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LEAD ARTICLE

“THE SHAME OF AMERICAN EDUCATION” REDUX

Robin Rumph, Chris Ninness, Glen McCuller,
James Holland, Todd Ward, and Tiffany Wilbourn¹
Stephen F. Austin State University

ABSTRACT: Skinner's classic article is reinterpreted in light of contemporary events. Skinner principally blamed cognitive psychology and colleges of education for the shameful state of American education. This paper asserts it is the philosophy of progressive education and its dominant influence over how teachers are trained that are largely the causes of American educational ineffectiveness. The authors analyze progressive education and No Child Left Behind (NCLB) using organizational, metacontingency, and macrocontingency analysis. The authors support NCLB's and the Individuals with Disabilities Education Act's (IDEA) emphasis on science-based pedagogy as a step in the right direction.

KEYWORDS: Progressive education, metacontingency, macrocontingency, NCLB, IDEA, pedagogy

Skinner's (1983) classic paper “The Shame of American Education” was originally published in the *American Psychologist* and later appeared in a collection of Skinner's papers (1987). It was aimed directly at cognitive psychologists. Skinner blamed modern cognitive psychology, in part, for the United States being what the National Commission on Excellence in Education (NCEE, 1983) termed “*A Nation at Risk*.” The NCEE report described the United States as being threatened by “a rising tide of mediocrity.” Skinner (1987) also blamed colleges of education as the place where “psychological theories come into the hands of teachers” (p. 120).

HISTORICAL ROOTS OF PROGRESSIVE EDUCATION

The failure of colleges of education to teach science and subject-based pedagogy has a long history that cannot be attributed solely or even primarily to cognitive psychology. To be sure, mentalistic psychologies have influenced education but other historically significant influences are clearly evident. In the 1920s and 30s, William Heard

¹ Author note: Portions of this paper were presented at the 31st annual convention of the Association for Behavior Analysis, Chicago, May, 2005. We gratefully acknowledge Angela Ford for contributions in developing this manuscript. Correspondence concerning this article should be directed to Robin Rumph, School & Behavioral Psychology Program, PO Box 13019 SFA Station, Stephen F. Austin State University, Nacogdoches, TX, 75962 (email: rrumph@sfasu.edu).

Kilpatrick, George Counts, and Harold Rugg of Columbia's Teachers' College set forth and promulgated the social reconstruction wing of the progressives' educational agenda. Their goal was to transform American public schools with the goal of transforming the larger society. They saw the public schools as a means to a socialist end.

E. D. Hirsch (1996) chronicles the key historical events in progressive education's birth during the early part of the 20th century. For Hirsch, William Heard Kilpatrick was "the most influential introducer of progressive ideas into American Schools of education." Kilpatrick's (1918) "project method" article was the most widely distributed of its era and still serves as one of the current bases for "hands on learning," "holistic learning," and "discovery learning."

Rugg and Shumaker (1928) published the influential *The Child Centered School* which remains a center point of progressive education's attack on subject matter based pedagogy. They state:

The hallmarks of the new school are freedom, activity, and creative self-expression. The old school is described as the listening regime, a place of fears, restraints, and long weary hours of suppression whose philosophy is based on outmoded allegiance to discipline and subject matter. The new school is devoted to self-expression and maximum child growth, a place where children are eager to go to school because...they mold in clay and sand, they draw and paint, read and write, make stories and dramatize them, they work in the garden, they churn and weave and cook: its philosophy is the concept of Self. The whole child is to be educated, hence the materials of education are as broad and interrelated as life itself. For experience is not only an intellectual matter; it is physical, rhythmic, emotional. (cited from Hirsch, 1996, p. 52)

Counts (1932) challenged his progressive colleagues in the Progressive Education Association to go beyond their upper middle class histories and reject the influences of capitalism. He urged his colleagues to emancipate themselves

from the influence of this class, face squarely and courageously every social issue, come to grips with life in its stark reality, establish an organic relation with the community, develop a realistic and comprehensive theory of welfare, fashion a compelling and challenging vision of human destiny, and become somewhat less frightened than it is today at the bogeys of imposition and indoctrination.

