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# John Dewey's Critique of Scientific Dogmatism in Education and Implications for Supervision

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## Abstract

Drawing on Dewey's critique of the way educators, historically, have tried to promulgate definitive prescriptions for educational practice, this article examines implications of the use of science for supervisory practice and for the field of supervision as a whole. A content analysis of Dewey's *The Sources of a Science of Education* indicates the pervasiveness of the technocratic nature of teaching and supervision. Historical evidence is presented to indicate the degree and manner to which educators have tried to use science to justify inspectional and prescriptive practices of supervision. The significance of Dewey's work is in the realization that science alone should not dictate supervisory practice. Rather, viewing science with more tentativeness and exploration is needed. Lessons from Dewey's work are discussed, as are implications for the field of supervision.

## Keywords

Dewey and supervision; the science of supervision; history of supervision

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## Introduction

Arguably, the most egregious deficiency in education, and particularly in regards to the field of supervision, is its ahistoricism (e.g., Gordon, 2020). Educators, laypeople, policymakers, and other politicians often neglect to consider historical antecedents in promulgating and implementing ideas and programs. The past is viewed, at best, as an interesting exercise in nostalgia but with few lessons to inform and shape current practice. They eschew Ernst Cassirer's (1953) astute observation that the past, present, and future form an "undifferentiated unity and an indiscriminate whole" (p. 8). Fredrich Kummel (1966) explains this notion of temporality as a historical process "in which the past never assumes a final shape, nor the future ever shuts its doors." He continues, "Their essential interdependency also means, however, that there can be no progress without a retreat into the past in search of a deeper foundation" (p. 50).

To think historically requires a realization that past generations might have encountered equally intractable problems that we face today, and they might have invaluable suggestions to confront these issues. To think historically encourages the art of reflection and, at the same time, demands forbearance. To think historically means to ask these, among other questions: "How have significant ideas, events, and people influenced or informed current practice?"; "How are our advocated theories and prevailing practices connected to the past?"; and "What might we learn from the past to shape current policy and practice?"<sup>2</sup>

Past and current clarion cries for increased accountability (Smith & Benavot, 2019), implementation of high stakes testing within a standards-driven political economy (Au, 2015; Hursh, 2013), "rac[ing] to the top" by attempting to increase "student outcomes" within a globally competitive environment (Onosko, 2011), and eschewing technocratic approaches to teaching and supervision (Garman, 2020), viewed historically, are not new, albeit their form and emphases might vary. The national movement towards standards-based education with its emphasis on raising standards and promoting uniformity of curricular offerings to raise academic achievement, for instance, has been a long-established reform proposal (Seguel, 1966). Efforts over the past 30 years at establishing national or state standards have not been viewed within a historic context. We have not asked what can be learned from examining efforts by The Committee of Ten, of 1892, which sought to establish new curriculum standards for high school students so that all students would receive a high-quality academic curriculum (Kliebard, 1987).

Equally forgotten, is the establishment of the Commission on the Reorganization of Secondary Education in 1918 that advocated a diversified curriculum, making allowances for a variety of curriculum "tracks" for the varied abilities of students (Krug, 1964). Nor do we consider the development and impact of the College Entrance Examination Board (formed in the 1890s), the Scholastic Aptitude Test (the first SAT was administered in 1926), and the American College Testing Program (established in 1959) as guardians of standards applied to academic curricula. The passage of the National Defense Education Act (NDEA) which poured millions of dollars into mathematics, sciences, and engineering is similarly overlooked in the attempt to raise levels of student achievement and assessed by national standardized tests (Ravitch, 1995).

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<sup>2</sup> This article is based, in part, on research for a chapter I wrote in Stuckart and Glanz (2010).

Forgotten are the reforms of the early to mid-1980s (National Commission on Excellence in Education, Carnegie Forum on Education and the Economy, and the Holmes Report) in which attention was drawn to the assertion that schools had lowered their standards too much and that American students were not competitive with their international counterparts. In 1989, President George H. W. Bush and state governors held an Education Summit and established six national education goals to be achieved by the year 2000. Signed into law by Congress during the Clinton administration on March 31, 1994, "Goals 2000" proclaimed, in part, that by the year 2000 "U.S. students will be first in the world in science and mathematics achievement" and "Every school will be free of drugs and violence and will offer a disciplined environment conducive to learning."

