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Adult Literacy Policy, Scientifically Based Research, and Evidence-Based Practice

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INTRODUCTION

Legislators, policymakers, and funders of programs and services in health care, social service, and, most recently, education have employed the terms *evidence-based practice* and *scientifically based research* in determining which programs and practices to fund. Within the past year, adult literacy educators have begun to see these terms appear in national and state guidelines for program funding. In its simplest form, the use of these terms indicates that programs should not be funded unless the practices they employ are supported by research (evidence-based practice) and unless that research was conducted according to specific scientific guidelines (scientifically based research). In short, these two terms mean that adult educators are being asked to conduct research in a "scientific" way to generate appropriate evidence about what works, and then use that evidence in their practice.

Debates over what counts as scientifically based research make the issue much more complex and political. To date, there is no single, precise, universally accepted definition of scientifically based research. Disagreements usually revolve around standards for evidence. At one end of a continuum is a 200-plus-word definition of scientifically based reading research that has been written into law (see pages 4–5 of this volume). The U.S. Department of Education (Orland, 2002) has elaborated on this definition, indicating that randomized trials (random assignments to conditions) with a control group are the gold standard for scientifically based research. At the other end of the continuum are broader definitions of science, such as Berliner's citation of Percy Bridgeman, who in 1947 said that there is no scientific method, merely individuals "doing their damnedest with their minds, no holds barred" (Berliner, 2002). From these perspectives, scientifically based research includes a much broader array of research.

In the United States, federal funding of literacy education and research has been linked to increasingly empirical definitions of scientifically based literacy research. The legislated federal definition of scientifically based reading research is found in the Reading Excellence Act of 2000 (U.S. Department of Education, Office of Elementary and Secondary Education, 2002) as well as the No Child Left Behind Act of 2002 (U.S. Department of Education, 2002a) and has been refined and narrowed still further in the U.S. Department of Education's strategic plan for 2002–2007.

Several social forces are driving the use of evidence-based practice and scientifically based research as tools for program funding. Among these forces are:

- A society-wide push for quality control.
- The desire for rational tools to inform funding reallocations and cuts.
- Growing skepticism among taxpayers and the public about the value of what their taxes fund.

In the area of education, and literacy education in particular, this movement toward accountability has become entangled with political battles over definitions of evidence and which educational practices do or do not have the required sorts of evidence. For adult literacy practice, the debate is further complicated by the fact that only a small number of research studies specifically related to adult literacy have been done (compared to the research on children's literacy that is funded) and that even fewer of these studies meet some criteria for scientifically based research.

This chapter examines what scientifically based research has meant in a variety of contexts before focusing more specifically on what federal

definitions of scientifically based literacy research mean and are likely to mean for adult literacy education and research. Responses of several professional organizations to calls for scientifically based research are considered, as are scholarly analyses of the roles research can and cannot effectively play in informing policy decisions. As adult literacy organizations have not officially responded or offered commentary on the move toward scientifically based research, postings offered on the National Institute for Literacy (2002) listserv are used to highlight a variety of perspectives among adult literacy educators and researchers. The chapter concludes by focusing on recent efforts to catalogue what scientifically based research has to say about adult reading instruction and by suggesting how adult literacy educators and researchers might respond to recent legislation and the U.S. Department of Education strategic plan most productively.

WHAT IS SCIENTIFICALLY BASED RESEARCH?

The movement toward making policy and funding decisions using information with the pedigree of scientifically based research did not start with education and is not limited to the United States. For example, over the past 10 to 15 years, market reforms in health care delivery have focused on the effectiveness of hospitals and mental health care. Governments, insurance providers, and health maintenance organizations have developed guidelines for subsidized treatments based on synthesis studies of treatment effectiveness. Davies, Nutley, and Smith (2000) make a case for scientifically based approaches to policy and funding in health care, education, criminal justice, social care, welfare policy, housing, transportation, and urban policy. In England, Evans and Benefield (2001) report the Secretary of State for Education and Employment as stating:

> Social science should be at the heart of policymaking. We need a revolution in relations between government and the social research community—we need social scientists to help determine what works and why, and what types of policy initiatives are likely to be most effective. (Blunkett, 2000, cited in Evans & Benefield, 2001, p. 527)

In relation to literacy education practices in the United States, the National Reading Panel (NRP) review of research related to reading instruction at K–12 levels established a set of "evidence-based methodological standards" (NRP, 2000, p. 2) for selecting research studies on the effectiveness of various instructional practices. The guidelines for

acceptable studies are extensive and woven throughout the first 30 pages of the publication. Criteria for accepted studies include: (a) having reading as an outcome measure; (b) being published in English in a refereed, peer-reviewed journal; and (c) using an experimental or quasi-experimental design with a control group, or a multiple-baseline method (NRP, 2000, p. 5).

Findings and language from the NRP study shaped language and definitions appearing in the federal Reading Excellence Act of 2000. The Reading Excellence Act Web site indicates that the legislation authorizes the U.S. Department of Education to improve literacy in several areas and that it "base instruction, including tutoring, on scientifically based reading research" (U.S. Department of Education, Office of Elementary and Secondary Education, 2002). Under Title VIII, Section 2252, Definitions of the Reading Excellence Act, criteria of scientifically based reading research are provided. They are:

> The term "scientifically based reading research"
> a. means the application of rigorous, systematic, and objective procedures to obtain valid knowledge relevant to reading development, reading instruction, and reading difficulties; and
> b. shall include research that:
>   i. Employs systematic, empirical methods that draw on observation or experiment.
>   ii. Involves rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions drawn.
>   iii. Relies on measurements or observational methods that provide valid data across evaluators and observers and across multiple measurements and observations.
>   iv. Has been accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparably rigorous, objective, and scientific review.

