

## Causal Talk! Broadening and Deepening the Logic of Teaching

Greg Seals  
Independent Scholar

**Abstract:** Theoretization of teaching's causal efficacy remains controversial between insistence upon randomized experiment to assess educational efficacy and insistence upon qualitative understanding of pedagogical encounters to assess educational efficacy. A source of controversy is tendency to treat causes as metaphysical entities rather than methodological constructs. To minimize controversy, I offer a Deweyan theory of teaching and give it three causal articulations — covering law, correlational, interactional — spanning, without loss of meaning, the quantitative-qualitative spectrum of causal accounts of teaching. Dewey's trans-causal theory makes a variety of causal talks acceptable in education, adding a multi-purpose tool, causal talk, to workbenches of theorists, researchers, and practitioners alike. Adding causal talk to educational theory, methodology, and practice builds attention to students' lives into construction of educative experiences thus diminishing power relations in schools.

Theorizing causal efficacy in teaching remains controversial. Parties to the controversy range from those who insist upon quantitative randomized experiment as the only valid assessment of causal efficacy of teaching to those who find causal efficacy a matter only accurately assessed in terms of qualitative understanding of specific contexts of pedagogical encounter.<sup>1</sup> A source of controversy is tendency to treat causes as metaphysical entities when causes are more adequately understood as methodological constructs.<sup>2</sup> To make this point, I offer a broadly Deweyan theory of teaching and give it three different causal articulations — covering law, correlational, interactional — to bridge the presumed chasm described by quantitative and qualitative accounts of causal efficacy in teaching. The theories of teacher efficacy I offer span a range of accounts of causation without loss of meaning in the variables they use. All the theories concern educational energy; but from different perspectives. Thus, my theory of teaching is trans-causal: It makes a variety of causal talks acceptable in education and, thereby, adds a multi-purpose tool, causal talk, to the workbenches of education theorists, researchers, and practitioners alike. While it adequately describes teacher efficacy at the interpersonal level, causal talk also guides construction and justification of teaching decisions at logical levels deeper and more general than individual assessment of pedagogical encounters and instructional action *in situ*. Causal talk, a trans-causal theory of teacher efficacy, turns teaching into the science of converting potential educational energy among students in any given classroom into kinetic educational energy among those students in that classroom.

---

<sup>1</sup> See Joseph A. Maxwell, "Causal Explanation, Qualitative Research, and Scientific Inquiry in Education," *Educational Researcher*, 33, no. 2 (March 2004): 3–11; Richard J. Elliott, "Causality, Values, and Education," *Journal of Thought*, 14 (January 1979): 29–32; George C. Stone, "John Dewey's Concept of Causation in Instructional Practice," *Journal of Thought*, 31, no. 2, (1996): 73–84; and Frances C. Wade, "Causality in the Classroom," *Modern Schoolman*, 28 (January 1951): 138–146.

<sup>2</sup> Various philosophies agree from Post-Kantian Idealism to Peircean Pragmatism to Pluralistic Postmodernism: James O. Bennett, "Dewey on Causality and Novelty," *Transactions of the Charles S. Pierce Society*, 16 (Summer 1980): 225–241; Jim Garrison, "Nietzsche, Dewey and the Artistic Creation of Truth," *European Journal of Pragmatism and American Philosophy*, 7, no. 2 (2015): 204–228; Jim Good and Jim Garrison, "Dewey, Hegel, and Causation," *Journal of Speculative Philosophy* 24, no. 2 (2010): 101–120; Larry Hickman, "Dead Souls and Living Instruments," *Southwest Philosophy Review*, 7, no. 1 (1991): 1–18; Bella K. Milmed, "Dewey's Treatment of Causality," *Journal of Philosophy*, 54 (January 1957): 5–18; and Robert Reuter, "The Radical Agent: A Deweyan Theory of Causation," *Transactions of the Charles S. Pierce Society*, 29, no. 2 (1993): 239–257.

