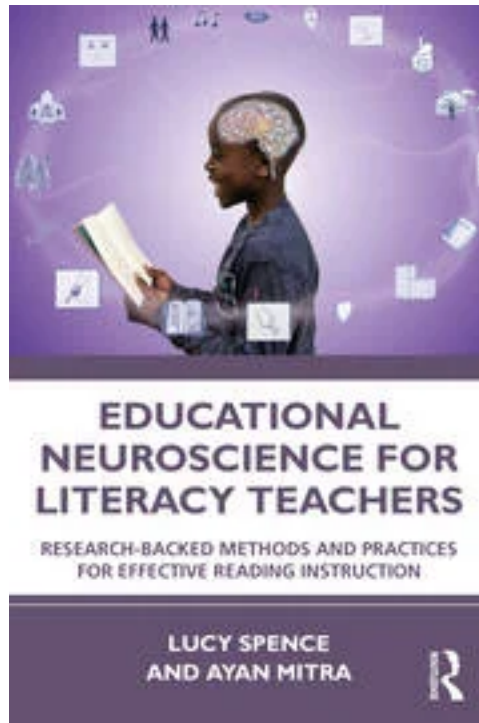


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JOURNAL OF LANGUAGE & LITERACY EDUCATION

Review of Educational Neuroscience for Literacy Teachers Lucy Spence and Ayan Mitra

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Spence, L., & Mitra, A. (2023). *Educational neuroscience for literacy teachers*.
Routledge.

ISBN: 9781003256199

Educational Neuroscience for Literacy Teachers is more than a book about the brain and literacy pedagogy best practices. The co-authors, Ayan Spence, a neuroscience researcher and Lucy Mitra, a former English as a second language and literacy educator and currently a university language and literacy professor, introduce themselves as passionate about understanding and bridging literacy education and neuroscience. Their book is a treasure trove of information and practical ideas to guide teachers. But it is also a counter-narrative against disinformation within the American context of what education journalist and author Laura Pappano (2024) describes as "the hijacking of public education by a far-right Christian movement" (p. xii). In this book review, I will briefly summarize the book. However, I will focus specifically on their arguments around language, languages of instruction, the pedagogy of reading and writing, and the implications for educational policy. The authors use a wide range of neuroscience research to show educators how they can best teach literacy. They also demonstrate how neuroscience does not support the current right-wing agenda pushing for, often successfully, policies that hinder effective education, especially for minoritized students.

In the first chapter, we learn about the interconnection between the neurobiological brain and the development within our sociocultural world. The authors teach us about the parts of the brain, hormones, and neurotransmitters related to print literacy acquisition. The brain receives sensory input and input from our bodies, such as our heart, gut, and hormones. Describing the brain functions and connections as a 'reading network,' Spence and Mitra explain the importance of neuroplasticity- the brain's "remarkable ability to adapt and change" (p.11). They describe basic brain anatomy, and the roles different parts play in learning, remembering, and understanding reading and writing as we grow and develop. This chapter would be less for experts and more for educators or researchers in other fields interested in understanding some basics or who would like some 'proof' that the pedagogies of balanced literacy (including explicit, phonics-based instruction) are critical. Spence and Mitra connect the latest research in neuroscience, neurobiology,

and literacy to guide preservice teachers and educators from pre-kindergarten to grade 12 to help all young people with their literacy journey. The authors remind us that only 1/3 of grade four students in the U.S. received a 'proficient' or higher in reading- a shocking number. The authors include children's book recommendations and lesson plan outlines, all designed with optimal literacy learning to help teachers help their students. These lesson plans and book recommendations continue throughout the chapters.

The most important part of this chapter, and I believe the most important part of the book, is Spence and Mitra's discussion about educational policy. The authors show how neuroscience does not support some of the divisive and damaging American policies enacted by state legislators. These issues are in the news: state legislations are banning critical race theory and teaching about racism and the history of racial discrimination, restricting teaching about diverse gender identities and sexual orientations, excluding socio-emotional learning (SEL) from classrooms, arguing against bilingual language programs, promoting English-only instruction, and banning books from school libraries. Spence and Mitra (2023) argue that "special interest groups that support curriculum enforcement by legislation would benefit from understanding neuroscience findings on the interconnected nature of learning" (p. 20). They maintain best classroom practices, including teaching about the "history of racial discrimination" (p. 21), including SEL in classrooms, bilingual programming and translanguaging practices, and culturally sustaining pedagogies.