In the early 1990s, the U.S. Congress established the National Council on Educational Standards and Testing (NCEST) that encouraged educators and politicians to translate somewhat vague national goals into content curriculum standards. NCEST recommended that educators establish specific standards in specific subject areas. The National Council of Teachers of Mathematics (NCTM) led the way by publishing standards that quickly influenced textbook companies and testing agencies. Continuing in the tradition of standards-based education, President George W. Bush signed into law the "No Child Left Behind (NCLB) Act of 2001," a reauthorization of the Elementary and Secondary Education Act Legislation of 1965, which has since morphed into the Every Student Succeeds Act (ESSA). President Obama's Race to the Top still casts its shadow through the Trump era, and likely into the Biden administration, encouraging predefined standards use of scientific data to measure teacher effectiveness and global competition.

Garman (2020) most recently, characterized these national proposals as a "decades-long nightmare of political accountability." In dramatic, almost poetic fashion, she personalizes quite effectively the impact of the "nightmare":

Thus we are forced to confront the nightmare, a country that is rapidly moving away from democratic principles and more towards an autocracy. For me, the question remains: How do I work with other educators to inquire about effective, democratic, and morally responsive supervision, curriculum, and pedagogy where the real work must be rendered in a world of horrifying illusion? I am constantly challenged to become a radical revolutionary to promote a praxis of resistance and culturally relevant pedagogy that addresses the structural inequities that have existed for so long in our nation. (p. 16)

All these proposals that Garman (2020) decries, and I enumerated above, that rely on questionable scientific data practices, it seems to me, serve, most simply, to revisit past educational transgressions, and might, even worse, exacerbate and sustain the very problems they were meant to resolve.

This article focuses on supervisory practice that has mirrored, in many ways, more general developments described above in regards to education and curriculum. Furthermore, although examination of science regarding education and curriculum has been undertaken (see, e.g., Kliebard, 1987), little, if any, attention has been paid to this topic in the field of supervision. Therefore, the nature of scientific inquiry itself is examined in regards, specifically and narrowly, to supervisory theories and practices that have gained attention and legitimacy amidst the

prevailing standards-based educational environment. I will examine possible antecedents for present-day proclivities to implement "science-less" supervisory practices that have not undergone empirical scrutiny. I will also point out that Dewey's work may help us place current supervisory efforts in a sounder, more "scientific" frame.

This work began when I reread John Dewey's (1929) often neglected work titled *The Sources of a Science of Education*. This seventy-seven-page essay is remarkable in several ways. First, it represents a concise yet strident critique of educational practice in the early decades of the twentieth century. Dewey chastises educators who seek to apply preliminary yet unproven scientific findings to immediately solve urgent practical problems in schools, Dewey charts an intellectually cogent path for establishing a scientific base to education, teaching, and curriculum.

A second reason why Dewey's work is so important is that it influenced some educators in his day to address difficult problems facing schools. Ever-increasing administrative and organizational demands of the newly established school bureaucracy necessitated, for instance, better means of facilities management, operational governance, curriculum development, and ensuring teacher quality. Educators looked to science to help provide some answers and guidelines for practice. In this light, Dewey's admonitions, in his day, are historically relevant.

Third, highlighting Dewey's arguments sheds light on a nearly forgotten period in American educational history, and serves as a guidepost to help current educators find an appropriate and reasonable balance between the art and science of teaching. And finally, Dewey's work can perhaps serve as an intellectual anchor to address current supervisory practices within an educational and political climate that seeks quick solutions to intractable problems.

