

## **Jean Piaget's Debt to John Dewey**

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### **Abstract**

Jean Piaget became a veritable institution unto himself in education and psychology, largely as the result of his developmental-stage theory advanced over the second quarter of the twentieth century. Not until Piaget was 73 did he make mention of John Dewey's work at Dewey's laboratory school, founded in 1894 at the University of Chicago. But here he made no mention of Dewey's findings on thinking as a maturational growth process marked by distinctive sequential stages, as explicated by Dewey (1899, 1902, 1910, 1933). This article examines the powerful and unmistakable isomorphism between Piaget's and Dewey's stage theory and the mystery of why Piaget never gave recognition to Dewey's seminal work.

### **Key Words**

Piaget, Dewey, developmental-stage theory

Virtually any comprehensive analysis of thinking as a growth or developmental process invariably invokes the name of the Swiss psychologist Jean Piaget (1896-1980).

From his work with Binet in 1919, Piaget developed interest in why children make mistakes. He went on to investigate how the child develops mental structures from experience.

Working with individual children in what he called the clinical method, Piaget proceeded to ask specific questions as to their perceptions of and relations to natural phenomena, environment, physical objects, physical causality, and relations to others (1928, 1929, 1936; Evans, 1973).

### **Piaget's Developmental Stages**

From his investigations with individual children, Piaget developed his theory of maturational thinking, namely thinking as a process of growth, progressing through specifically identifiable stages.

Piaget's work is so widely known to the readership of this journal that only the briefest summary is presented here in terms of stages of thinking linked to sequential periods of cognitive development:

- (1) the sensory-motor stage (the first two years of life) when the infant learns to control perception and motor responses in dealing with physical objects and responding to language;
- (2) the preoperational or representational stage in

which the child learns to extract concepts from experience and later to make perceptual and intuitive judgments (to about age 6 or 7);

- (3) the stage of concrete operations in which the child learns to solve basic physical problems by anticipating consequences perceptually (age 7-11); and
- (4) the stage of formal operations (late childhood or early adolescence) in which the individual learns to think hypothetically and to theorize and experiment (Piaget, 1950, pp. 87-158; 1970, pp. 170-173; Piaget & Inhelder, 1969).

Earlier explications of Piaget's work may be drawn from *The Language and Thought of the Child* (1926), *The Child's Conception of the World* (1929), *The Child's Conception of Physical Causality* (1930), *The Origins of Intelligence in Children* (1952; originally published in French, 1936), *The Psychology of Intelligence* (1950); and *The Construction of Reality in the Child* (1954).

Although aspects of Piaget's work have been met with controversy (Piatelli-Pelmarini, 1980), his developmental stage theory has had a marked impact on the field of psychology; and although he never claimed to answer the curriculum question (what knowledge is of most worth, and how knowledge should be organized and taught), he has had a profound influence on the world of education.

## The Deweyan Legacy

In his assessment of the experimentalist-progressive movement in education as orchestrated by John Dewey (1859-1952), James B. Conant held that the movement was inescapably an expression of the uniquely American experience. In Conant's words, "I had the feeling that, like the Austro-Hungarian Empire of the nineteenth century, if John Dewey hadn't existed he would have had to be invented" (1959, p. 94).

Two years after the opening of the University of Chicago in 1892, President William Rainey Harper brought John Dewey to Chicago to establish the Department of Pedagogy and the Department of Philosophy; and only two years after Dewey's arrival, the University Elementary School was opened as a laboratory school in the Department of Pedagogy.

Following a falling out with Harper, Dewey moved to Columbia in 1903 (Dykhuisen, 1973). Although Dewey's tenure and work in the University Elementary School was short lived, he nevertheless was able to develop his theory of thinking as a growth or sequential-maturational process expressed in stages of human development.

And whereas Piaget decades later appropriately characterized his own methodology with individual children as clinical, Dewey's observations and insights were focused on the cognitive growth of the child in classroom and school-wide learning situations with compeers – extending into social, emotional and artistic expression and development.

In 1899, from a series of lectures to parents and others interested in Dewey's University of Chicago Elementary School,

Dewey authored *The School and Society*. This was followed by *The Child and the Curriculum* in 1902. In these two works, Dewey examined the nature of the learner in the context of the structure and function of the school curriculum, and life in and for a democratic society.

With his focus on the school years, Dewey had relatively little to say about infancy, although he trenchantly pointed out that in coming to the traditional school, the child "does not bring both his body and mind with him; he has to leave his mind behind, because there is no way to use it in the school. If he had a purely abstract mind, he could bring it to school with him, but his is a concrete one, interested in concrete things, and unless these things get over into school life he cannot take his mind with him" (1899, p. 80). Dewey was to elaborate extensively on the concrete stage of infancy and early childhood in *How We Think* (1910, 1933).

## Mind as Growth

In *The School and Society*, Dewey likened the new findings on the nature of the learner as a veritable Copernican revolution (1899, p. 34). "Now we believe in the mind as a growing affair, and hence as essentially changing, presenting distinctive phases of capacity and interest at different periods," he hypothesized, as he went on to point to the profound implications for the needed curriculum transformation:

If once more we are in earnest with the idea of mind as growth carrying with it typical features distinctive of its various stages, it is clear that an educational transformation is again indicated. It is clear that the selection and grading of material in the course of study must be done with

reference to proper nutrition of the dominant directions of activity in a given period ... (p. 104).

