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editors: gustavo e. fischman / melissa cast-brede / gene v glass

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Óskarsdóttir, G. (2016). *The brain controls everything: Children's ideas about the body*. Charlotte, NC: Information Age Publishing.

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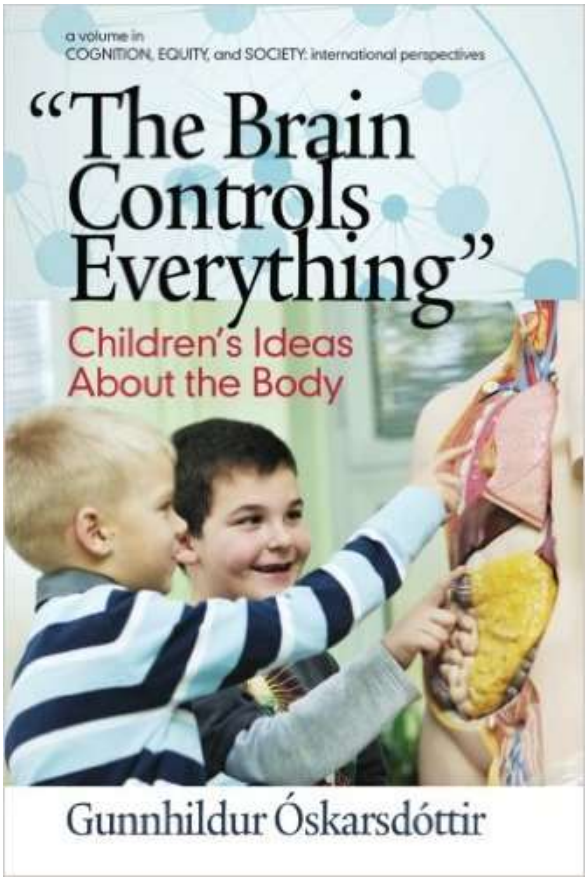

This volume, by Gunnhildur Óskarsdóttir, is part of the series in *Cognition, Equity, and Society: International Perspectives,* edited by Bharath Sriraman. The author, who has been a primary school teacher as well as a lecturer and teacher trainer at the Icelandic University of Education, presents findings based on a cognitive study conducted about 10 years ago in Iceland. What makes the book especially interesting is that it brings a new perspective of cognitive changes that occur in children ages 6 and 7 years old. The author describes in depth how ideas about body structure, location, and function of bones and other organs changed over two school years, and were influenced by curriculum, instruction, and peer interactions in a constructivist classroom.

The book structure is as follows: the structure of the study, a literature review, the methodology, results, and an ending discussion and conclusions. An appendix contains materials such as diagnostic tests,

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visuals, and questions that help explain and support the study and its findings.

The review of previous research is especially well written and documented. The author explores theoretical ideas of cognition and compares the works of Jean Piaget and Lev Vygotsky in depth. Attention is given to how the theories differ. The importance of a social dimension in learning and language are stressed repeatedly. When children come to school, they already have knowledge about their body. How and under what circumstances do ideas develop and change?

It is fascinating to explore the ages and stages involved in understanding our bodies. Conceptual knowledge ranges from general naming to understanding body functions and processing. The author infuses a plethora of support research to help the reader understand how this unfolding of development occurs. For example, a shift from general factual knowledge about the body and organ functioning to understanding the systems connecting the organs is described. Multiple studies are presented that give the reader benchmarks or norms as to when developmental shifts occur. Included in the review of previous research are: theoretical ideas about cognition; children's ideas about the body; bones and muscles; heart, blood circulation, and lungs; digestion; the brain; reproduction; interaction-learning from each other and from the teacher; teaching about the body; and the learning of quiet children. The author clarifies how the research of others fueled her own research interests.

Based on rich data collection, the reader is guided through the project as children study, dialogue, and report about their findings. We are told, not surprisingly, that the heart is among the organs which is known most about; and, it is characteristically presented in a V-shape, such as Valentine's heart, drawn inside the body. Less is known early on about bones and skeletal structure. Early depictions may have a "bone" shaped figure just placed in the body, unconnected to anything else. Understanding function and process follow naming and identifying. The lungs were also among the interesting topics of discussion. Children knew the lungs played a role in breathing but knew little about the process of breathing. They did, however, make a connection between smoking and the health of lungs.

The methodology for the study is clear. The *National Curriculum Guide: Natural Science* suggests a spiraled approach, where ideas are presented and build on previous knowledge. The research focused on a group of children in a class, with a comparison of their ideas about the body before and after their involvement in a defined educational project. Artifacts, such as drawings, interviews, and diagnostic tests were used to collect data. The author identifies the research as "eclectic," employing a variety of methods. The classroom selected for study was described as traditional. Teacher interviews provided insight into the teacher, curriculum, and instructional practices. Interviews with children mined what they knew about a given topic. There were also interviews with parents. Drawings helped provide additional insight into the children's understanding. Support for assessing knowledge using drawing analysis was provided through reference to several other studies using the same or similar process. Diagnostic tasks provided additional information. Student teachers involved in the study helped to interpret the meaning of active learning and how what is taught in school must be transformed into active learning, while valuing the differences in how children are active.

The book reports in detail children's understanding about the body and how their ideas change. Knowledge about bones/skeleton and muscles are described. Understanding about the organs of the body as well as the heart and blood circulation and the lungs, digestion, brain, and liver and kidneys is explored. Qualitative and quantitative data were collected. Drawings and interviews were deemed valuable in the process.

The teaching methods were diverse, incorporating such approaches as questioning, investigation, demonstrations, discussion, drama, interactive activities, etc. In the discussion and conclusion section, the author shares that different methods of teaching have different influences on children. Thus, a variety of methods, including those deemed more passive like lecturing and telling, have value and should be used in conjunction with other methods. An interesting finding was that supposedly quiet children did not learn less than others; in fact, they learned more than some other children labeled as visibly active.

Science was a perfect curriculum choice for this study, especially anatomy. The children were interested in their bodies and how they function. The author acknowledges the important role of the teacher in influencing and encouraging, or discouraging, how children express their ideas. Body language, voice, and tone are all important in instruction. The sharing of ideas among the children had potential influence on the learning of all. Working with peers and receiving information from them can contribute to the development of ideas. This peer interaction, as well as whole class discussion is valuable. Along with the teacher's leadership, it was found that peer influence fosters cognitive development and understanding.

So, all in all, what is the take-away from reading the book? In my opinion, as an early childhood educator, it reinforces the value of active learning and the value of a skilled teacher understanding, observing, and facilitating the learning process. It also stresses the potential influence of peer interaction and environment. Of special interest, however, was the predictable nature of the unfolding of knowledge in the area. We label or name first and better understand and make connections later.

This rich description of the journey of a group of children gives us a profile of learning through a highly focused lens. The findings are important to early childhood educators as well as others interested in the foundational learning of specific aspects of anatomy and science. The fact that the study was situated in Iceland helps us strengthen our understanding of the commonalities of the how children learn worldwide.

About the Reviewer

Kathleen Fite is a Professor of Education in the Department of Curriculum and Instruction, College of Education, at Texas State University. She has a long history of scholarly productivity and activity at the national and international levels. Her primary areas of interest are early childhood and lifespan development, education, and learning.

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