Adult Education Literacy Instruction:
A Review of the Research

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Preface

This report is the product of the NIFL/NCSALL Adult Literacy Research Working Group (ALRWG), a panel of experts on reading research and practice convened by the Institute and the National Center for the Study of Adult Learning and Literacy to identify and evaluate existing research in adult reading instruction and to provide a summary of scientifically based findings. This report is a follow-up to the Group's initial effort, *Research-Based Principles for Adult Basic Education Reading Instruction,* published in 2002. Members of the Working Group participated in planning and executing this follow-up document over the course of several meetings. In addition to the Group's coordinator, John R. Kruidenier, the Group asked three other members to contribute directly to the report. Mary E. Curtis conducted a review of adolescent reading instruction research and wrote the sections of the report describing the research associated with the adolescent research findings that appear throughout the report. Charles A. MacArthur reviewed the adult and K-12 research on reading-writing connections and wrote the sections of the report that introduce writing as a topic for reading instruction (in Chapter 4, Introduction to ESOL and Writing Topics) and that describe the adult and K-12 writing assessment and instruction research (in Chapter 6, Alphabetics, and Chapter 9, Comprehension). Heide S. Wrigley wrote the introduction to the ESOL topic in Chapter 4, a summary of current research and practice.

Executive Summary

The Adult Literacy Research Working Group (ALRWG), a panel of experts on adult reading research and practice, was established by the National Institute for Literacy (NIFL) in collaboration with the National Center for the Study of Adult Learning and Literacy (NCSALL). It was part of the Institute's efforts to provide educators, parents and others with access to scientifically based reading research, including research-based tools for improving literacy programs and policies for children, youth and adults, through the Partnership for Reading.

The purpose of the ALRWG 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. This document is a follow-up to the original review of Adult Education (AE) reading instruction research, *Research-Based Principles for Adult Basic Education Reading Instruction Research.* It presents findings from an analysis of the AE reading instruction research base and is designed as a resource for practitioners and reading researchers. It focuses on *findings* that can be derived from the research and their application in AE settings.

For the purposes of the ALRWG, "adult reading instruction research" is defined as 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 ABE (Adult Basic Education) programs, ASE (Adult Secondary Education) programs, ESOL (English for Speakers of Other Languages) programs and adults with a learning or reading disability.

Evaluating the Research

Two reports were influential in guiding the work of the ALRWG: *Preventing Reading Difficulties in Young Children* from the National Research Council of the National Academy of Sciences and *Report of the*

National Reading Panel: Teaching Children to Read. With some important modifications, the guidelines used for selecting and evaluating AE reading instruction research are similar to those developed by the National Reading Panel (NRP) in their review of research related to reading instruction with children (National Institute of Child Health and Human Development, 2000a). For the NRP review, major topics for study were established, studies were located through a literature search and studies were evaluated using a set of "evidence-based methodological standards."

The ALRWG made several significant modifications to the approach used by the NRP because of differences in the research base. Important modifications included the addition of topics especially important to adult reading professionals, the inclusion of studies related to the assessment of reading ability and the inclusion of nonexperimental studies as well as those involving the use of control groups because of the relatively small number of experimental studies in adult literacy.

Like the NRP, the major topics selected for study by the ALRWG are those components of reading found by the National Research Council and others to be crucial during reading instruction: alphabetics (phonemic awareness and word analysis), fluency, vocabulary and comprehension. The ultimate goal in reading is comprehension. Readers read a text in order to understand and use the ideas and information contained in it. Comprehension is improved when readers understand the key concepts or vocabulary in a text. Reading comprehension may suffer, however, when readers are unable to recognize individual words in a text. A reader may be conceptually ready to understand a text, for example, but will not have the opportunity to do so if he or she cannot read the individual words. To read individual words, the reader must know how the letters in our alphabet are used to represent spoken words (alphabetics). This includes knowing how words are made up of smaller sounds (phonemic awareness) and how letters and combinations of letters are used to represent these sounds (phonics and word analysis). The ability to figure out how to read individual words, however, is not sufficient. Readers must also be able to rapidly recognize strings of words as they read phrases, sentences and longer text. Fluent reading is crucial to adequate comprehension.

Effective reading and writing instruction cannot occur without sufficient motivation. Motivation is one of the additional topics selected by the ALRWG for study, along with others that are especially important for

adult reading instruction: reading assessment, program type (ABE, ASE, ESOL), adults with a learning disability (LD), instructional methods (strategies, material, the intensity and duration of instruction and teacher preparation) and other topics including age and program goals and setting.