Dewey provides a scientific theory of how to create educational value when he says, in *Experience and Education*, “Continuity and interaction in their active union with each other provide the measure of the educative significance and value of an experience.”<sup>3</sup> The theory is scientific since use of the word ‘measure’ suggests an equivalency, an equation, obtaining between continuity and interaction and the educational value of an experience. *Continuity* points out all experiences come out of the past (P), occur in the present ( $c_1$ ), and move into the future ( $c_2$ ). *Interaction* points out all experiences involve transaction between what goes on psychologically for the person having the experience and what goes on in physical and social environments in which the experience takes place ( $i^2$ ). Features of educational encounters of theoretical interest to Dewey are those that indicate school experiences ( $c_1$ ) that appeal to students’ ways of making meaning (P), that aid students in navigating their extra-school lives ( $c_2$ ), and that promote, in classrooms, conditions fostering shared desire among teachers and students to work together ( $i^2$ ). These are of theoretical interest to Dewey because these features describe experiences in which students are most likely to learn curriculum. (Each feature has been given a variable label in this paragraph to prepare the reader for next steps in development of what will be articulated as Dewey’s law.) Organizing the four variables provided by Dewey’s comment about continuity and interaction providing the *measure* of the educational value of an experience we can come up with what looks like a natural law about teaching. Call it the universal law of educational energy:

$$E = P \frac{c_1 c_2}{i^2}$$

Unfortunately, claiming that Dewey’s views enjoy the logical status of a law might make many philosophers of education balk. Such an achievement may be presumed to be impossible or outside the scope of Dewey’s thinking.<sup>4</sup> However, in opposition to this reluctance about laws Dewey embraces laws as scientific truisms, *pro forma* expressions of dialectical intent, not matters of fact. According to Dewey, the ancient Greeks achieved the idea of science without themselves becoming the best of scientists. They accomplished this sleight of mind by insisting that observations of and beliefs about natural events be focused away from the artisan’s concern with occasions of use; and focused instead on discovery of logical relationships among existences. Concentration on description of formal relationships among existences expressed in symbolic statements of wide scope is the distinctive intellectual characteristic of science. Science converts qualities to relations thereby infusing things with forms they did not have until subjected to scientific scrutiny. The implement the scientist employs to accomplish conversion of properties to relations is the law. Laws convert qualities to relations by describing some qualities

<sup>3</sup> John Dewey, *Experience and Education*, Volume 13, 1938-1939 *John Dewey: The Later Works, 1925-1953*, ed. Jo Ann Boydston (Carbondale: Southern Illinois University Press, 1988), 1-62. The quote comes from 26.

<sup>4</sup> It is worth noting that *Experience and Education* holds a unique place in Dewey’s *oeuvre* insofar as it was commissioned as a self-critical appraisal of its author’s previous thinking on the idea of education. J. Wesley Null mentions this fact at 1049, n. 36 of his “William C. Bagley and the Founding of Essentialism: An Untold Story in American Educational History,” *Teachers College Record* 109, no. 4 (April, 2007): 1013-1055. Barbara Levine tells the story in slightly more detail in her “Textual Commentary” on *Experience and Education* at 410-414 in Volume 13 of *John Dewey: The Later Works*.

as constant functions of some other qualities. Constant functions of related qualities find expression in law-like statements because it is a truism or a tautology to say that ordered relationships are mathematical or mechanical or logical in character. That is simply what it means, says Dewey, to say it is possible to regulate events in ways that achieve desired outcomes: “The technique of equation and other functions characteristic of modern science is, taken generically, a method of thoroughgoing substitutions. It is a system of exchange and mutual conversion carried to its limit.”<sup>5</sup> Dewey’s ideas connecting educational energy to qualities of experience describe a conversion of experience into education. As Dewey says, continuity and interaction *measure* educational value.