His view was that the classroom teacher could undo the cultural indoctrination of capitalism and remake society by counter-indoctrination in socialistic ideas (Counts, 1932). Counts is the ideological predecessor of critical pedagogy that combines Marxian analysis, pedagogy, and social transformation.

Critical pedagogy problematizes the relationship between education and politics, between sociopolitical relations and pedagogical practices, between the reproduction of dependent hierarchies of power and privilege in the domain of everyday social life and that of classrooms and institutions. In doing so, it advances an agenda for educational transformation by encouraging educators to understand the sociopolitical contexts of

“THE SHAME OF AMERICAN EDUCATION” REDUX

educative acts and the importance of radically democratizing both educational sites and larger social formations” (Fischman & McLaren, 2005, p. 425).

PROGRESSIVE VIEWS

It is this history of progressivism in education that has resulted in failing schools. Cognitive theories are chosen by the progressives to the extent that they reflect progressive views or to provide cover for their underlying subjectivism and activism. When using the term “cognitive skill” in a meeting with a progressive colleague one of the authors was informed that term “cognitive skill” was a repugnant behavioral term. Although progressive educators find behaviorism loathsome, they are not necessarily enamored with cognitive psychology either. Progressive education’s allegiance to some particular cognitive psychology is determined more by its contribution to a larger world view of romanticism, naturalism, or socialism/Marxism than any scientific allegiance to its views and methods.

Evers and Clopton (2003) suggest that progressive ideas in the early 20th century grew from an activist religious piety they termed “*pietist millennialism*.” Much of the religious zeal of this view was secularized and attached to the social reconstructivists’ agenda of transforming society. Evers and Clopton (2003) state: “Armed with moralistic self-assurance, scientific sounding rhetoric and with an anti-intellectualism inherited from the Romantic movement progressive educators have consistently resisted academic rigor in the school classroom” (p. 261). Even today, the progressives claim the moral high ground, even though it has become increasingly clear that the pedagogies they have championed have been failing while effective alternatives have been readily available (Carnine, 2000). No amount of objective data has yet been enough to convince them that their religion-like belief system is the cause of the dismal performance of American schools.

Hirsch (1996) described the culture of progressive education as a “thoughtworld,” “an impenetrable fortress,” and an “orthodoxy masquerading as reform.” He pointed out that for the progressive, no matter how badly the schools fail, it is unthinkable that if a problem were to be admitted at all, the answer could be anything other than more progressive education. To do so would require the progressives to “deconstruct” the foundation of ideas that has led to a set of cultural practices resulting in cumulative detrimental, albeit unintended, effects on the nation as a whole.

In general, modern cognitive psychology and behavioral psychology share the belief that the use of the scientific method is a means of knowing the world. This is not a belief among progressive educators. Instead of quantitative research methods, the progressives have adopted qualitative ones. A subjective form of pragmatism is substituted for a more objective utilitarian form, with qualitative research methods preferred over quantitative. Smith (1998) states, “So rather than qualitative research pursuing empiricist logic in documenting and analyzing information to a sufficient standard to provide valid accounts, a moral regulative ideal has a utilitarian purpose. The drive is for sufficient compelling evidence in order ‘to persuade one another of the value

or goodness of a way of thinking” (Scwandt, 1993, p. 20, quoted in Smith, 1998). The moral regulative ideal of which Smith speaks is a Marxian view of democracy.

Even reading instruction can be seen through the lens of Marxian ideals by progressive educators. Shannon (2000) laments that teachers are being asked to use direct instruction scripted lessons to achieve a business-like efficiency. Shannon views this pedagogical reform as a move toward mass production for the benefit of the capitalist class resulting in the alienation of teachers from their work and their students “because the fetishism of the commodified programs makes it appear as if the materials are the agents of teaching and learning” (p. 7).