Spence and Mitra's discussion about negative school policies in the U.S. is supported by another book I was reading by Laura Pappano (2024) called *School Moms: Parent Activism, Partisan Politics and the Battle for Public Education*. Pappano describes a climate of polarization and fear in the United States where those on the far right warn that children are being indoctrinated with "woke racial and gender ideologies that threaten their well-being" (Pappano, 2024, p. 121). She describes how state and district

Spring 2024 2 politicians have a lot of control over policies. In many districts across the United States, trans, non-binary, and queer students are facing far-right, conservative policies and laws that constrain schools and teachers from providing safe and inclusive classrooms. Pappano also explains that social and emotional learning in schools is threatened by lawmakers and school boards, who are, in turn, controlled by a far-right movement that describes SEL as anti-family.

In the second chapter, Spence and Mitra explore relevant theories in education, biology, neurological processing, and instructional frameworks. I will only briefly list some of them so that readers can understand the authors' paradigms when connecting their research to the other scholars' theories. First, the educational theories they draw on include Vygotsky's (1978) zone of proximal development, Bruner's (1976; 1990) strategies of scaffolding, and Paris' (2012) and Ladson-Billings' (1994) culturally relevant and sustaining pedagogy, Moll's (1992) funds of knowledge, and various scholars' theories about metacognition. Second, biological theories include ontogenic adaptation epigenetics and optimal environments. Some implications relate directly to the importance of inclusive and welcoming learning environments. Third, they explore neurological processing models related to reading and some instructional frameworks supported by the most recent neuroeducational research. These include the writing process, reader response such as literature circles response journals, dialogic teaching, which "...shifts the power dynamic away from the teacher as students think more deeply and question ideas" (Spence & Mitra, 2023, p. 42), inquiry learning, and critical literacy and social justice, where students question the power behind the text. I appreciate the authors framing their arguments about the interconnections between the brain and the sociocultural environment explicitly and seamlessly within these educational frameworks that most teachers and preservice teachers are likely already familiar with. The interconnections are highlighted within Mary Helen Immordino-Yang's embodied brain theoretical framework. Her work inspired the authors, and she even wrote the foreword to the book, where she describes the

importance of educators teaching reading "...in socially, emotionally, culturally, linguistically, and cognitively appropriate ways" (p. vii).

Immordino-Yang's embodied brain theory is explored in the third chapter. Spence and Mitra describe how we learn literacy within our brains, bodies, and our environments. They tell us that "literacy involves material objects and our bodies within spaces. It involves doing something with our body and mind. It involves our feelings and interactions" (Spence & Mitra, 2023, p. 47). By 'embodiment,' Spence and Mitra describe how "...our minds and bodies interact with the environment" (p. 47). They explain how the central and peripheral nervous and somatosensory systems work together. We optimize these systems for our students when teachers, schools, families, and communities provide optimal learning environments and instructional strategies. We derive a sense of self and community within these interacting systems, and we learn best in environments that allow us to feel safe and free to move and explore. This chapter emphasizes two main ideas: We can use what we know about the brain to understand our students better and provide the best possible environments and learning opportunities for them, and policymakers must address school inequities and the social and economic factors (structural and personal) that make it difficult for students to learn.