### **Dewey's Sequential Stages of Growth: Maturation Thinking**

Beyond the stage of infancy and preschool childhood, Dewey explicitly posited his psychological hypotheses "from the matter of stages of growth:"

#### **Stage I: ages 4 to 8**

The first stage (found in the child, say of from four to eight years of age) is characterized by directness of social and personal interest and by directness and promptness of relationship between impressions, ideas, and action. The demand for a motor outlet for expression is urgent and immediate. Hence the subject-matter for these years is selected from phases of life entering into the child's own social surroundings, and, as far as may be, capable of reproduction by him in something approaching social form—in play, games, occupations, or miniature industrial arts, stories, pictorial imagination, and conversation (1899, pp. 105-106).

At this stage, continued Dewey, the vague unity of experience is transformed by the need for the child to learn to secure "practical and intellectual control of such methods of work and inquiry as will enable him to realize results for himself" (p. 107). Here Dewey held that the school is not to be conceived as a place apart, but as intimately connected to child life or experience outside of school. The school must then link child life and school life to enlarge, enrich and extend learning experience (p. 106).

#### **Stage II: after child enters school**

From this first stage beyond infancy and earliest childhood, Dewey turned to the second stage of development after the child enters school.

In the second period, extending from eight or nine to eleven or twelve, the aim is to recognize and respond to the change which comes into the child from his growing sense of the possibility of more permanent and objective results and of the necessity for the control of agencies for the skill necessary to reach these results. When the child recognizes distinct and enduring ends which stand out and demand attention on their own account, the previous vague and fluid unity of life is broken up. The mere play of activity no longer directly satisfies. It must accomplish something—to lead up to a definite and abiding outcome, hence the recognition of rules of action (pp. 106-107).

Thus the child learns to command the basic skills not as mere symbolics or ends, but as tools for the uses and pursuit of knowledge by necessitating recourse to books for satisfaction, solution and growth (pp. 111-112).

#### **Stage III: follows first two developmental periods**

In the third period following the first two developmental periods of the school years, the child is engaged in a transition to the power of reflective attention whereby solutions to questions or problems are sought investigatively, held Dewey.

#### **Stage IV: intervening stage**

"In the intervening stage (in the child from eight to, say, eleven or twelve)," continued Dewey, problems may be addressed for practical or tangible results rather than to

answer an intellectual question. But when the power of reflective attention is realized, intellectually speaking, the person becomes educated with the power of self-directed inquiry, personal interest and insight (pp. 145-149).

And what of the teacher? In Dewey's words, "it is the teacher's business to know what powers are striving for utterance at a given period in the child's development, and what sorts of activity will bring them to helpful expression, in order then to supply the requisite stimuli and needed materials" (p. 130).

### **Fivefold Activities in Child Development**

Throughout all four stages, Dewey posited that the child's drive for activity or engagement develops in the following realms beyond physical activity: (1) social activity – through conversation and interpersonal relationships, (2) investigative activity (e.g., taking things apart to see how they work – as distinguished from investigation or reflection through hypothetical thinking for problem solving, which is developed in the more matured child), (3) constructive activity – building or making things and putting them together to make them work, and (4) artistic activity (1899, pp. 43-62).

"Life is the great thing after all, the life of the child at its time and in its measure no less than the life of the adult," wrote Dewey in pointing out that it would be strange indeed if the child's needs for a rich, expanding and growing life should somehow conflict with growth into the possibilities of later, adult life (p. 60).

### **From Curiosity to Reflective Thinking**

In *How We Think*, published in 1910 (revised ed., 1933), Dewey offered teachers a comprehensive explication of growth in the process of thinking, from the concrete or most

elemental level to the complete act of thought or reflection. Beginning in infancy, the first manifestation of curiosity is characterized by "a vital overflow, an expression of an abundant organic energy. A physiological uneasiness leads a child to get into everything – to be reaching, poking, pounding, prying" (1910, p. 31).

In this period of infancy and earliest childhood, the individual learns to master the body through interactions with the physical and social environment. "The child has to learn to do almost everything: to see, to hear, to creep, to walk, and so on" (1910, p. 157). In effect, all of the child's senses are forward-reaching and out-reaching, "ceaselessly active in enlarging the range of experience" (1910, p. 313).

Dewey then offers Wordsworth's stanza as germane particularly to infancy and childhood (1910, p. 31):

The eye—it cannot choose but see;  
We cannot bid the ear be still;  
Our bodies feel, where'er they be,  
Against or with our will.

"All our sense and motor organs are, when we are awake, acting and being acted upon by something in the environment," Dewey continued, as he went on to expand on how this curiosity of interaction with the environment grows and becomes intellectual as well as instrumental (1933, pp. 36-39).

As with the stages of cognitive development, curiosity is manifested in the infant as organic energy or an organic stage; this stage is followed by a growing social engagement or social stage of development, "as the child learns that he can appeal to others" and then when the child begins to realize "that the facts which directly meet the senses are not the whole story, that there is more behind them

and more to come from them, lies the germ of intellectual curiosity" (1910, p. 32).