Use of K–12 Research

One task for the ALRWG was to identify gaps in the AE reading research and to consider how these gaps might be addressed. What research is needed and, of more immediate concern, where should the AE instructor look for suggestions on the best ways to teach reading to AE learners when the AE research has not yet addressed a topic? One strong recommendation from the ALRWG was to look to the NRP results for K–12 (elementary and secondary school) students, selecting those approaches to reading instruction that were likely to work with adult learners. To do this, the ALRWG established criteria for evaluating the application of K–12 reading research to adult reading instruction. These criteria take into account the existing AE research, the important differences between children and adults and the strengths and weaknesses of K–12 research in each of the topic areas. Several reviews were used to help fill gaps in the AE reading instruction research, to provide support when K–12 and AE research findings were compatible or to signal caution when they were contradictory. These included the review of the National Reading panel and follow-ups to this review, the review of the National Literacy Panel on Language Minority Children and Youth, the Institute for Education Sciences *Practice Guide* for instruction of English learners, *Learning to Achieve* (a review adult LD research) and two reviews conducted for the ALRWG—one of the research on adolescent reading instruction and one of research related to reading-writing connections.

A Brief Summary of Findings From the Research Review

Most of the findings derived from the AE reading instruction research are "emerging findings" because they are based on a relatively small body of experimental research. There is much more research focusing on children, as demonstrated in the report of the National Reading Panel and follow-up reviews. The small size of the AE reading instruction research base precludes establishing

more than roughly half a dozen robust, stronger findings based solidly on large numbers of research studies that have been replicated. Some of the topic areas reviewed contain very few or no research studies. This does not necessarily suggest that the quality of AE reading instruction research is poorer than K–12 reading instruction research or other bodies of research, only that there is less of it.

Approximately 100 qualifying research studies were identified in the literature search based on the criteria used. From the results reported in these studies, about 40 stronger, research-based findings for AE reading instruction were identified, along with approximately 20 weaker findings. More than 60 specific findings that might be used to supplement the AE research were derived from the K–12 research. *Stronger findings* from the adult research were based on results from at least two experimental studies (including quasi-experimental studies) and any number of nonexperimental studies. Findings based on fewer than two experimental studies were labeled *weaker findings*.

Findings from the adult reading instruction research show that adults can have difficulties with any of the crucial aspects of reading: alphabetics (phonemic awareness and word analysis), fluency, vocabulary or comprehension. It is important to assess adult students' abilities in each of these areas in order to identify what they already know as well as what they need to work on during instruction. Assessment for instructional purposes is one of the first tasks a teacher performs. One fairly robust, stronger principle in the AE research suggests that assessing each component of reading in order to generate profiles of students' reading ability gives teachers much more instructionally relevant information than any test of a single component can. Profiles may help identify the strengths and needs of distinct groups of AE learners with unique profiles. There appear to be profiles, for example, for each of the major AE learner groups: those in ABE (Adult Basic Education), ASE (Adult Secondary Education) and ESOL (English for Speakers of Other Languages) programs and those with a reading disability.

As expected, beginning readers in ABE programs have lower scores in alphabetics, fluency, vocabulary and comprehension on average than readers in ASE programs. The average reading levels of adults in ASE programs approach those of the average reader in the general population. Beginning readers in ABE programs differ from children who are beginning readers in their sight word and vocabulary knowledge. Perhaps because of adults' life experience and years of exposure to print, they have a greater store of sight words (words recognized on sight without having to be sounded out) than children learning to read. Beginning readers in ABE programs also have a greater store of vocabulary knowledge than children. This advantage, however, disappears as children's and adults' reading improves.

Many adults in AE report having a learning disability. While alphabetics skills generally improve as adults' reading improves, this is not the case for adults with a learning disability in reading. They have lower alphabetics ability relative to their vocabulary knowledge. Adults in ESOL programs, on the other hand, have lower vocabulary knowledge on average relative to their alphabetics ability because of their language difficulties. Both groups have relatively lower fluency and comprehension. For adults with LD, problems with alphabetics will have a negative impact on fluency and comprehension. For English language learners, problems with English, including vocabulary, may negatively affect fluency and comprehension. The differences between the ESOL reading profile and the profile of an average native speaker of English may diminish over time as nonnative speakers improve their English.