Grover "Russ" Whitehurst, Assistant Secretary of the U.S. Department of Education's Office of Educational Research and Improvement, has spoken in support of the federal move toward using scientifically based research in education. Whitehurst indicates:

> Something needs to be done differently in education, and if it's based on science it's more likely to be cumulative and produce serious change. We want to see objective research in education that's as rigorous as topics in health and medicine. . . . We would like to see less of the type of research that is advocacy research, where the answer is determined before the research is conducted. (Murray, 2002, p. 53)

In February 2002, the U.S. Department of Education hosted a seminar entitled "Inside Scientifically Based Research" at which several commissioned papers were presented and discussed. The seminar and papers elaborated on the logic and basic principles of scientifically based research and went on to address its specific application to math education, early reading education, safe and drug-free schools, and comprehensive school reform. It is not possible or appropriate in this chapter to address all aspects covered in the forum. It is worth noting, however, that the papers did not contradict the legislative definition of scientifically based research (U.S. Department of Education, 2002b).

THE BROAD INTERNATIONAL PRESENCE OF EVIDENCE-BASED PRACTICE

A key force pushing the use of evidence from scientifically based research to guide literacy education practice is the seemingly ubiquitous use of this approach in many other areas of human activity. Scientifically based research has become part of the zeitgeist of the developed world. As mentioned previously, the joining of policy to synthesis studies of scientifically based research precedes its application to literacy education and extends beyond the United States. For much of the past decade, government agencies and consortia of professional associations have been systematically producing evidence-based practice guidelines for policymakers, members of professional associations, and consumers of products and services. An Internet search using the phrase "scientifically based research" produces over 300,000 postings. Although heavy on health care topics, postings and publications also address education, technology, business practices, social services, and criminal justice.

Since 1997, Durham University in England has hosted biennial international conferences to examine evidence-based policies and indicator systems. Special focus has been given to anthropology, business, education, government, health research, medicine, psychology, and policy studies (Fitzgibon, 1999). These conferences draw speakers from Australia, Belgium, Canada, the United States, the Netherlands, England, Wales, Scotland, and Ireland (University of Durham, 2003). By 1999, the Economic and Social Research Council, the United Kingdom's largest funding agency for research and postgraduate training in social and economic issues, launched the Evidence-Based Policy and Practice Initiative to

develop a comprehensive scientifically based research network with research units covering policy issues on public health, children, economics, ethnic health, neighborhood (i.e., community) research, social care (i.e., welfare), and research utilization (Economic and Social Research Council, 2003). In Australia, the National Health and Medical Research Council (NHMRC, 1999) published an evidence-based strategy for youth suicide prevention based on a systematic literature review. Several dozen Australian universities, colleges, and hospitals have set up Web sites providing access to information on evidence-based practice in areas related to physical health, mental health, nursing, dentistry, veterinary medicine, clinical practice, and education. In the United States, the Agency for Healthcare and Research Quality, in conjunction with the American Medical Association and the American Association of Health Plans, sponsors the National Guidelines Clearinghouse (NGC; U.S. Department of Health and Human Services, 2003). The NGC is a comprehensive database of evidence-based clinical practice guidelines and related documents. The NGC publishes evidence-based practice guidelines on dozens of topics, makes these guidelines available over the Internet, and provides updated information through a regular newsletter and electronic forum. The Agency for Healthcare Research and Quality has funded 12 Evidence-Based Practice Centers whose goal is to develop evidence reports and technology assessments on clinical topics that are common, expensive, or significant for the Medicare and Medicaid populations. The overall goal is to improve the quality, effectiveness, and appropriateness of health care by facilitating the translation of scientifically based research findings into clinical practice (Agency for Healthcare Research and Quality, 2003).

POLITICAL CAMPS IN THE "READING WARS"

In the United States, the increased federal emphasis on scientifically based research for funding literacy efforts, based on evidence from such research, appeared after more than a decade of academic debate about how schools and teachers should deal with literacy. These debates mainly focused on the early reading education of children, but there has been some carryover to teaching beginning reading to adults. To the public, the debate appeared to be between two camps of scholars:

• Advocates of holistic approaches to learning literacy that built on the learner's interests, heavily employed literature and authentic (i.e., nonschool) materials, and called for learners to use reading and writing

to accomplish "authentic" tasks such as writing stories, producing newspapers, or preparing projects.

• Advocates of more direct instruction in aspects of literacy, such as phonemic awareness (i.e., recognizing letter–sound relationships, rhyming, etc.), using phonics as a code-breaking strategy, vocabulary development, and strategies (i.e., summarizing, predicting, comparing, etc.) for improving reading comprehension.

During much of this polarized debate, scholars and classroom teachers called for more balanced approaches and recognition that both camps could generally agree on what constituted good instruction (Aihara, Au, Carroll, Nakanishi, Scheu, & Wong-Kam, 2000; Fitzgerald, & Noblit, 2000; Freppon & Dahl, 1998).