What have been the pedagogical processes and psychological theories emphasized by progressive education? Preferred pedagogical practices have included discovery learning, whole language reading, “whole math,” and peer teaching. Cognitive psychological theories have included multiple intelligences, learning styles, developmentalism, naturalism, and constructivism. Teachers are asked not to teach but to facilitate learning. The teacher is not to tell or show the students but to allow them to discover their own individual knowledge. Paradoxically, it is permissible for an untrained peer to show and tell. The knowledge gained by students is said to be different for each student. Independent reality separate from the person’s own knowledge is denied. Progressive pedagogy does not analyze subject matter into foundational constituents and more complex composites, nor does it sequence material in such a way that constituents are taught before composites. Intentionally, the progressives use top down teaching, in which the sequences are inverted such that the more complex skill is introduced first and the foundational skills for it are assumed to be acquired in the context of the more complex task. Slavin (2003) describes top-down teaching this way: “Top-down means that students begin with complex problems to solve and then work out or discover (with the teacher’s guidance) the basic skills required” (p. 259).

It is not that progressive ideas can never be put to good use; they can (Johnson & Street, 2004). However, using indirect pedagogy to establish foundational constituent skills is simply ineffective and inefficient. Inevitable difficulties will occur in obtaining the skill at all, and in the absence of practice, established skills remain fragile. Weakly established skills are subject to forgetting, hinder the acquisition of composite skills of which they are a component and are less likely to combine with other skills through contingency adduction (Johnson & Layng, 1992). Behavior analysts Layng, Twyman, and Stikeleather (2004) have developed methods to engineer discovery after directly training constituent skills and using precisely designed instructional sequences. Designed instructional sequences are not a component of contemporary or historical progressive education pedagogy but are a component of most effective pedagogies.

Despite various reports issued over the past 50 years indicating that systematically teaching the elemental constituents (sound symbol correspondences, the phonetic code) is superior to what Flesch (1981) called the look and say approach, progressive educators have steadfastly refused to teach the elemental constituents of reading (Anderson, Hiebert, Scott, & Wilkinson, 1985; Flesch, 1955; Flesch, 1981; Chall, 1967; Adams, 1988). One of the principal developers of whole language, Goodman (1986) states,

“THE SHAME OF AMERICAN EDUCATION” REDUX

“Matching letters with sounds is a flat-earth view of the world, one that rejects modern science about reading” (p. 371). “Whole Language denies there is any sequence of reading skills” (Groff, 1991, p.1). Political pressure has led progressive educators to disguise whole language by using euphemisms such as “balanced reading” or “consensus reading.” “What’s going on in many places in the name of ‘balance’ or ‘consensus’ is that the worst practices of whole language are persisting, continuing to inflict boundless harm on young children who need to learn to read” (Moats, 2000, pp. iii-iv).

As with reading, math can be viewed through the Marxian lens by progressive educators. Progressive educators mix social justice, multiculturalism and ethnomathematics in textbooks meant for use in public schools. Ravitch (2005) states:

Now mathematics is being nudged into a specifically political direction by educators who call themselves “critical theorists.” They advocate using mathematics as a tool to advance social justice. Social justice math relies on political and cultural relevance to guide math instruction. One of its precepts is “ethnomathematics,” that is, the belief that different cultures have evolved different ways of using mathematics, and that students will learn best if taught in the ways that relate to their ancestral culture. (p.1)

Progressive education does not sequence mathematics instruction in a manner consistent with its vertical hierarchically arranged structure. The result is an introduction to topics that fails to examine the necessary prerequisite knowledge for the skill to be taught. An examination of 2004 state standards suggests that the “whole math” perspective still greatly influences the mathematics education of the nation (Klein, 2005). Still, as in the National Council of Teachers of Mathematics (NCTM) standards of the 1990s, in elementary schools calculators have replaced the learning of the foundational constituents of math, basic math facts. Likewise, procedural math is overlooked. “Only a minority of states require knowledge of the standard algorithms of arithmetic for addition, subtraction, multiplication, and division. Many states identify no methods for arithmetic or worse, ask students to invent their own algorithms or rely on ad hoc methods” (Klein, 2005, p. 10). Estimation is a valuable skill and should be taught. However, progressive educators over-utilize estimation because they have failed to teach standard procedural math skills. Consistent with their views of “hands on learning” progressive educators over-rely on manipulatives such as Popsicle sticks. This over-reliance on physical representations continues even into high school, potentially fostering dependencies as students fail to grasp the underlying mathematical concepts (Klein, 2005). In some cases progressive education textbooks have simply forgotten to include the math. An infamous textbook dubbed *Rainforest Algebra* by the media, caused quite a stir because of its progressive features. “No algebra expression can be found in the book until page 107,” but it has “appealing artwork, tempting chili recipes, exhilarating poetry, piercing political insights on environmental issues and fascinating myths of baffling African astronomy fabricated by European anthropologists” (Patterson, 1997, p. 1).