In this article, I use historical research with an emphasis on content analysis (Krippendorff, 2018) while examining Dewey's *The Sources of a Science of Education*, since it plays a pivotal role in more deeply understanding the origins of many dilemmas we face in schools, and more particularly, related to issues faced by the field of supervision. I perused the literature that critiques, and rightly so, the technocratic, myopic, and destructive nature of policies and programs that have dominated the educational milieu over the past forty years or so. I was motivated to write this article, utilizing Dewey's work as its fundamental rationale, to indicate the possible origins of our problems because without precisely identifying the source for the technocratic nature of teaching and supervision, we may either miss important directions to take or, perhaps even more egregiously, repeat past mistakes.

My research was guided by one overarching question, "What are Dewey's arguments for establishing sources of science in education given the context in which it emerged?" The next section addresses this question. Following this history, I will attempt to answer, "What is the historical significance of Dewey's work and what can we learn from it?" Then I will offer a conclusion, but perhaps a not too optimistic one.

## Historical Perspective

There is no extant and complete research in the field of supervision that examines this topic (i.e., John Dewey and the science of supervision). Some authorities have tangentially addressed some of these issues (e.g., Tomlinson, 1997). A few dissertations have as well (Arlington, 1972; Button, 1961; Glanz, 1977). These doctoral dissertations were general treatments but not in-depth analyses. What follows then is a historical perspective forming the core of the study.

Unprecedented growth precipitated by the industrial revolution characterized the second half of the 19th century. During this period, schoolmen, specifically superintendents, began shaping schools in large cities into organized networks. In the battle that ensued to reorganize the nation's schools, sources of authority and responsibility in education were permanently transformed (Tyack, 1974). By the end of the 19th century, reformers concerned with undermining inefficiency and corruption transformed schools into streamlined, central administrative bureaucracies with superintendents as supervisors in charge.

Supervision, during this struggle, became an important tool by which the superintendent legitimized his existence in the school system (Glanz, 1977; 1991). Supervision, therefore, was a function that superintendents performed to oversee schools more efficiently. Supervision can best be viewed as an inspectional function during this period. The practice of supervision by inspection was indeed compatible with the emerging bureaucratic school system with its assumption that expertise was concentrated in the upper echelons of the hierarchy.

Many teachers perceived supervision as inspectional, rather than as a helping or improvement function. Numerous technological advances greatly influenced American education after 1900. As a result of the work of Frederick Winslow Taylor (1911), who published a book titled *The Principles of Scientific Management*, "efficiency" became the watchword of the day. Taylor's book stressed scientific management and efficiency in the workplace. The worker, according to Taylor, was merely a cog in the business machinery, and the main purpose of management was to promote the efficiency of the worker. Within a relatively short period of time, Taylorism and efficiency became household words and ultimately had a profound impact on administrative and supervisory practices in schools.

Franklin Bobbitt (1913), a professor at the University of Chicago, tried to apply the ideas that Taylor espoused to the "problems of educational management and supervision." Bobbitt firmly held that management, direction, and supervision of schools were necessary to achieve "organizational goals." Bobbitt maintained that supervision was an essential function "to coordinate school affairs.... Supervisory members must co-ordinate the labors of all, ... find the best methods of work, and enforce the use of these methods on the part of the workers" (pp. 76, 78). The employment of scientific principles in supervision, said Bobbitt, is a necessity for the continued progress of the school system.

Many supervisors, including principals, were eager to adopt Bobbitt's ideas of scientific management for use in schools. Just as "supervision as inspection" reflected the "emergence of bureaucracy" in education, so too "supervision as social efficiency" was largely influenced by scientific management in education. It is within this context that Dewey's work emerged.

The movement to alter supervisory theory and practice toward more democratic and improvement foci, while at the same time minimizing the evaluative function, occurred in the 1920s as a direct result of growing opposition to autocratic supervisory methods. Influenced in large measure by Dewey's (1929) theories of democratic and scientific thinking as well as by Hosis's (1920) ideas of democratic supervision, supervisors attempted to apply scientific methods and cooperative problem-solving approaches to educational problems (Pajak, 1993). Dewey's work, in particular, served as the intellectual impetus to marshal opposition against emerging attempts to apply social efficiency to educational problems.