Considering more specifically the mathematical formulation given to Dewey’s ideas, note that the equation follows closely Dewey’s discussion of continuity and interaction as “Criteria of Experience,” the title of Chapter 3 of *Experience and Education*. Continuity is divided by interaction to capture the significance of Dewey’s claim that interaction influences the way continuity applies in some given experience. Importance is given in the numerator to the experiences brought by students to a lesson to accommodate Dewey’s use of stages of normal development talk and his insistence that no subject matter is intrinsically educative considered independently of the stage of growth a learner has achieved. Moreover, Dewey distinguishes closely between stage of development and inner states of learners. He argues that teachers must have a general understanding of the attitudes and habitual tendencies that are conducive to growth and be sympathetically, if not empathetically understanding of what in fact is going on in the minds of those who are learning at some given time in some given place. The elements of the numerator are multiplied together because they are the three elements of a single concept, continuity. Smaller values on any item in the numerator threaten large reductions of educational energy. Interaction is squared in the denominator to stress the importance of interaction to Dewey’s understanding of the connection between experience and education. The distance between inner and outer in an experience is measured, so to speak, twice in the formula to indicate that as distance between inner and outer in an experience increases educational energy decreases exponentially, not merely linearly. *Vice versa*, as distance decreases, educational energy increases at a rapid rate. Finally, Dewey’s claim that continuity and interaction are features of all personal experience permits statement of Dewey’s ideas on teaching as a universal law of educational energy. That is, although it is possible, as done here, to focus Dewey’s law on the educational energy expressed in experiences had at school, it is also the case that all experiences have some degree of educational energy because all experiences involve to some degree the qualities of continuity and interaction.

Dewey’s law looks like Newton’s universal law of gravitational attraction for three reasons: 1) to piggyback on an already accepted lawful statement, and one used by Dewey as exemplary of its kind; 2) to accommodate Dewey’s views on developmental psychology and effects of interaction on continuity (as discussed more fully in the immediately preceding paragraph), and 3) to provide epistemological power missing from most educational theory. This epistemological power derives from a strategic switch away from providing moral reasons for adopting democratic education and towards offering scientific reasons for adopting democratic education. As Dewey says, “What is implied in the constructive ideas of philosophy is that they have

---

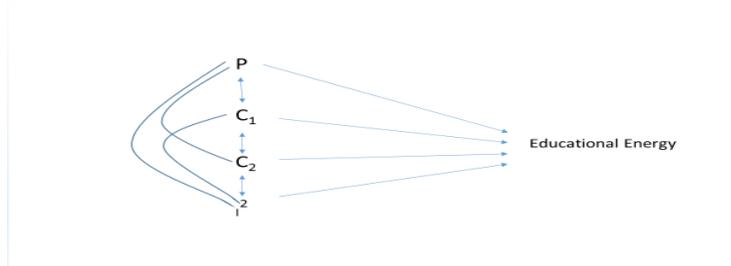
<sup>5</sup> Materials informing this paragraph and the paragraph immediately preceding it may be found in John Dewey, *Experience and Nature* in *John Dewey: The Later Works, 1925-1953*, Volume 1, 1925 ed. Jo Ann Boydston (Carbondale: Southern Illinois University Press, 1981), 119.

authority over activity to impel it to bring possible values into existence, not, as in the case of science, that they have authoritative claim to acknowledgement because they are already part of the order of nature.”<sup>6</sup> With Dewey’s law, teaching becomes the science of creating educational energy, or more in tune with scientific parlance, since energy can be neither created nor destroyed, with the universal law of educational energy teaching becomes the science of extracting maximal educational energy out of learning environments. Teaching is a process of converting potential educational energy into kinetic educational energy.

While the idea of educational energy may sound odd, think about prosaic but metaphorical ways we already speak in terms of educational energy: The “light bulb comes on” upon a sudden realization. We say one is “hit by a ton of bricks” when learning an important truth or encountering a life changing idea or event. We tend to quote favorably the proverbial description of “education as the kindling of a flame” rather than the filling of a vessel. Think of E as an example of what philosophers recognize as epistemic emotions, like surprise, curiosity, and (un)certainty.<sup>7</sup> ‘E’ describes the emotional intensity with which students learn.