From this stage, curiosity "becomes intellectual in the degree to which it is transformed into interest in finding out for oneself the answers to questions that are aroused by contact with persons and things" (1933, p. 39). The purposeful and hypothetical mode of thinking at this sequential stage is expressed, "To the degree that a distant end controls a sequence of inquiries and observations and binds them together as means to an end, just to that degree does curiosity assume a definitely intellectual character" (1933, p. 39).

Dewey proceeded to address the significance of attitudes and appreciations in this process of growth in thinking right up through self-directed reflection for problem solving through the testing of hypotheses in the complete act of thought (1933, pp. 106-118).

### **Isomorphism: From Dewey to Piaget**

It is unlikely that Dewey's developmental stage theory was largely unrecognized or ignored on the ground that Dewey's credentials in psychology lacked standing. In fact, his book on psychology, published in 1887 was hailed in many quarters as the "new psychology" for showing the emergent influences of biology on psychology and other fields, and the essential role of experimental method in advancing the field of psychology (Dykhuisen, 1973, p.37).

To Dewey psychology is philosophic method (Early Works of Dewey, 1, pp. 153-167). Dewey, of course, was to go on to advance and orchestrate the American born philosophy of pragmatism or experimentalism into an educational/social theory revealing how the structure and function of the school curriculum must be in harmony with the very

nature of the learner in and for a democratic society (1916). Hence, for example, the problem method or method of intelligence – the power of hypothetical thinking in action – signals the great transformation for productive membership in a free society. In this connection, the school must be a designed environment for the social and intellectual transformation of the rising generation.

In the Preface to Piaget's *The Language and Thought of the Child*, Edouard Claparede (1873-1940) identifies several notables whose research was most influential for Piaget (1955, p. 13; original French edition, 1923).

As a disciple of Claparede, Piaget succeeded Claparede as director of the Institute Rousseau, founded by Claparede in 1912, which became the Institute of Educational Sciences at the University of Geneva. Claparede also founded the International Bureau of Education which became an organ of the United Nations with Piaget as successor to Paparede (Hamelme, D., 1998, pp.159-171).

In this Preface to Piaget's *The Language and Thought of the Child*, Claparede also points out that Piaget was "lucky enough" to be initiated into psychology at a young age when "vistas were opening out before our science" and, "for James, Flournoy and Dewey it was the dynamic and pragmatic tendency that counted; for Freud, psycho-analysis; for Durkheim (no matter whether his doctrine was sound or not) the recognition of the role played by social life in the formation of the individual mind; for Hall, Groos, Binet and the rest, genetic psychology propped up by a biological conception of the child. By a stroke of genius, M. Piaget having assimilated these new theories, or rather having extracted the good from each, has made them all converge on to an interpretation of the child's mentality" (1955, p. 13).

Claparede was a great admirer of Dewey and openly drew upon Dewey in advancing his own research on intelligence as growth through stages of development (1967). In his Introduction to Piaget's *Language and Thought of the Child*, Claparede specifically points out that Piaget had indeed "assimilated" new theories from Dewey and others on the interpretation of the child's mental development (1955, p. 13; originally 1915).

Although Piaget's maturational theory of cognitive growth most closely matched Dewey's theory and structural framework, stage-by-stage (Dewey, 1899, 1910, 1916), Piaget never cited Dewey's contributions in this connection (see Table I).

Piaget was to go on to construct the most detailed map or conceptual framework for cognitive development as a maturational sequence or progression, but he left the curriculum question to Dewey and to Dewey's fellow experimentalists.

The developmental-stage theory of Piaget is so unmistakably and powerfully isomorphic with Dewey's categorical developmental-stage theory that it is a mystery as to why Piaget, in his "clinical" research, chose not to give recognition to Dewey's earlier unique and enduring work from studying children in naturalistic social interactions in the environment of the classroom, school, and playground—in contrast to Piaget's method of eliciting answers to calibrated questions posed sequentially to the individual child and classifying the responses.

Even more of a mystery is the failure of the profession to recognize, reveal, and build upon the Deweyan and Piagetian connection. The creation of a science of education, as in the case of all science, is based on building conceptual connections through problematic ideas in the testing of hypotheses for the advancement of knowledge.

Not until 1969 did Piaget acknowledge Dewey's contributions to education science. But although Piaget reviewed his own work on the significance of developmental stages to education science, he still made no acknowledgment of Dewey's developmental-stage theory as formulated from Dewey's studies of children in his laboratory school in Chicago (1970, pp. 170-173).

Piaget's *Science of Education and the Psychology of the Child*, published in French in 1969 and translated into English in 1970 appeared when Piaget was 73 years of age. In essence it was an effort to sum up his lifetime contributions to child psychology and to evaluate the historic advances in education science. But the book is conspicuous for having made no reference whatsoever to Dewey's developmental stage theory and Dewey's classic, *The Sources of a Science of Education*, published in 1929.

Table I presents summary descriptions and abbreviated quotations on the four principal developmental stages, contrasting Piaget's formulations with those identified by Dewey a half century earlier.