Examination of the literature indicates, however, that the momentum of social efficiency with its crude and ill-conceived application of science to solve educational problems gained rather than lessened as a result of Dewey's work. Although in the 1930s and 1940s educators believed that autocratic supervisory practices were no longer viable, they urged for more scientific approaches to supervisory practice in schools. In much earlier times, supervision was conducted by employing checklist-type rating cards. The early attempts to apply science via "rating cards" were now losing favor. Burton (1930), a prolific writer in supervision, explained that the use of "rating schemes from our prescientific days, . . . would be wholly inadequate today." Although Burton recognized the usefulness of rating in some instances, he believed that "it is desirable and rapidly becoming possible to have more objectively determined items by means of which to evaluate the teacher's procedure" (p. 405).

One of the foremost proponents of science in education and supervision was A. S. Barr (1931). He stated emphatically that the application of scientific principles "is a part of a general movement to place supervision on a professional basis." Barr stated in precise terms what the supervisor needed to know:

Supervisors must have the ability to analyze teaching situations and to locate the probable causes for poor work with a certain degree of expertness; they must have the ability to use an array of data-gathering devices peculiar to the field of supervision itself; they must possess certain constructive skills for the development of new means, methods, and materials of instruction; they must know how teachers learn to teach; they must have the ability to teach teachers how to teach, and they must be able to evaluate. (p. x)

"In short," concluded Barr, "they must possess training in both the science of instructing pupils and the science of instructing teachers. Both are included in the science of supervision" (p. xi).

Barr (1925) said the supervisor should "first formulate objectives, followed by measurement surveys to determine the instructional status of schools. Then, probable causes of poor work should be explored through the use of tests, rating scales, and observational instruments" (p. 360). The results of supervision, continued Barr, must be measured. Most important, according to Barr, the methods of science should be applied to the study and practice of supervision. More concretely, he asserted that a scientific analysis of teaching is a necessary part of the training of a supervisor: "How can the scientific knowledge of the teaching process be brought to bear upon the study and improvement of teaching?" Barr contended that teaching could be broken down into its component parts, and that each part had to be studied scientifically. If good teaching

procedures could be isolated, thought Barr, then specific standards could be established to guide the supervisor in judging the quality of instruction. He based his scientific approach to supervision "upon the success of the professional student of education in breaking up this complex mass into its innumerable elements and to study each objectively" (pp. 360, 363).

One of the earliest objectors to the use of scientific supervision was a professor of education at Ohio State University named Orville G. Brim. In an article entitled "Changing and Conflicting Conceptions of Supervision," Brim (1930) acknowledged "the rapid growth of scientific supervision." He labeled the application of science to the work of supervisors as "inspectorial, a fact-finding process." He claimed that the use of "diagnostic tests" and recording teacher behaviors in "numerical form" had the "quality of authority, of finality." Decrying such an application of science to the work of supervision, Brim stated emphatically and with a tinge of sarcasm:

This belief in the reliability of the findings of scientific investigations, the belief that the standard established should become the universal practice, has tended to make the scientific supervisor more autocratic than his predecessor, the inspector, for the scientific supervisor thinks he has the authority of 'facts' spelled in capital letters. (p. 133)

While others joined Brim in his condemnation of the injudicious application of science to supervisory practice, the impetus for their criticisms can be found in the groundbreaking work of John Dewey (1916, 1929). Dewey (1916) believed that the future of civilization depended "upon the widening spread and deepening hold of the scientific habit of mind; and that the problem of problems in our education is, therefore, to discover how to mature and make effective this scientific habit" (Boydston, 1985, p. 78). Dewey (1916) held that:

Science must have something to say about what we do, and not merely about how we may do it most easily and economically. . . . When our schools truly become laboratories of knowledge-making, not mills fitted out with information-hoppers, there will no longer be need to discuss the place of science in education. The problem of educational use of science is to create an intelligence pregnant with belief in the possibility of the direction of human affairs by itself. . . . The method of science engrained through education in habit means emancipation from rule of thumb. (pp. 167, 168)

Dewey (1916) asserted that science, to have any lasting effect in schools, must be grounded in the "lived experience" of the members of each school. Science is experience becoming rational, said Dewey. "The effect of science is thus to change man's idea of the nature and inherent possibilities of experience." By the same token, he said:

...it changes the idea and the operation of reason. Instead of being something beyond experience, remote, aloof, concerned with a sublime region that has nothing to do with the experienced facts of life, it is found indigenous in experience: the factor by which past experiences are purified and rendered into tools for discovery and advance. (p. 228)

Dewey, in sum, believed that scientific theory was related to practice "as the agency of its expansion and its direction to new possibilities" (p. 228).