However, stating Dewey’s theory of teaching in law-like fashion carries a logical cost. In *Logic: The Theory of Inquiry* Dewey creates a special place for law-like statements. The second section of the chapter on “Mathematical Discourse” has the italicized heading, “*The Two Types of Universal Propositions.*”<sup>8</sup> All universal statements claim abstract relations among concepts; but law-like statements claim application of those concepts to physical existence. Dewey marks this distinction by saying all universal propositions describe transformations; but laws describe processes of transformability among existing things. Like all laws, therefore, Dewey’s law must be given a material interpretation to describe its applicability to existence. Laws need flesh and bones, that is, expression as generic statements (universals that describe patterns among existences), and singular statements (descriptions of connections among particular things).

We can accommodate the need for an inductive version of Dewey’s law by rewriting it as Dewey’s heuristic: Changes in four independent variables (P,  $c_1$ ,  $c_2$ ,  $i^2$ ) explain changes in one dependent variable (E, educational value, or, as labeled in the model, educational energy):



<sup>6</sup> John Dewey, "The Determination of Ultimate Values or Aims Through Antecedent or A Priori Speculation or Empirical Inquiry," Volume 13, 1938-1939 *John Dewey: The Later Works, 1925-1953*, ed. Jo Ann Boydston (Carbondale: Southern Illinois University Press, 1988), 260-274. Find the quote on 263-264.

<sup>7</sup> For examples of these discussions see Peter Carruthers, “Are Epistemic Emotions Meta-Cognitive?” *Philosophical Psychology* 30, nos. 1-2 (2017): 58-78 and Randall Collins, *Interaction Ritual Chains* (Princeton, NJ: Princeton University Press, 2004).

<sup>8</sup> John Dewey, *Logic: The Theory of Inquiry* in *John Dewey: The Later Works, 1925-1953* Volume 12, 1938, ed. Jo Ann Boydston (Carbondale: Southern Illinois University Press, 1986), 394.

Following phenomenological theorist of sociology, Alfred Schutz, in materially interpreting Dewey's law/heuristic, we can also accommodate Dewey's singular statement requirement for explaining the causal efficacy by thinking in terms of life worlds pedagogy. According to Schutz, the life world is everyone's paramount reality and consists of stocks of knowledge, personal interests, and degree of interpersonal understanding.<sup>9</sup> Where Schutz says, generally, stock of knowledge, Dewey's law specifically directs attention when planning lessons to consideration of ways in which students make meaning in/of the world (P). Where Schutz says interests or relevancies, Dewey's law says pay attention to the pragmatic tasks students face ( $c_2$ ) as a rich resource to most closely connect curriculum to students' outside of school lives. Finally, where Schutz says, generically, interpersonal understanding, Dewey's law recommends focus on creation of classroom interaction ( $i^2$ ) that establishes meaningful academic relations with students as they complete classwork. Incorporation of each element Schutz finds invariant in the life-world into the structure of the universal law of educational energy demonstrates Dewey's law comprises a set of phenomenological variables. On this view, a teacher's job is to get students to adopt curriculum ( $c_1$ ) into their life world (P,  $c_2$ ,  $i^2$ ). Adoption of curriculum into one's life world converts potential classroom E into kinetic E to greater or lesser extent depending how deeply or shallowly curriculum is adopted into the life world.