The AE research shows that adults can make progress in each component of reading and ultimately improve their reading comprehension, the goal for reading instruction. Alphabetics can be taught to AE learners using direct and explicit instruction in phonemic awareness (PA) and word analysis (WA). This research finding is supported by a much larger body of research with children indicating that effective alphabetics instruction includes systematically teaching letter-sound correspondences directly and explicitly. This approach works with all adults, including those with LD and those in ESOL programs. Research with children also finds that English language learners benefit from the same instruction as native speakers, especially when modifications to instruction are made that take into account their language differences. Modifications include the use of bilingual instruction when possible, the use of peer tutoring in heterogeneous groups and taking into account similarities and differences between the learner's native language and English (using the

similarities and pointing out the differences when appropriate). These findings for English learners apply to instruction in any of the components of reading.

Adults' reading fluency can be improved using repeated readings of texts, or reading the same text multiple times. This finding is also supported by a much larger body of research with adolescents and children that finds that guided, repeated oral reading of passages of text is the most effective approach to teaching fluency. While the adult research did not find a direct link between improved fluency and improvement in reading comprehension, the research with children did. Research with children also found that guided, repeated oral reading worked well with poor readers at any reading level. This supplements the adult research that included readers in ABE but not ASE programs.

There is much less vocabulary research with adults than research on alphabetics, fluency or comprehension. Findings from the vocabulary research suggest that adults can improve vocabulary through instruction and that effective instruction includes the opportunity to use new words many times and to process them deeply. Research with children supports and extends this finding. K–12 research finds that effective vocabulary instruction includes active engagement during instruction, repetition and the use of multiple contexts, and listening and wide reading that increases exposure to new concepts. Vocabulary instruction is especially important for English language learners. Research with children finds that bilingual discussion of new words and the use of computers and multimedia are effective approaches to instruction with this population. Vocabulary instruction is also important for adults in ASE programs, especially those working on the GED (General Educational Development) program, but none of the AE vocabulary studies included these learners.

There is more AE comprehension research than alphabetics, fluency or vocabulary research. While this research shows that participation in AE programs can lead to increases in reading comprehension achievement, specific strategies for improving comprehension are just beginning to be identified. These include direct reading comprehension strategy instruction, instruction in multiple components of reading and enabling instruction or settings (such as providing aides for teachers). Direct strategy instruction includes guided practice in specific strategies with learners

gradually taking responsibility for implementing the strategies. More research is needed, but the following strategies have received at least some support in the AE research: question asking, question answering, summarizing, organizing information by focusing on topics and monitoring comprehension. The larger body of research with children, both native and non-native speakers, supports and extends these findings. K–12 research has identified additional strategies that are effective, including the use of graphic organizers, the use of story structure and cooperative learning. Summary writing is supported by research with both adults and children. Another writing task supported by research with children, writing about content-area material, is effective for learning or understanding content-area material. This research demonstrates that writing is another strategy that can be used to improve comprehension. While there is no AE research available describing effective writing instruction, extensive research with children has identified 10 effective approaches: strategy instruction, summarizing, peer assistance, setting goals for the written product, word processing, sentence combining, process writing with professional development, inquiry, prewriting activities and study of models.

AE research related to teaching materials suggests using adult-oriented or contextually relevant materials. These materials may be effective because they increase student motivation and engagement. Research with children finds that comprehension is improved when motivation and engagement are high. This can happen when children are provided interesting texts to read, are provided choices for reading, develop reading goals and participate in collaborative learning.

Most of the AE research involves learners in ABE level programs. More research is needed with learners in ASE and ESOL programs and AE learners with LD. Research with LD adults in the general population finds that explicit instruction in comprehension strategies is effective. They also benefit from more intensive instruction and one-to-one or small group instruction. Finally, research with children finds that English language learners benefit from the same comprehension and writing instruction as native speakers, with the modifications mentioned above that take into account their language differences.

Chapter 1
Introduction

The most recent large-scale national assessment of adults' reading ability in the United States, the National Assessment of Adult Literacy (NAAL), found that 12 to 14 percent of adults, about 27 to 31 million people, were "Below Basic" readers. According the National Center for Education Statistics (NCES), which conducted the study, these adults are unable to consistently read and understand information at the "Basic" level, or roughly the level at which the average high school graduate reads. This includes information in short, commonplace texts and simple documents, such as news articles, pamphlets, bus schedules and food labels. Many adults at the Below Basic literacy level have difficulty with even simpler reading tasks like locating specific information in short, commonplace texts (Kutner et al., 2007). Eleven million of the 27 to 31 million adults at the Below Basic literacy level, or about 6 percent of all adults, were found to be nonliterate in English (Baer, Kutner, & Sabatini, 2009).