THE NATIONAL READING PANEL (NRP) STUDY

In 1997, political pressures to resolve the debate and provide guidelines for evidence-based reading practice similar to those in health care led Congress to request that the National Institute of Child Health and Human Development (NICHD) consult with the U.S. Department of Education "to convene a national panel to assess the status of research-based knowledge, including the effectiveness of various approaches to teaching children to read" (NRP, 2000, p. 1). Many outside the literacy field saw the NRP as a means to sort through contradicting scholarly claims. However, studies of holistic reading approaches tended to employ more qualitative methods, and studies of direct instruction were more likely to employ traditional experimental and quasi-experimental designs. Therefore, conversations at professional conferences and concerns expressed at NRP open forums indicated that experimental research constituted the criterion for choosing studies to review. Some within the field saw the work of the NRP as a means to elevate one side of the debate and undercut the other.

The NRP (2000) study employed an approach for sorting through thousands of reading research studies, attempting to parallel scientifically based research syntheses and statistical meta-analyses in health care and social service. Studies selected for the meta-analysis needed to meet several criteria, including adequate description of participants, interventions, methods, and outcome measures. In addition, studies needed to provide sufficient information to allow computation of effect sizes. To then do a meta-analysis of an intervention's effectiveness required a sufficient

number of qualifying studies (usually four to five) using similar interventions with comparable groups. Effects were analyzed using three effect sizes (i.e., .20 = small, .50 = moderate, and .80 = large). The requirements for qualification for the meta-analysis greatly reduced the number of studies included in the NRP study. For example, of 1,962 studies addressing alphabetics, only 52 qualified, and of 1,260 studies addressing fluency, only 14 qualified. Of the 350 studies addressing the use of computer technology, 21 qualified, but a meta-analysis was not possible because the studies were spread over too many different grade levels and interventions.

The NRP study reported information in the categories of strategies found effective for teaching alphabetics; reading fluency; reading comprehension, including vocabulary; and, to a lesser extent, for using computer technology in reading instruction. The studies within each category were organized to support several dozen approaches to teaching various aspects of reading. For example, four different approaches to teaching phonics were all found equally effective as long as the approaches were taught systematically. Strong and moderate effects were also reported for several strategies to teach fluency, vocabulary, and comprehension. More limited recommendations were made for the use of computer technology in the teaching of reading because of the inability to do meta-analyses. Many other approaches schools commonly use were excluded from the analysis because there were too few qualifying studies to document their effectiveness. The scholarly discussion in the 480-page NRP subgroup report expands on gradations of evidence (i.e., correlations but not experiments) and areas in which evidence was not available. The distillation of these expanded discussions to a 35-page summary document became a list of reading instruction approaches endorsed by a sufficient number of qualified research studies. Some approaches made the list, but many did not.

As mentioned previously, language from the NRP study and findings were incorporated into legislation and funding guidelines within months of the study's release. It took a bit longer for the scholarly community to analyze the NRP findings, as well as the move toward scientifically based research, and respond.

RESPONSES OF PROFESSIONAL ORGANIZATIONS

There has been no official response to definitions of scientifically based research from adult literacy professional organizations (i.e., the American

Association of Adult and Continuing Education and the National Coalition for Literacy). There have been responses, however, from the National Reading Conference (a professional association of literacy researchers), the International Reading Association (a professional association of reading educators), and the American Psychological Association. Members of the literacy organizations concerned with children's reading had been aware of the move toward scientifically based research through the workings of the NRP in the late 1990s and with the publication of the NRP report in 2000. The American Psychological Association has been asked to play an advisory role in helping to devise legislated definitions of scientifically based research.

National Reading Conference Response

The National Reading Conference (NRC) commissioned Pressley (2001) to analyze the NRP study and prepare a response from the NRC. Pressley's main criticisms were not so much related to the NRP's findings, which he found credible, as they were to what he felt the NRP ignored. He noted that the NRP, by deciding to employ a statistical meta-analysis approach, in essence "decided early in its process to focus on only a very few topics and limit its review to experimental and quasi-experimental evidence" (Pressley, 2001, p. 2). The meta-analysis decision meant that the NRP ignored some studies that were scientifically validated by its criteria if there were too few studies in that area to perform a statistical meta-analysis. Pressley maintained that this excluded well-designed studies (because there were only two or three per topic) related to home storybook reading, television effects (e.g., Sesame Street or captioning), community resources, whole language, language of instruction, and school reform movements. The statistical meta-analysis approach automatically excludes newer topics and approaches that have been examined by only a few studies, even if those studies are scientifically based (i.e., experimental and with adequate sample sizes).

Pressley's analysis also decried the exclusion of qualitative research. He noted that the exclusion of well-performed qualitative research prevents the inclusion of very useful information about how effective instruction is organized and executed. Similar criticisms were made in a minority report written by Yatvin (NRP, 2000), a member of the NRP and a reading educator in Oregon.

In an earlier paper commissioned by the NRC, Purcell-Gates (2000) responded to the exclusion of qualitative and ethnographic research from

the NRP study and from legislated definitions of scientifically based research. She made the point that many important educational questions simply cannot be answered by placing people in randomly assigned treatment and control groups for both ethical and logistical reasons. She indicated that qualitative and descriptive research, however, provides information useful for policy development about such questions as: "What knowledge do teachers draw upon or use to inform their practice? What opportunities exist for learning, at both classroom and school levels? How do social interactions among students influence their learning to read?" (p. 6).

