (Cozolino, 2013, p. 159). Particular emphasis is put on negative social interactions “closing our mind” (Cozolino, 2013, p. xxvi). As specific examples, the impact of negative social interaction and stress is documented by cases of bullying and causes and consequences of teachers’ burning out. Then, as the opposite to stress, he refers to the role of positive support, humor and laughter, increased attention and hormonal activity resulting in higher synaptic plasticity, which altogether has a positive influence on the process of learning.

In the third part (How to Turn Brains On) Cozolino deals with ways of stimulating the brain for learning. In this respect, first of all the importance of the “emotional attunement” of the teacher and learners is pointed out,

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<sup>1</sup> An extensive review by David Skorunka of the second edition of Siegel’s principal work *The Developing Mind* can be found in issue 3-4 of *Psychotherapie*, vol. 6, 2012.

which is rather different from what is usually meant by the suggestion that teachers should have a good relationship with students. The matter of emotional attunement is related to “mirror neurons” which are responsible for imitating other people, therefore playing an important role in observational learning. As for what stimulates the brain to learning, Cozolino uses the neuroscientist’s perspective to refer to the importance of narration and stories in both traditional and contemporary approaches to learning. In this chapter, he also describes the importance of games for learning from a neuroscientific viewpoint.

In the final part of the publication (*Applying Social Neuroscience in Schools and Classrooms*) the author strives to answer a fundamental question: What does neuroscience bring to educational sciences? This part starts with a rather unusual reflection on the psychological, social and neuroscientific factors which are necessary for learning gradually to become “wisdom”. This enables Cozolino to continue discussing the question of why it is important for students and teachers to learn about the functioning of the brain and the way the brain learns. A few basic theses which are important for students and teachers are summarised, meant to express the elementary facts of neuroscience which must be respected in order to achieve the best possible effects for learning and teaching. Let us choose at least some of these statements (instead of commenting on them, I invite inquiring readers to look up the explanations in the book): the brain is a social organ of adaptation; we have two brains (a reference to the different functions of the two hemispheres); conscious awareness is an island in a sea of automatic processes; unconscious automatic processes are very fast; the mind, the brain and the body are interconnected, sleep is vitally important for learning, and so on. This outline is enhanced by a few specific findings of cognitive psychology directly related to the learning process. They indicate that learning is strengthened by regular regaining of attention to the subject (it is good to shift attention to another subject every 5 to 10 minutes). Another way to strengthen learning is practice and repeated effect because learning “involves the strengthening of connections between neurons” (Cozolino, 2013, p. 232). Learning is also strengthened by means of “multichannel” processing (it is important to transfer information in multiple ways and channels such as sensoric, semantic, motoric, visual and emotional). Another support to learning is “conceptual processing” (this means that it is important to divide the learning material into meaningful units, which enables easier memorising). Yet another way to strengthen learning is the testing of hypotheses and feedback (learning is based on attempts and errors, so for this process it is crucial to detect any possible errors and rectify them). Stimulation of some external circumstances strengthens learning as well (the right acoustics, sufficient lighting in the classroom, and so forth). One more support for

learning is musical training (e.g., children who practice playing an instrument have shown better verbal memory).

After a clearly arranged enumeration of these important impetuses related to the process of learning, the author concludes the book with the idea of “tribal learning” and “tribal educators” who embody observance of the important principles he has described in the previous chapters. He comes up with a similar idea to Maffesoli’s (1996) in *The Time of the Tribes*, but he approaches it from another perspective and applies it to education. He refers to the fact that the functioning of a “tribal society” in the classroom and the role of teachers as “tribal leaders,” who are responsible for physical and emotional security, is an important element of attachment-based teaching. In this regard, several examples of teachers who seem to be prototypes of these “tribal leaders” are mentioned. Their case histories show how they succeeded in guiding even “unteachable” students to very good results by observing some of the principles described.

On the whole, the book is written in a fairly readable form, accessible to those who have just a modest knowledge of neuroscience. It does not bother the reader needlessly with incomprehensible numbers and data of neuroscientific research. Although there are few graphic figures in the text, intelligible tables with quotations from research summarise clearly the arguments in support of the statements.

When looking for what neuroscience can bring to educational sciences the author accentuates the balance between the findings of neuroscience and those of the social sciences. He presents more than just hard data such as results on functional magnetic resonance, encephalograms and neurobiological experiments, because he knows that in any case these data cannot capture the substance of learning. In most cases, such data can refer only to the limits and possibilities to be respected from the perspective of neuroscience in order for the processes of learning and teaching to be as efficient as possible. So the neuroscientific view has its limits, just like any other science. The limits of the study of the mind and brain have already been pointed out by Varela (as cited in Blackmore, 2005), who speaks about the traditional attitude to research as a “methodology of the third person” in which, in very simplified terms, information is mediated through measurement technologies only. To those who adhere to this position, Varela says: “We are extremely naive. It is like people before Galileo looking at the sky and thinking that they were doing astronomy” (Varela; in: Blackmore, 2005, p. 221). He criticises the idea that reductionism alone would suffice to explain the human mind and brain as well as the processes of learning.

If we want to get to what occurs in our minds and, therefore, discover how the processes of learning work, according to Varela it is important not to forget the “perspective of the first person” who has direct access to the

authentic experience of the self. On the other hand, this person may perhaps be captured by phenomenological or rather neophenomenological procedures. For instance, a specific methodological procedure of this kind may be “clean language” (see Owen, 1996) which tries “not to pollute” the respondent’s experience by asking questions containing as few assumptions of the researcher and as many precise words of the respondent as possible. This prevents experience in the first person from being influenced by the researcher.

If researchers combined both perspectives, they would have a better chance of getting to the substance of learning than by using only the methodology of the “third person.” Indeed, not only does Cozolino use results originating from the methodology of the third person, he also uses methodologies based on the first person, combining both approaches efficiently. Thanks to this he proceeds to the wording of important neuroscientific principles related to education and schooling, namely those already mentioned: attachment-based teaching, tribal learning, tribal educators, attunement between teacher and students etc.

The scope of the book is so extensive that many aspects could not be explored in depth. If the reader expects, for instance, a detailed analysis of neurobiological mechanisms of learning at genetic or molecular levels, other literature such as Rudy (2008) must be consulted. However, despite these drawbacks the book is an extraordinary performance, primarily in summarising the latest knowledge of neuroscience and referring to its application in education and schooling. It is also commendable how it goes beyond this application and creates new challenges for education and schooling, e.g., by offering the concepts mentioned. Besides this, the book is a unique source of references to literature engaging with neuroscience and education. Because of all these incentives, it is very much worth taking a look at this book.

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