This NCES study, the National Assessment of Adult Literacy, also reported that 50 to 60 million adults are at the Basic literacy level. The best readers in this group can read high school level material but have difficulty reading texts that are more dense and complex. Summarizing these texts, making inferences, determining cause and effect and recognizing an author's purpose are all difficult tasks for Basic readers. They are not yet at a minimum level for experiencing success in today's labor market (Tamassia, Lennon, Yamamoto, & Kirsch, 2007, p. 67).

Adults with low literacy are likely to face a number of difficulties. They are at a disadvantage when looking for employment, for example, because most jobs require a high school level of reading or better (Reder & Vogel, 1997; Tamassia et al., 2007; White, Strucker, & Bosworth, 2006). Low literacy is associated with lower income levels (Bynner & Parsons, 2009; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; Kutner et al., 2007). Low-literate adults have difficulty accessing or understanding health-related information, are hospitalized more often and do not manage chronic diseases as well (Kutner, Greenberg, Jin, & Paulsen, 2006; Rudd, Anderson, Oppenheimer, & Charlotte, 2007; Rudd, Kirsch, & Yamamoto, 2004). Overall, they are more likely to ex-

perience poor health and a shortened life span (Baker, Parker, Williams, & Clark, 1997; Kutner, Greenberg, et al., 2006; Rudd, Moeykens, & Colton, 2000).

The U.S. Department of Education, through the Office of Vocational and Adult Education, Division of Adult Education and Literacy, provides funding to states for more than 1,200 adult education programs that include literacy instruction for adults who did not graduate from high school or whose literacy level is below the high school level (Tamassia et al., 2007). Out of a total target population of about 40 million adults, states provide services for about 2.5 million (Lasater & Elliott, 2005). The 25–30 million adults with severe reading difficulties identified by NCES, along with a large group of immigrants whose first language is not English, make up the bulk of those in the target population who are eventually served in literacy programs for adults who read anywhere from a beginning level up to a 12th grade level. Forty-four percent of learners in government-funded adult education (AE) programs participate in English for Speakers of Other Languages (ESOL) programs. Thirty-nine percent participate in Adult Basic Education (ABE) classes for beginning readers (reading roughly at the K-8 level), and 19 percent participate in Adult Secondary Education (ASE) programs for those working on a high school equivalency certificate (and reading roughly at the 9–12 grade level) (Tamassia et al., 2007).

The Adult Literacy Research Working Group (ALRWG, formerly called the Reading Research Working Group) was formed to identify and evaluate existing research related to adult literacy reading instruction in order to provide the field with research-based products, including a description of research findings for researchers and professionals. In 2002, the ALRWG completed an analysis of the AE reading instruction research base, focusing on principles that could be derived from the research, instructional practices based on these principles and a research agenda for the future (Curtis and Kruidenier, 2005; Kruidenier, 2002, 2007). This report presents an update to the first analysis completed in 2002.

The ALRWG was sponsored by the National Institute for Literacy (the Institute) in collaboration with the National Center for the Study of Adult Learning and Literacy (NCSALL). It was part of the Institute's effort to provide educators, parents and others with access to scientifically based reading research, including research-based tools for improving literacy programs

and policies for children, youth and adults, through a partnership with the Eunice Kennedy Shriver National Institute of Child Health and Human Development and the U.S. Department of Education Office of Vocational and Adult Education. ALRWG was a part of NCSALL's effort to disseminate the best available research-based advice to practitioners, administrators, policy makers and scholars in the adult literacy field (Comings & Crawford, 2007).

The ALRWG was a panel of experts in the field of adult literacy research established by the Institute and NCSALL in order to

- Identify research related to adult reading instruction in the field of adult literacy that is scientifically based;

- Prioritize the research in terms of its relevance and importance for literacy instruction at the adult level;

- Identify gaps in the research;

- Come to a consensus on a list of research-based findings for adult literacy reading instruction that can then be disseminated to adult literacy practitioners; and

- Identify the best ways to disseminate the research-based findings and related practices.