Table I

*Developmental Stages of Thinking*

<b>Stage I Sensory-motor (infancy to age 4)</b>	
Dewey (1899, 1910, 1916, 1933)	Piaget (1950, 1969)
<p>All sensory and motor organs ceaselessly active in vital overflow of an abundant organic energy; objects are sucked and fingered with forward-reaching and outreaching activity to make new contacts with new objects. Such activities are not conceptual, but are vital to development of intellectual operations (1910, pp. 30-32; 1933, pp. 36-37).</p> <p>Adaptation of sounds to making sounds becomes the great instrument of social adaptation with the development of speech (1910, p. 159).</p> <p>Soon distinguishes persons as the most important and interesting of all objects. Childhood play and games in developing perceptions, concepts, intelligence and social growth (1933, p. 210).</p> <p>“When things become signs, when they gain a representative capacity as standing for other things, play is transformed from mere physical exuberance into an activity involving a mental factor. A little girl who had broken her doll was seen to perform with the leg of the doll all the operations of washing, putting to bed, and fondling, that she had been accustomed to perform with the entire doll. The part stood for the whole.... In using their</p>	<p>Preconceptual coordination of successive perceptions and overt physical movements linked by brief anticipation and reconstruction, but not arriving at an all-embracing representation of continuous vision and fusion necessary for understanding the whole. From uttering sounds to imitating sounds and certain words with vague meaning (to end of 2-nd year) followed by beginning of systematic conceptual learning of language (“symbolic function”) linking meanings of relations between symbols/signs and reality of social life (1950, pp. 120-129).</p> <p>People afford the greatest pleasure known to the child’s limited experience (1950, p. 158).</p> <p>From simple symbolic play to assimilation of reality into activity proper (1969, pp. 156-157). “Playing with dolls does not serve solely to develop the maternal instinct but also provides a symbolic representation of all the realities the child has so far experienced but not yet assimilated in a form that it (sic) can relive and therefore vary according to its needs. So that in this respect symbolic play, like exercise play, is also to be explained as an assimilation of reality into the self....the symbol in play is to the individual what the verbal sign is to society.” (1950, pp. 156-157).</p>



<p>toys, children are living not with physical things, but in the large world of meanings, natural and social, evoked by these things...they are subordinating the physically present to the ideally signified. In this way, a world of meanings, a store of concepts (so fundamental to all intellectual achievement), is defined and built up...not only do meanings thus become familiar acquaintance but they are organized, arranged in groups, made to cohere in connected ways” (1910, pp. 161-162).</p>	
<p><b>Stage II Pre-operational/representational (from ages 4-7 or 8)</b></p>	
<p>Dewey (1899, 1910, 1916, 1933)</p>	<p>Piaget (1950, 1969)</p>
<p>Directness of social and personal interest and promptness of relationship between impressions, ideas and action; urgent and immediate demand for a motor outlet. Transforming vague meaning of experience to secure practical and intellectual control of methods of activity and inquiry approaching social form as will enable the child to realize results for himself in play, games, pictorial imagination, conversation, and occupations (1899, pp. 105-106).</p> <p>Child’s incessant questioning of “What is that?” “Why?” – not for technical explanation, but for social engagement through language and to expand acquaintance with mysteries of the environment, setting the germ for intellectual activity (1910, p. 32).</p> <p>The passage of play into work through work as play (1910, pp. 164-167).</p>	<p>From initial egocentricity into a system of relations that are decentralized with respect to self, intellectually and socially. A gradual coordination of representative relations and thus a growing conceptualization which leads from the symbolic or pre-conceptual/prelogical phase to beginnings of intuitive reasoning with perceptual sensorimotor adjustments (1950, pp. 120-139).</p> <p>“The earliest ‘whys’ seem more affective than intellectual in character.... But we have yet to ascertain how the child passes from that affective curiosity... to curiosity in general, and finally to the more subtle forms of intellectual interest such as the search of causes” (1955, p. 173).</p> <p>Play transformed into adapted constructions of work (1969, p. 157).</p>

<b>Stage III Concrete operations (from 7-8 to 11-12 years)</b>	
Dewey (1899, 1910, 1916, 1933)	Piaget (1950, 1969)
Mere play of activity no longer satisfies but must accomplish something – leading to a definite outcome. Hence the recognition of rules in games and actions. A growing sense of possible results of activities and necessity for control of agencies for the skill necessary to reach the results. Command of basic skills not as mere symbolics but as tools for uses in the pursuit of knowledge for solution and growth (1899, pp. 106-112).	Rules in games are the result of negotiation, compromise, agreement (1969, p. 127).  Development of organized/operational groupings of thought that can be manipulated or known through the senses in solving basic physical problems by anticipating consequences. Progressive development of intuitive thought (1950, pp. 139-147).
<b>Stage IV Formal operations (from late childhood through adolescence)</b>	
Dewey (1899, 1910, 1916, 1933)	Piaget (1950, 1969)
Development in the power of reflective thought, defined as “active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends.” From a state of perplexity, controversy, doubt concerning a problem, the adolescent becomes capable of setting the problem to be solved by formulating ideas/hypotheses to be tested for possible solution, based upon the best available evidence, by means of appropriate methods, materials and procedures (1910, pp. 3-115; 1916, pp. 169-178; 192; 1933, pp. 107-118).	Hypothetico-deductive and inferential thinking. Thinking beyond the present and forming “theories” about everything. Reflective thought when the adolescent relies on the necessary validity of inferences. Formal thought is perfected and its groupings characterize reflective intelligence (1950, pp. 123, 142-150).

Here we find that Piaget not only posits identical stages that had been formulated by Dewey more than a generation earlier, but that Piaget uses and paraphrases Dewey’s expressions, examples and descriptions in explicating the progressive cognitive growth of the learner through the developmental stages.

