

THE 100-YEAR JOURNEY OF EDUCATIONAL PSYCHOLOGY

FROM INTEREST, TO DISDAIN, TO
RESPECT FOR PRACTICE

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We can date the emergence of the discipline of educational psychology to the same year in which Granville Stanley Hall called 26 colleagues to his study to organize the American Psychological Association (APA) (Hothersall, 1984). Thus, when the APA recently celebrated its centennial, we in the Division of Educational Psychology, Division 15, felt like the party was for us.

From the very beginning of the APA, psychoeducational issues were important to our leaders, and those issues influenced the growth of academic and scientific psychology. In what follows, I describe the founding years of both general and educational psychology, noting the important individuals of those times and their influence on our discipline. The time period for those events was approximately 1890 to 1910, the same years that saw American psychology separate from its European roots and grow into a uniquely American discipline. But, we should remember that our field began long before that time.

The Origins of Educational Psychology

Our field probably started unnoticed and undistinguished, as part of the folk traditions of people trying to educate their young. For example, the ancient Jewish ritual of Passover precedes the contemporary work of Cronbach and Snow (1977) by hundreds if not thousands of years, yet fully anticipates their scholarship into aptitude-treatment interactions. The leader of the Passover service is commanded to tell the story of Passover each year but is ordered to tell it differently to his sons, according to their individual differences. To the wise son, he teaches the entire story, with all the details and in all its complexity. To the contrary son, he teaches in a way that emphasizes belonging to a community. To his simple son, the leader responds in still different ways. It is likely that even before these times, from the emergence of Homo sapiens, whoever reflected on teaching probably had thoughts that we would now label as mainstream educational psychology. It could not be

otherwise. To reflect on any act of teaching and learning demands thinking about individual differences, assessment, development, the nature of the subject matter being taught, problem solving, and transfer of learning. These psychological topics are vital to education and therefore are vital to human social life. Thus, issues central to our current interests have been the subject of discussion throughout the centuries.

In the fifth century B.C., Democritus, for example, wrote on the advantages conferred by schooling and the influence of the home on learning (Watson, 1961). A century later, Plato and Aristotle discussed the following educational psychology topics (Adler, 1952; Watson, 1961): the kinds of education appropriate to different kinds of people; the training of the body and the cultivation of psychomotor skills; the formation of good character; the possibilities and limits of moral education; the effects of music, poetry, and the other arts on the development of the individual; the role of the teacher; the relations between teacher and student; the means and methods of teaching; the nature of learning; the order of learning; affect and learning; and learning apart from a teacher.

During Roman times, Quintilian (35-100 A.D.) argued in favor of public rather than private education to preserve democratic ideals--a battle still being fought today. He condemned physical force as a method of discipline, commenting that good teaching and an attractive curriculum take care of most behavior problems -- advice that is as appropriate today as it was 2,000 years ago. He urged that teachers take into account individual differences, suggesting that they take time to study the unique characteristics of their students. He also set forth criteria for teacher selection (Quintilian's *Institutio Oratoria*, translated by Butler, 1953; *Quintilian on Education*, translated by Smail, 1966; and Wilds & Lottich, 1964). Quintilian's arguments, although archaic in form, are still functional educational psychology. For example, in Book I of the *Oratoria* he wrote

As soon as the child has begun to know the shapes of the various letters, it will be useful to have them cut out on a board, in as beautiful script as possible, so that the pen may be guided along the grooves. Thus mistakes such as occur with wax tablets will be impossible to make for the pen will be confined between the edges of the letters and will always be prevented from going astray. (Adapted from both the Butler and Smail translations)

A contemporary educational psychologist or psychologically trained special educator would probably now cite B. F. Skinner on error reduction but would give similar advice.

Comenius (1592-1671), a humanist writing at the beginning of the modern era, also influenced both educational and psychoeducational thought (1657; Broudy, 1963). He wrote texts that were based on a developmental theory and in them inaugurated the use of visual aids in instruction. Media and instructional research, a vibrant part of contemporary educational psychology, has its origins in the writing and textbook design of Comenius. He recommended that instruction start with the general and then move to the particular and that nothing in books be accepted unless checked by a demonstration to the senses (Broudy, 1963). He taught that understanding, not memory, is the goal of instruction; that we learn best that which we have an opportunity to teach; and that parents have a role to play in the schooling of their

children.

The contributions of one of our many ancestors often are overlooked, yet Juan Luis Vives (1492- 1540) wrote very much as a contemporary educational psychologist might in the first part of the 16th century (Vives, 1531/1913; Charles, 1987). He stated to teachers and others with educational responsibilities, such as those in government and commerce, that there should be an orderly presentation of the facts to be learned, and in this way he anticipated Herbart and the 19th-century psychologists. He noted that what is to be learned must be practiced, and in this way he anticipated Thorndike's law of exercise. He wrote on practical knowledge and the need to engage student interest, anticipating Dewey. He wrote about individual differences and the need to adjust instruction for all students, but especially for the "feeble minded," the deaf, and the blind, anticipating the work of educational and school psychologists in special education and the area of aptitude-treatment interaction. He discussed the schools' role in moral growth, anticipating the work of Dewey, Piaget, Kohlberg, and Gilligan. He wrote about learning being dependent on self-activity, a precursor to contemporary research on metacognition, where the ways in which the self monitors its own activities are studied. Finally, Vives wrote about the need for students to be evaluated on the basis of their own past accomplishments and not in comparison with other students, anticipating both the contemporary motivational theorists who eschew social comparisons and those researchers who find the pernicious elements of norm-referenced testing to outweigh their advantages. Thus, long before we claimed our professional identity, there were individuals thinking intelligently about what we would eventually call *educational psychology*. Our roots are deep within the corpus of work that makes up Western intellectual history.

In this brief reminder of our roots, we must note also the mid-19th century philosopher and psychologist, Johann Friedrich Herbart (1776-1841). He not only may be considered the first voice of the modern era of psychoeducational thought, but his disciples, the Herbartians, played a crucial role in preparing the way for the scientific study of education. They wrote about what we now call *schema theory*, advocating a cognitive psychology featuring the role of past experience and schemata in learning and retention. Herbartians promoted teaching by means of a logical progression of learning, a revolutionary idea at the end of the 19th century. They promoted the five formal steps for teaching virtually any subject matter: (a) preparation (of the mind of the student), (b) presentation (of the material to be learned), (c) comparison, (d) generalization, and (e) application. It was the Herbartians who first made pedagogical technique the focus of scientific study, pointing the way, eventually, to the field of research on teaching, a very fruitful area of research in educational psychology.

Although the Herbartians oversold their ideas and claimed a scientific base that they did not have, the educational psychologists at the turn of the 20th century owed them a monumental debt. The Herbartians had played an important role in convincing the teachers and school administrators of America that education was a field that could be studied scientifically. To promote this radical idea, the National Herbart Society for the Scientific Study of Education founded a yearbook series under that name.¹ The yearbooks of that organization, and its successors, featured chapters about the emerging science of pedagogy by prominent educational psychologists.

Science and Education

We must remember that before the turn of the 19th century, experimental methods in education were brand new phenomena. These new methods were not accepted by all as appropriate to the study of educational topics. Ironically, although Herbart's name was invoked by those promoting the scientific study of education, he rejected the notion that one could have an experimental psychology. Herbart was an empiricist, dedicated to observational methods, and a developer of mathematical psychology. But he maintained that one could not experiment with the mind (Boring, 1950). Although Wundt, Ebbinghaus, and James were challenging those beliefs in the psychological laboratories that existed at the end of the 19th century, there was still opposition to psychological science in education at that time. This was based, in part, on the very strong belief that education is a moral and philosophical endeavor, and therefore, its problems cannot be solved by scientific study. Such beliefs permeated education because its leaders often came from religious backgrounds and training (Tyack & Hansot, 1982) rather than from the liberal arts or the emerging sciences. Breaking down the resistance to science as a means for the study of education and promoting the acceptance of scientific findings as a guide to educational policy were most important events in the history of our field. Although educators' refusal to use our science as a guide to policy and practice is not now as widespread a problem as it once was, barriers to the use of scientific findings have not disappeared completely. The research on retention in grade, corporal punishment, and bilingual education, for example, are contemporary cases of this historic resistance.

Paving the Way for Thorndike

It is customary to attribute the paternity of educational psychology to E. L. Thorndike, whose contributions are noted later. He was bright, brash, amazingly productive, and as he proceeded to organize the field, he revealed an unshakable faith that psychological science could solve many of the ills of society. But like another prophet, reformer, and founder 2,000 years before him, the way to the "true path" had to be prepared. In this case, the true path was science, not faith, and we should note those who served that role for Thorndike.