The elements of Schutz' eidetic reduction of the life world map directly onto three of the independent variables in the universal law of educational energy: 1) knowledge, especially ways of meaning making, students bring to an educational experience, 2) the transaction of the process of the educational experience with student perception of the significance of the process, and 3) students' life outside the context of the educational experience. All but one independent variable of Dewey's law finds expression in the idea of the life world. The odd man out is curriculum ( $c_1$ ). The other independent variables match up to elements of the life world to permit assertion that educational experiences appealing to students' ways of making meaning, aiding students in navigating their extra-school lives, and promoting in classrooms conditions of social significance of interaction with the educational environment are lessons likely to concreate into, likely to become accepted as, part of students' life worlds. Because of its structural connection to the concept of the life world, Dewey's law may be understood to be describing effective instruction as a paradigm of life worlds pedagogy. Success of classroom instruction relies on instructor empathy towards students as informed by the universal law of educational energy. Seeing teaching as a process of connecting curriculum to students' life worlds makes teachers ethnographers of curriculum. Teachers considered as ethnographers of the curriculum make it their business to create events of concreation of curriculum into students' life worlds. These events of concreation, what Dewey may have called comings-to-know, produce educational energy. Dewey's law understands the work of teachers with students as a matter of creating educational energy in which teachers and students form academically significant relationships with one another at the intersection of their life worlds. The universal law of educational energy, when given a phenomenological interpretation, brings students and teachers humanly together in efforts meaningfully to share school curriculum.

Building such relationships among teachers and students taps into Dewey's vision of democratic education as the cutting edge of social hope. Consider two quotes from Dewey on this idea:

---

<sup>9</sup> Alfred Schutz, "Tiresias, or Our Knowledge of Future Events," in ed. Arvid Brodersen, *Alfred Schutz: Collected Papers, Volume II* (The Hague: Martinus Nijhoff, 1971), 276-285.

The aim of education is development of individuals to the utmost of their potentialities. But this statement as such leaves unanswered the question of the measure of the development to be desired and worked for. A society of free individuals in which all, in doing each his own work, contribute to the liberation and enrichment of the lives of others is the only environment for the normal growth to full stature. An environment in which some are limited will always in reaction create conditions that prevent the full development even of those who fancy they enjoy complete freedom for unhindered growth.<sup>10</sup>

and, “Democracy as a way of life is controlled by personal faith in personal day-by-day working together with others ... to cooperate by giving differences a chance to show themselves because of the belief that the expression of difference is not only a right of the other persons but is a means of enriching one’s own life-experience, is inherent in the democratic personal way of life.”<sup>11</sup>

Use of elements of the life world to materially interpret Dewey’s law protects the universal law of educational energy from claims that formalization of science is a source of irresponsible behavior by scientists. L’ubica Učnik, Ivan Chvatik and Anita Williams point out that formalized sciences tend to “proceed on the level of abstraction only. Leaving the life world behind, we assume that this formalized account of the world is more accurate, and therefore more true. We then proceed to use it to understand the life world.”<sup>12</sup> Absenting itself from the life world in this way, remarks Rosemary R. P. Lerner, science forgets that it “can only claim partial and relative truths and validities.”<sup>13</sup> “Formal procedures,” James Mensch notes, “are, in fact, omnipresent. From the algorithms determining market investments to the reduction of much of the social sciences to statistical analyses, both our claims and our decisions exhibit the formalization that marks our age.” The problem with the ubiquity of formal systems of science, from Mensch’s point of view, is that “formalization abstracts from the embodied particularity of being, thereby abstracting from both the individual that bears responsibility and the individual to whom he or she responds.” “Only by forgetting the embodiment,” Mensch continues, “...can we be trapped by this formalism.” When formalism neglects embodiment then formalism robs itself of claims to objective knowledge for it is “embodied particularity that is required for there to be genuine others and, hence, for there to be the objective knowledge that exists through intersubjective confirmation.” Thus, Mensch concludes, “respect for our embodied particularity, in both its capabilities and vulnerabilities, is something that formalization forgets only at its peril.”<sup>14</sup>

However, these concerns about formalization in science leading inevitably and with untoward effect away from the life world and toward entirely abstract thinking do not apply to

---

<sup>10</sup> John Dewey, “The Need for A Philosophy of Education,” Volume 9, 1933-1934 *John Dewey: The Later Works*, JoAnn Boydston, ed. (Carbondale: Southern Illinois University Press, 1986), 202.