In addition to summaries of the research, the ALRWG developed a reading instruction training workshop, a series of newsletters, a description of U.S. government-supported resources for adult educators (Comings & Crawford, 2007) and a standardized, norm-referenced assessment of adult educators' knowledge of research-based reading instruction practices for adults (Bell, Ziegler, & McCallum, 2004; Ziegler, McCallum, & Bell, 2007, 2009). The ALRWG analysis and summary of adult reading instruction research was also an important resource for a first guide to research-based reading instruction for adult educators (McShane, 2005) and an interactive assessment website for adult educators (Davidson, Strucker, & Bruce, 2009).

For the purposes of the ALRWG, "adult reading instruction research" was defined as research related to reading instruction for low-literate adults, aged 16 and older, who are no longer being served in secondary education programs (as defined in the Adult Education and Family Literacy Act, Title II of the Workforce Investment Act, PL105-220, 1998). 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 ABE, ASE and ESOL programs and adults with learning or reading disabilities.

How This Report Is Organized

The second chapter of this report, following the Introduction, presents the methods used to select and evaluate research related to Adult Education (AE) reading instruction. The methods used in this review place a premium on experimental research studies. Ideally, these studies objectively compare groups of learners receiving different forms of reading instruction and use statistical procedures to help determine how likely it is that one approach is significantly different from another. These studies are designed to increase our confidence in drawing conclusions about the effectiveness of a particular approach to instruction. This review uses nonexperimental reading instruction research to support findings based on experimental studies and to note promising directions that AE reading instruction research may be taking.

The third chapter contains a list of findings from the research. This list serves as an index to the AE and K–12 reading instruction research findings presented in the main sections of the report. The findings are categorized based on the number of experimental studies supporting them and the population from which they come. **Stronger findings** are the strongest statements made about AE reading instruction in this review and are based on two or more experimental studies and any number of nonexperimental studies of adults who qualify for or are in adult education programs. **Weaker findings** are based on one experimental and any number of nonexperimental studies.

Findings from literacy research with children, adolescents and other adults (those not necessarily eligible for AE services) are used to help fill in gaps in research with AE adults. The rationale for use of research with K–12 and other, non-AE populations is explained in the last section of this Introduction. These findings from K–12 and other populations are based on thorough reviews of the research: reports from government-sponsored panels of experts on K–12 literacy instruction including the National Reading Panel (NRP; National Institute of Child Health and Human Development [NICHD], 2000a, 2000b) and the

National Literacy Panel on Language Minority Children and Youth (NLP; August & Shanahan, 2006); follow-ups to the NRP review (Baker, 2008; Ehri, 2004; Guthrie & Humenick, 2004; Kamil, 2004; and Stahl, 2004); reviews sponsored by government agencies including a K–12 Practice Guide developed for the Institute for Education Sciences (Gersten et al., 2007) and a review of research on adults with learning disabilities conducted for the National Institute for Literacy (Taymans et al., 2009); and two reviews conducted for the ALRWG, a review of adolescent reading instruction research (Curtis, 2006) and a review of writing instruction research (MacArthur, 2008).

In the list of findings in the third chapter, ***Adolescent Research Findings*** are based on the review of the adolescent reading instruction research (for ages 15–19 or grades 9–12) conducted for the ALRWG. These findings are listed before other findings from research with children because adolescents are closer in age and other characteristics to young adults. ***K–12 Research Findings*** are based on results from the NRP report and follow-up reviews. ***K–12 Second Language Research Findings*** are based on the NLP review and ***K–12 Reading-Writing Research Findings*** are based on the second review conducted for the ALRWG. Methods used in the adolescent and reading-writing reviews conducted for the ALRWG are described in Chapter 2, Methods. Only one ***Other Adults Research Finding***, located in Chapter 9, Comprehension, was derived from the review of research on adults with learning disabilities (Taymans et al., 2009).

Many of the findings derived from the AE reading instruction research might be considered "emerging findings" because they are based on a relatively small body of experimental research. There is much more reading instruction research focusing on the K–12 level, both experimental and nonexperimental, as demonstrated in the report of the National Reading Panel (NICHD, 2000a, 2000b). The small size of the AE reading instruction research base precludes establishing more findings based solidly on large numbers of research studies that have been replicated. Some of the topic areas reviewed contain no or very few research studies. This does not necessarily suggest that the quality of AE reading instruction research is poorer than K–12 reading instruction research or other bodies of research, only that there is less of it. The relative quality of the AE experimental research base is the subject for another review, one that looks at the relative ratio of experimental to nonexperimental studies in various fields, for example, or that analyzes the relative quality of methods used.