SKINNER'S VIEWS OF DISCOVERY

Skinner (1968) made his views of the method of discovery quite clear:

If the student can be taught to learn from the world of things, nothing else will ever have to be taught. This is the method of discovery. It is designed to absolve the teacher from a sense of failure by making instruction unnecessary. The teacher arranges the environment in which discovery is to take place, he suggests lines of inquiry, he keeps the students within bounds. The important thing is that he should tell him nothing.

The human organism does, of course, learn without being taught. It is a good thing that this is so, and it would no doubt be a good thing if more could be learned in that way. Students are naturally interested in what they learn by themselves because they would not learn if they were not, and for the same reason they are more likely to remember what they learn in that way. There are reinforcing elements of surprise and accomplishment in personal discovery which are welcome alternatives to traditional aversive consequences. But discovery is no solution to the problems of education. A culture is no stronger than its capacity to transmit itself....It is quite impossible for the student to discover for himself any substantial part of the wisdom of his culture, and no philosophy of education really proposes that he should. Great thinkers build upon the past, they do not waste time in rediscovering it. It is dangerous to suggest to the student that it is beneath his dignity to learn what others already know, that there is something ignoble (and even destructive of rational powers) in memorizing facts, codes, formulae, or passages from literary works and that to be admired he must think in original ways. It is equally dangerous to forgo teaching important facts and principles in order to give the student a chance to discover them for himself. Only a teacher who is unaware of his effects on his students can believe that children actually discover mathematics, that (as one teacher has written) 'in group discussion they can and do figure out all the relationships, facts, and procedures, that comprise a full program in math' (p. 110).

Unfortunately, Skinner was incorrect in one respect. Progressive educators actually suggest that discovery and the naturalism from which it stems are the answer to the problems of student learning. Progressive educators deem factual knowledge unimportant, and skills that require practice such as writing, mastering math facts or spelling are eliminated from the curriculum as unimportant nuisances (Quirk, 2000; Wheatley, 2006).

WAR BETWEEN PEDAGOGIES

Skinner pointed out that each of the reform proposals that were being made in the period immediately preceding his paper had a curious omission: namely how teaching could be improved. He described it as a "conspiracy of silence." Skinner suggested that pedagogy had become a "dirty word." Soon after Skinner's paper was published, this silence would be broken and pedagogy would come to the forefront. From the mid 1980's until the present, there has been an open battle between the progressives and the instructivists. Baxter (1988) described it this way: "The battle of the day is to determine the approach in teaching children to read with precision....I call this the battle between

“THE SHAME OF AMERICAN EDUCATION” REDUX

Direct Instruction...and the Whole Language approach.” The Math Wars between scientifically validated approaches and progressive approaches soon followed.

During the 1990s the United States underwent an unprecedented curricular “reform” of the public schools. By 1990, the ideological legacy of Kilpatrick, Rugg and Dewey controlled virtually all colleges of education and their respective teacher organizations. The NCTM and the National Council of Teachers of English developed standards reflecting progressive values and pedagogy. These curriculum standards were then adopted by state after state as the frameworks for reading and math. The end result was the standardization of ineffective practices leading to inadequately trained teachers and low-achieving students in basic academic domains (Rumph, Ninness, & McCuller, 2001). A generation of students would be taught in progressive schools with progressive pedagogy but not without a fight. “Reforms” touched every state and virtually every school district.