One of those who set the stage for Thorndike was the great muckraker and classroom observer Joseph Mayer Rice (1857- 1934), the father of research on teaching. Rice endured great difficulties for his beliefs just a few years before the experimental psychology of E. L. Thorndike was deemed acceptable (see Rice, 1912). In 1897, in Atlantic City, New Jersey, Rice was asked to present his empirical classroom-based research on the futility of the spelling grind to the annual meeting of school superintendents. I do not think they were as polite as today's administrators, as they attacked the speaker, yelling the equivalent of "give him the hook." Leonard P. Ayres (1912) reports on the meeting as follows:

The presentation of these data threw that assemblage into consternation, dismay, and indignant protest. But the resulting storm of vigorously voiced opposition was directed, not against the methods and results of the investigation, but against the investigator who had pretended to measure the results of teaching spelling by testing the ability of the children to spell.

In terms of scathing denunciation the educators there present, and the

pedagogical experts who reported the deliberations of the meeting to the educational press, characterized as silly, dangerous, and from every viewpoint reprehensible the attempt to test the efficiency of the teacher by finding out what the pupils could do. With striking unanimity they voiced the conviction that any attempt to evaluate the teaching of spelling in terms of the ability of the pupils to spell was essentially impossible and based on a profound misconception of the function of education. (p. 300)

The school administrators would not hear Rice's research because faculty psychology was still dominant, and thus it was clear to them that the spelling faculty needed exercise; besides, it was good for children to work hard and memorize, learning at the same time obedience, diligence, habits of concentration, and so forth. It was the process, not the outcome, that determined good teaching. Good teaching, a normative judgment, was more valued than efficient or effective teaching, terms that derive their meaning from empirical data. Educational issues, for these administrators, simply could not be decided by scientific work. Decisions about what was beneficial to children were best made by those with a religious background or philosophic training, called to the profession to take responsibility for educating the young. Obviously, a good deal of preparation was needed for our field to emerge as the dominant science in the world of education.

By 1912, however, the climate had undergone a change. At that year's meeting of the superintendents, 48 addresses and discussions were devoted to tests and measurement of educational efficiency. Underlying the addresses and discussions was the proposition "that the effectiveness of the school, the methods, and the teachers must be measured in terms of the results secured" (Ayres, 1912, p. 305). In 1915, the antiscience forces had their last chance to challenge the new science, and they lost. Charles Judd (1925) made the following remarks about that meeting of superintendents:

There can be no doubt as we look back on that council meeting that one of the revolutions in American education was accomplished by that discussion. Since that day tests and measures have gone quietly on their way, as conquerors should. Tests and measures are to be found in every progressive school in the land. The victory of 1915 slowly prepared during the preceding twenty years was decisive. (pp. 806-807)

The Grandfather and Granduncles of Educational Psychology

Three individuals prepared the way to that victory so decisively won, eventually, by E. L. Thorndike. These major figures were William James, his student G. Stanley Hall, and Hall's student, John Dewey. These three men—our grandfather and granduncles—distinguished themselves in general psychology as well as in educational psychology, fields that overlapped considerably at the end of the 19th century. I focus, particularly, on the science that these three men promoted. However, it was not their views of psychological science that were ultimately adopted by our field. It was the views of their successor, E. L. Thorndike, that conquered. I argue that Thorndike's version of science and his vision of educational psychology has led us to a narrower conception of our field than would have been true had the views of these three other ancestors gained prominence.

William James

William James (1842-1910) can be considered the central figure in the establishment of psychology in America. Compared with his contemporary, the great Wilhelm Wundt (1832-1920), German founder of experimental psychology, James was said to have had "the courage to be incomplete" (Boring, 1950, p. 516). His was a psychology of humility, humor, and tolerance, particularly when it is compared with the psychology of Wundt or, later, that espoused by his own very serious student, E. L. Thorndike. James's (1890) *Principles of Psychology*, published in 1890 after 12 years of labor, was the preeminent event in American psychology (Barzun, 1983), although Professor James did not think so at the time. When he finally sent the manuscript to his publisher, Henry Holt, he wrote

No one could be more disgusted than I at the sight of the book. No subject is worth being treated of in 1000 pages! Had I ten years more, I could rewrite it in 500; but as it stands it is this or nothing loathsome, distended, tumefied, bloated, dropsical mass, testifying to nothing but two facts; 1st, that there is no such thing as a *science of* psychology, and 2nd, that W. J. is an incapable. (H. James, 192(, p. 294)

James's version of psychological science argued against the elementalism of the Europeans, giving us the notion that consciousness was continuous—a stream—and not easily divisible. Moreover, and still more startling, he said consciousness chooses—it controls its own attention. Thus, built into James's views of experimental psychology were cognitive and teleological conceptions of individuals, beliefs the nascent behaviorists chose ultimately to ignore. James did not believe that ignoring those attributes of humans might be bad for scientific psychology, as long as psychologists remembered that there were other legitimate ways to conduct inquiries about human consciousness and behavior. That is, he probably would have found nothing wrong with a scientific and strongly behavioral psychology if it helped the field make progress. But such a psychology, James thought, certainly would not provide a complete picture of humans. It would provide merely a glimpse of those complex beings.

The *Principles* also made much out of the role of nurture by emphasizing the plasticity of the nervous system, at least among the young. James called acquired habit "the enormous fly-wheel of society" (W. James, 1892, p. 21). It was habit, he explained, that keeps the workers of the most repulsive trades in their business. It keeps the fishermen and loggers, the miners and the farmers, all steadily working and not rising up and attacking the rich. It is early acquired habit that guides behavior and provides the glue that holds society together. Thus, James saw education as a crucial element of society, with the school a place for habits to be acquired by design, not willy-nilly. In his emphasis on habit, he provided the intellectual environment for his student E. L. Thorndike, who would more thoroughly explore habit formation in school and out. Sadly for us, the *Principles* marked the turning point after which philosophy rather than psychology was to dominate James's life. But in that philosophy he gave us another set of uniquely American views, called *pragmatism*, in which the test for truth was whether or not ideas worked for the individual. As a result, James took away the eternal verities of Aristotle and the revealed truths of religion and gave us social criteria for determining truth. Truth would thereafter be written with a small "t," because it

became relativistic and personal. Testing whether ideas worked, whether they were functional for the individual or for an animal (the distinction between human and animal disappeared after Darwin), led to psychology's development of functionalism. This set of beliefs (see Angell, 1907) became the theoretical underpinning for growth in many areas of psychology, particularly educational psychology.

In 1891, Harvard's administrators asked James to provide some lectures on the new psychology to the teachers of Cambridge, Massachusetts. These talks were polished and expanded over the years and published in 1899 as the now famous *Talks to Teachers on Psychology* (W. James, 1899/1983). With that book, we have our field's first popular educational psychology text, including speeches first delivered in 1892 (see p. 3, W. James, 1899/1983).² The lectures of 1892 marked the beginning of a vigorous educational psychology presence in America. A scholar of international renown had now become associated with our field and provided intellectual grounding for its growth. The year 1892, then, may be used to mark the beginnings of both the APA and the field of educational psychology.

As we determine lineage, James may be thought of as our grandfather, but he did not have much respect for the teachers to whom he spoke. On teachers' comprehension of his lectures, he said

A teacher wrings his very soul out to understand you, and if he ever does understand anything you say, he lies down on it with his whole weight like a cow on a doorstep so that you can neither get out nor in with him. He never forgets it or can reconcile anything else you say with it, and carries it to the grave like a scar. (W. James, 1899/1983, p. 241)

And, during his 1898 lecture tour to California, he wrote to his brother Henry that the tour ended in a blaze of glory

With many thanks for having emancipated the school teachers' souls. Poor things they are so servile in their natures as to furnish the most promising of all preys for systematic mystification and pedantification on the part of the paedagogic authorities who write books for them, and when one talks plain common sense with no technical terms, they regard it as a sort of revelation. (W. James, 1899/1983, p. 241)

James's science was an eclectic one, and this he communicated in his talks to teachers. In one of his most quoted and least influential statements, conspicuously ignored by educational psychologists over the years, we find James saying

You make a great, a very great mistake, if you think that psychology, being the science of the mind's laws, is something from which *you can* deduce definite programmes and schemes and methods of instruction for immediate school-room use. Psychology is a science, and teaching is an art; and sciences never generate arts directly out of themselves. An intermediate inventive mind must make that application, by using its originality. (W. James, 1899, 1983, p. 15)

James recognized that psychologists could not tell educators precisely what to do:

A science only lays down lines within which the rules of the art must fall, laws which the follower of the art must not transgress; but what particular thing he shall positively do within those lines is left exclusively to his own

genius. ... To know psychology, therefore, is absolutely no guarantee that we shall be good teachers. To advance that result we must have an additional endowment altogether, a happy tact and ingenuity to tell us what definite things to say and do when that pupil is before us. That ingenuity in meeting ... the pupil, that tact for the concrete situation, . . . are things to which psychology cannot help us in the least. (W. James 1899/1983, pp. 15-16)

As will be shown, this was not the psychology or the science of Thorndike. In its time, it was also a direct slap at the "scientific" movement of the Herbartians, who were at the peak of their influence. James's comments on other aspects of the emerging scientific psychology were equally cautious, and, at least in public, he was very supportive of the wisdom of practicing teachers. He criticized the attempt to make over teachers into psychologists or scientists in the service of the child study movement. He said it was not a teacher's duty to collect scientifically rigorous observations, because to act as a scientist often conflicted with one's performance as a teacher. The teacher's approach to the child was necessarily ethical and concrete, whereas the psychologist's was necessarily abstract and analytical. These are not habits of mind that are easy to blend. James also believed that laboratory studies in psychology had to fail the test of usefulness for teachers because they did not treat the whole person in real contexts.

Man is too complex a being for light to be thrown on his real efficiency by measuring any one mental faculty taken apart from its consensus in the working whole. ... No elementary measurement, capable of being performed in a laboratory, can throw any light on the actual efficiency of the subject; for the vital thing about him, his emotional and moral energy and doggedness can be measured by no single experiment, and becomes known only by the total results in the long run.... The total impression which a perceptive teacher will get of the pupil's condition, as indicated by his general temper and manner. by the listlessness or alertness, by the ease or painfulness with which his school work is done, will be of much more value than those unreal experimental tests, those pedantic elementary measurements of fatigue, memory, association, and attention, etc., which are urged upon us as the only basis of a genuinely scientific paedagogy. Such measurements can give us useful information only when we combine them with observations made without brass instruments, upon the total demeanor of the measured individual, by teachers with eyes in their heads and common sense, and some feeling for the concrete facts of human nature in their hearts. (W. James, 1899/1983, p. 82-84)

Clearly, William James would approve of the portfolio assessment movement of our times and support the ways in which Howard Gardner and Robert Sternberg have broadened our conceptions of intelligence. James consistently held a holistic view of human beings, and he understood the important distinction between the real world on the one hand and both laboratory and school tasks on the other. Despite his private comments about the pedestrian minds of teachers, he put faith in the classroom teacher to guide the young to acquire proper habits. In so doing he rejected those who saw the mission of the school as curriculum bound, with the teacher there merely to impart facts (Bowen, 1981). James also rejected the view that science could provide much advice to teachers about what to do in concrete situations. He did, however, see the study of psychology as useful in three ways: to provide the underpinnings for beliefs about instruction, to prohibit teachers from

making certain egregious errors, and to provide intellectual support to teachers for some of their pedagogical decisions.

G. Stanley Hall

G. Stanley Hall (1844-1924), founder of the child-study movement that James worried about, was a promoter of psychology in ways that James must have found distasteful. Hall was APA's organizer and its first president. He was as much an educational psychologist as anything else we might label him, and that came to him naturally (see Ross, 1972). Hall's mother was a major influence on him, a schoolteacher who did something quite unusual for her time, or for any time. She kept detailed records of her students' developmental progress. Hall, in becoming our first developmental psychologist, eventually followed the paths that she had originally laid out. Hall's father had for a time also been a schoolteacher. Thus, it should come as no surprise that Hall also taught school on completion of his precollege education. After additional studies, some for the ministry, some in Europe, Hall eventually received the first doctoral degree in psychology in America (Ross, 1972). The granting institution was Harvard University, the year was 1878, and Hall's major advisor was William James. Hall promptly returned to study in Europe for 2 years, returning home without funds. This is when the famous president of Harvard, Charles W. Eliot, made the first of the two requests by the administration of Harvard that markedly influenced our field. In 1880, Eliot rode by Hall's house and, while still astride his horse, asked the impoverished Hall to deliver a series of public lectures on education, under the auspices of the university (Ross, 1972; Joncich, 1968). The delivery of that Saturday morning series of talks on psychology and education preceded James's by about a decade. It was such a smashing success that the president of the newly founded Johns Hopkins University, after ignoring Hall for many years, asked Hall to visit his institution and repeat them. Once again, the lectures on psychoeducational issues were a great success, and the persuasive, energetic Hall was offered a job as a professor of psychology and of pedagogy. Interestingly, E. G. Boring never mentioned the latter part of Hall's title in his classic *History of Experimental Psychology* (1957). Perhaps Boring, like Hall himself, kept the pedagogical work at a distance because of its low status (see Ross, 1972, for a description of Hall's fright at taking a professorship in pedagogy).

The research laboratory Hall founded at Johns Hopkins, as opposed to the one James had halfheartedly developed, was the first formal laboratory for the study of psychology in the United States. The laboratory also introduced, by courtesy of the university president, something unique in America--fellowships for graduate students. These attracted some other soon-to-be notable figures, John Dewey and James McKeen Cattell. Each of them profoundly affected the history of our field, and each of them found it difficult to work with Hall.

Hall is remembered at Hopkins by the APA for founding the first English language psychology journal, the *American Journal of Psychology*. But Hall also founded the second English language psychological journal in America, and it was an educational psychology journal. That came about after Hall went to Clark University as its first president in 1888. There he founded first a pedagogical seminary, or workshop, for the scientific study of education. Then, he provided it with a journal titled the *Pedagogical Seminary*, which is still published under a different name, the

Journal of Genetic Psychology (Boring, 1950).

Hall placed the pedagogical courses in the psychology department at Clark University and had them taught by W. F. Burnham, a psychologist he brought with him from Hopkins. Burnham stayed at Clark 36 years, making it one of the first universities to have a genuine and continuous department of educational psychology, although it was not originally known by that name .³

With his study of the contents of children's minds, begun in 1883 among Boston kindergarten children, Hall is credited with starting American developmental psychology in general and the child study movement in particular. Like Piaget 50 years later, Hall inquired into children's conceptions of nature, including animals, plants, and the solar system. And like Robert Coles 100 years later, he questioned what children knew about numbers, religion, death, fear, sex, and their own bodies. By 1915, Hall, with his students and coworkers, had developed 194 questionnaires to determine what youngsters and adolescents knew (Hall, 1923).

Hall's influential views on science, however, are our primary interest here. His was a science that was open to common people, not removed from daily life and definitely not conducted in a laboratory. Hall (1897) wrote that the laboratory was not a place to learn about the real feelings and beliefs of individuals. The natural environment, using ordinary people as data collectors, was needed to establish his new science of child study. The Boston study that launched Hall's career was research of this type, carried out by the teachers of Boston. It was a brilliant educational psychology investigation, and because there had never been any studies like it in America, it may qualify as the first empirical educational psychology study that was widely disseminated, as well.

The teachers who collected the data learned that 80% of the children knew where milk came from, but only 6% knew that leather came from animals. They learned that 94% of the children knew where their stomachs were, but only 10% knew where their ribs were. Actually, although the United States was still a rural country, 20% of those youngsters had never seen a cow or a hen, 50% had never seen a pig or a frog, and 80% had never seen a crow or a beehive. Boring (1950, p. 568) informs us of the important moral that was derived from this research: "Show children objects, explain relationships to them, do not trust them to know meanings or referents of common words; they must be taught." This advice to urban educators dealing with children from many different language groups and cultures is as compelling today as it was 100 years ago.

Hall was a great organizer, popularizer, and teacher of psychology. In fact, in 1893, 11 of the first 14 PhDs given in American psychology were to Hall's students. By 1915, Hall's students numbered well over half of all PhDs in American psychology, a group that included H. H. Goddard, Lewis Terman, and Arnold Gesell,⁴ all of whom profoundly influenced general, developmental, and educational psychology (see also Diehl, 1986, for Hall's paradoxical views on the education of women). So, Hall was arguably the most influential psychologist in the United States in the years just before and after the turn of the 19th century. But Hall's very popular science actually became more unscientific with each passing year. The samples he obtained were poorly described or unknown, the questionnaires he developed were not psychometrically sound, the data collectors were untrained, and the data were

poorly analyzed. It is tempting to suggest, as well, that because he worked with people of low status--teachers--there was suspicion about his data from the scientific community.