And, as shown in Table I, we find this expressed first by Dewey and later by Piaget, such as in relating how the child’s interactions with the doll represent manifestations of the process of transforming physical play into symbolic meaning; or in how children learn to recognize the necessity of rules in the conduct

of games (no rules, no game); or in how the child's incessant use of "whys" is not an expression of the need for technical explanation, but for social engagement; or in how the power of hypothetical or reflective thinking is expressed in the formulation of systematic evidence for problem solving.

In building upon the seminal work of Dewey, it would seem clear that Piaget owed a debt to Dewey. But no less important in the conduct and advance of scientific inquiry is the obligation of attribution in connecting the genesis and transformation of ideas from one investigator to another.

Again, as shown in Table I, Piaget's framework marking the distinctive stages of cognitive development corresponds with that of Dewey's, along with the sequential behavioral descriptions and examples manifested by the learner at each stage.

At the sensory-motor stage (infancy to age 4), Dewey and Piaget provide descriptions and examples of the infant's growth from pre-conceptual perceptions and overflow of organic or physical energy to transforming the utterance of sounds to imitation and then to social and conceptual adaptation through the learning of language.

Piaget, as with Dewey, relates how at this stage the infant soon distinguishes persons as the most important and interesting of all objects. And both Dewey and Piaget single out the significance of play and games in developing perceptions, concepts and social growth – from simple symbolic play to assimilation of reality and the organization and connection of meanings.

At the pre-operational or representational level (ages 4-7 or 8), Dewey and Piaget describe the transformation of vague

meaning of experience from the pre-conceptual to conceptual control of activity in social form through imagination and conversation, with the transformation of play into work and work as play. Here both Dewey and Piaget point out that at this stage the child's incessant questioning of "Why?" or "What is that?" is not for intellectual explanation, but is affectively motivated for social engagement through language, thereby setting the germ for intellectual growth.

At the stage of concrete operations (from 7-8 to 11-12 years), as shown in the table, Dewey and Piaget point out that here mere play no longer satisfies, but must accomplish something; hence the need for agreed-upon rules. Activities are regarded as consequential, and basic skills are no longer merely symbolic, but become tools for use in learning.

Finally, at the stage of formal operations (late childhood through early adolescence), the power of reflective thought becomes manifested. Through hypothetical thinking, problems are tested for validity, reliability and possibilities for solution and application by devising appropriate means and material resources. This development, of course, bears profound consequences for the individual, the school curriculum and society.

Dewey repeatedly pointed to the significance of ideas as indispensable constituents of inference and in the formal operations of thinking. "Without a guiding idea, facts would be heaped up like grains of sand; they would not be organized into intellectual unity," commented Dewey (1933, p. 133). Considering that the examination of ideas tends to stimulate and hold adolescent interest, to open possibilities for inquiry in the formulation of hypotheses, and to the uses of factual knowledge as evidence, it is puzzling

that so much teaching and testing in school remain traditionally factual and error-oriented rather than idea-oriented and problem-centered.

Returning to the mystery of why in his writings Piaget chose not to connect his work with the earlier work of Dewey on developmental stage theory, we might ask: was Piaget in a race for the prize? Was he so imbued with his own clinical methodology that he sought not to give recognition to Dewey's methodology of direct observation of children in natural situations of the classroom, school and playground?

Then there is the mystery of why Dewey's early and powerful work on maturational stage theory of cognitive development was so massively overlooked by the profession. This may be best explained, at least partially, by the contrasting lifetime careers of the two men.

The twentieth century ushered in a rising tide of knowledge eclosion and specialism. Dewey was to go on to transform the uniquely American theory of pragmatism into an experimentalist theory of education for democracy—what Gunnar Myrdal called “the most perfected educational theory developed in modern times” (1962, p. 883; originally published in 1944).

Whereas Dewey was to become America's leading philosopher, Piaget in Europe concentrated his work on developmental/cognitive psychology, and built an international reputation in his chosen specialized areas of research over his lifetime.

### **The Curriculum Connection**

Developmental-stage theory informs educators on the nature of the learner and the conditions necessary for the full growth of intelligence at

critical periods of the lifespan—which, in turn presents profound implications for the structure and function of the school curriculum.

As noted earlier, Piaget never purported to connect developmental-stage theory to the needed systematic transformation of the school curriculum and to the social development of the child and adolescent. Such work was to be undertaken by Dewey from the time he established his laboratory school through his entire professional life.

In *Democracy and Education* (1916), Dewey held that “the school must itself be a community life in all which that implies” and that, “Social perceptions can be developed only in a genuinely social medium—one where there is give and take in the building up of a common experience...continuous with that out of school” (p. 416). Here Dewey forged the connection between the curriculum and cognitive and social growth for democratic living, in that democracy requires schools that employ reflective thinking as method in the education of adolescents.

In *Democracy and Education*, Dewey not only devoted entire chapters titled “Education as a Social Function,” “Education as Growth,” “Thinking in Education,” and “The Nature of Subject Matter,” but also chapters on each of the broad fields of the curriculum. It is indeed puzzling that many students in the social and philosophical foundations of education who are assigned to read *Democracy and Education* fail to fully recognize the power of Dewey's curriculum connection.

