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Bharath Sriraman

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What's all the commotion over Commognition?

A review of Anna Sfard's (2008) ***Thinking as Communicating***, Cambridge University Press, ISBN 978-0-521-86737-5,. (xxiii + 324 pp), $99.

Bharath Sriraman
The University of Montana

If straight edge and compass constructions are the so-called "atoms" of Euclidean geometry, if sequences are the "atoms" of Analysis, then what are the "atoms" (if any) of mathematics education? Arguably mathematics education is a much wider field than Euclidean Geometry or Elementary Analysis, however there are several fundamental things that the field purports to study, chief among which is mathematical thinking or more generally "thinking". The book under review, though it appears in a Cambridge University Press series entitled *Learning in Doing: Social, Cognitive, and Computational Perspectives*, is in my view situated at the intersection of Consciousness Studies, Linguistics, Philosophy and Mathematics Education. One does not come across books within the mathematics education genre that take on the tasks of operationalizing thinking and defining consciousness. This review began a year ago when an excerpt from the book was included in vol5, nos2&3 [July 2008] of the journal. My personal interest in the contents of the book lay in the promise that the book would tackle existing dichotomies in the current discourses on thinking with the aim of showing they are resolvable or even transcend-able?

To do so, the author Anna Sfard coins the concept of commognition- a dissected juxtaposition of cognition and communication in order to remove the duality between thinking and communicating, and to resolve the four quandaries that have plagued existent discourses on thinking, namely-the quandary of number, the quandary of abstraction (and transfer), the quandary of misconceptions, the quandary of learning disability. Each quandary is illustrated and explained to the naïve reader in the form of discourse transcripts in chapter 1. The transcripts are presented as episodes from a larger data set. Chapter 1 sets the tone for the rest of the book. Even though there are many new terms that constitute the concept of "commognition", these terms are explained in the glossary towards the end of the book.

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Chapter 2 entitled Objectification problematizes the ineffectiveness of (existing) research which does not recognize that Research (capital R) ultimately is a form of communication defined by cogent narratives, with different disciplines according different rules of endorsement and engagement. Sfard warns of the dangers of unifying labels used in dominant research discourses that stand for many different phenomena and thus impede any form of clear communication to occur as well as impede the formulation of common definitions necessary to operationalize mathematical thinking without creating irresolvable dichotomies. Dichotomies invariably arise when attempting to objectify human activities (involving thinking and learning) and when attempting to communicate it. Chapter 3, Commognition: Thinking as Communication begins with the famous words of Richard Rorty "The world does not speak, we do" and goes on to give a short history of Disobjectification of Discourses on Thinking [pp. 68- 76]. The crux of this chapter is to reveal to the reader linguistic traps inherent in the way language in structured, especially when we accept that language is culturally oriented and dependent.

The most compelling chapter of the book in my opinion is chapter 4: Thinking in Language, in which an interesting definition of "consciousness" is found. Sfard explains the dilemmas arising when we try to separate thinking from speaking, awareness from consciousness, and often invokes Vygotsky and Wittgenstein to drive home the point that paradoxes are bound to occur in any attempt to carve thinking into micro-components. As a reader one actually finds oneself within the stream of thought that Sfard carefully wades into, to arrive at her eureka(!) discovery of recursivity (of reflexivity at ever deepening levels) to be the elementary particle of commognition. At least to me, this was a new presentation of something well known within the canon of consciousness studies that occurs at the intersection of theology, science, psychology and linguistics. For instance in an article I wrote together with the philosopher Walter Benesch on the topic of consciousness and science (see Sriraman & Benesch, 2005), we analyzed non-dual traditions, particularly the Advaita tradition of Shankara from the 9th century (AD) in India. In this paper we defined human consciousness as the possibility of attending/intending, and described specific experiences and their interpretations as possibilities for consciousness as attentions and intentions. Experiencing is a synthesis of *of* and *for*. Alternatively, from the position of Shankara and Advaita-Vedanta: the possibility of superimposing and the possibilities for superimposition. We gave an example of this synthesis by trying to explain and/or define 'self' or 'world'.

Any explanation, interpretation, definition, etc. is an attending/intending flow with at least five aspects.
1. The 'observer, interpreter, explainer';
2. The 'interpreted, observed, explained' or experienced object which is the
context to which the interpreter refers;
3. The process of 'interpreting, observing, explaining';
4. The 'interpretation, observation, explanation' that emerges from 1 – 3; and
5. The 'awareness' of and ability to distinguish the preceding four aspects of this continuum and to focus upon them individually and collectively, assigning each significance and value.

It is within this fifth aspect that perspectives occur on the other four and upon number five itself. Every aspect of this continuum provides a vast number of possibilities for consciousness, while consciousness as the possibility of the totality is not reducible to any particular aspect, and is the source most clearly reflected in the fifth aspect. This five-aspect continuum seems to us implicit in all subject-object-process language- understanding relationships. The challenge is to preserve the totality of ‘‘consciousness as possibility’’ while utilizing and/or emphasizing particular aspects within it as possibilities for consciousness. Otherwise, we confuse the aspect with the whole.It is the processing of ‘‘consciousness as possibility’’ that is the source of exploring, explaining, defining—the possibility for theorizing, theologizing, biologizing, cosmologizing, psychologizing. It is the processing of ‘‘consciousness as possibility’’ that discusses the ‘‘possibilities for consciousness’’ in the contexts of the sciences, arts, and humanities (Sriraman & Benesch, 2005).

At the end of chapter 4, and the culmination of part I of the book, Sfard takes an evolutionary view of the human linguistic communication and claims that it is characterized by “unbounded recursivity”, a claim that I agree with. In her words: “Our unbounded ability to communicate about communication was also said to play a crucial role in the phenomenon of consciousness” (p. 124).

Part II of the book consists of 5 chapters (chps 5-9) which focus specifically on mathematics as discourse. Sfard puts forth her thesis that mathematics is a form of communication and presents copious examples from the historical development of mathematical objects to substantiate the argument that discursive objects are a natural outcome of mathematical communication (viewed from a lengthy time span). These chapters cohesively use commognitive grammar (pun intended) to put forth the claim that mathematics is an autopoietic system. Episodes continually interspersed in the second part of the book lend credence to the claims. Ultimately the book clearly identifies mechanisms that underlie the historical development of the subject and how commognition becomes central to how thinking and learning progress within shared communities of learning. It would be particularly interesting for the radical constructivist camp within mathematics education to read this book and analyze whether their position can be subsumed as an extreme case within the commognitive framework- after all we do talk to ourselves! This could well be the goal of a graduate course.

The reader is bound to ask whether the four quandaries are resolved in the book? My slant on this, one way or another would take away the intellectual tension that arises when reading this book. So I urge the interested reader to answer this for themselves by reading the book. Given the generality and universality of the part I of the book, Sfard carefully annotates the book with footnotes that explain her rationale, motivation and warrants for statements made, in addition to listing instances/disclaimers in which certain claims are not applicable. This is very masterfully done and allows one to enter her stream of “commognition”.

Caveat emptor: The book is not an easy read by any means, but well worth one's time and efforts if one is active as a researcher in mathematics education, and constantly stumped by the inability to clearly communicate about the same research problems, or the same research concepts, or the same "things" that are being operationalized differently. Thinking as Communicating provides the grammar by which communication can be better fostered between researchers analyzing the same discursive "mathematical" objects in teaching and learning situations. I highly recommend the book.

Reference

Sriraman, B., & Benesch, W. (2005). Consciousness and Science: An Advaita-Vedantic perspective on the Theology-Science dialogue. *Theology and Science, 3(*1) 39-54.