Hugo Munsterberg was the psychology professor at Harvard hired by William James as he moved himself away from psychology and into philosophy. Munsterberg is generally acknowledged as the founder of applied psychology, particularly forensic psychology. Near the turn of the 19th century, he launched a particularly vicious attack on the child study movement (Munsterberg, 1898a, 1898b) and was joined by others. E. L. Thorndike (1898b), who was remarkably tolerant of their amateurishness, still called the child study movement "very poor psychology, inaccurate, inconsistent and misguided." He predicted that very few successful hypotheses and very little verification of their findings would occur. Ultimately, it appears that the child study movement failed because it was not good science and because Hall, who held it together, had developed some very strange views of education and child rearing. The legacy of the child study movement, however, was enormous (Siegel & White, 1982). These terribly imperfect, naturalistic studies that relied on teachers and parents as researchers, formed "the beginnings of a host of new areas focusing on the child, such as experimental child psychology, educational psychology, school psychology, physical education, social work, mental retardation, mental hygiene, and early education" (Davidson & Benjamin, 1987, p. 56).

So, we have a popular movement that accomplished at least three things. First, it presented a view that science could guide educational thought, paving the way for Thorndike, who would soon follow. Thorndike's second book, it should be noted, was titled *Notes on Child Study* (Davidson & Benjamin, 1987; Joncich, 1968). Second, the movement promoted the belief that anyone could be a scientist, that is, that reliable data could be gathered by minimally trained individuals. Finally, the movement promoted the idea that data from the natural environment are at least equal to those of the laboratory. These are once again contemporary views in education, and the critics of those views today are not unlike those who condemned such work in the past. The question then and now is "What is the warrant for thinking thus and so, or for acting in such a manner?" Hall's answer to that question was not acceptable to the community of scholars of that time. Although Hall's science was not good science, it prepared a lot of people for better science and for a different view of science.

John Dewey

The contributions of another American giant, John Dewey (1859-1952), were, like James's, in three intertwined fields of study: philosophy, psychology, and pedagogy.

Dewey obtained his doctorate at Hopkins in 1884, with Hall as his advisor, although they appear not to have liked each other. Dewey wrote a psychology text in 1886, 4 years before James's *Principles* came out. Although well received, it was not a major intellectual event in the field. It was decidedly philosophical, which was perfectly natural for its time (Dewey, 1886). One of Dewey's very few empirical articles was published in 1894, the year he went to the then newly created University of Chicago. It was an article on the relative frequency of word use by

young children, probably his own (Dewey, 1894). His first major article in psychology came out in 1896. It was on the relations between stimuli and responses, and it had a particular American flavor to it (Dewey, 1896). As with the work of James before him, it was against elementalism and in defense of a more holistic view of stimuli and their associated responses, including the context in which they occur. Dewey noted that stimuli and responses occur as part of previous and future chains, because that is the nature of experience. Therefore, we should really think of the stimulus and response as inseparable entities. Experience, as James had noted, is a stream. Dewey argued that what held together stimuli and their responses were the interpretations given to both, thus putting consciousness, attribution, and constructivist views squarely before the emerging stimulus-response (S-R) psychologists of that time.

Dewey's important psychological article (1896) had immediate educational implications. If it was the whole act that constituted the basis for learning, then the prevalent form of instruction at that time had to be inappropriate. Reciting lessons to students, where teachers acted like they were pouring knowledge into students' heads, had to be a mistake. Lessons of that type were, at best, emphasizing only one part of a system. Where was the emphasis on having children respond, on having them be active in some way? What was to be done about will, volition, and motivation? And where was there time allotted during teaching for interpretation, to the making of meaning out of what was presented? These concerns are as relevant today as they were 100 years ago when they were forcefully brought to the attention of educators. And lest we forget how radical these ideas were (and still are), we should note that powerful forces lined up against Dewey when he was introducing the "new" education in the first yearbook of the Herbartians (Dewey, 1895). For example, 2 years later in the third yearbook of that series, U.S. Commissioner of Education William T. Harris (1897) was still advocating traditional methods. He stated the four cardinal rules for efficient instruction: "The child must be regular [in attendance] and punctual [in assignments], silent and industrious. . . . It is this which 'builds character' " (pp. 59, 65). Obedience to authority was considered necessary for developing the child's personal sense of responsibility and duty (Monroe, 1952).

Dewey and his colleagues at the University of Chicago founded the functionalist school of psychology, a way of thinking about psychology that was strongly influenced by Darwin. Functionalists promoted a psychology interested in the purpose of behavior or the function of mind. That is, instead of describing some event, say a rat's pursuit of food or a child's acquisition of fear, psychologists should ask what would that behavior accomplish? What purpose would it serve? What is the behavior's function? Functionalism promoted the study of both animal psychology (for Darwin linked us to the animal world) and educational psychology (for Darwinian theory suggested also that societies evolve and that one of the most important means for doing so seemed to be education). Our field has its roots deep in the functional school of psychology that emerged at the turn of the 19th century, and that point of view continues to have contemporary followers (Berliner, 1990).

Before obtaining his doctorate with a thesis on the psychology of Kant, Dewey had been a high school teacher. Thus, more than most, he could fulfill the duties expected of him when he moved to Chicago to the Department of Philosophy, Psychology and Pedagogy. In fact, soon after his arrival, he founded an elementary

school as a place to learn more philosophy, more social theory, and more psychology. His laboratory school began as a place to study how children learn, not as a site for teacher education, as some laboratory schools became later. Dewey, the pedagogue, was against imparting mere knowledge, believing that such information was either wrong or would soon be outdated. He was against rote learning and drill and practice approaches. He was for what we would call today the development of thinking skills and against the attainment of decontextualized, inert forms of knowledge. In the fullest functionalist tradition, he said that knowledge was a tool, not an end in itself (Dewey, 1910). He advocated allowing students to participate in the educational process because it was their personal needs that were the starting place of that process.

The principles of effort and interest were the guiding psychological principles of the day. But to Dewey, neither the motivating factors associated with effort nor the development of interest was the means by which education could best be accomplished. Those were external factors, under the direction and control of the teacher. He felt that the individual's internal processes must be understood. Most important were the urgent needs, impulses, and habits that each child possessed (Dewey, 1895, 1910). It was when the teacher found these and created an environment to free these qualities that the greatest and most meaningful learning took place. Dewey, therefore, believed in a personal and idiosyncratic curriculum for each child. Thus, the project method was advocated by the progressive educators who tried to put Dewey's ideas into practice. Our contemporary norm-referenced standardized achievement tests, which are based on the assumption of a common school curriculum for all students, would not be appropriate for the conceptions of schooling that were held by Dewey.

Dewey also recognized the uniqueness of the teacher's role as a fellow human being in a community of learners. In his presidential address to the APA in 1899, he (1900) chose to discuss educational issues, particularly psychology and social practice. He pointed out the failure likely to occur should educational psychology not recognize that the teacher

lives in a social sphere--he is a member and an organ of a social life. His aims are social aims ... Whatever he as a teacher effectively does, he does as a person; and he does with and towards persons. His methods, like his aims, ... are practical, are social, are ethical, are anything you please--save merely psychical. In comparison with this, the material and the data, the standpoint and the methods of psychology, are abstract. . . . I do not think there is danger of going too far in asserting the social and the teleological nature of the work of the teacher; or in asserting the abstract and partial character of the mechanism into which the psychologist ... transmutes the play of vital values. (p. 117)

In that speech in which he reminded psychologists about the nature of classroom teaching, Dewey asked also whether it was possible to have the educational psychologist on one side, acting as a legislator, and classroom teachers on the other, acting as a class of obedient subjects. He wondered, "Can the teacher ever receive 'obligatory prescriptions'? Can he receive from another a statement of the means by which he is to reach his ends, and not become hopelessly servile in his attitude?" (p. 110). His answer, of course, was that the pronouncements of psychologists with regard to classroom practice had to be tempered.