ADI News chronicled the battles in its pages. The articles “California Textbook Commission Chooses Myth Over Research” (Groff, 1989), and “Why I Sued California” (Englemann, (1991), are examples. Englemann (1992) also wrote about the war in his book, *War Against the Schools’ Academic Child Abuse*.

THE EFFECTS OF PROGRESSIVE EDUCATION ON THE NATION

The performance of the students of the United States can be described as fair to poor in international assessments. The Program of International Student Assessment (PISA) is a multi-national project coordinated by the Organization of Cooperation and Economic Development (OCED). It assesses the performance of 15-year-old students of nations across the world in reading literacy, mathematics and, in 2006, science. The 2003 assessment has the United States ranked 25th of 30 OCED countries in mathematics and 16th of 30 OCED countries in reading literacy (Institute of Education Research, 2006).

The National Assessment of Educational Progress (NAEP) trend results suggest that the reading scores of 9-year-olds improved during the 1970s and then declined in the mid 1980s and then remained steady until 1996. The period from mid 1980s through the mid 1990s is the period of the ascendancy of whole language as the standard method of reading instruction for the nation. The most recent 2004 NAEP assessment and the first post-NCLB assessment included in the trend analysis show a reversal, with scores at the highest level for 9-year-olds at all levels of proficiency of any assessment period (National Center for Educational Statistics, 2006).

In mathematics, trends in scores of 9-year-olds on the NAEP were steady from 1973 to 1982. Scores increased in the mid-1980s until 1990, then flattened out for the rest of the decade. This flat performance occurred just after the NCTM published its standards based on progressive pedagogy in 1989 that were subsequently adopted by most states in the early 1990s. The latest scores reported in the trend analysis are from 2004 and the first since NCLB. They show the largest increase in average scores of any two adjacent periods and the highest student performance in math of any NAEP assessment (National Center for Educational Statistics, 2006). Only after NCLB did scores increase.

The United States is also falling behind in science. The Third International Math and Science Survey assessment has American twelfth graders finishing 19th of 21 countries even though typically high scoring Asian countries withdrew in part due to the less rigorous nature of the test compared to the previous assessment. The United States finished last in physics and next to last in advanced math (National Center for Educational Statistics, 2006). Had the Asian countries chosen to be included in the assessment, it is likely that the results for the United States would have appeared even worse. These results from 2003 come from a generation of students who have almost exclusively been taught with whole language reading and “whole math.”

NCLB AND IDEA

Let us examine some of the changes required in NCLB. NCLB provides for the allocation of funds to states for the purpose of increasing student achievement. States that accept these funds must follow the standards within the legislation. States are required to administer tests to assess the educational progress of their children. Districts not making sufficient yearly progress are targeted for governmental assistance and are subject to corrective actions and potential restructuring. Corrective actions could include implementing a new curriculum, replacing staff, decreasing management authority at the school level, and appointing outside experts to advise the schools. Restructuring could involve terminating the staff and re-establishing as a charter school or turning control over to a private company. NCLB establishes the Reading First initiative that supports scientifically based pedagogy in reading programs. Teachers must also have a core academic competency in addition to general teacher education.

In the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA), the language of NCLB is followed closely. Particularly important in this regard is the NCLB definition of scientifically based research. “It is research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs” (NCLB, 2001). Research should evaluate its effectiveness by “using experimental or quasi-experimental designs in which individuals, entities, programs, or activities are assigned to different conditions and with the appropriate controls to evaluate the effects of the conditions of interest with a preference for random-assignment experiments, or other designs to the extent that those designs contain within-condition or across-condition controls” (NCLB, 2001). The primary research method of progressive education, qualitative research, is not included as a strategy considered to be scientific. In general, the research methods of progressive education are repudiated as far as providing evidence of educational effectiveness.