Over the years, the present author asked students who had just completed a philosophy of education course at Rutgers, in which John Dewey's *Democracy and Education* was required reading, to describe Dewey's

organizational framework for the curriculum as presented in the book. They invariably expressed surprise when I pointed out that the book contains separate chapters under such titles as “The Significance of Geography and History,” “Science in the Course of Study,” “Intellectual and Practical Studies,” “Physical and Social Studies,” and “Vocational Aspects of Education.” And it is doubtful that very many teachers of educational philosophy realize that *Democracy and Education* was originally published as a Macmillan textbook.

### **Toward a Science of Education**

Dewey contended that the sources of a science of education are to be determined by educational problems, with educational practices providing the data or subject matter which forms the problems for inquiry and solution. Psychology and other social sciences may be drawn upon, but the sources of the problems must stem from educational practices which are also the ultimate test of the validity and value of the research findings.

As for philosophy, its value as a source is determined only by the extent to which it provides working hypotheses of comprehensive application. To which Dewey added, “But if a philosophy starts to reason out its conclusions without definite and constant regard to the concrete experiences that define the problems of thought, it becomes speculative in a way that justifies contempt” (1929, p.56).

Dewey’s conviction that educational practices provide the problems for investigation and solution, and consequently are the sources for the building of a science of education (1929, pp.35-36) find expression and validation in the work he conducted in his laboratory school at the University of Chicago.

In 1969, Piaget offered some belated recognition of Dewey’s work in his laboratory

school before the opening of the twentieth century. In a chapter titled “The Genesis of the New Methods” in *Science of Education and the Psychology of the Child* Piaget notes:

In the United States, the reaction against the static nature of nineteenth century psychology made itself apparent in two ways. On the one hand the work of the pragmatists had revealed the role of action in the constitution of all mental operations, and of thought in particular; on the other, the science of mental development, of genetic psychology, had increased considerably in scope ... These two trends found their exact point of intersection in John Dewey, who in 1896 was already creating an experimental school in which the work of the students was centered upon the interests or the needs characteristic of each age group (1970, p. 147; originally published in French in 1969).

Of course, Dewey’s findings from work in his laboratory school were far greater than being centered on the interests and needs of students (Dewey, 1899, 1902; Mayhew & Edwards, 1936; Tanner and Tanner, 1990; Tanner, L., 1997).

It is clear that Piaget was well aware of Dewey’s research at the University of Chicago Elementary School. And although Piaget reviewed here the value of his own developmental-stage theory to education science, he made no mention of Dewey in this connection (1970, pp. 170-173), but went on to discuss briefly the early experiments by Dewey in his experimental school whereby the children were allotted an essential place in the social life with compeers in the classroom and school by learning to collaborate in intellectual activity as well as establishing self-governing moral discipline (p. 174).

At the outset, Piaget made note that over the period from 1935 to 1965, advances were made by “great writers” in most of the natural and social sciences, but no great pedagogue had emerged (1970, p. 9). He proceeded to dismiss Dewey in this connection on the ground that Dewey was a philosopher, but nevertheless cited Dewey with Durkheim as founders of a sociology of education as a discipline through the systematic study of the school and classroom (p. 19), and listed Dewey among the great names in psychology (p. 145).

Clearly, Piaget revealed that he was well aware of Dewey’s orchestral contributions to education and social thought, and more specifically to psychology. And he did credit the theorists of the new school with developing the school curriculum “in forms assimilable to children of different ages in accordance with their mental structure and the various stages of their development” (p. 153).

Returning to Piaget’s contention that no great pedagogue had emerged over the historic period from 1935 to 1965, he apparently failed to recognize that the term pedagogy, came to be discarded by experimentalist-progressive educators for reducing education methods to mechanical procedures and devices that reciprocally treat subject matter as fixed bodies of ready-made content to be reproduced by rote for the recitation and examination (Dewey, 1933, p. 81). For Dewey, education is the process of “reconstruction of experience which adds to the meaning of experience and which increases ability to direct the course of subsequent experience” (1916, pp. 89-90).

The great deficiency of pedagogical theory since the time of Herbart, continued Dewey, “lies in ignoring the existence in a living being of active and specific functions which are developed in the redirection and combination

which occur as they are occupied with their environment” (1916, p. 83). As Dewey continued with regard to Herbartian theory,

The theory represents the Schoolmaster come to his own. The philosophy is eloquent about the duty of the teacher in instructing pupils; it is almost silent regarding his privilege in learning. It emphasizes the influence of intellectual environment upon the mind; it slurs over the fact that the environment involves a personal sharing in common experience. It exaggerates beyond reason the possibilities of consciously formulated and used methods, and understates the role of vital, unconscious attitudes.... It takes, in brief, everything educational into account save its essence.... (1916, pp. 83-84).

For Dewey, the essentials of method are embodied in the complete act of thought or method of intelligence. Hence the teaching-learning process becomes truly educational and not merely instructional. In *Democracy and Education* (1916), Dewey orchestrated his thoughts on democratic theory and education into his experimentalist philosophy based on the idea of progress for the individual and society.

