

# Piaget and Education

Jean Piaget

*Science of Education and the Psychology of the Child.* New York: Grossman, 1970. Pp. 186. \$7.50.

Irene J. Athey and Duane O. Rubadeau

*Educational Implications of Piaget's Theory.* Waltham, Mass.: Ginn-Blaisdell, 1970. Pp. xxxi + 378. \$6.95 paper.

Reviewed by ROCHEL GELMAN

*Jean Piaget, author of the first book, is Professor of Experimental Psychology and Director of the Institute of Educational Science at the University of Geneva. He is renowned for his contributions to an understanding of cognitive development, educational theory, and practice, the history and theory of knowledge, and the field of logic. He has authored more than 30 major books and a vast number of articles.*

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WITH the current proliferation of books and discussions about the

implications of Piaget's work for education, it is a pleasure to have available the translations of Piaget's 1935 and 1965 essays on this subject. These excellent essays (which appear in translation in *Science of Education and the Psychology of the Child*), provide a basis for evaluating books such as the collection of readings edited by Athey and Rubadeau (*Educational Implications of Piaget's Theory*) that take up the question of what Piaget's theory holds out for education. More importantly, they serve to highlight the kinds of questions that need be asked whenever a body of research and theory in child development is used to prescribe applications for education.

The reader interested in the topic of Piaget and education, will want to first know Piaget's theory. And, Piaget's book gives an unusually clear presentation of the theory—particularly those aspects that deal with the concepts of assimilation, accommodation, and operation. The juxtaposition of the two essays, written at an interval of 30 years, also provides insight into the origin and subsequent development of the theory. On the other hand, the lack of a clear, accurate, and organized presentation of the motivating Piagetian theory is one of the major drawbacks of the book of readings by Athey and Rubadeau. The editors chose to let the reader derive an understanding of the theory from other reference sources and/or the many summary statements of the theory which repeatedly occur at the beginning of the selected readings. By virtue of the fact that these are introductory statements, they are (with

very rare exception) too brief and sometimes misleading. Many pages are wasted in the repetition of these introductory statements.

But neither of these books is intended as a theoretical treatise. Instead, they are intended to inform educators as to how they might alter their practices in the light of Piaget's theory. Although Piaget does not offer detailed curricula, he does offer many insights into how his theory might be applied to education, a cogent discussion of the science of pedagogy, and some cautions about the difficulties of translating findings in child development into practical pedagogical principles. Further, in the course of his discussion he gives an interesting review of international happenings in education as well as some of the history of educational reform. Most importantly, Piaget's discussion of the science of pedagogy serves to establish guidelines for the application of his theory (and presumably any other theory) to the educational enterprise.

FIRST, Piaget maintains that pedagogical theorists should draw much more extensively upon knowledge and experts in other disciplines—particularly psychology. Pedagogy he argues should be the most interdisciplinary of all scientific undertakings. Secondly, pedagogical innovators should take greater care to ensure that the programs they establish accurately embody the theories that inspire them. Finally, Piaget is at pains to emphasize the importance of long term, objective evaluation of the effects of educational techniques. He points out, for example, that we have little knowledge about the efficacy of different programs and examination procedures, how much students remember of their education, and whether or not it matters if students do remember what they learn. He emphasizes that evaluations of the teaching techniques of yesterday or today are almost exclusively subjective. As such, they must be based upon currently fashionable prejudices, self-interest or both. Piaget correctly points out that this is an unacceptable state of affairs for any practically oriented science. Thus, Piaget highlights three issues that we can focus on in an evaluation of efforts to develop peda-

logical innovations based on his (or her's) theory. These pertain to accuracy of translation, the use of an interdisciplinary approach, and the evaluation of educational planning.

THE wide variety of articles presented by Athey and Rubadeau makes it clear that many educators are considering Piaget. There are articles on early childhood education, the educationally handicapped, communication in language and art, the teaching of science and mathematics, and test development. What is not clear is whether those who would use Piaget to introduce educational reform have considered the very issues raised by Piaget.