When discussing writing, Spence and Mitra focus on the process writing framework, which includes prewriting, brainstorming, drafting, editing, revising, and publishing. While they do not delve into post-process writing theories or frameworks such as community publishing and writing for social change and authentic audience, they outline some classroom strategies for optimal brain learning, and some are part of post-process writing frameworks. For example, they suggest teachers "address real issues in students' communities...encourage writing about students' concerns and interests...invite guest speakers from the community...invite students' family members to share expertise and stories [and] address a variety of narrative structures used in different cultures" (p. 64). As well, Spence and Mitra remind us that "...students must have a chance to

form their thoughts, rather than immediately churning out a predictable essay" (p. 42), which also hints at the sort of deindustrialized writing education called for by Kalan (2021). The authors do not elaborate on moving beyond essayist forms of writing or exploring publishing for students beyond "...stapling pages into a booklet, preparing a digital text, reading the text aloud, or posting it on a bulletin board" (p. 42). I believe they missed an opportunity to explore post-process writing within their embodied brain theoretical framework and critically examine power relations in the classroom, moving beyond writing as a cognitive process (Atkinson, 2003).

Chapter 4 explores the "social and emotional brain" (Spence & Mitra, 2023, p. 68) to show teachers how vital social and emotional learning is for our students' feelings of well-being and overall learning. They give us practical lesson plan outlines, showing how to include these elements in our classroom instruction. They give evidence to policymakers who enact "over-reaching policies and laws [that are] burdensome for teachers who are responsible for children's education" (Spence & Mitra, 2023, p. 22). Emotions are a critical component of literacy learning. Yet, in many states, these critical conversations within the social and emotional learning (SEL) framework are discouraged or banned in schools (Pappano, 2024). Spence and Mitra use the example of Simon et al.'s (2022) study about using graphic novels about the Holocaust (Maus by Spiegelman) to teach adolescents reading, writing, and social-emotional learning. While we would likely all agree this sounds like a good pedagogy, the authors explain why. Three networks in our brain are interconnected when we read within social contexts: executive functioning, such as memory and focus; a default mode network, helping us interpret and reflect; and a salience network, helping us balance thinking and feeling. Most educators will not need to be convinced of this, but I appreciate the authors making explicit arguments for SEL in chapter four. It is disheartening to read in the news about how positive initiatives for children are being politicized and painted as negative, and this feels like a spark of scientific truth in the dark.

In chapter six, the authors explore reading comprehension. Using the balanced literacy model, they describe elements of the reading workshop that are beneficial for helping our students make meaning of texts. I was interested to see that what Spence and Mitra describe as balanced literacy is not the same as the balanced literacy approach that was widely used in the context where I have taught for many years in Ontario, Canada. There, balanced literacy refers to teaching reading through the three-cueing approach to reading instruction, where students are taught to read with prediction strategies. The language curriculum has recently been changed to include a robust phonics approach aligned with Spence and Mitra's description of a balanced literacy model. I believe this is important to mention in case educators or administrators see the balanced literacy in the book and think it refers to a lack of phonics instruction.

In chapter seven, the authors stress teaching explicit phonics-based instruction within the balanced literacy framework, describing the importance of teaching with positivity. In this chapter, we finally hear the authors discuss learning disabilities (dyslexia), although only briefly. They hinted at it in chapter five, discussing technology and multimodal literacies, suggesting a universal design approach (UDA) (Coyne et al., 2012) as an essential pedagogical strategy. I wish the authors had spent more time on the neuroscience behind learning disabilities and the pedagogies such as UDA. I feel the authors missed another opportunity to explore an important educational issue.

For me, the most fascinating part of the book was chapter 8, which was about languaging. We learn about the brain and how it engages with and is changed by multilingual communication. Spence and Mitra describe themselves as fascinated with languages (Mitra is a plurilingual from India). The authors use Ladson-Billings (1994) and Paris and Alim's (2014) culturally sustaining pedagogy to elaborate on the concepts of languaging and encourage educators to open space for the students' multiple languages in the classroom. I appreciate their connection between culturally sustaining

pedagogy and languages, as this sometimes can get lost in educational policy.