In addition to his basic democratic concern for building relationships between the educational psychologist and the classroom teacher on the basis of equality, Dewey would add another factor, particularly if the results to be disseminated were based primarily on laboratory work. That factor was tentativeness:

The great advantage of the psychophysical laboratory is paid for by certain obvious defects. The completer control of conditions, with resulting greater accuracy of determination, demand an isolation, a ruling out of the usual [means] of thought and action, which leads to a certain remoteness, and easily to a certain artificiality. When the result of laboratory experiments informs us, for example, that repetition is the chief factor influencing recall, we must bear in mind the result is obtained with nonsense material--i.e., by excluding the conditions of ordinary memory. The result is pertinent if we state it thus: The more we exclude the usual environmental adaptations of memory, the greater importance attaches to sheer repetition. It is dubious (and probably perverse) if we say: Repetition is the prime influence in memory. Now this illustrates a general principle. Unless our laboratory results are to give us artificiality's, mere scientific curiosities, they must be subjected to interpretation by gradual re-approximation to conditions of life ... The school, for psychological purposes, stands in many respects midway between the extreme simplifications of the laboratory and the confused complexities of ordinary life. Its conditions are those of life at large; they are social; and practical. But it approaches the laboratory in [that it is simpler]. . . . While the psychological theory [c]ould guide and illuminate the practice, acting upon the theory would immediately test it, and thus criticize it, bringing about its revision and growth. In the large and open sense of the words psychology becomes a working hypothesis, instruction is the experimental test and demonstration of the hypothesis; the result is both greater practical control and continued growth in theory. (pp. 119- 120)

So, Dewey also recognized a wholism, a concern for the life of teachers and a respect for them, and a distrust of laboratory studies as influences on practice.

Views of the Founding Figures Before Thorndike

After considering the founding figures of both the APA and educational psychology, it might be useful to review their characteristics. James, our grandfather, taught that psychology did not have the whole picture of human beings and that science probably never would. He saw activities such as mental testing and the like as reflecting only certain aspects of an individual. He saw the teacher as having a practical wisdom. Teaching, he believed, was an art that could not in any direct way be much touched by psychology, particularly its laboratory findings. Teachers, James noted, were ethical and concrete, and psychologists were abstract and analytic, thus making communication difficult between them.

In Hall and Dewey, our granduncles, we have former classroom teachers who respected teachers and the complexity of teaching more than did James. Hall's science had a common sense to it; he trusted teachers to be good observers and data collectors, and he defended passion, sentiment, and love as elements in the making of a good science of child and educational study. Although generally poorly carried out, his was a science more naturalistic than laboratory based, more clinical than experimental, and more qualitative than quantitative. Dewey held to a holistic psychology, understood the teacher as a social being, and thought that if

psychology presented its findings as truths to be applied it would necessarily put teachers in a position of servitude. He saw laboratory psychology as limited and all psychological findings as tentative, as working hypotheses for teachers to test.

Despite their many personal and professional differences, these three founders of general and educational psychology had no problem agreeing that psychology had to take a major interest in education and that it was destined to be the "master science" for pedagogy. There was still a question, however, about which view of science was to dominate. This was the context for the father of our field, Edward Lee Thorndike, whose views differed from these individuals in important ways.

Edward Lee Thorndike

Much has been written about E. L. Thorndike (1874-1947), and unquestionably our discipline has prospered because of his contributions. It is difficult, therefore, to say, "Thanks, Ned, but you took too narrow a path." However, I believe that Thorndike's views resulted in a major shift in psychology, and it had serious consequences for our discipline. From a field genuinely interested in issues of schooling, psychology became disdainful of school practice. Thorndike's influence resulted in an arrogance on the part of educational psychologists, a closed-mindedness about the complexities of the life of the teacher and the power of the social and political influences on the process of schooling. It was fated, however, because Thorndike was a product of a time when an unbounded faith in what science could accomplish seemed justified. He was a product of his age as we are of ours, and we are as obligated to look differently at his contributions as he was obligated to hold the beliefs that he did.

Thorndike was a bright New England minister's son who, with his brothers, needed to get high grades to receive scholarships for college. Eventually, three Thorndikes became professors at Columbia University, attesting to the powerful values of the family.⁵ We get some intimation about what was to come when Thorndike, an undergraduate at Wesleyan in 1895, wrote about the criteria for judging a novel. He commented that a proper novel was one designed to transmit information, to influence the intellect through its truth. The novel was definitely not to be judged on its ability to excite the emotions (Joncich, 1968). Permeating Thorndike's formative years, and influencing the work of his lifetime, was the belief in truth, discovered through science, as the way to perfect mankind. The mind and science, not emotion, were to be trusted. Early in his career, he wrote, "One can readily show that the emotionally indifferent attitude of the scientific observer is ethically a far higher attitude than the loving interest of the poet" (E. Thorndike, 1899, p. 61).

While at Wesleyan, Thorndike (and his fellow undergraduate Charles Judd) studied psychology from James Sully's (1889) *Outlines of Psychology*, the first edition of which was published in 1884, 6 years before James's *Principles*. Sully's book had a subtitle that is often overlooked, namely, *With Special Reference to the Theory of Education*. Sully wrote that his goal was "to establish the proposition that mental science is capable of supplying those truths which are needed for an intelligent and reflective carrying out of the educational work" (Sully, 1889, p. 1). Thorndike may have been influenced by this general and educational psychology text before he

read James's *Principles*. In his autobiography, however, he noted that it was James who so interested him that he bought the two volumes of the *Principles*, the only text he purchased while an undergraduate (E. Thorndike, 1936).

After graduating from Wesleyan, Thorndike went to Harvard for two years (1895-1897), where he came under the influence of the brilliant and eclectic William James. There he took up experimental psychology, first with children and then with animals as subjects, housing his chickens in James's basement after his landlady refused to let him keep them in her house. Dissatisfied, in part, with James's increasing distance from psychology, Thorndike moved to Columbia University for a year of study with the well-respected James McKeen Cattell, a student of Wundt, Galton, and Hall. Cattell was the first person in the world to hold the title of professor of psychology and ranked second only to James as the most influential psychologist of his time (Boring, 1950; Charles, 1987). With Cattell's life devoted to the study of individual differences and mental measurement, this founder of the Psychological Corporation was certainly as much an educational as he was a general psychologist. Cattell allowed Thorndike to bring his chickens from James's basement to the attic of the new facilities at Columbia University. In this setting, Thorndike wrote his classic thesis, *Animal Intelligence* (1898 a), and gained his first notoriety as a psychologist of considerable talent. His first job after graduation was as a professor of pedagogy and director of the practice school at Western Reserve University. Thorndike's disdain for most of what had been written about education is palpable in his claim that he read everything of use in pedagogy in the 8 weeks before the semester began.

The quality of Thorndike's teaching was not a problem, but his experience in the schools was not a happy one: "The bane of my life is the practice school they stuck me with. It takes a whole day every week and is a failure at that" (Joncich, 1968, p. 234). Instead of promoting the practice school, he tried to open an educational laboratory (Joncich, 1968, p. 163). How different from Dewey at Chicago, who saw the school as the laboratory!

A year later, in 1899, Thorndike was brought to Teachers College as an instructor in psychology, where he remained a dominant force in psychology for 43 years, writing 50 books and 400 articles, all without a typewriter or a calculator (R. L. Thorndike, 1985). Compared with the brilliant Dewey, whose students said he was at his best when he forgot to come to class (Joncich, 1968), Thorndike rated quite favorably as a teacher. But he did not handle practical concerns very well. He was not unkind when such issues arose, but when a school superintendent asked him what he might do about a particular real-world dilemma, he responded "Do? Why, I'd resign!" (Joncich, 1968, p. 217). Thorndike fought with his dean over the usefulness of real-world experience for training teachers, with Thorndike against it. In fact, by 1914, he advised his graduate students, the future leaders of our discipline, to read all they could about education in order to learn what was happening in the schools but not to bother spending their precious hours visiting the classroom (Joncich, 1968, p. 231). Arthur Gates, a student of Thorndike's at about that time, who was soon to be a nationally recognized educational psychologist on the faculty of Teachers College, had "never heard of him going into the schools" (Joncich, 1968, p. 231).

We all know of the success Thorndike had in banishing mental discipline with his

transfer studies and of the success of his *Educational Psychology* textbooks, his texts on mental and social measurement, and those on general psychology. He also wrote influential books on the psychology of school subjects, such as arithmetic and reading. He gave us the first standardized achievement test (Watson, 1961) and developed intelligence tests and compiled dictionaries, as well. He was named president of the APA in 1912, early in his career. The written works and attitudes of this enormously influential teacher of educational psychology promoted and directed our field for half a century

The Written Record

Thorndike believed that only empirical work should guide education. His faith in experimental psychological science and statistics was unshakable. In his *Introduction to Teaching* (E. Thorndike, 1906), he wrote that psychological science is to teaching as botany is to farming, mechanics is to architecture, and physiology and pathology are to the physician.