International Reading Association Response

The International Reading Association (IRA) did not respond directly to the NRP report, but adopted a lengthy policy position statement entitled *What Is Evidence-Based Reading Instruction?* (IRA, 2002). The IRA policy statement parallels the NRP report in stating that evidence should be objective, valid, reliable, and refereed, but it does not limit evidence to experimental or quasi-experimental studies, nor to reading instruction approaches supported by the five or more studies required to qualify for a statistical meta-analysis. The statement takes care to distinguish between literacy instruction *practices* and *programs,* noting that the practices of providing direct instruction in several ways for decoding and reading comprehension are supported by evidence, but evidence supporting a particular reading program is usually mixed. In fact, most large studies of program differences reveal as much or more difference between teachers using the same program than average differences between programs. The statement goes on to list 10 strategies for reading instruction that the IRA views as evidence-based and concludes by providing an extensive list of resources and information about reading instruction strategies supported by research.

American Psychological Association Response

The American Psychological Association (APA) has established a presidential task force on psychology and education. Chaired by Robert Sternberg, the task force plans to explore how teaching and learning in schools can be restructured to better help all children learn. In addition, existing APA divisions (i.e., Division 15: Education and Division 16: School and

Society for the Study of School Psychology) will be producing research-review criteria and research-based guidelines for practice. "The effort is inspired, in part, by an APA Division 12 (Society of Clinical Psychology) project that identified research-based clinical interventions" (Murray, 2002, p. 54). In addition, staff from the APA's Public Policy Office have provided guidance in shaping legislative definitions of scientifically based research, supporting attention to objective procedures and empirical methods. According to the APA *Monitor on Psychology,* the next step is for the APA Public Policy Office to focus on "psychology's contribution to teacher preparation, and again, the definition of scientifically based research" (Murray, 2002, p. 54).

A Comparison of Responses

Writings from literacy organizations (i.e., NRC and IRA) call for expanding what counts as evidence to include evidence generated by both well-done qualitative research and research on newer topics that have not yet accumulated enough studies to meet the criteria of statistical meta-analyses. The IRA position statement goes on to specify criteria and definitions of what constitutes acceptable evidence. These criteria indicate that acceptable evidence should be:

- Objective: Data would be identified and interpreted similarly by any evaluator.
- Valid: Data adequately represent the tasks that children need to accomplish to be successful readers.
- Reliable: Data will remain essentially unchanged if collected on a different day or by a different person.
- Systematic: Data were collected according to a rigorous design of either experimentation or observation.
- Refereed: Data have been approved for publication by a panel of independent reviewers. (IRA, 2002)

The APA has not taken an official position in relation to scientifically based research. Murray (2002), who writes for the organization in its official publication *Monitor on Psychology,* indicates that the APA has had a strong role in shaping the current definition of scientifically based research and that it has supported attention to objective procedures and empirical methods.

FUNDING AND SCIENTIFICALLY BASED RESEARCH

Definitions of scientifically based research have been embedded into federal legislation and specifications for what sorts of research, programs, services, and materials may receive federal funds. In fact, use of scientifically based research is highlighted as a major purpose of the No Child Left Behind Act of 2002, as articulated in purpose "(9) promoting school-wide reform and ensuring access of children to effective scientifically based strategies and challenging academic content" (U.S. Department of Education, 2002a, p. 16). The term "scientifically based research" appears 122 times throughout the legislation, in relation to nearly every provision of the law. A typical example is the provision for professional development in reading instruction specifying that professional development "shall include information on instructional materials, programs, strategies and approaches based on scientifically based reading research" (U.S. Department of Education, 2002a, p. 127). Similar requirements are specified for materials and training provided to tutors, parents, and those participating in family literacy programs.

The U.S. Department of Education's Strategic Plan for 2002–2007 also highlights scientifically based research in Strategic Goal Four: Transform Education into an Evidence-based Field (U.S. Department of Education, 2002c, pp. 58–63). Performance targets are set for research funded by the U.S. Department of Education. For example, by 2004, 95% of all funded research must be "deemed of high quality by an independent review panel of qualified scientists" (U.S. Department of Education, 2002c, p. 61). These scientists are not to be the same as the peer review panel, and the performance target is to include "all research and evaluation studies initiated by any office within the department, but would exclude collections of statistics" (p. 61). To make intentions perfectly clear, the plan goes on to specify that by 2004, 75% of funded projects that address causal questions will employ randomized experimental designs.

The strategic plan goes on to set up parallel performance targets for the dissemination and use of information from scientifically based research studies. For example, the plan specifies that the U.S. Department of Education "will create and maintain an online database of quality research on topics relevant to educational practice" and "will create and distribute user-friendly syntheses of quality research that bear on significant problems in educational practice" (U.S. Department of Education, 2002c, p. 62). In addition, the department charges itself with creating a variety of guides "on how to engage in evidence-based education" (p. 62).

The federal government's clear intent to fund predominantly scientifically based research and programs guided by such research is likely to have a major impact on educational research and practice. Shortly after the release of the U.S. Department of Education's five-year Strategic Plan, an editorial addressing the plan and its implications appeared in the *Journal of Curriculum and Supervision* (Davis, 2002). It notes: "In the past, educational researchers adopted and shifted their research paradigms and techniques on the basis of scholarly exposition, demonstration, and persuasion. In the current scene, on the other hand, bureaucratic mandates supersede the reasonableness of research options" (Davis, 2002, p. 277). He goes on to elaborate on the new emphases, observing that educational research:

> will not be so much interested in meanings, the interpretations of programs in practice and of students in particular contexts, as it will be concerned to have met established "scientific" criteria. It will seek causal relationships and replicable practices that can be advocated as remedies. (Davis, 2002, p. 277)

He predicts that scholars will subject the strategic plan "to penetrating, likely ruthless criticism" (Davis, 2002, p. 277) and some will attempt to do research without federal support, but their underfunded efforts will be few and their results will be ignored by official programs.