In his summing up of the modern developments in psychology and pedagogy, Piaget pointed out, as did Dewey decades before him, that as the child progresses to the stage of hypothetico-deductorial operations, “the child becomes capable both of combining those hypotheses and of verifying them experimentally, then it goes without saying that our schools owe it to themselves to develop and to direct such capacities in order to use them in

the development of the experimental attitude of mind and of methods of teaching” (1970, pp. 52-53).

### What is Childhood?

Piaget goes on to ask, “What is childhood then? And how are we to adjust our educational technique to beings at once so like and yet so unlike us?” (p. 153). He refers to the view of childhood by the theorists of the new school led by Dewey and fellow experimentalists.

In Piaget’s words: “Childhood, for the theorists of the new school is not a necessary evil; it is a biologically useful phase whose significance is that of a progressive adaptation to a physical and social environment” (p. 153),

- Three-year old: “Look! Sand!”
- Four-year old: “I wonder how it got there?”
- Six-year old: “I guess a man put it there, but I don’t know how he could be so tall to reach the top of it.”
- Seven-year old: “They pick it up in a steam shovel and a dump truck delivers it.”
- Nine year-old: “Oh, everybody knows that.”  
(Brandes, May 26, 1963, p. 22).

In his autobiography, Max Planck, Nobel Laureate in physics, addresses the same phenomenon and its profound significance—namely the loss of wonderment as the child grows up:

The more the child matures, and the more complete his world picture becomes, the less frequently he finds reason to wonder. And when he has grown up, and his world picture has solidified and taken on a certain form, he accepts this picture as a matter of course and ceases to wonder. Is this because the adult has fully fathomed the correlations and the necessity of the

to which we might add, a necessary phase in development. “The traditional school reduced all socialization whether intellectual or moral, to a mechanism of constraint,” observed Piaget, whereas cooperation and collaboration are most apt to encourage real exchange of thought and discussion, which is to say, all the forms of behavior capable of developing the critical attitude of mind, objectivity, and discursive reflection” (p. 180).

Perhaps the best expression of “what is childhood” and the development of children’s thinking may be found in the following interchange as recorded by a mother of five children upon standing on the edge of a large urban construction site:

structure of his world picture?  
Nothing could be more erroneous than this idea.

No! The reason why the adult no longer wonders is not because he has solved the riddle of life, but because he has grown accustomed to the laws governing his world picture. But the problem of why these particular laws and no others hold, remains for him just as amazing and inexplicable as for the child. He who does not comprehend this situation, misconstrues its profound significance, and he who has reached

the stage where he no longer wonders about anything, merely demonstrates that he has lost the art of reflective reasoning (1949, pp. 92-93).

This loss in wonderment with maturity is not necessarily inevitable. With every new discovery or insight one's world picture is expanded, deepened and enriched, thereby advancing the wondrous in the structure of the world picture (p. 93).

### **The Darwinian Influence: What Would Darwin Think?**

Both Dewey and Piaget were profoundly influenced by Darwin (Dewey, 1910, p. 127; Boring, 1950, pp. 272-278; Piaget, 1950, p. 12). From Darwin to Dewey to Piaget, human development was seen as encompassing three inexorably interdependent growth processes: physical, social and cognitive. For Dewey, the rising generation requires the power of problem solving in coping with a precarious and changing environment. Consequently, education should be the means of learning to think, and hypothetical thinking opens the door to problem solutions and progress for the individual and society.

For Dewey, this meant that the school curriculum must engage the learner in growth in the capability of dealing with the emergent problems of life through the method of intelligence (1933, 1938). But the curriculum of the traditional school was focused principally on established-convergent learning regularities as opposed to emergent learning

The exemplar of established-convergent learning is the multiple-choice test which requires the student to select the correct pre-constructed answer from the other (incorrect) pre-fabricated answers. In contrast is the short-answer test item or short essay item which asks

the student to construct a correct answer in his own words, such as defining a problem or formulating one or more hypotheses for solving a given problem.

The latter represents emergent learning to the extent that it engages the learner in reformulating and applying knowledge for solving a heretofore unseen problem situation, as opposed to simple recall or reproduction of information. In the first instance, the answer is prefabricated for the student; in the second instance, the answer is constructed by the student. The former may be answered correctly by simple recall; the latter evokes evidence of critical thinking.

In contemporary times it is a strange state of affairs that the worth of the learner, the teacher and the school is measured by student scores on external, high-stakes, computer-scored, multiple choice, standardized tests focused on established-convergent learning to the neglect of emergent learning.

Considering that the power of hypothetical thinking is the exalted stage of evolution of the human mind, one is left to ponder what Charles Darwin would think of the multiple-choice test as the measure of mind. And whereas teaching-to-the test was long considered to be cheating, it is now regarded as a pedagogical best practice.

### **Adolescence and Reflective Thinking**

During the era of progressive education in the United States, experimentalist educators embarked on large-scale and intensive research studies and efforts in reconstructing the high-school curriculum so as to connect the curriculum with the emerging potential power of reflective intelligence or hypothetical thinking in adolescence (Aikin, 1942; French & Associates, 1957).



“Adolescence is not a synonym for magic,” observed Dewey (1933), but “affords an opportunity for thinking of a more comprehensive and abstract type,” to which he added: “Only by making the most of the thought factor already active in the experiences of childhood, is there any promise or warrant for the emergence of superior reflective power at adolescence or at any later time period” (p. 89).