MACROCONTINGENCY, METACONTINGENCY, AND ORGANIZATIONAL ANALYSIS OF PROGRESSIVE EDUCATION

The success or failure of our system of public education is critically important to the welfare of our culture. Skinner (2001) may have stated it best in saying that “a culture which raises the question of collateral or deferred effects is most likely to discover and

“THE SHAME OF AMERICAN EDUCATION” REDUX

adopt practices which will survive” (p. 9). With the United States under-performing in international comparisons of reading, mathematics, and science the continued failure of our educational system places the United States and its culture at risk. A significant failure of the American educational system could put the viability of its culture in question.

The culture of progressive education has failed to consider the long-term effects of its practices. It has systematically ignored data from many sources indicating that the effects of its practices have been deleterious and that more effective practices have been available. Instead, it has actively tried to reduce or prevent the collection of objective data of the educational system’s performance in culturally important areas such as reading, mathematics, and science. Hirsch (1996) documents the assault on objective measurement by progressive education. Jones’s (2004) viewpoint of scientific measurement is typical of progressive educators. He states, “Scientific measurement cannot truly ‘objectify’ learning and rate it hierarchically. Accurate decisions about the quality and depth of an individual’s learning must be based on human judgment” (p. 585).

Kosloff (2001) suggests that the culture of progressive education is failing to fulfill its manifest function: namely to “prepare children for adulthood, disseminate and inculcate the conceptual knowledge, practical skills, and moral principles for competent participation or citizenship in society.” (p. 9). Skinner (1987) stated “We would all be better off if education played a far more important part in transmitting our culture.” (p. 130). However, progressive education has more often been interested in the transformation of the culture to its own vision rather than transmitting it.

Glenn (2004) termed the relationship between a cultural practice and the aggregate sum of its consequences, a *macrocontingency*. The entirety of all the mass of behavior of all those engaging in the practice is termed *macrobehavior*. Glenn (2004) points out that “an important feature of a macrocontingency is that its cumulative effects are additive. The more widespread the practice the greater its cumulative effects....” (p. 143). In the case of progressive education, the macrobehavior of progressive educators both in the public schools and in colleges of education have negatively affected the human resource capability of Americans with the resulting decrements in its citizens’ economic abilities, social participation in their own culture and abilities to participate with other cultures.

Glenn (2004) states that the cumulative effects of a cultural practice cannot act as a selection device because a cultural practice is a class of acts that are functionally independent of one another. That is to say, the cumulative effects are not the result of behaviors from a common lineage. To alter the negative outcomes produced by progressive educational practices, the individual contingencies or the interlocking behavioral contingencies (IBC) of progressive educators would need to be altered.

Colleges of education are a non-core subsystem of the American public education system that provide training and human resources to the core systems: the public school systems. Public school systems “process” the students and the resulting product, the educated student, is received by universities, trade schools and business schools for further processing; by governments and businesses as a resource for production; by

society and its governments as a participating citizen; and by families to fulfill a multitude of functions. Colleges of education are responsible for replicating behavior/environment relations in future teachers and administrators that will subsequently participate in the IBCs of a given school and lead to educational outcomes. Colleges of education are also responsible for replicating the behavior/environment relations of education professors into the behavior of the future replicators, college professors, so that the future education professors' behavior participates in the same or similar IBCs as the current college professors. In participating in these IBC's the behavior of the individual is being maintained by consequences embedded in the IBCs. Glenn (2003) suggests that the selecting environment responsible for the IBC's may come to have "little or no consequence functions with respect to the behavior in the interlocking contingencies." (p. 237). In such a case the IBC's will continue to occur until the contingencies of selection of the organization are altered by one or more factors in its external environment, particularly those of one or more of its receiving systems. As long as colleges of education continue to replicate behavior/environment relations in their students that participate in the contingencies that maintain ineffective educational practices, negative effects will continue to accumulate and affect the nation.

A college of education is a complex cultural organization that has resulted from processes of cultural selection. The nested hierarchies of (IBC's) are not dependent on the behavior of any set of particular people. People are replaced as needed with other people whose behavior then enters into the IBCs. As long as a college of education, as an organizational entity, produces outcomes that make it more likely that its IBCs will recur, then the college of education will continue to exist. There is increasing evidence that colleges of education are not providing outcomes that ensure that their current IBCs will continue.