The Educational Researcher (Berliner, 2002) provided a forum for several commentaries on the federal definitions of scientifically based research. Berliner questioned the federal government's narrow definition of science and went on to observe that limiting educational research to control group studies is not wise because of the myriad of interactions involved in educational achievement, the history of greater variation among practitioners of a teaching strategy than between groups using different strategies, and the difficulty of compiling research results over decades because of such societal changes as stance toward race and gender. Feuer, Towne, and Shavelson (2002), who were involved in writing the NRP study, addressed several criticisms of the study but also indicated that, like all research, the NRP should be debated and discussed rather than be seen as the final word on what works with reading instruction.

THE HISTORY OF LITERACY RESEARCH

Legislating language to define which research is acceptable for supporting instructional practice is a striking change from the ways in which research

has previously informed classroom instruction and government policy. In past decades, research addressed questions about how literacy is practiced and how literacy learning occurs. It examined forces that facilitate or inhibit literacy learning in particular contexts and situations, using the tools of cognitive psychology, linguistics, sociology, anthropology, literary studies, and several other disciplines. The goal has nearly always been to understand more clearly how the complex process of becoming literate can occur. This body of knowledge was intended to inform, but not direct, instructional approaches. Indeed, the process of how individual teachers and learners work together most effectively has consistently been understood as a balance between the science of using effective teaching and learning strategies and the art of being able to match teaching approaches to the complexities of individual learners and situations, as well as to the particular strengths of the teacher.

Lessons Learned Three Decades Ago

During the 1960s, attempts were made to employ the models used in agricultural research to determine which reading programs yielded the most in terms of learner gains. In the mid-1960s, the federal government funded Bond and Dykstra (1967, 1997) to examine the impact of several prominent reading programs on the reading improvement of children in first grade. The impetus for this research was an attempt to use scientifically based research to determine what works. The study, like the NRP study, found that systematic teaching of decoding and word-study skills was preferable to ad hoc approaches.

Through most of the 1970s, discussions at literacy conferences and in major literacy journals continued to address the limitations of traditional experimental and quasi-experimental research in educational settings. For example, Farr and Weintraub (1975), in an editorial in *Reading Research Quarterly,* made the following comments about reading research:

> What has brought about a situation in which researchers do not have the tools, techniques, methodologies and approaches to help them study the problems that are important to the reading field? It seems that it may be the result of methodological incarceration. Methodological incarceration occurs when research and investigation are restricted by the traditional concepts of how a study should be designed as well as those which dictate what research is. (p. 1)

The editorial went on to suggest borrowing methodological techniques from anthropological research and mentioned the impact and insights

derived from the early, nonexperimental case studies performed by Strang and Gray. Farr and Weintraub (1975) further noted that problems and conflicts:

> arise from the differences between the goals of good research and the goals of funding agencies. Funding agencies need answers to specific questions; they need to report to their clients that the research efforts are paying dividends in terms of specific improvements in instruction; and usually they need to show these specific results in a very short period of time. On the other hand, the goals of good research should include encouraging more thinking, grappling with issues as they arise and pursuing topics whether they lead to specific instructional solutions or not. (p. 3)

In a response to this editorial, Fay (1975) called for more teacher research that focused on a particular classroom and group of children. He noted:

> Every teacher is in a position to be an experimenter, to move beyond custom and impulse, and to test research knowledge in his classroom . . . the teacher's basic purposes are close at hand, and he need not be concerned with generalizing beyond his own experience. The teacher is concerned with *his* professional growth and *his* children. (p. 1)

Throughout the next two decades, literacy research grew, drawing on the insights of qualitative research studies, studies using mixed methodologies, and experimental design studies. Teacher research has also grown and added to the knowledge base. In many ways, recent legislation and government policies specifying which methodological approaches may be funded and used to inform instruction may ignore the reasons and rationales of three decades ago for adding other research approaches to the experimental approach.

WHAT AN EMPHASIS ON SCIENTIFICALLY BASED RESEARCH AND EVIDENCE-BASED PRACTICE MEANS FOR ADULT LITERACY RESEARCH AND EDUCATION

Much of the funding for adult literacy programs comes from federal monies passed through the states. In 1999 federal and state governments allocated a total of $1.1 billion for adult basic education service delivery. Slightly less than half of these funds came as grants from the federal government

to the states. To receive funds, a minimum 25% state match is required. State matches ranged from 25% in Mississippi, Texas, and Tennessee to a 91% match for California, with most states contributing in the 30% to 40% range (Alamprese, 2002). Receiving federal monies most often entails incorporating exact language from federal legislation into state guidelines and directives. The repeated use of the term *scientifically based research* in federal specifications has guaranteed that the concept will remain intact as monies move through state programs. (See, for example, California's *No Child Left Behind Program Guidelines,* California State Board of Education, 2002.) Adult educators seeking state or federal funding for family literacy programs are now required to indicate how scientifically based research is being used for instruction and program development. Adult literacy researchers seeking federal research support will need to adjust their study designs to address definitions of scientifically based research. Qualitative researchers will be competing for vastly diminished funding.