There seemed to be a mechanical model underlying Thorndike's ideas about the application of psychology to schooling. Although he often noted that schools were complex sites, he managed to ignore the difficulties inherent in applying psychological science to school problems. He didn't seem to recognize the need for the "intermediate inventive mind" that James did, nor did he feel the need to reapproximate psychological findings into the school, as Dewey did. He not only ignored the unscientific musings of educators, he ridiculed them. For example, in his introduction to his first educational psychology text, he stated,

This book attempts to apply to a number of educational problems the methods of exact science. I have therefore paid no attention to speculative opinions and very little attention to the conclusions of students who present data in so rough arid incomplete a form that accurate quantitative treatment is impossible. (E. Thorndike, 1903, P. V)

Thorndike showed this unbridled faith in science, once again, in the introduction to the brand new *Journal of Educational Psychology* (E. Thorndike, 1910):

A complete science of psychology would tell every fact about every one's intellect and character and behavior, would tell the cause of every change in human nature, would tell the result which every educational force ... would have. It would aid us to use human beings for the worlds welfare with the same surety of the result that we now have when we use falling bodies or chemical elements. In proportion as we get such a science we shall become masters of our own souls as we now are masters of heat and light. Progress toward such a science is being made. (p. 6)

Thorndike, unlike his mentor James, did not have the courage to defend an incomplete science. It is unlikely, for example, that James could have ever thought what Thorndike (1909, reprinted in Joncich, 1962) wrote with fervor:

Man is free only in a world whose every event he can understand and foresee. . . . We are captains of our own souls only in so far as ... we can understand and foresee every response which we will make to every situation. (p. 45)

We can contrast this attitude with the one expressed by E. C. Tolman in his presidential address to the APA in 1937. There, Tolman wondered if psychology

was ready to guide any kind of human behavior, because it still could not predict which way a rat would turn in a maze (Joncich, 1968). Thorndike had no such discomfort with psychology. He had absolute certainty about the potential of a rational, scientific approach to education. For example, when he applied his connectionist psychology to the learning of school subjects, as in his *Psychology of Arithmetic* (1922), he derived his practices from logic and laboratory, *not* from the teaching of arithmetic in the field. He then claimed that this new pedagogy differed from the old because

the newer pedagogy of arithmetic ... scrutinizes every element of knowledge, every connection made in the mind of the learner, so as to choose those which provide the most instructive experiences, those which will grow together into an orderly, rational system of thinking about numbers and quantitative facts. (p. 74)

No tentativeness is shown here. Every connection is analyzable and then analyzed. Today, we would call the work commonsensical, systematic, and organized according to some reasonable principles of instruction. Today, we would probably not call the work scientific but, rather, logical. It is interesting to note and reflect on the fact that Thorndike apparently never field-tested the ideas and materials he promoted in the different subject matter areas. He was so sure of his scientific footing that field-testing his texts and educational materials in the various school subjects seemed absurd. It appears as if Thorndike had fallen into the same trap that the school administrators had fallen into when they would not accept Rice's work on spelling. The administrators with their moral philosophy and Thorndike with his science both believed strongly that they knew what was proper. Their beliefs were so powerful that empirical data were not seen as relevant (Travers, 1985).

Thorndike's surety about science carried over into his work on quantitative methods, where he wrote eloquently about the power of educational measurement (E. Thorndike, 1918):

Whatever exists at all exists in some amount. To know it thoroughly involves knowing its quantity as well as its quality. Education is concerned with changes in human beings; a change is a difference between two conditions; each of these conditions is known to us only by the products produced by it--things made, words spoken, acts performed, and the like. To measure any of these products means to define its amount in some way so that competent persons will know how large it is, better than they would without measurement. . . . We have faith that whatever people now measure crudely ... can be measured more precisely. (p. 16)

There is more of this throughout Thorndike's writings and those of his graduate students. Psychology need not go into the classroom; it can derive its laws from the laboratory and hand them down to teachers, thus creating the very condition that Dewey in a nearby office had decried. Thorndike promoted the belief that science and only science would save education. Indeed, he believed it would save all of society. His belief was that quantitative experiments were to be preferred over qualitative, clinical, or naturalistic observation. By the time World War II was near, at many institutions these beliefs had resulted in the irrelevance of the discipline of educational psychology. It had, in general, oversold what it could deliver. For example, Frank N. Freeman wrote the conclusion to the 1938 yearbook of the National Society for the Study of Education, a publication summarizing the

achievements of the scientific movement in education. Freeman (1938) remarked that what had been accomplished appeared to be superficial, addressing the husk, not the kernel, of the educational process. He speculated that the scientific movement that Thorndike headed had gone as far as it could in improving education. Hilgard (in press), reviewing the 37 chapters of that yearbook, believes they provide testimony that wrong directions were taken by the field. It was a time when members of educational psychology refused to take seriously the world of schooling and the importance of the social lives of the students, teachers, and others who spend considerable amounts of time in that setting. Disdain for practice was the prevailing attitude. Because Thorndike and his followers took too narrow a view, our field had begun to show its weaknesses.

The Nether Side of Thorndike's Influence

McDonald (1964) called that period before World War II the nadir of the profession, and this is partially true, although it was also a function of a great depression. Some enduring work of practical significance was completed during the 1930s by those whom we call educational psychologists--Gates, Brownell, Pressey, McConnell, to name just a few--but much of the work that impacted our field was being done by psychologists who were not primarily interested in education. With hindsight, however, it appears that by the time World War II began, educational psychology had gone astray. But the debacle could not be addressed properly until after the war, a time that was actually one of opportunity and progress for our discipline. Psychologists and educational psychologists found meaningful work to perform in the war, because they better than others could advise on how to take a farmer or a store clerk and 8 weeks later provide an electronics repairman or a bombardier. They tested, evaluated, and designed instruction. The theoretical debates about the status of constructs within different learning theories, which had dominated psychology in the 1930s, ended with the war and never again interested the field of psychology as they had. In part, that was because the practical concerns of education during the war made it clear that there was little hope of finding a single, all-purpose learning theory. Learning theories provided guidance for thinking about different kinds of instructional problems, but, as James long before had noted, intermediate inventive minds were needed to solve the real problems of education. The war did not require theoretical elegance from its psychologists. It required solving practical, not laboratory, problems, such as the problem of rapidly teaching masses of men to reach acceptable levels of competency in hundreds of specialty areas (see Allport, 1947; Skinner, 1961; and McKeachie, 1974 for discussions of these issues). With the help of psychologists, the task was accomplished. Some of the people who came to a better understanding of educational problems during that time period, and who later influenced our field, included Walter Borg, Lee J. Cronbach, John Flanagan, N. L. Gage, Robert Gagne, Robert Glaser, J. P. Guilford, and B. F. Skinner. The roots of some of the changes that were to come in educational psychology had their origin in World War II, but those changes were still quite slow to come.

Every few years from the end of the war on, committees were formed to deal with educational psychology's increasingly obvious problems (Grinder, 1978). A 1948 committee of APA's Division 15 (the Division of Educational Psychology), concerned with our irrelevance, noted that educational psychology had disavowed responsibility for the directions in which education would go. Educational

psychologists seemed to be interested in the laws of learning, not in issues of schooling and teaching. Worse, this committee noted that educational psychologists could neither understand nor be understood by educators--the ultimate irony for a field that once accepted the homage of educators as practitioners of the "master science" (Cubberley, 1919; Grinder, 1989). Another report issued in 1954 (Grinder, 1978) pointed out that the most influential theorists were abandoning educational psychology and retreating to the field of experimental psychology. In the 1970s, yet another report noted our failures and tried to define the discipline and chart its future (Scandura et al., 1978). Each report was still burdened by the "middleman" notion, articulated well by Robert Grinder, the official Division 15 historian (1978). Grinder wrote that we should take again the middle ground once envisioned for our discipline, a position between psychology with its disciplinary rigor on the one hand and education with its messy problems on the other. But I think that it is no longer enough to advocate simply a middle position between psychology and education. That position is looked down on by psychology because it is applied and practical, and it is looked down on by teachers and teacher educators because it is scientific and irrelevant to their problems. Something a bit different than just a middle position is needed, a point I discuss shortly, after examining educational psychology at mid-century.

Educational Psychology at Mid-Century

At least one part of our problem as a field was due to the overall success of psychology in the United States. Forty years ago, A. D. Woodruff (1950) noted that educational psychology had no domain that was really its own to any greater extent than it belonged to others. The APA Divisions of Evaluation and Measurement, Childhood and Adolescence, Personality and Social, School Psychology, and Maturity and Old Age appeared to have as much claim as we did on the study of such psychological functions as learning, adjustment, individual differences, tests and measurement, statistics, and growth and development.

I believe the perception that we had no particular mission other than to apply general psychology to education is what brought us most of our trouble. Woodruff (1950) clearly understood that a problem existed. He did not see, however, that the solution was in taking seriously a slightly different mission than that of merely bringing the gifts of psychology to education, whether education wanted them or not.