Over several decades it has become clear that the receiving systems of the public education system have become dissatisfied with the product produced. Dissatisfaction with the public schools during the 1990's was especially high as parents turned to charter schools, home schools, magnet schools, and private schools as alternatives. However, the IBCs of the public education system as a whole and of colleges of education in particular have become stagnant and data suggestive of the negative cumulative effects of its macrobehavior insufficient to result in organizational change to alter those cumulative effects. Without effective organizations to teach teachers effective pedagogies and the knowledge of the subjects they are to teach, there is little hope that outcomes will change in the system of public education.

Glenn and Malott (2004) indicate that "in organizations metacontingencies have three components: IBCs, their aggregate product and their receiving systems." The receiving system provides the consequences that form the selecting environment of the IBCs. In its role as a receiving system, state and federal governments systematically have altered the selecting contingencies that make up part of the external environment of public school systems and colleges of education.

Glenn (2004) suggests two ways in which IBCs can be altered. "The first is by altering the external selecting environment and waiting for variations in the IBCs to

“THE SHAME OF AMERICAN EDUCATION” REDUX

produce outcomes suitable to the new selection contingencies....The second way...entails altering the components of the IBCs so they are better adapted to the current environment” (p.148). The first approach is a survival of the fittest approach in which the organization adjusts to the contingencies or fades away. The second approach provides a helping mechanism in which the IBCs are directly altered in a planned way to meet the new selection contingencies.

NCLB and the Individuals with Disabilities Education Act (IDEA) represent an alteration of the selecting contingencies by a receiving system. Within NCLB, there is evidence of both strategies elaborated by Glenn. First, the law substantially changes the contingencies of selection. It also provides mechanisms to change IBCs through assistance and other means once schools have failed to meet the selection contingencies. Skinner (1987) suggested “that the taxpayers and parents should demand their money’s worth” (p. 129). NCLB represents the response to that demand. The strength of the NCLB contingencies at the public school level and indirectly at the level of colleges of education may be sufficiently strong to have great potential for improving the ways that schools operate.

It would appear that the contingencies of selection will first impact public schools and then colleges of education. As punitive sanctions are applied, public schools acting as a receiving system are not unlikely to demand that colleges of education produce teachers who are knowledgeable in content subjects and science-based pedagogy. Glenn and Malott (2004) state “in the ecology of an organization the output of one system directly affects the functioning of other systems. In organizations core systems are essential parts directly responsible for generating the aggregate product” (p. 101). Within the system of public education, colleges of education are not core systems. They supply human resources to the core system. Alternative routes to teacher education already exist. Forty-seven states have alternative preparation programs with as many as half of the new teachers in Texas being trained in these programs (NCEI, 2006). Outside providers have a chance to displace colleges of education if the colleges of education do not respond effectively to the altered contingencies of selection. At some point one would expect that the core systems of education will demand change so that they can survive the altered contingencies of selection themselves. If colleges of education are unwilling to adapt, they may be unable to find customers for their services, resulting in their own demise.

Glenn and Malott (2004) point out that it is not unusual for core systems to compete with other systems within an organization. The core system, in this case the public school systems, could provide their own training services to teaching personnel. Glenn and Malott (2004) note that training systems are often redundant with the core system because the training personnel in the subsystem are not sufficiently familiar with the core system to provide adequate training. Should the school systems seek other avenues for training, potentially assuming the function themselves, and should the resulting new IBCs, such as those involved in research based pedagogies, produce more favorable outcomes including satisfying the contingencies of selection provided by the receiving systems, then colleges of education may no longer be needed to train teachers.

In the past, human resources provided by colleges of education have been largely interchangeable no matter what college of education had produced them. Colleges of education who change their practices to conform to the new contingencies of selection provided by the receiving systems may have a competitive advantage and survive while those non-conforming may fade. Conforming programs may be sought out while non-conforming ones are shunned.

