

A Law-like Statement of Dewey's Views on Pedagogy

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THE PROBLEM OF TRANSLATION

John Dewey worried about the fundamental problem of the translation of scientific research into forms useful for schooling practice in the 1929 inaugural Kappa Delta Pi lecture, "The Sources of a Science of Education."¹ Resolution of the problem, argued Dewey, held great promise of reward. Creation of systematic methods of inquiry into issues of education would enable educators to understand education better; control it less haphazardly and with less routine; promote steady and cumulative growth of intelligent, communicable insight and power of direction in schooling; and liberate schooling practice from uniformity of approach by describing far-reaching purposes of schooling with their source in conditions wider and deeper than daily need of educational practice. (*SSE*, 1-8)

Sadly, Dewey observed, an obstacle stands in the way of any direct translation of scientific findings about topics of educational interest into rules of action for educators:

No conclusion of scientific research can be converted into an immediate rule of educational art. For there is no educational practice whatever which is not highly complex; that is to say, which does not contain many other conditions and factors than are included in the scientific finding (*SSE*, 9).

The controlled conditions required for laboratory work also require maximum isolation of attention on a few factors to the exclusion of other, oft times educationally relevant factors (*SSE*, 33).

Upon surveying the education research-practice impasse, Dewey proposes that laws of translation are the only feasible solution for bridging the gap. Laws yield intellectual instrumentalities, forms of thought to be used by educators in the particular circumstances in which they teach. They do not prescribe substantive rules of practice thought to be applicable to all educational situations whatsoever. Laws are not aimed directly at the educator's behavior; but indirectly, through his attitudes and intentions, her professional habits of inquiry, observation, and interpretation (*SSE*, 6, 9-10, and 14). Dewey finds the final reality of educational science in the minds of persons engaged in directing educational activities: "Results may be scientific short of their operative presence in the attitudes and habits of observation, judgment, and planning of those engaged in the educative act. But they are not *educational* science short of this point. They are psychology, sociology, statistics, whatever" (*SSE*, 16). Dewey describes this distinction as the point on which his whole discussion turns.

As Dewey sees it, laws are most likely to make good on the promise of translation of science into school for several, interrelated reasons. First, laws support the sort of systematic method of inquiry Dewey says defines science as a social phenomenon. Second, laws are the sort of thing designed to do jobs of translation.

Laws, again by definition, are connecting principles which link different phenomena together. Third, facts interrelated by laws form a system, that is to say, a science. "The practitioner who knows the system and its laws is evidently in possession of a powerful instrument for observing and interpreting what goes on before him" (*SSE*, 10). Dewey asserts, and cites the history of physics as proof of the fact, that the most exact measurements and most regular correlations do not yield science outside the scope of some general concepts that give guidance as to what measurements to connect and how to understand connected measurements. He sums this point by saying, "Science does not emerge until these various findings are linked up together to form a relatively coherent system — that is, until they reciprocally confirm and illuminate one another, or until each gives the others added meaning" (*SSE*, 10).

The problem facing practitioners of a purposive activity possessed only of measurements and correlations on which to base their judgments, in this case education, is that they will attribute scientific value to results reached by practitioners of activities already recognized as scientific and establish educational theory on details of what is known and current at a particular time (*SSE*, 13 and 34). The result of yielding to this temptation will be either a recurring cycle of educational fads or a pseudo-scientific commitment to educational Essentialism. These are predictable and familiar outcomes insofar as the former arises when educational interest shifts constantly from partially relevant scientific finding to partially relevant scientific finding, and so on, in oblique effort to illuminate the nature of the educative act by the lights of non-education disciplines. The latter is the result of substitution of the statistical survey of existing educational practice for reasoned determination of the sort of practices schools should adopt to provide the best possible education for their students. Both strategies Dewey derides as arm-chair science or science which lacks vital connection between field-work practice and the research it does (*SSE*, 13, 22, 26, 28, 34, and 37). Supervising from the comfort of the recliner, neither is able to contribute to Dewey's project of demonstrating that, as he puts it, "Education is autonomous and should be free to determine its own ends, its own objectives" (*SSE*, 38).

