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# What Should Experimental Psychology Contribute to a Theory of Education ?



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WHAT SHOULD EXPERIMENTAL PSYCHOLOGY CON-  
TRIBUTE TO A THEORY OF EDUCATION?

BY ALBERT H. ABBOTT, B.A., PH.D.

As the term "education" has, in ordinary usage, two rather distinct meanings, so the theory of education may be said to have two distinct phases, as it emphasizes the one or the other of these meanings. In the first place, "education" may be said to refer to an end, more or less fully attained, to a result which has been accomplished, to a possession which has been secured, and so one speaks of a person's "education" as of something which he has. As this meaning of "education" is emphasized the theory of education deals largely with the ideal or complete man. In the second place, "education" may be said to refer to the process by which this result has been reached, and in this sense it becomes equivalent to the process of teaching and learning if we confine our attention to schools and their work. As this meaning of "education" is emphasized, the theory of education will, as a matter of course, deal largely with the process of teaching and learning and points of interest closely related to these.

The theory of education which emphasizes the ideal man has one point in its favor. It will possess a degree of unity and completeness which no other form of theory can well possess. It has these properties because the method used is essentially deductive in character, and so the theory of teaching and learning as well as of the subjects to be taught, and the time at which they ought to be taught will be reached largely as a deduction from the ideal man set up as the end of education.

Such a theory has, however, rather obvious disadvantages. In the first place it is competent for anyone to ask, How was this ideal discovered? And that question is a troublesome one, for the ideal of one age is not that of another, nor is the ideal of one thinker necessarily that of his neighbor. And again, there are two aspects of the ideal which ought to be sharply distinguished. If one believe in development, the ideal, as the last stage of such progress, must be spoken of as a possibility simply in order to place something at the end of the series, but such is not an ideal

with a specific content, nor indeed can it be. The ideal man, as a *matter of content* rather than as a merely limiting conception, is an entirely different matter, and as this is the only kind of ideal from which anything can be deduced, it becomes the form in which the ideal man enters a theory of education.

Whatever value such a theory of education may have by way of inspiring and encouraging teachers and others to self-sacrificing devotion, it ought to be viewed with serious apprehension when it enters the realm of the actual practice of educating, for it has no facts on which to construct a safe theory of either teaching or learning, and it has nothing at all of value to say on the question of the subjects to be taught. In any case experimental psychology can contribute very little, if indeed anything, to such a theory of education.

On the other hand, experimental psychology is calculated to contribute much to a scientific theory of teaching and learning, since it is just the mental operations involved in both the teacher and the pupil that form the essential aspect of the psychologist's work.

But just here a rival appears under the name of Genetic Psychology, and sets up its claim to be regarded as the natural basis of the theory of education. It professes to investigate the development of mind from the infant to the adult; indeed in some cases it professes to begin even lower than the infant.

One need give no arguments to-day to prove that the genetic method is the best, most useful contribution of the idea of evolution to biological science. The study of the *development* of plants and animals has made biology what it is to-day. Surely such a method would prove equally useful in psychology! The answer to that suggestion may be put briefly. It is easily possible to study the development of plant and animal organisms. *Consciousness CANNOT be studied the same way.* Plants and animals can be observed and, so far as their structures are concerned, studied genetically, but consciousness is *never* observed either in child or adult life by anyone but him whose it is. Therefore, the first task in the study of child or animal consciousness must be the construction of what one may suppose to be the experience of such "lower" (!) forms on the basis of observed movements, sounds, etc. To construct the great complexity of the adult ex-

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perience on the basis of all the movements, sounds, etc., he may make, is clearly impossible, unless one set out with the view that the consciousness of men is essentially the same wherever found, and then proceed to give to the other practically what he finds in himself, and even then the sum-total of bodily movements serves but inadequately the purpose suggested. In the case of the child, however, the matter is more serious, for no matter what his experience may be, his bodily movements must be relatively simple since the requisite nervous co-ordinations are lacking for any but the very simplest movements. For example, he cannot use articulate speech even if he wants to do so, for his vocal apparatus is not yet ready for such a complex task. Therefore the movements, sounds, etc., of the child must be completely inadequate to express the complexity of the adult consciousness, supposing, as Angell suggests, and as we believe correctly, that all the complex mental processes (judgment, conception, memory, imagination, perception, emotion, volition, etc.) "are in one form or another present in consciousness from the very first."\* A study of the child or animal under these conditions is valuable as a means of understanding something more about them, but it is useless as giving a solution for the problems of psychology. The interpretation of the more or less convulsive movements of the child or of his cries and smiles becomes itself the great problem, and genetic psychology will have performed its service well if, on the basis of the known facts of adult psychology, it succeed in giving some reasonable idea of what the child is mentally. It can, however, never be regarded as a basis either natural or secure, for a scientific theory of education. That alone can be found in the results of experimental psychology.†

What we understand by experimental psychology may be found stated in some detail in the Report of this Association's Easter meeting in 1903,‡ therefore we need here remark only that it is an investigation of the facts of experience or consciousness under known conditions in order to discover what the facts of conscious-

\* "Psychology," p. 230.