With few exceptions, textbook writers in educational psychology also misperceived our mission. From Thorndike's time to the 1960s, the texts were usually rehashed versions of Thorndike's S-R associationism and general psychology, with the students required to do all the work to figure out how that material applied to education (Grinder, 1989). Although educational psychology had established itself as the "master science" in teacher education, the texts were found to be terribly wanting in studies of them conducted over many years (Hall-Quest, 1915; Remmers & Knight, 1922; Worcester, 1927; Blair, 1949). Dael Wolfle (1947), writing about psychological textbooks in 1947, gave a formula for writing textbooks in educational and child psychology. He said,

If you wish to write an educational psychology text, start with a good average introductory text. Remove the chapters which deal with the nervous system and sense organs and write three new chapters to use

up the space. These three new chapters will have such titles as Learning in the Schoolroom, Measuring Student Progress, and Social Psychology of the Schoolroom. ... While you are collecting royalties on your text in educational psychology you will want to write a child psychology text. The rules are easy to follow. Start again with the good average elementary text ... (p. 441)

Wolfe (1947) added that if you were writing an educational psychology text you had to delete all references to *subjects* and insert the term *pupil*, whereas if you were writing a child psychology text you had to use the term *children* instead of *subjects*. His final advice to authors of educational and child psychology texts was to rearrange the order of the chapters that were found in general psychology texts. Even as late as 1968, when Ausubel (1968) wondered if there was such a thing as a discipline of educational psychology, he noted that the texts in use were

a superficial, ill-digested, and typically disjointed and watered-down miscellany of general psychology, learning theory, developmental psychology, social psychology, psychological measurement, psychology of adjustment, mental hygiene, client-centered counseling and child-centered education. (p. 1)

In the same year in which John B. Carroll, one of our most honored educational psychologists, published his model of school learning (Carroll, 1963a), he also wrote about the discipline of educational psychology. The creator of one of our discipline's most elegant, parsimonious, and influential theories of learning, one derived from a practical problem of instruction, noted that the potential of educational psychology remained untapped because it seemed not to be concerned with genuine educational problems. Carroll said that until educational psychology provided evidence that it dealt with the real problems of schooling, "we shall continue to teach educational psychology to teachers with a mixture of pious optimism and subdued embarrassment" (Carroll, 1963), P. 119).

Philip Jackson (1981), writing a decade ago, laid the problems of our field squarely at Thorndike's feet. He cited four ways in which the introduction to the maiden issue of the *Journal of Educational Psychology* set the stage for the difficulties that would follow. In that introduction, Thorndike first failed to distinguish between the goals of and the methods used in the physical and the social sciences. To Thorndike, people were as easy to study as stones and toads. The methods of psychology, geology, and biology were not different, and the validity of the inferences to be made were seen to be equivalent. Second, Thorndike did not pay enough attention to the social and historical contexts in which people lived and in which schools operated. Third, Thorndike had a blind faith that all of the achievements of science were desirable. He seemed to believe this even after Hiroshima and the Nazi extermination camps, events that caused many people to question their faith in science. Finally, Thorndike overlooked the aesthetic dimension of science. The art of educational psychology surfaces occasionally, as it does in every other branch of science. Ironically, although completely unaware of it, E. L. Thorndike displayed that artistic quality a number of times.

As Jackson (1981) also noted, the final blow to Thorndikian conceptions of educational science came from our own highly respected educational psychologist, Lee J. Cronbach (1975). At the APA convention in 1974, on the occasion of his

receipt of one of the Distinguished Scientific Contribution Awards for 1973, Cronbach made it clear that inconsistent findings hindered certain kinds of progress in our field. Once we attend to the interactions in our data, he said, "we enter a hall of mirrors that extends to infinity" (1975, p. 119). He noted that many social science findings do not hold for long. Educational psychologists can demonstrate Decade x Treatment interactions, an occurrence almost unfathomable to most physical scientists. Thorndike would not know what to do with Cronbach's advice to social scientists, namely, to join with humanistic scholars and artists in trying to pin down the contemporary facts. For to understand individuals in their contexts, Cronbach said, is no mean aspiration. In fact, lately, our field seems to be heading that way (see Anastasi, this volume, for similar concerns about context in the area of educational and psychological measurement).

Recent Trends

As noted in the previous discussion, educational psychologists have often been functionalists. Using the functionalist approach to the history that we just covered, we should now ask what was learned that could be of use to us?

We are at the end of a century in which we psychologists first showed great *interest* in education. Eventually, although productive and busy in academic settings, we showed *disdain* for the real-world problems of schooling. And because of that we lost the special place we had in schools of education throughout the country. But educational psychology has been slowly changing, and we now, more than ever before, have come to *respect* educational practitioners and the instructional, political, and social problems they encounter. The 100-year journey from interest, to disdain, to respect has positioned our field to be more productive than ever before, although we will need to judge that productivity by different standards. We may need to abandon, for example, the heavy reliance on refereed journal articles about basic learning processes to prove our worth as scholars. We may need to also value an educational psychologist's analyses of work in demonstration projects, programs of teacher education, practitioner collaborations, curriculum development projects, and so forth. Taking seriously the work of education need not hamper productivity, but a redefinition of what it means to be productive will be needed. There are already many contemporary trends that demonstrate that a high level of productivity within scientific educational psychology can come from an increased concern for the problems of education and its practitioners. These are discussed briefly, below.

Research on Teaching

From the 1960s on, we have developed a specialty area in research on teaching (see Gage, 1963). From initial simple models of behavior using traditional psychological methodology, we have moved to more sophisticated, cognitively oriented, naturalistic, contextually sensitive, participatory studies. Many in this field have recognized the importance of knowing intimately the goals and intentions of the teachers they study, in order to make valid local inferences (see, e.g., Wittrock, 1986).

Instructional Psychology

A major area of educational psychology has been instructional psychology. Writing for the *Annual Review of Psychology* a decade ago, Lauren Resnick (1981) noted that the problems of real-world instruction were beginning to guide the development of instructional psychology:

An interesting thing has happened to instructional psychology. It has become part of the mainstream of research on human cognition, learning and development. For about 20 years the number of psychologists devoting attention to instructionally relevant questions has been gradually increasing. In the past 5 years this increase has accelerated so that it is now difficult to draw a clear line between instructional psychology and the main body of basic research on complex cognitive processes. Instructional psychology is no longer basic psychology applied to education. It is fundamental research on the processes of instruction and learning. (p. 660)

The Psychology of School Subjects

A resurgence of interest in schooling by educational psychologists was described, appropriately enough, in the G. Stanley Hall Lecture Series by Lee Shulman (1981), over a decade ago. He and his students have once again brought to the forefront of educational psychology the study of school subjects, demonstrating a concern for practice and the problems of instruction in the real world (Shulman, 1987, in press). This time, the psychology of school subjects is not merely the commonsense psychology of Thorndike, but a cognitive psychological approach that is equally concerned about the thinking of the learner, the structure of the discipline to be learned, and the form of explanations available to the teacher (For a sampling of this contemporary literature see Leinhardt & Smith, 1985; Lampert, 1990; Wilson & Wineberg, 1988; Wineberg & Wilson, 1988).

Methodology

Our methodology increasingly has expanded to make use of (a) cases -- as to document the genuine problems faced by real people in education; (b) naturalistic studies--so that we may enhance external validity; (c) qualitative research because many of us have decided that Thorndike was wrong and that not everything that we can describe should be measured; and (d) small samples, intensively studied--because we have seen that different but useful things are learned from studies of a few informants, in depth, rather than from studies of many subjects whose thoughts are barely known. What Thorndike took from Galton, by way of Cattell and Boas, is seen to be less useful today than it had been. It is the systemic (total environment) effects that often need to be studied. Most of the analytic techniques that we possess cannot deal with reciprocal relationships and are designed for the study of only a few variables at a time, thus simplifying the analysis of most educational situations. These techniques may not be adequate for the job (see Salomon, 1991). Ethnomethodology (e.g. Erickson, 1986), rather than biostatistics, is becoming an important source of new ideas for educational psychologists who choose to work in school settings on genuine educational problems.