<sup>11</sup> John Dewey, “Creative Democracy - The Task Before Us,” Volume 14, 1939 -1941 *John Dewey: The Later Works*, JoAnn Boydston, ed. (Carbondale: Southern Illinois University Press, 1988), 230.

<sup>12</sup> L’ubica Učnik, Ivan Chvatik and Anita Williams, “The Phenomenological Critique of Formalism: Responsibility and the Life world,” in eds. L’ubica Učnik, Ivan Chvatik and Anita Williams, *The Phenomenological Critique of Mathematization and the Question of Responsibility: Formalisation and the Life World* (New York: Springer, 2015), 12.

<sup>13</sup> Rosemary R. P. Lerner, “*Mathesis Universalis* and the Life world: Finitude and Responsibility,” in eds. Učnik, Chvatik and Williams, *The Phenomenological Critique of Mathematization and the Question of Responsibility*, 155.

<sup>14</sup> James Mensch, “Formalisation and Responsibility,” in eds. Učnik, Chvatik and Williams, *The Phenomenological Critique of Mathematization and the Question of Responsibility*, 187 and 195, respectively.

the science of teaching. Teaching carried out under the auspices of the universal law of educational energy, despite its mathematized scientific expression, does not and cannot forget the life world. The life world is that from which the universal law of educational energy draws its data. Dewey's law keeps Mensch's idea of embodied particularity at the forefront of teachers' attention. Successful teaching relies heavily on accurate understanding of students' biographically determined situations. Dewey's law is not a view from nowhere; but rather, describes a teacher's-eye view on students' life worlds vis-à-vis school curriculum. Dewey's law engages teachers and students in the infinite task of understanding one another. Mall makes the important observation that "Any open hermeneutics has for its motto: the will to understand and the will to be understood."<sup>15</sup> Dewey's law envisions teaching as an open process of mutual understanding and thus establishes teaching as an inherently responsible, even though mathematically formalized, science. Where the mark of a responsible science is the respect that science pays to the life world as the science is implemented, the science of teaching bears the mark of a responsible science. Despite being a formalized science, teaching remains a non-technized science.

Dewey's law, therefore, requires us to distinguish large culture from small culture. Adrian Holliday notes the need to distinguish two paradigms of culture. What has become the default notion of culture refers to prescribed ethnic, national, and international entities. This large culture paradigm is by its nature vulnerable to a culturist reduction of 'foreign' students, or 'foreign' teachers, and their educational contexts. In contrast, a small culture paradigm attaches culture to small social groupings or activities wherever there is cohesive behavior, and thus avoids culturist ethnic, national, or international stereotyping. Ethnography uses small cultures as the location for research, as an interpretive device for understanding emergent behavior, rather than seeking to explain prescribed ethnic, national or international difference.<sup>16</sup> As Russell Jacoby points out, pluralistic multiculturalism employing a large culture paradigm inevitably plays out as an attempt to get representation or power for one's preferred group and taps thoughtlessly and brutally into the ideology of the market. Cultures writ large simply become market niches when "Pluralism, the ideology of the market and the individual, becomes the bedrock principle of liberals and leftists." Behind a façade of cultural diversity lurks the monoculture of the market: "After the rhetoric is stripped away, the call for power and its decayed psychological form, empowerment, suggests a converging politics, monoculturalism. Everyone wants a bigger piece of the same action." Jacoby even goes so far as to argue that "Multiculturalism is not the opposite of assimilation, but its product." In this way, Jacoby denies the truth of the very first premise of arguments endorsing large culture cultural pluralism, namely, "that numerous distinct "cultures" constitute American society."