What scientifically based research means to the field of adult literacy is discussed in this section using information from two sources. In the absence of positions and commentary from adult literacy organizations, samplings of the thoughts and opinions of adult educators and researchers are drawn from a lengthy discussion of this topic on the National Literacy Advocacy listserv of the National Institute for Literacy.[1] This listserv analysis is followed by a review of efforts to determine evidence-based principles and practices for adult reading instruction by a joint research group supported by the National Institute for Literacy (NIFL) and the National Center for the Study of Adult Learning and Literacy (NCSALL).

A Sampling of Thoughts and Opinions on Scientifically Based Research and Evidence-Based Adult Literacy Practice and Policy

During April and May 2002, the topic of evidence-based practice in adult literacy, and evidence qualified to inform practice, was discussed extensively on the National Literacy Advocacy listserv of the National Institute for Literacy. (The full archives of this discussion can be found at http://www.nifl.gov/lincs/discussions/nifl-nla/nla.html)

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[1] Authors of specific listserv postings are not identified in this section because it is the nature of a listserv to allow anonymity if writers desire. Although many writers indicate their identity, some employ the use of Web names and pseudonyms, making it impossible to be consistent in naming authors.

In April, writers expressed concerns that only one sort of evidence (evidence from empirical, experimental research) would be considered acceptable and that this move toward scientifically based research was highly political. The democratic nature of adult education (i.e., the predominant focus on adult goals rather than mandated reading skill goals) was mentioned as one way that adult literacy education differed from children's schooling. Several writers called for a more eclectic approach to criteria of evidence and for dialogues across research traditions that would allow qualitative case studies to inform later control group studies. Demetrion, manager of a community-based volunteer literacy program, hoped "for a profound and balanced eclecticism where methodology is placed in its proper role in helping to shed light on the content of scholarship."

In early May, John Comings, director of the National Center for the Study of Adult Learning and Literacy, reanimated the discussion by posting an essay expressing the view that the political nature of the term *scientifically based research* should not prevent the field from considering its value. Comings went on to describe various stages of the research process during which different sorts of research are needed as hypotheses are developed, tested, and refined. He observed, "Evidence-based education will require support to research that is sufficient, in terms of funding and duration, and that encourages interaction and cooperation among researchers." He also differentiated between types of research viewed as acceptable and the overall concept of practice being based on evidence, whatever its source, suggesting a need to reach some form of consensus on the purposes of adult literacy and concluded, "I feel we should accept evidence-based education (while defending it against inappropriate use as a political tool) and fight for a piece of the pie."

Comings' posting was praised for its thoughtfulness, openness to a broader definition of evidence, and sensitivity to the complexities of the research process. It also sparked much more detailed and elaborate responses to what scientifically based research and evidence-based practice mean for the field of adult literacy. It is useful to examine some of the points made during that ongoing discussion.

Demetrion observed that it was not at all clear "on consensual grounds whether adult literacy more properly belongs in the realm of cultural studies . . . or to scientific forms of investigation." He pointed out that scientific research places cognitive psychology in a more authoritative role in research paradigms and suggests a more rigid experimental approach

that greatly limits what sorts of questions may be addressed. He expressed concerns about the reductionism in this methodology and what it leaves out, as well as that this scientific approach "would tend to delegitimize practitioner research."

King commented that:

> The failure is not in trying to disregard scientific method, but rather in failing to distinguish the different forms of data, data collection, the import of the prior development of the scientists' questions on humans and their outcomes, and the ethical–political implications of the outcomes themselves, including the covert assumption that complete predictability is a goal.

King's critique went on to make several additional points about problems with positivism, including its exclusion of the voices of adult learners and their goals in determining the effectiveness of programs. She concluded with skepticism about the openness to other voices by "those who are making decisions, especially where adult education is concerned" and worried that the available research will be converted to "mandated applications which must be applied thusly or else."

Hansen responded from the perspective of a program provider who was skeptical about resources for and benefits of the detailed research program Comings described. She asked:

> If the field can't get funding for a much needed accountability tool, whatever would lead any of us to believe that they'd fund such research and a national system connected to state professional development systems as you write here?
>   Who exactly is going to pay for this wonderful scientific experiment? Will the [beneficiaries] truly be the non-reading or low-level literacy student? Or would it in the end benefit only the researchers and the program administrators tallying their numbers?

Hansen related her experience of having to delay service and hope for students because resources were not available, concluding, "Let's pursue establishing policy that will be funded to increase our outreach so more adults, who need help changing their reading capabilities, get that opportunity in the current generation."

Later postings from other program providers underscored concerns about funding and that the nature of scientific research could mean denial of services to adults placed in control groups. Grubb expressed the suspicion that the whole endeavor "is merely another attempt to justify failure to provide our field with adequate funding."

