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Bharath Sriraman

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Analogies and Mathematics: What is the connection?

Bharath Sriraman

Lyn English (Ed). ***Mathematical and Analogical Reasoning of Young Learners***. New Jersey: Lawrence Erlbaum & Associates, 2004. ISBN 0-8058-4945-9.

In the last decade and a half mathematics education literature has shown a rapid increase in books and articles that focus on the social and cultural issues related to mathematics learning and teaching. Although the social and cultural dimensions are important and relevant, the cognitive dimension of mathematical learning is equally important and received less attention. *Mathematical and Analogical Reasoning of Young Learners* takes us back to the very roots of learning and investigates foundational questions on the nature of and the evolution of reasoning in young children. The book also partially addresses cross-cultural themes in that it reports the results of a 3-year longitudinal study whose participants were children in Australia and the United States. This naturally leads to the question of the variance or the invariance of the findings across these two cultures, and an explanation for the nature of the similarity or dissimilarity in reasoning patterns.

Reasoning by analogy is a fundamental human trait. One encounters excellent examples of this propensity to “analogize” in ancient Greek philosophy. If an ancient Greek philosopher were asked: why do we create analogies? The answer would simply be to create a framework by which we could better understand the dimensions of human experience. By analogy (pun-intended) the book seeks to understand the relationship between mathematical reasoning and children’s natural tendency to create analogies. For instance, attribute blocks have been used for along time to help children distinguish shapes spatially. If a child is able to distinguish between and triangle and circle, mathematics educators need to further ask what was the reasoning process that enabled the child to make the distinction. Again by analogy this is a fundamental question, which permeates research on the cognitive dimensions of mathematical learning.

The research reported in the book includes an exposition and analysis of the measures used to study the aforementioned questions. The researchers found that the development of mathematical and analogical reasoning in young children followed a similar path. Although there were individual differences, the cross-cultural differences were minimal. This is attributable to the similar socio-economic demographics in the Australian and U.S schools. Classroom instruction naturally played an important role in how the measures changed over the period of three years and children in the U.S fared slightly better than their Australian counterparts. More importantly it was heartening to note that the research indicated improvement over time in both countries.

Lest the reader of this review assumes that the book simply contains the reports of an empirical study, several chapters are devoted to classroom discourse and case studies, which qualitatively analyze the role of discourse in the development of mathematical and analogical reasoning. The vignettes provide a rich glimpse at the remarkable abilities of children to reason in natural and non-contrived contexts. Several chapters are also devoted to investigating the “analogous” research questions of the study with the teachers of the young participants. This in my opinion balances the book and presents a very different perspective. That is, it presents the beliefs of the teachers about the development of mathematical and analogical reasoning of their students. The

concluding chapters of the book contain commentaries that analyze and critique the studies reported in the previous chapters of the book in addition to the possibilities for future research.

This book is a very useful resource not only for mathematics education researchers, cognitive psychologists and teacher educators but would also benefit classroom teachers of young children. Understanding the development of children's reasoning processes would help teachers tailor instruction that facilitates and nurtures the natural "mathematical" tendencies of young children. I recommend it very highly.