The main sections or chapters of the report focus on the major aspects of reading instruction: assessing students in order to describe their reading "profiles" or overall reading ability, alphabetics instruction, fluency instruction, vocabulary instruction and reading comprehension instruction. Assessment of student strengths and needs in reading is presented first because it is one of a teacher's first tasks. Sections on the major components begin with alphabetics and end with comprehension. This corresponds to the movement from smaller units of instruction to larger ones and also from those aspects of the reading process that are considered "enabling" (alphabetics and fluency) to those that are considered the ultimate goal in reading (vocabulary and comprehension) (Snow, Burns, & Griffin, 1998; NICHD, 2000a).

Although each component is covered in a separate section of the report, this does not mean that they should be taught separately. In fact, research suggests they need to be taught together for instruction to be truly effective (Snow et al., 1998; NICHD, 2000a). Although research may attempt to isolate effective instructional approaches or aspects of effective instruction, this does not imply that only one approach should be used or that instruction should focus on only one aspect of reading.

Each of the main chapters of the report presents (1) a description of the major aspect of reading covered in the chapter, including a ***definition*** and ***rationale*** and, when appropriate, how a reading component is ***assessed***; (2) brief overall ***summaries of research*** preceding major sections; (3) findings listed by category and followed by a short summary of supporting research; and (4) findings derived from research with other populations (adolescents and children).

Subtopics important to AE reading instruction, identified by the ALRWG, are listed in the left column in the following table. These form subsections in the report. All subsections are shaded in the table. The ***Overall*** subtopic aggregates appropriate studies across the other Instruction subtopics to answer the general question, "Is it possible to increase AE students' reading achievement in each of the components of reading (alphabetics, fluency, vocabulary and comprehension)?"

The final chapter of the report summarizes some of the more important findings and presents an agenda for

future research based on these findings. The tables in the Appendix contain more detailed information about each of the adult and adolescent studies referred to in the review, such as sample size; participants' age, language, and reading level; and study type (assessment or instruction; experimental or nonexperimental), outcome measures, treatment and results.

This review attempts to maintain a close link between the AE reading instruction research base and the findings that are derived from it. The statement of each finding in the main sections includes citations that refer to relevant research studies. Studies that support a finding are cited as well as those that may not. Citations for instructional studies with relevant experimental-results, as defined in Chapter 2, Methods, are under-lined, while citations for instructional studies with nonexperimental results are not. Assessment studies, those studies that describe AE learners' reading, are underlined if they use sound inferential statistical procedures or large and representative sample sizes, as described in Chapter 2, Methods. Assessment studies that take snapshots of learners' reading abilities do not necessarily compare groups over time and therefore might not use an experimental design.

Some studies are cited more than once. These studies deal with more than one issue and are used to support more than one finding. Because a study may have both experimental and nonexperimental results, it is possible that its citation will be underlined in one instance (when its experimental results support a finding) and not in another (when its nonexperimental results are used in support of a finding).

Table: Report Organization

Section Contents	Assessment Profiles	Alphabetics PA	WA	Fluency	Vocab	Comp
Assessment of Component						
All adults	✓	✓	✓	✓	✓	✓
ABE, ASE, ESOL	✓	✓	✓	✓	✓	✓
Adults with LD	✓	✓	✓	✓	✓	✓
Other topics	✓	✓	✓	✓	✓	✓
Instruction						
Overall		✓	✓	✓	✓	✓
Methods and material						
Teaching strategies		✓	✓	✓	✓	✓
Instructional materials		✓	✓	✓	✓	✓
Intensity and duration		✓	✓	✓	✓	✓
Teacher preparation		✓	✓	✓	✓	✓
ABE, ASE, ESOL		✓	✓	✓	✓	✓
Adults with LD		✓	✓	✓	✓	✓
Other topics						
Age		✓	✓	✓	✓	✓
Goals and setting		✓	✓	✓	✓	✓
Developmental disab.		✓	✓	✓	✓	✓
Motivation		✓	✓	✓	✓	✓

PA=Phonemic Awareness, WA=Word Analysis, Vocab=Vocabulary, Comp=Comprehension, ABE=Adult Basic Education, ASE=Adult Secondary Education, ESOL=English for Speakers of Other Languages, LD=Learning Disabilities