† The difficulties in interpreting the adult consciousness are not overlooked here, but we need hardly enter into a discussion of them in this connection. Suffice it to say that an experiment is possible as soon as the observer is able to understand the nature of the task set him. The difficulty of interpretation is not here absolutely overcome; it is only reduced to a minimum.

‡ Also in *University of Toronto Monthly*, Vol. I, No. 3.

ness really are, *i.e.*, to analyze them into their elements, etc., and to discover under what conditions—qualitative and quantitative—these facts arise and combine with one another. In addition to these positive statements it may be well to call attention to the fact that experimental psychology and physiological psychology are not identical. The latter is an attempt, now from the side of psychology, now from the side of physiology, to correlate mental and physiological facts. It is in no sense an *explanatory* science. It must fail completely if it attempt to “explain” either the mental by the physiological or the physiological by the mental. To correlate these two realms, and that only, is its work, and hence it might just as well be called psychological physiology—as indeed in connection with the sense organs and their functions it essentially is—as physiological psychology, which it happened first to be called.

One of the great difficulties in experimental psychology is the discovery of scientific methods by which the more complex facts of consciousness may be investigated. It is evident that such methods may be found for the investigation of sensation much more readily than for the investigation of memory, reasoning, volition, etc., and so it came about that sensations were investigated first, and that exact research in the realm of the complex facts is still largely a matter of the future. The failure to discover methods offers, however, no foundation upon which it may be urged that these facts are not open to experimental research. Just as the physicist has stood and still stands before many problems in hope that the desired methods of research may be found, and yet never doubts of the possibility of investigating all facts in the physical world, so the psychologist stands before the complex facts of consciousness and believes, as he has a right to believe, that no fact of consciousness is by its nature above or beyond the possibility of experimental research. The achievements of psychology at the present day are, therefore, not to be taken as the measure of what it can do, but rather merely as an indication of the direction in which its work lies. Our subject is, accordingly, not What has experimental psychology contributed to a theory of education? but rather What is it by its very nature calculated to contribute to such a theory? It, therefore, involves the question, In which direction should the philosopher, who is con-

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structing a theory of education, look for the solution of his problem regarding the facts? Should he look in the direction of a purely speculative philosophy which presents an ideal, or in the direction of a more or less speculative psychology, which presents the child and its supposed development, or should he look for his facts in that department of psychology in which exact scientific methods are used? To ask such a question is surely to answer it, for, if the theory of education is to be scientific in any sense it must be founded upon facts and, even more exactly, upon just those facts which experimental psychology presents.

To a theory of education then, essentially in the form of a theory of teaching and learning, experimental psychology should contribute the following:

1. Scientific definitions of the terms used to designate mental operations.

It is necessary to point out here only two things. First, the elements of any science can never be defined within that science at least, and as the elements of consciousness are the very last and final results of the process of analysis they can never be defined at all. So the sensations—red, blue, hot, cold, etc.—admit of no definition whatever. Second, scientific definitions of the complex facts consist in stating their constituent elements, and in nothing more. This is the only definition or “explanation” which science recognizes in the physical sciences; it is the only kind a psychologist can give if he be true to the methods of science.

To contribute such definitions of the terms used in a theory of education would be by no means the least service which experimental psychology could render, and it can be very largely done at the present day.

2. Experimental psychology, should contribute, with such definition, an accurate account of the elements of consciousness and of the conditions under which they arise.

3. In addition to such an account of the elements there should be contributed a scientific theory of the more complex facts of consciousness, such as memory, imagination, association, thought, emotion, volition.

Here one needs to remember that we are not yet, nor are we likely to be for many a day, able to say with any degree of com-

pleteness, what the facts of these complex processes are. Much is known but seemingly much more remains to be discovered. In the absence of all the facts, those facts which are known should be used, as they are in all the sciences, as a basis for strictly scientific speculation regarding the undiscovered facts, and thus the theory be made which may be used as a means of gathering up and expressing what is now known, and of leading to still more discoveries. Such a stimulating theory of complex mental operations is needed in a theory of education, for the teacher is one who may well be looked to to test the theory in a rough way, and so be able to throw out suggestions to those who may be able to test it accurately.

4. The last contribution which need be mentioned is already hinted at in the last paragraph. We may state it as follows: When speculation along educational lines goes beyond the facts of experience, as these have been discovered, which it certainly must do, experimental psychology should be regarded as the corrective and check on such speculation at every step, since, particularly in a theory of education, agreement with fact rather than mere logical consistency must be regarded as the test of the acceptability of any hypothesis.

This latter contribution is, after all, the abidingly necessary one, for through it alone will the educationist and the psychologist be kept in living touch with one another. When the educationist speculates as to the facts, he has always the means of ascertaining whether his guess is valid or not by simply trying it, or having it tried experimentally, and he would do well to look upon his speculations continually in that light. It is healthier for him, and it is better for science. If a discovery is made our knowledge is advanced one step; if his theory be proven false perhaps a not less important advance has been made, for he is set to work again along probably more profitable lines, and the rising generation has been spared the all-too-sad results of an error applied to educational practice. This latter is, after all is said and done, just what everyone wishes to avoid, for the purpose of education is to train children not according to this, that or the other theory, but to train them as they alone can be trained, namely, in accordance with the conditions which consciousness prescribes in its very constitution.



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