Dewey's (1929) most scathing critique of existing scientific practices in the schools, as well as the most lucid exposition of his ideas on scientific inquiry, was set forth in his sometimes read, but not understood, volume *The Sources of a Science of Education*. In response to the question: "is there a science of education? . . . Can there be a science of education?" Dewey replied that while scientific and systematic investigation sheds light on a range of facts by enabling "us to understand them better and to control them more intelligently, less haphazardly and with less routine," our current utilization of science in schools is inadequate and misdirected. He denounced the current practice of science in education. There is "a strong tendency to identify teaching ability with use of procedures that yield immediately successful results, success being measured by such things as order in the classroom, correct recitations by pupils in assigned lessons, passing of examinations, promotion of pupils to a higher grade, etc." Educators, he charged, "want recipes for classroom success." This view of "science is antagonistic to education as an art," declared Dewey (pp. 14, 17).

Dewey claimed the use of rating schemes was not an "enhancement of science in education," but a detraction from the true aims of science. "Such attempts, even when made unconsciously and with laudable intent to tender education more scientific," he said, "defeat their own purpose and create reactions against the very concept of educational science" (p. 5). Dewey concluded his little book with a recapitulation and final admonition. The only way, said Dewey, to create a science of education is to involve oneself in the "educational act itself." The intense interaction between practitioner and pupil will in and of itself yield "scientific formulations." He then says:

Education is by its nature an endless circle or spiral, . . . in its very process it sets more problems to be further studied, which then react into the educative process to change it still further, and thus demand more thought, more science, and so on, in everlasting sequence. (p. 70)

Dewey (1929) warned that to ignore the value of "experimentation and discovery" will lead to a mistaken conception of the "true meaning of scientific inquiry" (p. 2). Science based on experimentation, said Dewey, is emancipatory and purposeful. Dewey's ideas of science as applied to educational practice did not receive wide acceptance. Supervisors, in particular, did not adopt Dewey's model of scientific inquiry. Much of his writing, especially about the science of education, was technical and enigmatic in its presentation. As a result, confusion and misinterpretation of Dewey's views prevailed.

Given the fact that there was much misunderstanding, it was not surprising that supervisors did not adopt Dewey's ideas. More significantly, supervisors eschewed his ideas about science because they were more interested in definite, ready-made prescriptions. Dewey's admonitions to avoid definitive scientific formulations in favor of gradual experimentation of ideas in the classroom did not find favor among supervisors. Supervisors desperately wanted instant solutions to the problems they faced in schools. Rating schemes, for example, were appealing to supervisors because they could, it was thought, accurately assess the performance of teachers' work. Their ideas backfired as teacher opposition to rating schemes and misuse of science grew in intensity (Hill, 1918; Rousmaniere, 1992).

Although Dewey's ideas did not hold sway in most schools, proposals were proffered that aligned with Dewey's scientific formulations. Throughout the thirties, forties, and fifties, the idea that supervision involves improving instruction based on classroom observation gained momentum (see, e.g., Burton & Brueckner, 1955). Supervision as a means of improving instruction through observation was also reinforced by the use of "stenographic reports" which was the brainchild of Romiett Stevens, a professor at Teachers College, Columbia University. Stevens thought that the best way to improve instruction was to record verbatim accounts of actual lessons, "without criticism or comment." Stevens's stenographic account was "the first major systematic study of classroom behavior" (Hoetker & Ahlbrand, 1969). Dewey, I surmise, would have applauded Stevens's stenographic accounts because they were descriptive, not prescriptive. Stevens' work needs greater attention because it laid the groundwork for much of the descriptive, non-judgmental approaches of supervision that were advocated in the 1970s and still in use today.