Use of Research With Other Populations

One task for the Adult Literacy Research Working Group was to identify gaps in the AE reading research and how these gaps might be addressed. Where should the AE instructor look for suggestions on the best ways to teach reading to AE learners when the AE research has not yet addressed a topic? Several government-funded reviews and follow-ups to these reviews have summarized reading instruction research results at the K–12 level (August & Shanahan, 2006; Baker, 2008; NICHD, 2000a, 2000b; Gersten et al., 2007; McCardle & Chhabra, 2004; Taymans et al., 2009). One strong recommendation from the ALRWG is to look to these results for K-12 students, selecting for consideration those approaches to reading instruction that might also work with the AE learner. Two additional reviews were conducted for the ALRWG, one of reading instruction for older adolescents and one of writing instruction to improve reading (Curtis, 2006; MacArthur, 2008). Like all reviews, each of these has its strengths and weaknesses. The National Reading Panel Report, in particular, had a substantial impact on reading education and policy and has received a lot of attention (Shanahan, 2003; Camilli, Vargas, & Yurecko, 2003).

The findings or conclusions related to reading instruction from these reviews are used in this report in several different ways: (1) to help "fill in gaps" in the AE reading instruction principles where no or very few research-based results are available; (2) to provide support for tentative conclusions related to AE reading instruction (when the findings from these reviews and those for adults are compatible); and (3) to signal caution when the findings are not compatible. The guidelines used in selecting K–12 instructional practices that might be used with adults are presented in Chapter 2, Methods.

It is important to note that there are important differences between children and adults and that K–12 research does not focus on or directly address several topics important to adult education. The subtopics associated with AE program types (ABE, ASE and ESOL programs) are not addressed and neither are the subtopics of goals and setting (related to workplace, family and general functional literacy). All of these are important factors in AE instruction that may affect the outcome of instructional interventions. Adults may attend classes in workplace or family literacy settings or in community learning centers as well as in more formal educational settings, such as community college programs. In most of these settings, adults do not receive daily instruction in reading, as children do in the elementary education system. Adult attendance is not as good as children's attendance either, given the responsibilities of adult life. The demands of adult life may also make motivation a more important factor for adults.

Applying research from the K–12 level to adults is largely speculative, especially in areas where there is little existing AE research. Nevertheless, a convincing argument can be made for the use of K–12 results with adults when very few or no research-based practices exist at the adult level. Until there is a larger body of AE research, AE instructional practices must move ahead without being informed by AE research. Those practices based on a strong, carefully synthesized K–12 research base may provide the best source of promising ideas for instruction with adults. The skills necessary for successful reading are the same or, at least, very close to being the same in adults and children. However, differences such as age and lifestyle and how these affect reading growth and instruction are crucial to consider. It should be remembered that AE is different from K–12 education in ways that have the potential to affect reading instruction outcomes: adults are older; AE is not mandatory and adult attendance may not be as consistent; adults cannot spend hours each week on reading instruction, as do children; adults and children may bring different strengths and weaknesses to reading instruction; adults' goals and experience are very different from children's; and adults have different interests so that approaches and materials that appeal to children may not appeal to adults. A priority for research with AE learners should be to evaluate the use of promising approaches developed at the K–12 level with adults (e.g., Alamprese, 2009; Winn, Skinner, Oliver, Hale, & Ziegler, 2006).

Chapter 2
Method

For this review, major topics for study were established, studies were located through a literature search and studies were evaluated using a set of "evidence-based methodological standards." These standards were similar to those used in a review of reading research at the K–12 level by the National Reading Panel (NICHD, 2000a, p. 2). However, the method established by the ALRWG was different in several significant ways from the method used by the NRP. Important modifications included the addition of topics especially important to adult reading professionals, the inclusion of studies related to the assessment of reading ability and the inclusion of nonexperimental studies as well as those involving the use of control groups. In this chapter, the method used for review of AE reading assessment and instruction research is presented first, followed by the adolescent and reading-writing reviews. The criteria used for deriving findings from the reviews are presented in the last two sections.

Selecting Topics for the AE Review

Core topics for adult education (AE) review are based on those aspects of reading found by the National Research Council (NRC) and others to be most important in learning to read: alphabetics, fluency and comprehension (NRC, p. 2; Snow, Burns, & Griffin, 1998, p. 2). Several additional topics important to the field of AE were added to the core categories by the ALRWG. The Developmental Disabilities category was added during the literature review when studies of Down syndrome adults' reading were found. All topics are listed below.