Assessment

In another mainstream area of educational psychology, assessment, we see less interest in classical standardized testing of achievement, a field (like many others)

that Thorndike heavily influenced. We now see more concern for (a) the assessment of portfolios--to better reflect the achievement of students in their classrooms; (b) performance tests--a venerable form of assessment brought back into the limelight because we have learned that classical forms of testing can not easily be made to tap complex aspects of human cognition; (c) informal classroom assessment by teachers--because informal assessment, conducted on the run by sensitive teachers trying to make sense out of a large group of very heterogeneous students, is how the vast majority of classroom assessments are carried out, and it is these data that are used in teachers' decisions about instruction or the need for special services for particular students; and (d) program evaluation--which now is seen as a political process, to be conducted by a whole range of social scientists and humanistic scholars, to educate decision makers for making responsible choices in a democratic nation (see Cronbach, 1980, for a synthesis of these views, as well as the writings of other distinguished evaluators such as House, Stake, or Weiss in McLaughlin & Phillips, 1991). These contemporary views of evaluation are far more Deweyan and much less Thorndikian than was true when educational psychologists began to work in program evaluation.

Other Trends

There is current work by Snow and his colleagues (Snow, Corno, & Jackson, in press; Corno, 1993) on issues of conation and volition, closely allied with James's psychology. Contemporary research on expert-novice differences in a domain of knowledge is fundamentally developmental cognition, the field developed by Hall. The current interests in socially shared cognition and the psychological work of Lev Vygotsky are closely allied with the psychology of Dewey. In every area of educational psychology, we see today more studies of psychoeducational phenomena, and more methods for the study of those phenomena, that are compatible with the ideas of our grandfathers and granduncles, William James, G. Stanley Hall, and John Dewey. The turn of the 19th century, however, was not their time to influence educational psychology; it was Thorndike's. But fashion changes. Although it is always hard to read the zeitgeist when in its midst, it does seem that as the next century dawns we have begun to pay more attention to the issues that our grandfathers and granduncles were concerned about. We have so much that is new, once again, to learn. We need only be sure not to be led astray by the currency and trendiness of methods and ideas. This we can do if we keep before us the motto of the philosopher D. C. Phillips (1987) who, when commenting on new methodology, pointed out that no matter what was said, "worry about warrant will not wane."

Redefining Educational Psychology

If we are to sustain the changes in our field that are now occurring, the definition of educational psychology will have to be modified. Many writers, particularly Wittrock (1967, 1992) and Berliner (1992), have remarked that we should not think of ourselves as a subdiscipline or merely an applied discipline, carrying psychology to education. In fact, the evidence is quite clear that the gifts to general psychology from educational psychology have been many and profound (Berliner, 1992), so that it clearly is not a one-way thoroughfare for the passing on of knowledge. I have already noted that something more than simply occupying a middleman position is needed. I think Richard Snow (1981) put it best: Our job is to psychologize about

educational problems and issues and not simply to bring psychology to education, as if we were missionaries carrying out the Lord's work. The latter approach somehow breeds arrogance and disdain, characteristics that got us into trouble in colleges of education throughout the nation. The designation of our field as the "master science" by Cubberley (1919), although flattering, has not been conducive to building equality among the members of the interdisciplinary teams of social scientists and practitioners with whom we work.

I believe that to see ourselves as psychologizing about the problems and issues of education is different in important ways from simply being a middleman. The psychologizing role certainly requires that we bring our considerable talents, our rich disciplinary perspective, our concepts and methods and habits of mind to bear on the genuine problems of administrators, teachers, students, curriculum and instruction, teacher education, and so forth. But, as stated, it is the problems of the field that are the origins of our interest as psychologists. This is a subtle but crucial difference from the way educational psychology has been thought about since Thorndike conquered the field. This formulation recognizes both the importance of understanding the problems of the individuals struggling to make schooling successful *and* the importance of our disciplinary perspective. This way of defining our field lends dignity to the work of the educators, for *their work rather than our discipline becomes the basis of our inquiry*. Implicit in recognizing the primacy of the problems of practice is that we have license to explore more deeply the social, moral, political, and economic forces that impinge on the psychological processes we have a preference for exploring. To know educators as they are, in the contexts in which they work, through the eyes of psychology, is no mean achievement.

Conclusion

E. L. Thorndike is a hero of mine. I do not think we need detract from his greatness as we recognize his shortcomings. The new generation of educational psychologists would do well to read him but to recognize the limits of his views, many of which grew out of the times in which he lived. In the second century of educational psychology, our science probably needs to be more descriptive and participatory, in the style of Hall. It needs to be less strident about pronouncing, ex cathedra, its findings, a warning that was first given to us by James. Our science needs to be more tolerant of the teacher and the complexity of the social, moral, and political world of classrooms and schools, as Dewey reminded us. Educational psychology also needs to be more eclectic in its methods, for surely we have learned that science is not synonymous with measurement and experimentation. We can forget, as soon as possible, the claim of objectivity that Thorndike thought could be made. Contemporary feminist, minority, and Marxist scholars have all shown us that gender, ethnicity, and the commitments of the investigator are not to be denied in scientific investigations, but valued for their contributions to the choice of topics to be studied and the interpretations that are made of the findings. Science never was as neutral as Thorndike believed it to be, and to perpetuate that myth among the next generation is nonsensical.

For a new century, educational psychology can start again to rebuild our relationships with our partners in the educational enterprise by picking our problems to study, and designing our teacher education courses, with concern for the educational contexts in which teachers and students work. Many of us, of course,

will continue to work in laboratory settings, libraries, and offices, at a distance from the problems of schools. Such preferences are always to be defended. High quality work from such approaches has been, and will continue to be, informative and admired. But many more of us in educational psychology ought to take as our starting point for psychologizing the problems that teachers and students face in the course of their work. When we come to know the people and the problems they face well, that will enrich our discipline and enhance our usefulness. We should then be able to dazzle the students in programs of teacher education, for we have the tools and the information to improve society and education, just as Thorndike thought we did. We just need to go about it differently.

Humility and tentativeness, rather than surety and arrogance, can help us build bridges to the practice community. Attempting to provide locally valid rather than broadly generalizable knowledge is probably a more reasonable goal for many of us than the one held by Thorndike (see Goldenberg & Gallimore, 1991). Educational psychology certainly has much to offer if treated more as Dewey thought it should be, as a set of working hypotheses rather than as a set of valid findings ready to be applied. We need to remember William James and the courage that it takes to be incomplete. If we attend to it, history will have taught us much that is of value as we face our second century.

Our journey from interest, to disdain, to respect for the world of practice has led us to redefine our field and its methods a number of times. But in the transformations that took place we never seemed to lose sight of our fundamental goals: to understand and improve education in our society. Those goals are likely to remain constant even as the future brings other changes to our discipline. Whatever the next century brings us in terms of new psychological theory and new educational problems,

We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.
(T. S. Eliot, *Four Quartets*, 1969)

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NOTES:

1. As the Herbartian movement faded, the organizers of the Society changed their

name to the National Society for the Experimental Study of Education and continued publishing yearbooks with a strong empirical and scientific base. Eventually, as experimental methods were finally and grudgingly accepted in education, they changed their name to the National Society for the Study of Education, and to this day they still publish high-quality yearbooks on educational issues.

2. In the preface to *Talk to Teachers*, James wrote, "In 1892 I was asked by the Harvard Corporation to give a few public lectures on psychology to the Cambridge teachers." But in the history and the letters covering the origins of that series of lectures (p. 234, W. James, 1899, 1983), it appears that James began them in the fall of 1891 and finished them in the winter of 1892. He appears to have forgotten some of the background to the origins of the lecture series when he wrote the preface, which was approximately 7 or so years later. He regarded the enterprise as forced labor and lamentable work (p. 234). so it is not surprising if some error of memory occurred.

3. A great deal of the subject matter of educational psychology had been taught, from 1863 on, at the normal school in Oswego, New York, in a child study course. That course probably was the model for the child study courses that spread to other normal schools after the Civil War (Watson, 1961). And those courses are the immediate predecessors to the courses on educational psychology that we see today in programs of teacher preparation. Courses explicitly titled "Educational Psychology" generally began just before the end of the 19th century (Charles, 1987). The first of these was apparently taught at the University of Buffalo in 1895, followed by one at the Normal school at Greely in 1896. The third course in the country with that particular title was taught by E. L. Thorndike at Teachers College, beginning in 1902 (Joncich, 1968).

4. It appears that the first person in the nation to hold the title of "School Psychologist" was Hall's student, Arnold Gesell (Kramer, 1987).

5. The tradition continued, as two of Thorndike's sons acquired doctorates in physics, his daughter earned a doctorate in mathematics, and son Robert L. Thorndike went on to a distinguished career as a professor in psychology and education at his father's institution, Teachers College, Columbia University. Robert L.'s son, Robert M. Thorndike, is the third generation of educational psychologists. A faculty member at Western Washington University, his scholarly work, like that of his father and grandfather, has been in the areas of educational measurement and intelligence testing.