As supervision matured in theory throughout the fifties and beyond, emphasis was placed on participative and collegial functions of supervision. Invented by Morris Cogan (1973) at Harvard University, clinical supervision was conceived as a "vehicle for developing professionally responsible teachers who were capable of analyzing their own performance" with an "emphasis on reflective problem solving" (Pajak, 2000, p. 5). Goldhammer (1969), one of the early proponents of clinical supervision and a student of Cogan, stated that the model for clinical supervision was "motivated, primarily, by contemporary views of weaknesses that commonly exist in educational practice" (p. 1).

The premise of clinical supervision was that a prescribed, formal process of collaboration between teacher and supervisor could improve teaching. The literature of clinical supervision has been replete with concepts of collegiality, collaboration, assistance, and improvement of instruction. Garman's (2020) recent article on this topic sheds more in-depth light than I have space for here. Suffice it to say, clinical supervision favored collaborative practice over inspectional, faultfinding supervision. Supervision as a science seemed to take a backseat to more simply engaging teachers in meaningful conversations about their practice in the classroom. Prescriptive measures of supervision were not advocated.

It should be noted, though, that as is usual practice in education and supervision, in particular, a disconnect between advocated theory and everyday practice in schools existed. Many schools, despite advocacy for collaboration, incorporated traditional forms of inspectional supervision. Such practices focused on observation usually for evaluation wherein a supervisor observes a teacher (a pre-conference might have occurred) and then writes up a formal evaluation for the teacher's file (a post-conference may or may not have occurred). Supervision of this sort was reminiscent of impressionistic and evaluative supervisory practices throughout the early twentieth century.

From the 1980s and over the next several decades a spate of alternative methods of supervision arose. In the early eighties, developmental supervision, in which varying levels of teaching abilities were acknowledged, gained attention (Glickman, 1981). By the end of the decade transformational leadership, which advocated that supervisors serve as change-agents, became popular (e.g., Leithwood & Jantzi, 1990). Other writers, in the 1990s, advanced alternative

approaches known as “culturally-responsive” supervision (e.g., Bowers & Flinders, 1991). Teacher empowerment (e.g., Darling-Hammond & Goodwin, 1993) gained attention as a viable means for teachers to become active participants in decision-making processes in schools. Peer supervision (e.g., Willerman et al., 1991) appeared in the literature as an alternative to traditional supervision by “professionally trained supervisors,” as did cognitive coaching (Costa & Garmston, 1994). Other collegial and democratic supervisory methods continued to receive attention (e.g., Ovando, 1995, 2000).

The publication of *Supervision in Transition* in the early 1990s by the Association for Supervision and Curriculum Development (ASCD) marked a refinement in the changing conception of supervision as a democratic enterprise. Other models and conceptions of supervision emerged in an attempt to extend democratic methods to disassociate itself from bureaucratic, inspectional, and “scientific” supervision. Yet, the high-stakes accountability era held sway wherein directive approaches to supervision were commonplace (Marshall, 2003; Sullivan et al., 2005). One such practice, known as the walk-through, was promulgated by Downey et al., (2004) in a volume titled *The Three-Minute Walk-Through*. Such practices found justification within a standards-based educational milieu. They also found legitimacy given the overall pejorative legacy of the supervision field. “Walk-throughs,” conceived of as a democratic process, involving teachers, was used primarily as a monitoring tool (Roberts, & Pruitt, 2003). Such a supervisory practice was aligned with attempts to discover a science of teaching.