To begin, there is considerable confusion over what represents a translation of Piagetian thought. This derives from a failure to recognize that the theory can be translated at two levels, the general and the specific. One can distill the theory into a general set of principles (as many have) and then design programs based on these. However, if translation is restricted to this level, the probability of misrepresenting the theory is great. Many of the general Piagetian principles are far from being unique to Piaget's theory—as Piaget himself shows us. For example, Piaget's theory yields the principle that children learn best by acting on their environment. This same principle can be derived from theorists as diverse as Dewey, Skinner, and several Russians. Or both Piaget and Skinner would have children learning at their own pace. But it should be obvious that programs which *seem* to accord with Piaget's theory at the general level may violate the theory at the more specific level. Apparently, it is not obvious. Otherwise, the editors would not have made reference to programmed learning in their discussion of the educational implications of Piaget without indicating how programmed learning is likely to be inconsistent with Piagetian-based programs.

The failure of Athey and Rubadeau to consider the problems of translation may account for the impression that many of the papers do not belong in

the book and the fact that papers often contradict each other or the editors' remarks. For example, one is told by the authors that "discovery learning, particularly at the earlier ages" is indicated by Piaget's theory. Yet Buell's article suggests that discovery learning is best suited to secondary education. By appealing to the specifics of Piaget's theory the editors could have told the reader that discovery learning procedures for science teaching may do little to help the five-year-old child who cannot conserve quantity.

The foregoing suggests that the interesting challenge for educators lies in the area of designing detailed programs that derive from Piaget's work. And it is surprising that there are so few readings in Athey and Rubadeau at this level. However, the scarcity of such programs may derive from a concern as to whether Piaget's work is ready for translation at the specific level. If, as Piaget contends, preschool children cannot treat quantity as invariant and cannot be taught to do so, and if Piaget's theoretical account of conservation is correct, then we should not try to teach nursery school children arithmetic. Instead we should concentrate on building the structures that are assumed to mediate the understanding of arithmetic. Or if elementary school-aged children generally lack formal operations, then it might be argued that they will not be able to understand the principles of physics or logic, and efforts to teach these before secondary school would be wasteful and frustrating for both the teacher and pupil. The problem, however, is that there is considerable disagreement about whether preschool children can or cannot treat quantity as invariant, whether they can be taught to conserve, and why they fail on Piaget's test of conservation. To illustrate, Athey and Rubadeau present several papers that argue that one cannot teach conservation. Yet, Goldschmid's paper reports the successful teaching of conservation, and still another paper (by Saevada and Nelson) questions the validity of using the conservation test to assess a child's understanding of length. Similarly, it can be seen from the collected readings that there would be dis-

pute as to whether elementary school children who fail Piaget's tests of formal thinking can learn logic and physics. The question then becomes one of whether there are features of Piaget's theory that should be translated into educational practice.

That the experts disagree highlights the difficulty of deciding what aspects of Piaget's work might be used in education. It also brings to the fore Piaget's suggestion that the educational enterprise would be aided by an interdisciplinary effort. If there is so much disagreement among the experts, might their presence only add to the confusion?

Of course, we do not mean to suggest that psychologists and other experts should not be consulted in the development of new curricula. Nor do we mean to suggest that Piaget's work should not influence such developments or provide the details of new programs. Rather, we wish to draw attention to the need for evaluation. It is essential that new techniques, even those recommended by experts, be subjected to systematic evaluation of their short-term, and even more importantly, long-term effects. Answers can be obtained to questions such as, do children who are taught concrete operations learn other skills and content areas better than children who are not; does it matter whether an active or intuitive teaching method is used, etc.?

EVEN if we assume that translation is accurate and that experts work well together, the fundamental issue is whether there will be any gain from the flurry of activity to translate Piaget into the classroom. Piaget's work is important for those who seek to understand intellectual development. It is quite probable that education can profit from his insights. However, the work is still in progress and does represent theory. Like any other theory, the long term results of its applications must be subjected to a program of systematic evaluation. Hopefully, educators will begin to do so and avoid the strong tendency to reify theories upon which programs are based.