Small culture approaches to multiculturalism provide protection against the problem with identity politics described by Jacoby as bringing new players to the table but never changing the nature of the game. Discovery of difference is what remains new about postmodernism. Recognition of the inevitability and ubiquity of human variation is what makes postmodernism more than a mere reaction to modernism.<sup>17</sup> Collecting and cataloging differences in life worlds

<sup>15</sup> R. A. Mall, "Phenomenology – Essentialistic or Descriptive?" *Husserl Studies* 10 no. 1 (January 1993): 13-30. The quote comes from 25.

<sup>16</sup> Adrian Holliday, "Small Cultures," *Applied Linguistics* 20, no. 2, (June, 1999): 237-264.

<sup>17</sup> See Sarah Sutro, "Magnifying Stillness: Locating Meaning in the Work of Ephraim Rubenstein," at <http://www.nccsc.net/essays/magnifying-stillness> *American Arts Quarterly* 31, no. 4 (Fall, 2014). There Sutro quotes Robert Atkins, *ArtSpeak: A Guide to Contemporary Ideas, Movements, and Buzzwords, 1945 to the Present*,

are processes of the utmost importance to our understanding of how effectively to apply the universal law of educational energy to actual contexts of instruction. Differences in life worlds of students present the puzzle cases by which Dewey's law may be challenged and refined. Identifying relevant differences among life worlds is the infinite task set for educators putting to use the universal law of educational energy. This provides Dewey's law with a sense of unfinishedness, which makes irresponsible any claims that the law may be applied abstractly without due consideration of variations, real or potential, in the contexts of its application. However, by the same token, it is unlikely that discovery of even radical differences in life worlds will lead to rejection of Dewey's law altogether. That is because any differences that may be described will one and all be differences that describe life worlds. Thus, even as pluralistic postmodernists explore the potential infinity of variation found within the conceptual space inscribed by the phenomenological idea of the life world, Dewey's law will likely remain indefeasibly valid as a method guiding research in education principally concerned with how to improve instruction for students in schools. Because it is radically context-dependent, Dewey's law avoids postmodern concerns about totalizing metanarratives.

In all three causal iterations of Dewey's theory of teaching given here, meaning of the variables remains the same. Any inquiry at any of the three logical levels – universal, generic, singular – looks into causal efficacy of teaching in terms of the same ideas, namely, connection of curriculum to elements of student life world. The covering law statement guides research into effective teaching by suggesting ideas and experiments for inquiry into teaching and by ruling out at the conceptual level avenues of inquiry as dead ends. The variables included in the covering law suggest restatement as a set of variables which, taken together, correlate to teacher causal efficacy. The singular restatement of the heuristic as life worlds pedagogy informs research into teacher-student relations in the pedagogical encounter by seeing the end-in-view of the practicing teacher to be causal efficacy of instruction. Each form of study performs the same set of operations but each at its appropriate logical level. The universal law of educational energy offers a *lingua franca* meaningful all along the spectrum of causal understandings of teacher efficacy, promising to ameliorate longstanding controversy about assessing teacher effectiveness. Positivists, pragmatists, postmodernists, and practitioners can agree on the specific phenomenon of interest to them, each from a unique, but complementary angle. Conceptual and correlational understandings of teacher efficacy now support teachers in justifying instructional decisions from causal standpoints broader than individual perceptions of instructional situations. Causal talk is what philosophers of education bring to classrooms in an effort to ameliorate issues of power differentials among students and teachers, bringing both together in a shared search for significance in the educational activities they undertake together at the intersections of their life worlds.<sup>18</sup>

---

(New York: Abbeville Press, 1990), 132, who writes specifically about postmodern art that “It is important to distinguish what is new about postmodernism from what is a reaction to modernism.”

<sup>18</sup> For a more thorough articulation and more detailed defense of the ideas presented in this article see Greg Seals, *Teachable Moments and the Science of Education* (New York: Routledge, 2019). The present treatment draws deeply on the book but adds discussion of Dewey's theory of causation which was missing from the longer discussion. Thanks to Jim Garrison for pointing out that omission.