Piaget distinguished three kinds of knowledge (physical, logico-mathematical, and social-conventional knowledge) according to their ultimate sources. He showed scientifically that children acquire logico-mathematical knowledge, including number concepts, by construction from within rather than by internalization from the environment. Based on this theory, I hypothesized that children should be able to invent addition, subtraction, multiplication, and division without any textbook, workbook, drill, or conventional algorithms. This hypothesis has been amply verified in grades 1-3. (orig.)

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