A perusal of the supervision literature from the beginning of the new century until today indicates that the supervision field still has difficulty ridding itself of its historic legacy. Space limitations allow for just a few notations. Sterrett et al. (2020) describe the “powerful potential” to achieve, what I would call, a Deweyian approach built on “reflection and collaboration.” They discuss the “potential,” indicating we are not there yet, by any stretch of the imagination. Garman (2020) more starkly paints a, certainly anti-Deweyian, gloomy picture:

The educational nightmare of accountability is the world of bogus claims of research-based practices, data-driven instruction, prepackaged and scripted curricula, classification of students and teachers, standardized rubrics and tests, AYP progress goals, and large scale data reporting, all in the service of political and economic imperatives made manifest through a dominant political spectacle of ‘accountability and choice.’ In this nightmare it appears that we have abandoned our democratic aspiration to create an educational system that meets the individual needs of every child, while at the same time allowing the roles of the supervisor to be eroded. (p. 16)

### **Lessons from Dewey**

Dewey understood, perhaps more than anyone during his day, the interrelationship among the educational enterprise, the role of a school in society, and the nature of teaching and learning. He realized the dialectical relationship between an academic discipline and curriculum. He knew that education, as a whole, and teaching, particularly, were social, dynamic processes not easily manipulated to conform to prescribed formulae. He cherished the learner and understood deeply the sacred job of a teacher.

Dewey's work is significant because it represents a clear and cogent departure from rigid conceptions of education based on vestiges of the bureaucracies of the past. Even more important is that Dewey and his colleagues confronted seemingly intractable problems not too dissimilar from ones faced by later generations of educators. The conditions and circumstances might have changed, but the fundamental premises and issues remain entrenched. Educators in Dewey's day realized these problems and looked to science for a cure-all. Dewey's vociferous attack was not necessarily about their attempt to study education scientifically. His critique centered on a two-fold problem. First, he lamented their impatience for quick solutions. "Learning to wait," Dewey (1929) explained, "is one of the important things that scientific method teaches, . . ." (p. 42). Dewey criticized educators who looked to science to provide ready-made answers. Second, and not an unrelated point, when science, he said, did yield some valuable (or in today's lingo "research-based") findings, even then, a deliberate, tentative, and inquiring stance must be taken.

Crucial to understanding Dewey's perspective and significance is:

...that the final reality of educational science is not found in books, nor in experimental laboratories, nor in the class-rooms where it is taught, but in the minds of those engaged in the educative act. But they are not *educational* [italics in original] science short of this point. They are psychology, sociology, statistics, or whatever. . . . This is the point upon which my whole discussion turns. We must distinguish between the sources of *educational science* [italics in original] and scientific content. We are in constant danger of confusing the two; we tend to suppose that certain results because they are scientific, are already educational science. Enlightenment, clarity and progress can come about only as we remember that such results are *sources* [italics in original] to be used, through the medium of the minds of educators, to make educational functions more intelligent. (pp. 32-33)

Surveying the scientific dimensions of supervision in light of Dewey's work, Killian and Post (1998) document the historic proclivity to cling to theories of scientific management in education and their impact on supervisory practice. They explain that as long as society values a technical-rational approach that emphasizes scientific discoveries as paramount, scientific conceptions of supervision are inevitable. Killian and Post explain, ". . . claiming that supervision and teaching are applied sciences lends respect to those fields, and that trying to use research to identify the 'one best practice' is attractive." They state that "teaching and learning are too complex to be captured simply. In the real world of teaching, none of the assumptions hold up very well and the related practices portray an unrealistic view of teaching and supervision" (p. 1051).

A more realistic view is aligned with Dewey's notions of the tentativeness of science in education and its exploratory nature. Killian and Post cite a variety of "problems that plague applications of scientific management to supervisory practice" including, among others, "rushed implementation" (p. 1051). "Failure to establish an adequate research base in advance of implementation," they explain, results in catastrophe (p. 1052). They offer this concluding note, scientific supervision, stemming from the days of Taylor and Bobbitt, "continues to be a major competing force in supervision." They say, we seem to prefer the exact answer to a wrong question rather than an approximate answer to the right question. Killian and Post end, "The important issue thus becomes, not so much whether the legacy of scientific management will

endure, but whether our predilection for the most simplistic of its forms can be tempered by some lessons learned about its failures” (p. 1052).