Dewey recommends philosophical, as opposed to empirical, investigation into the issue of the development of laws useful for the necessary translations. Since a variety of sciences, especially the psychological and social sciences, have bearing on problems of schooling, inquirers after laws that translate findings of varied fields into educational contexts need to take a perspective broader than that provided by any of these special sciences. On Dewey's scheme, science and philosophy relate symbiotically as specific to general, the difference marked by the generality of the hypotheses generated by the two types of discipline. Philosophical hypotheses, as the more general, affect the more specific ones in that the specific are dependent on the general for their significance (*SSE*, 26).

A general, philosophical hypothesis able to articulate the significance of scientific results for educational practice is precisely what is needed to solve the problem of the translation of the findings of scientific research into school settings. Thus, Dewey looks to philosophy of education as a source of working hypotheses

of comprehensive application to both special sciences and educational practice. Use of the range and freedom characteristic of the constructive, creative inventions of the philosopher, hoped Dewey, would effect discovery of new means of education practice. These means, in turn, would not merely suggest more efficient ways of achieving ends already current; but would yield ends qualitatively different from those already established (*SSE*, 26-27 and 31) and enable education practitioners “to carry out their work in a more liberal spirit, with escape from tradition and routine and one-sided personal interests and whims” (*SSE*, 29). However, Dewey did not, in “The Sources of a Science of Education,” develop any hypotheses of the desired sort.

AN UNFORTUNATE OMISSION

Dewey’s solution to the problems of translation is to equip education practitioners with at least one principle by which they can determine from their own perspective what scientific content is and is not relevant to their work as educators. The chief problem facing a policy of empirical investigation into research utilization in schools is that no set of variables presets parameters on what may be valuable for practitioners. Empirical studies do not tell you what to look for, they find what they are told to look for. Since there is a dearth of guidelines developed from the perspective of education practitioners about how to bring science to bear intelligently on the means of education, the empirical investigations and scientific results by which attempt is made to control education stay separated from, because guided by ends other than, the ends education practitioners should be setting for themselves (*SSE*, 37).

Equipped with a principle of determination, practitioners are able to use scientific results as intellectual tools in their own empirical procedures, as rules which direct their attention in the observations and inquiries they carry out as an organic part of their own work. The image that seems to be before Dewey’s mind here is that of a conceptual filter through which research results of sciences other than education must pass before they become accepted by education practitioners as valuable for educational science (*Ibid.*, 14 and 39). When educators begin to set and achieve their own research agendas in schools education will become, as Dewey turns the phrase, “an activity which *includes* science within itself” (*SSE*, 40).

This train of thought seems quickly to reach the end of its line, however. Dewey admits in 1929 that he knows of no laws able to guide education practice in the prescribed way. Nonetheless, Dewey remains resistant to empirical investigation of the matter: “Just because educational science has no such achievement of laws to fall back upon, it is in a tentative and inchoate state which renders it especially in need of direction by large and fruitful ideas” (*SSE*, 28).

Given this admission, Dewey’s resistance may seem more like recalcitrance. As long as laws governing education practice remain unformulated, the only reasonable procedure seems to be casting about for schemes that work and development of inductive generalizations based on patterns discerned in various attempts. What else is a scientist to do in the absence of law-like statements but cast about empirically for clues to successful processes of implementation? The short answer to this

question is: Nothing. A longer, hopefully more adequate answer, developed and defended in the following sections of this essay, is that by 1938 (in the presentation that completed the first ten-year cycle of the Kappa Delta Pi Lecture Series, *Experience and Education*) Dewey revealed thinking that provides materials from which a law governing educational practice may be constructed.

DEWEY'S PERMANENT FRAME OF REFERENCE

Dewey's explicitly stated purpose in chapter three of *Experience and Education*, entitled "Criteria of Experience," is to present the principles that are most significant in framing a theory of experience that informs educational practice (*EE*, 33). The success of that theory depends on Dewey's ability to express the necessary but non-analytic connection between experience and education (*EE*, 25 and 40) in a way that grounds an empirical and experimental philosophy of educative experience (*EE*, 25 and 28). This philosophy of educative experience looks to factors of control inherent in experience to discover and put into operation a principle of order and organization which follows from understanding what educative experience signifies (*EE*, 21 and 29).