REACTION OF PROGRESSIVE EDUCATION TO NCLB

Have colleges of education begun to alter their culture of progressive education to adapt to the new contingencies of selection? Phi Delta Kappan is the professional journal for education. Even a cursory review of article content suggests that progressive educators are not adapting. Some articles suggest that the crisis in education is a fabrication, that reform isn't needed (Boe, 2005). Many articles complain bitterly about mandatory testing (Boaler, 2003; Gould, 2003; Jones, 2004). One article suggests or perhaps hopes that NCLB may be unconstitutional (McColl, 2005). An April 2004 cover features a wolf in sheep's clothing with an apple in its mouth, implying that a government conspiracy is afoot. Another article suggests that NCLB is a right wing plot to privatize education (Kohn, 2004). Kohn, a progressive educator of the social reconstruction strain, states that progressive educators should not comply with the provisions of NCLB, rather, it is the progressive educator's obligation "to figure out how best to resist" (2004, p. 576).

THE FUTURE

Skinner (1987) stated "cognitive psychology is certainly in the ascendant"(p. 118). We believe that scientific models and by implication behavioral psychology models are now in the ascendant at least within public education. Scientific educational models, technologies of teaching, and products resulting from those technologies, have made significant progress since 1983. We are now in an excellent position to provide the world's best educational system. The failure of progressive education and the reaction of the culture to it, provide an enormous opportunity that we must not squander.

Challenges remain. NCLB is not without its imperfections. Punitive sanctions within the bill are likely to generate stiff resistance, as has been suggested above. Because the scores on assessments of student progress are the basis for punitive sanctions, it is not surprising to hear of reports of cheating to avoid the sanctions. Since teachers have only been trained in progressive pedagogy, cheating may be the only adaptive response available to them to avoid the sanctions. Widespread cheating would corrupt the database such that no one would really know how the nation's students are doing. However, the progressives' agenda to get rid of objective testing altogether would accomplish the same outcome. NCLB disaggregates school performance data by ethnic/racial groups and other categories, resulting in schools that are actually doing well overall being listed as failing due to a single subgroup under-performing. Data analysis needs to include measures of progress as well as absolute scores. Schools making adequate progress should not be considered failing, even if the absolute scores are considered low. Helping schools retrain

“THE SHAME OF AMERICAN EDUCATION” REDUX

teachers and administrators in effective science-based pedagogy and supervision methods is much preferable to terminating staff in a wholesale fashion.

Despite the challenges, NCLB remains the best hope for years to come for science-based pedagogy to be used in public schools and to reverse the negative influences of progressive education on the nation. However, it is unlikely that the contingencies within NCLB will produce needed changes immediately given contingency imperfections and stiff resistance. Soon claims of the failure of NCLB will be announced by progressive educators who wish it to fail in order to return to the unconstrained progressivism of the 1980s and 1990s. This eventuality would be a tremendous set back for science-based pedagogy (including forms strongly influenced by behavior analysis) and for the nation as a whole.

Changing education through government legislation is not an ideal strategy. Problems with contingencies are altered slowly and the contingencies may not be sensitive to circumstances within a particular school. Undoubtedly, it would be better to have educators reform themselves. However, progressive education has been around for 85 years and has won the hearts and minds of the field to such an extent that it is unlikely that education left to its own devices will ever reform itself. There is no self-correcting mechanism within progressive education. Objective data are deflected away like so much water rolling off a duck's back. The inherent subjectivism of mainstream educational research only serves to preserve the progressives' worldview while insulating it from criticism with claims that its methods are “research-based”.

We can only hope that the needed reforms contained within NCLB along with needed refinements are continued over successive governmental administrations. We believe that colleges of education are ideally the best place for teachers to be trained. However, unless the stranglehold of progressive educational views on colleges of education subsides, colleges of education may no longer be relevant to the current contingencies of selection and thereby lose their role as trainers of teachers. With or without colleges of education providing the training function of the educational system, it is science-based pedagogy that is needed to transform the schools from the Shame of American Education to its greatest pride.

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“THE SHAME OF AMERICAN EDUCATION” REDUX

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