In effect, the school, by means of the curriculum, must constitute a designed environment and experience for the growth of the powers of reflective thinking with the stage of adolescence. The transformation will not happen magically or spontaneously.

In the United States during the progressive era and extending through mid-twentieth century, extraordinary efforts were undertaken to create instruments for measuring growth in critical or hypothetical thinking in evaluating outcomes of the new problem-focused curricula of the high school (Smith & Tyler, 1942; French & Associates, 1957). Similar efforts followed in higher education around mid-twentieth century (Dressel & Mayhew, 1954).

The findings clearly revealed that the new curricula were yielding significant gains in critical thinking and problem-solving capabilities on the part of adolescents (Aikin, 1942). The tests or evaluative instruments were determined by the curriculum, whereas the current nationalizing syndrome of high-stakes testing in the United States puts the cart before the horse by having the tests determine the curriculum.

The tests and evaluative instruments developed by the experimentalists during the progressive era were designed to take into account adolescent and child development,

whereas the high-stakes tests of today are designed largely as measures of efficiency in knowledge transmission, subject-by-subject, with rankings and ratings of students, teachers and schools.

### **Why Reforms Often Fail**

From the work of Dewey and Piaget, we should know that any reform in education is destined for failure if it neglects or violates the nature and needs of the learner.

Consequently, it is indeed puzzling that no less a figure in cognitive psychology than Jerome Bruner, responding to what he referred to as “a long-range crisis in national security,” brought on by the Cold War and space race (1960, p. 1) would declare that “intellectual activity anywhere is the same, whether at the frontier of knowledge or in a third-grade classroom,” and that, “The schoolboy learning physics is a physicist, and it is easier for him to learn physics behaving like a physicist than doing something else” (p. 14).

Bruner’s reconceptualization of the nature of the learner apparently was made opportunistically to fit the federally financed national discipline-centered curriculum reforms in science and mathematics led by university scholar-specialists who had no interest in or concern for the nature of the learner, nor for the socio-civic democratizing function of the curriculum.

Bruner’s pronouncement was made through his position as chair and author of the report of a national conference of university scholars and leaders convened in an air of national emergency.

Interestingly, on the tenth anniversary of the publication of *The Process of Education* Jerome Bruner recanted his doctrine of disciplinary structure and of the child scholar,

and stressed the need to connect the curriculum to the problems of our society and educational opportunity including vocation (1971).

The current nationalistic foray for school reform in the United States, “Race to the Top,” also gives priority to the sciences and mathematics.

But whereas in the earlier reform movement, the public schools were to blame for the alleged American lag in the space race, the current crisis and national school-reform movement, Race to the Top, holds the public schools to blame for the alleged decline of America’s hegemonic dominance over the global economic marketplace.

And this time the cure is to be driven by external high-stakes testing. As in the school-reform movement of the space race, Race to the Top is fueled by international comparisons on achievement tests with no corrections made for the incommensurate pupil populations, nation by nation.

From developmental-stage theory, educators should know that to assess a child’s or adolescent’s growth in achievement by results principally on external, standardized, high-stakes, multiple-choice tests only raises points of conflict with the nature and needs of the learner and the structure and function of the curriculum.

Learning activities that children love and that develop the “mind’s eye” such as the studio arts (the visual arts and music) and shop classes, once ubiquitous in the elementary school, have been cut back vastly for purposes of economy and priority favoring traditional academics in the cause of American economic-industrial hegemony in the global marketplace.

The school life of the learner and the structure of the curriculum must be attuned to the kind of society the people believe in. Democracy requires an enlightened citizenry, and this in turn requires that the rising generation commands the powers of reflective thinking, as individuals and as citizens.

According to Dewey, the fundamental factors in the education process are (1) the learner as a developing being, (2) the curriculum as a functioning and developing structure of knowledge and know-how (methodology) for teaching and growth in learning, and (3) society as an emerging environment for constantly expanding lifelong learning (Dewey, 1902, p.4).

In short, any education reform will fail if the curriculum conflicts with the nature and needs of the learner. And any education reform will fail if it is not attuned to the democratic prospect and if it conflicts with life in a free society. The three fundamental factors must be seen and treated in interdependence and not in conflict if the problems of education are to be solved and progress is to be made (pp. 4-5). And, for both the individual and society, progress is far better than reform. Reform has an end. Progress has no end beyond itself.

### **The Child, The Teacher and The Curriculum**

The conceptual framework for developmental stage theory constructed by Dewey from his observations of children in his laboratory school during the short period of 1896 to 1904 marked the opening of a new era—the Century of the Child.

No longer was the child to be construed as an unformed being on a waiting list toward adult maturity. Now the case was

the child authentically as “Child” who engages his present capacities, attitudes and powers in the experience of learning as a process of growth. The teacher knows full well that she

cannot set the destiny of the child; nor can she know how those capacities, attitudes and powers will be realized through the school curriculum.

In Dewey’s words:

The case is of Child. It is his present powers which are to assert themselves: his present capacities which are to be exercised; his present attitudes which are to be realized. But save as the teacher knows, knows wisely and thoroughly, the race expression which is embodied in that thing we call the Curriculum, the teacher knows neither what the present power, capacity, or attitude is, nor how it is to be asserted, exercised and realized (1902, p.31).

**From Dewey and Piaget we learn that the work of the child is never done. It is always in the making.**

### **Author Biography**

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