This chapter promotes a move from monolingual teaching and supports anti-racist and equitable educational policies. Describing the advantages of bilingual programs and programs for 'emergent bilinguals,' they also point out how some dual language programs are often seen in affluent communities with 'native' English-speaking students to learn a 'world language, a criticism also made by Flores and Bale (2016). Spence and Mitra use García and Wei's (2014) description of languaging as "... using any of one's available linguistic resources to communicate with others and function in a social context" (p. 160). They explain that neuroscience supports the paradigm that "there are no separate systems for separate languages rather bilingual language users have been shown to have increased brain grey matter and neural connections" (p. 183). The authors focus on recent neurological, psychological, and literacy research to show how restrictive language policies in education hinder learning for plurilingual students, concluding that students benefit when they are free to engage with their entire linguistic repertoire.

Referring to the work of García and Kleifgen (2020), they describe translanguaging as going beyond code-switching in that language is conceptualized as unified within individuals, not as separate entities. The authors confirm that "translanguaging is consistent with neuroimaging studies. There are no separate systems for separate languages" (p. 171). However, they also refer to "the process of switching between different languages to produce words and grammatical structures" (Spence & Mitra, 2023, p. 169). While this reference to code-switching may not match with their definition by García and Kleifgen's (2020) definition of translanguaging (which argues strongly against the concept of codeswitching and states that there is a unified language repertoire within individuals), the authors are still promoting the use of 'heritage languages' and 'multiple languages' within a balanced literacy framework of instruction to increase student engagement.

One little organizational critique: I prefer long, detailed indexes in my non-fiction books. I want to know what is in the book, and I love being able to flip through a thick index to see all the concepts laid out, but this index needed to be more detailed for me. For example, when I was reading the index, I was surprised to see 'trauma' and 'learning disabilities' missing. Then, they briefly discussed trauma in chapter four and dyslexia in chapter seven. Also, they organized the bibliographies at the end of each chapter, so I had to flip through the book to see the authors referenced in the book. Finally, there was not a separate index for referenced authors. Not all books have this, but I appreciate it when they do.

Overall, this book teaches us about connections within our brains and the rest of our bodies, connections between each other, and the physical and immaterial aspects of our environments. Spence and Mitra use their literacy network metaphor to help us understand how "...emotion, one's body, languages, and one's brain" (p. 185) are situated within and interconnected with a social, cultural, and political context. This book brings together the brain, the body, emotions, politics, racism and oppression, pedagogy, and theory. The primary audience for this book is educators and teachers in training. The authors recognize that as teachers, we like to think of ourselves as part of the solution to problems and challenges our students may face, and we do not like to think of how we are also sometimes part of their challenges. This book is beneficial as a gentle instructional guide for educators and preservice teachers on not being part of the problem in our students' lives and academic trajectories and embracing the most effective and relevant pedagogies supported by complex (yet simplified for us) neuroscience research. They do not go into a scathing critique of the state of U.S. healthcare and high rates of poverty and racism other than to point out the lower rates of proficient reading levels or rates of reading for enjoyment among students with lower socioeconomic status and students of colour. For example, Spence and Mitra highlight how neuroscience shows us the critical importance of prenatal and infant care, proper healthcare, and a safe, nurturing

environment in the classroom for optimal brain development. This is where the strength of this book lies. Using neuroscience to back up their arguments, throughout the book, the authors demonstrate how literacy instruction is interconnected with our students' sociocultural environment.

The multidisciplinary nature of this book extends a hand to other fields, such as applied linguistics, where scholars such as García et al. (2018) are exploring the concepts of language and cognition and argue that languages "occupy a single, undifferentiated cognitive terrain that is not fenced off into anything like the two areas suggested by the two socially named languages" (p. 626). While the authors say they are also writing this for students in cognitive neuroscience and preservice teachers, I also recommend it to scholars and researchers in applied linguistics and literacy who want to explore the basics of the neuroscience behind translanguaging. I hope the authors write a second volume. I would like to read what they could share about writing literacy education, the brain, and trauma-informed instruction, especially as it relates to the experience of students who experienced gendered and family violence, forced migration, and the larger structures of violence and ongoing oppression from racism and colonial structures. This book contains no radical calls for action beyond improving our teaching with engaging, warm, culturally- responsive, and language-friendly practices. However, embedded within the book are responses to some of these polarizing issues that divide people, as the authors remind us of the critical importance of feeling that we belong and are safe. It may not influence policy, but one can hope.

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