Research-based practices are given much attention without, unfortunately, sufficient scrutiny as to their effectiveness. The proverbial bandwagon approach remains pervasive in our field. We need to understand that an over-reliance on "research-based" practices without examining the research underlying the particular practice is misguided. We need to understand that education is multivariate, and deriving findings without realizing the tentativeness of the findings is unfortunate. W. James Popham, Emeritus Professor in the UCLA Graduate School of Education (personal conversation) astutely observed that "even 'sound science,' at the very best, will only allow us to say, "If I use this research-supported tactic, it is more likely that my students will achieve the curricular aim I have in mind for them than if I did not use this research-supported tactic—but I can't be certain that it will work."

The late and famed Edward Pajak, a respected professor of supervision and former Chair of Education at Johns Hopkins University (personal conversation, Glanz, 2018) agreed that “the field of supervision doesn't seem to have much of a memory, which is true of education generally.” He also concurred that “Dewey’s influence on thinking in our field has been significant, but largely forgotten.” As regards a “science of supervision,” he said, “I think you're correct that we're now looking for scientific ‘answers,’ instead of employing the scientific process to the work of educators, which is what Dewey really proposed.”

## **Conclusion**

So, what can we learn from Dewey’s understanding of science and how might such an understanding inform current and, perhaps, future supervisory practice? The field of supervision needs to redefine, reculture, or, even, re-find itself (see English, 2007, who makes a similar argument about educational administration, albeit for different reasons). I think we need to find a more appropriate and reasonable balance between the art and science of teaching. Robert H. Anderson, one of the founders of the Council of Professors of Instructional Supervision (COPIS) and former professor at Harvard University (personal communication, Glanz, 2018) said that for us to have a science of supervision or education for that matter, we need to continue research to establish a “solid base” for teaching practice. Extant research findings, verified time and time again in differing contexts, it seems to me, is critical for establishing such a base. Moreover, additional empirical research in the field of supervision is critical. This journal has begun to inspire such work.

Continued research will provide us a deeper, more thorough understanding of good teaching practice and the role those concerned with instructional improvement can play. Supervision, certainly, can benefit profoundly from such a teaching research base to inform work with teachers. But in the end, a science of education is not what we should be looking for. Rather, as Dewey has admonished, we need to look for the “sources” of a science of education. In that light, our work is much more nuanced and tentative, less dogmatic and prescriptive. For Dewey, even expressed in his later works (Dewey, 1938), inquiry should be viewed as “thoughts-in-progress” to eschew misunderstandings and outright errors. Supervision, thus, becomes a process of engaging teachers in an artful, in-depth, and continuous dialogue or conversation about what is

transpiring in the classroom. That is the lesson I think Dewey would advocate. On this very point, Dewey (1929) said that education is unlike physics, chemistry, or biology.

Just because educational science has no such achievement of laws to fall back upon, it is in a tentative and inchoate state.... To treat them as scientific rather than as philosophic is to conceal from view their hypothetical character and to freeze them into *rigid dogmas* [italics added] that hamper instead of assisting actual inquiry. (p. 55)

As promised, I want to end in a more doleful, less Pollyannaish fashion. Our overly optimistic and hopeful approach has not worked because, at its essence, it is oblivious to the political realities in our midst. As long as policymakers hold sway, and as long as educators, and in our particular case, professors of supervision, are unable to present a cogent rationale for the essential nature of our work, little will change. Organizations aligned with the beliefs and values about teaching and learning that members of COPIS and the AERA-SIG hold dear, need to politically unite against forces that constrain and extinguish innovation (Gordon, 2019). The opposing forces are surely awesome. NCLB and Race to the Top had and still has bipartisan support. In the troubled world in which we now live, given the pandemic, attention is not focused on the issues Dewey highlighted. Our work, thus, is placed on the proverbial "back-burner."

However, if we can, indeed, marshal our troops, so to speak, through continued empirical research and increased political advocacy, among other strategies, then we have in John Dewey a progenitor who has given us the philosophical and theoretical framework to make positive change a reality. In this struggle, we must relinquish the quest for scientific certainty in our work, as Dewey (1988) has so eloquently advocated. In closing, I guess I am more of an "idealistic optimist," rather than a pessimist. That is, I am optimistic, but only in the long run.

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