In articulating his philosophy of educative experience, Dewey argues that the educative force or function or value or significance (*EE*, 42) of an experience is dependent upon the quality of an experience as assessed in terms of two criteria, both universal features of experience, namely, continuity and interaction (*EE*, 44-45). Dewey defines interaction as the disparity or congruity of the external (physical and social) environment encompassed in an experience with the internal state (the needs, desires, capacities, purposes, and so on) of the person having that experience. Interaction is enhanced as external environment appeals to inner state. This principle of interaction sets the chief job of the educator: manipulate the external environment of an experiential situation in ways that make contact with the minds of learners.² Interaction, moreover, influences continuity, the other chief variable constituting the educative force of an experience (*EE*, 37 and 42-45).

Continuity is a threefold concept. The very idea of continuity entails temporal sequence. Because events and things continue only over time, continuity implicitly makes reference to the past, the present, and the future. Thus, full assessment of the continuous quality of an experience must include evaluation of what the person having the experience brings to the experience, how internally coherent the present experience is, and how the experience will effect other, future experience (*EE*, 46-47).

Dewey says plainly that these two principles, continuity and interaction, are not separate from each other and exist in active union, interaction influencing the way in which continuity applies in any given experience (*EE*, 37 and 44). When continuity is influenced in a good way by interaction the result is enhancement of the potential for continued growth of the learner (*EE*, 38), defined by Dewey as the ability to control future personal experiences (*EE*, 25). When interaction influences continuity in a bad way the result is limitation of the potential for the continued control of future experiences by the learner (*EE*, 26 and 37).

DEWEY'S LAW

These are virtually the only clues Dewey leaves in *Experience and Education* by which his readers may hope to specify the details of what Dewey calls the "organic connection" between personal experience and education, which connection Dewey assumes "amid all uncertainties" to be his "permanent frame of reference" (*EE*, 25). The problem of ascertaining Dewey's meaning in this assumption is exacerbated by his use of the word "organic" to describe the connection between experience and education. Dewey's concept of an organic connection remains a riddle for scholars who advocate a variety of positions along a spectrum ranging from something like "have a common ground" to something more or less like "secret password at Hegel society meetings." Common to many interpretations, however, is the idea that in his use of "organic," Dewey was seeking to describe ways in which qualities might be said mutually to affect one another. So, for instance, in chapter three of *Experience and Education* Dewey asserts that variations in the continuity and the interaction of experiences determine corresponding variation in the educative force of experiences.

Experience and Education admits of an interpretation on which the appropriate interpretation of "organic" is "functional," where "functional" is taken in the sense usually applied to mathematical functions. That is, continuity and interaction may be said to stand to each other as elements in a mathematical formula purportedly descriptive of the educative force of any experience. A formula fitting this description that is attentive to Dewey's desire for a science of education and inclusive of Dewey's comments in *Experience and Education* about the relation of educative force to the continuous and interactive qualities of experience takes the following form where e is the educative force of an experience, p the relation of past experience

$$e \cup \frac{c_1 c_2}{i^2}$$

to present experience, c_1 the internal coherence of present experience, c_2 the coherence of present experience with future experience, and i^2 the distance between external and internal environments in an experiential situation. Applied to education in schools, the formula states that the educative force of any school lesson depends primarily upon relations among the experiences brought by students to the lesson, the coherence of the lesson, the continuity of the lesson with subsequent experiences had by students outside the context of the lesson, and the nearness of the external environment of the classroom to the inner states of the students filling it.

In the formula, continuity is divided by interaction to capture the significance of Dewey's claim, mentioned earlier, that interaction influences the way continuity applies in a given experience. Importance is given in the numerator to the experiences brought by students to a lesson in order to accommodate Dewey's use of stages-of-normal-development talk and his insistence that no subject matter is

intrinsically educative considered in independence of the stage of growth a learner has achieved (*EE*, 42-43 and 46). Moreover, Dewey distinguishes closely between stage of development and inner states of learners, arguing that teachers must have a general understanding of the attitudes and habitual tendencies that are conducive to growth and be sympathetically understanding of what is actually going on in the minds of those who are learning (*EE*, 39). The elements of the numerator are multiplied together because they are all three elements of a single concept, continuity. Smaller values on any item in the numerator threaten reduction of educative force. Interaction is squared in the denominator in order to stress the importance of interaction to Dewey's understanding of the organic connection between experience and education. As distance between inner and outer in an experience increases, educative force decreases exponentially, not merely linearly.