Efforts of the NIFL/NCSALL Reading Research Working Group

In 2001, NIFL and NCSALL supported efforts to develop guidelines for evidence-based principles and practices in adult reading education. They did this by bringing together a panel of experts on adult literacy research and practice.[2] The efforts of this panel, named the Reading Research Working Group (RRWG), led to the publication of *Research-Based Principles for Adult Basic Education Reading Instruction* (Kruidenier, 2002) and the establishment of an NIFL Web site for evidence-based practices in adult reading education: http://www.nifl.gov/nifl/partnershipforreading/publications/adult.html

The charge to the RRWG was "To identify and evaluate existing research related to adult literacy reading instruction in order to provide the field with research-based products including principles and practices for practitioners" (Kruidenier, 2002, p. 1). The focus was on:

> research related to reading instruction for low-literate adults, aged 16 and older, who are no longer being served in secondary education programs. This includes low-literate adults in community-based literacy centers, family literacy programs, prison literacy programs, workplace literacy programs, and two-year colleges. It includes research related to all low-literate adults in these settings, including adults in ASE (adult secondary education) programs, ESOL (English for speakers of other languages) programs, and adults with a learning or reading disability. (Kruidenier, 2002, p. 1)

The legislated definition of scientifically based research and the NRP's working plan were presented to the adult literacy panel as guidelines. In addition, the adult literacy panel was constructed to include a member who had also served on the NRP for K–12 reading.

It quickly became clear that any synthesis of adult reading research would have to differ from the NRP study in several ways. For example, the NRP synthesis had begun with several thousand research studies that were reduced by stringent research criteria to several hundred for inclusion in meta-analyses. Total studies of adult reading instruction number in the hundreds rather than the thousands, and only a fraction of these meets the requirements of the legislated definition of scientifically based research. No quantitative meta-analysis would occur with adult reading instruction

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[2] The author of this chapter served as a participant in some of the processes of this working group.

practice studies because there was not enough research available to perform a statistical meta-analysis. In fact, the total number of qualifying research studies identified in the peer-reviewed literature (including some technical reports) was approximately 70.

This small body of qualifying research necessitated several deviations from the NRP guidelines.[3] The adult literacy panel decided to arrange information in two categories: emerging *principles* and *trends*. Emerging *principles* were based on findings from at least two experimental studies (including quasi-experimental studies) and any number of non-experimental studies. Findings based on fewer than two experimental studies were labeled *trends*. In addition, the categories of *ideas* and *comments* were added. *Ideas* for adult reading instruction are based on a thorough review of reading instruction research at the K–12 level (NRP, 2000) and help to fill the gaps in the adult reading instruction research base. *Comments* are weaker, less conclusive findings from the K–12 research.

Guidelines for accepting qualitative studies addressing adult reading instruction were drawn from Denzin and Lincoln (2000), who state that the highest quality qualitative studies are those that collect data using multiple methods and use triangulation of these methods to support findings and any conclusions drawn from them. For techniques such as data coding (whether from transcripts, video tapes, or field notes), training and interrater and coder reliability should be performed. Only a few qualitative studies met all criteria of the study, and these were case studies corroborating findings of experimental studies.

The working group was also directed in its original charge:

> to identify gaps in the ABE reading research and to consider how these gaps might be addressed. What research is needed and, of more immediate concern, where should the ABE instructor look for suggestions on the best ways to teach reading to ABE learners when the ABE research has not yet addressed a topic? (Kruidenier, 2002, p. 1)

The group considered supplementing instructional practices supported by adult reading research with some findings from the NRP study of K–12 research. After a good deal of discussion about areas of difference and similarity among adult reading, children's reading, and adolescent read-

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[3] Dolores Perin, a reviewer of this manuscript and a member of the RRWG, has suggested the model used by this group for selecting research might guide other attempts to synthesize research on scientifically based instructional practices when randomized experiments and other types of quantitative studies are rare.

ing, the working group decided, with great caution, to draw on some of the K–12 research for specific ideas that might be used to supplement adult reading research.

NRP research was used in three different ways: (a) to provide support for tentative conclusions related to adult reading instruction (when the findings from the NRP and those for adults are compatible); (b) to signal caution when the findings are not compatible; and, (c) to help fill in gaps in the adult reading instruction principles when no or very few research-based results are available. The guidelines (listed in order of priority) used in selecting K–12 instructional practices that might be used with adults included studies for which:

- The research supported limited adult findings.
- The instructional approach was plausible for adults.
- The approach was supported by a strong (i.e., depth and breadth) body of K–12 research.
- The research addressed learning disabilities and older learners.

The report is organized to address what research evidence says about several aspects of adult reading instruction. Table 2.1 shows sections and subsections of the report.

Research-Based Principles for Adult Basic Education Reading Instruction (Kruidenier, 2002) serves to highlight a multitude of gaps in what scientifically based research on adult reading can say about instructional practice. The matrix in Table 2.1 is somewhat deceptive in that it suggests research is able to provide insight in each of the more than 100 cells. Even by using a single study to address several cells and by drawing on K–12 research, several cells remain empty, and even the cells with the strongest research support (i.e., *principles*) are supported by only a few studies. Given the criteria used to synthesize K–12 research and, indeed, standards from many other professions, nearly every area of adult reading research is a gap. Researchers proposing to do new research now have a common tool for making the case for the degree to which new research is needed.