This formula satisfies Dewey's desire for description of a non-analytic but universal connection between education and experience. It takes the form of what Dewey calls a hybrid universal statement, a statement with broader scope than an inductive generalization but narrower application than a definition. This logical oddity is perfectly suited, argues Dewey, for the foundation of scientific endeavor because it alone among general statements both suggests and closes off possibilities for educational research. A favorite Dewey example of a hybrid universal is the law of gravitational attraction and the law-like statement of Dewey's permanent frame of reference is isomorphic of its physics counterpart. Thus, in a logical sense, the formula also fulfills the Deweyan desire for an autonomous science of education (*SSE*, 5 and 38).

A CALL TO ACTION

The fundamental problem pointed out by Dewey in 1929 became a pressing problem in 1999 when the National Research Council (NRC) proposed a fifteen-year Strategic Education Research Program (SERP) and invited a year of dialog among educational researchers and educational practitioners "to see if, together, we can transform the SERP idea into a productive collaboration to use the power of science to improve education in the United States."³ SERP is intended to: (1) bring advances in research on human cognition, development and learning to bear on educational practice; (2) increase student engagement in the learning process and student motivation to achieve; and (3) transform schools and school districts into organizations capable of continuous improvement of their practices. However, the authors of a Feasibility Study for a SERP are admirably frank in admitting that the whole enterprise is threatened by lack of a clear solution to the overarching problem of "how to make the integration of research findings an organic part of the education system." (*ISL*, 2; also see 42.) This problem, designated by the SERP's authors as the problem of knowledge utilization or knowledge mobilization, is, they say, related to

issues about the preparation of teachers so that they can be consumers of research, about the design of schools to create effective learning environments, and about bringing policy into alignment with new strategies for teaching and learning. Above all, however, it is about the *translation* of research findings into forms useful for educational practice (*ISL*, 2-3, emphasis in original.).

Clearly the time has come for philosophers of education to offer guidance and leadership on this issue. Not only the NRC but at least two other major, national bodies have found their efforts at improvement of education stymied by lack of answer to the question of how to guarantee translation of research findings into schooling practice.⁴ Dewey's law is an initial step in that direction. Certainly, problems of interpretation of variables and their measurement remain unanswered by the form given to Dewey's view in this essay. However, it may still be hoped that Dewey's law, in its present form, may prove useful in stimulating discussion along lines desperately required for real improvement of relations between educational researchers and education practitioners.

1. Dewey's main contributions to the discussion come from *Experience and Education* (New York: Collier Books, 1963) and "The Sources of a Science of Education," in *John Dewey: The Later Works, 1925-1953*, vol. 5, ed. Jo Ann Boydston, (Carbondale: Southern Illinois University Press, 1984), 1-40. These texts will be cited as *EE* and *SSE*, respectively, for all subsequent references.

2. Behaviorists uneasy at unacceptable reference to mental states are referred to an idea primordial in Dewey, "The Reflex Arc Concept in Psychology" in *John Dewey: The Early Works, 1882-1898* vol. 5, ed. Jo Ann Boydston (Carbondale: Southern Illinois University Press, 1972), 97-113 — an essay demonstrating the mutual determination of environment and organism in the stimulus-response relation. Charles W. Morris in his editor's introduction to George Herbert Mead, *The Philosophy of the Act* (Chicago: University of Chicago Press, 1938), vii, puts Dewey's point with admirable clarity and succinctness: "the stimulus is actually a stimulus to the organism only in virtue of the implicit response or interest which sensitizes the organism to those features of the world capable of furthering the release of the response itself."

3. Committee on a Feasibility Study for a Strategic Education Research Program, *Improving Student Learning: A Strategic Plan for Education Research and Its Utilization* (Washington, D.C.: National Academy Press, 1999), 7. This text will be cited as *ISL* for all subsequent references.

4. Namely, President's Council of Advisors on Science and Technology (PCAST) and The National Academy of Education (NAE). See "Gorillas in Our Midst: Emerging Themes on How to Improve Education Research," *AERA Report from the Hill* (August/September 1999). Available online at: <http://www.aera.net/gov/rpn/n-06.htm>