The levels of evidence approach used in the adult reading research synthesis helps clarify a complicated body of evidence. Using the *principles, trends, ideas,* and *comments* framework makes it possible to share with educators and researchers the scant research information available and at the same time provide a mechanism for judging the trustworthiness of that information. However, the majority of evidence is at the low end of

TABLE 2.1
Report Organization

Section Contents	Section Titles in the Report						
	Assessment Profiles	Alphabetics		Fluency	Vocab	Comp	Tech
		PA	WA				
Assessment of Component							
All adults							
Adults with learning disabilities							
ESOL adults							
Instruction							
Overall							
Goals and setting							
General literacy							
Workplace literacy							
Family literacy							
Instructional practices							
Teaching strategies							
Instructional materials							
Intensity and duration							
Teacher preparation							
Learner Characteristics							
Functional reading level							
ESOL							
Learning disability							
Motivation							

Notes. PA = Phonemic Awareness, WA = Word Analysis, Vocab = Vocabulary, Comp = Comprehension, Tech = Technology
Source: Kruidenier (2002).

trustworthiness, with only a few findings rising to the level of *principles* (such as assessment studies describing adult learners' reading abilities).

Of particular concern to the adult literacy community is the limited generalizability of studies. Findings appropriate for adults pursuing the General Educational Development (GED) credential may not be at all appropriate for adults with very low literacy levels and those who may

have learning disabilities. Instructional approaches appropriate for learners whose first language is English may be less appropriate for the nearly one half of all adult literacy program participants who speak English as a second language. Even within this population, there are important distinctions to be made between learners literate in a first language and those who are not.

The problems of generalizability are magnified when drawing on research from K–12 populations. Studies that compare the literacy learning of adults to that of children and adolescents indicate that there are areas of both similarity and difference. *Research-Based Principles for Adult Basic Education Reading Instruction* (Kruidenier, 2002) takes a cautious approach to selecting K–12 studies to increase the probability of results being transferable to adult populations. Without more direct adult literacy research, however, it is a game of guesses.

IMPLICATIONS FOR POLICY

As mentioned earlier in the History of Literacy Research section, it is a striking change for the federal government to use legislated definitions of scientifically based research to determine what sorts of research and instruction will be funded. A good deal of scholarship has addressed the use of research for policy purposes. Klemperer, Theisens, and Kaiser (2001) suggest a useful system for categorizing research. These categories are defined as:

> *Enlightening Research* used to provide general notions or help in the process of shaping ideas or conceptualizations.
>
> *Political Research* used to back up political opinions that have already been formed. Contradicting research is generally ignored.
>
> *Problem-solving Research* used to find the right approaches for particular situations.
>
> The preferred way of solving the problem is not given. It is expected that the research will clarify the situation and have a direct influence on policy decisions to be made. (pp. 200–201)

Klemperer, Theisens, and Kaiser (2001) indicate that both enlightening and problem-solving research are needed and feed each other in a recursive fashion. To overly emphasize one type of research at the expense of the other can undercut the healthy interactions between these two types of research.

The federal government is not the sole funder of research, but it does fund a significant portion of adult literacy research. Current federal policies may very well create an imbalance among the types of research needed to inform instruction and future policies. At a minimum, this calls for a careful review of the consequences of federal policy on the range of adult literacy research.

IMPLICATIONS FOR RESEARCH

In terms of research, it will be important to monitor the implementation of the guidelines in the U.S. Department of Education's Strategic Plan. Of special importance will be which individuals are selected for an independent review panel of qualified scientists to oversee (and perhaps overrule) peer review panel judgments. Also, the degree to which any form of qualitative research or non-instructional research will be funded is not completely clear. The tone of the federal documents seems opposed to general, non-instructional research, but it is not clear whether such research will be completely blocked from federal funding.

Adult literacy researchers might begin to work more collaboratively and submit studies that include both quantitative and qualitative methods. The rhetoric of the profession has often called for such multiple-perspective work. Perhaps it is time to explore ways to follow our own advice. A mixed methodology approach could add to the rigor of studies through triangulation and also keep open the possibility of new insights arising from closer, qualitative examinations of contexts and processes. Comings' recommendation that adult literacy "fight for a piece of the pie" seems prudent. To do so will call for a degree of flexibility and tolerance among adult literacy researchers that surpasses past performance. Some of the energy allocated to critiquing the limitations and questionable conclusions drawn from methodologies other than a researcher's favorite might be instead focused on joint research problem solving with researchers whose perspectives and methodologies differ from one's own.

IMPLICATIONS FOR PRACTICE

What scientifically based research means at the program level will be determined, to a great degree, by state program officers. It seems clear that scientifically based research will appear in proposal guidelines and

that those seeking funding will need to demonstrate how their practice is based on evidence from scientifically based research. What is less clear is the degree to which *Research-Based Principles for Adult Basic Education Reading Instruction* (Kruidenier, 2002) will become adult education's NRP study and whether this will lead to King's fear of "mandated applications which must be applied thusly or else." Distributing federal funds through the underfunded bureaucracies of 50 different states has been singularly ineffective at mandating anything, but the fear is still worth noting. Like researchers, program providers are being challenged to be flexible and tolerant in seeking ways to maintain a focus on learner goals and voice and also incorporate evidence-based practices whenever possible. Professional groups within the community of adult literacy educators might call for a wider array of studies that can provide evidence for "evidence-based practice." Although the RRWG's guidelines are thoughtful and go beyond the National Reading Panel guidelines, there may be better ways to select which research is judged as scientific and qualified to guide instruction. The IRA has taken a position on the research findings it sees as qualifying as evidence in relation to literacy education. Adult literacy organizations should find a mechanism for reaching their own position statement through consensus. This seems especially important in light of the effort to narrow the array of acceptable evidence that appears in the U.S. Department of Education's Strategic Plan.

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