A. Instructional Focus

   1. Alphabetics instruction (including phonemic awareness and word analysis)

   2. Fluency instruction

   3. Vocabulary instruction

   4. Comprehension instruction

C. Instructional Methods and Material

   1. Teaching strategies and techniques used for reading instruction

   2. Instructional materials used for reading instruction

   3. Technology and reading instruction

   4. Intensity and duration of reading instruction

   5. Teacher preparation and reading instruction

D. Program Type

   1. ABE

   2. ASE

   3. ESOL

E. Adults with Learning Disabilities

F. Other Topics

   1. Instructional Goals and Setting

   2. Developmental Disabilities

   3. Motivation

G. Assessment of Learners' Strengths and Needs for Reading Instruction

Selecting Studies for Inclusion in the AE Review

Five main sources were used to locate relevant research articles: The PsycINFO and ERIC databases through early 2010, reference lists from relevant articles, recommendations from adult literacy researchers for relevant research articles that may have been missed in the database searches and previous reviews (Condelli & Wrigley, 2004; Torgerson, Porthouse, & Brooks, 2003, 2005).

To determine whether or not a study should be included in the review, the following criteria were used.

A. A study must focus on AE learners' reading development. AE students are those low-literate adults aged 16 and older who are no longer being served in a secondary education program (Adult Education and Family Literacy Act, Title II of the Workforce Investment Act, PL105-220, 1998). This would include adults scoring on the lowest two levels of the reading tests developed for the Adult Education Learner Survey (Tamassia, Lennon, Yamamoto, & Kirsch, 2007), the National Assessment of Adult Literacy (Kutner et al., 2007) or the National Adult Literacy Survey (Kirsch, Jungeblut, Jenkins, and Kolstad, 1993) or those with grade equivalent scores of K through 12 on a test of reading.

B. A study must include reading as an outcome measure or dependent variable. Basic reading outcome measures were those used by the NRP, including reading real words in isolation or in context, reading pseudowords that can be pronounced but have no meaning, reading text aloud or silently and comprehending text that is read silently or orally, including both individual vocabulary words and extended text (NICHD, 2000a, p. 5).

C. Studies published in refereed (peer-reviewed) journals are given the highest priority. These journals' editors select an editorial board and other independent peer reviewers who use a common set of criteria to review studies submitted for publication. Based on reviewer comments, the editors select articles for publication. The reviews are usually "masked" (information about authors is not provided), which helps to ensure that only studies without major flaws are published. Only six nonjournal/nonpeer-reviewed sources were selected for inclusion. Two of these were selected because they describe in more detail data frequently referred to in journal articles (Sticht, Armstrong, Hickey, & Caylor, 1987; Strucker, 1995) The others report results from five national surveys of adults, a large survey in Britain (Brooks et al., 2001) and four large surveys in the United States: the National Assessment of Educational Progress Young Adults Survey (Gallo, 1972), the Adult Education Program Learner Survey (Tamassia, Lennon, Yamamoto, & Kirsch, 2007), the National Assessment of Adult Literacy (Kutner et al., 2007) and the National Adult Literacy Survey (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993).

D. A study must contain a full description of outcome measures.

E. A study must contain careful and complete descriptions of the adults participating (age, demographic, cognitive, academic and behavioral characteristics) and must contain enough information to make judgments related to validity (cf., NICHD, 2000a, p. 28).

F. Any interventions (and assessment procedures) used in a study must be described in sufficient detail to enable the study to be replicated.

G. Results from intervention studies using an experimental or quasi-experimental design are given highest priority. These are both referred to as experimental results. Experimental results must be based on valid comparisons between groups with differences between groups tested statistically for significance (at probability levels of .05 or lower). Correlational and other nonexperimental results may be used to support experimental studies in a topic area or as preliminary/pilot data if no experimental data exist in a topic area.

H. Nonexperimental results from qualitative studies must be based on a sound analytical framework. Qualitative reading research focuses on literacy processes as opposed to quantifiable, numerical data related to growth in reading. The following description of qualitative research is paraphrased from the *Handbook of Qualitative Research* (Denzin & Lincoln, 2000, pp. 3–8): Qualitative research includes case study; personal experience; introspection; life story; interview, artifacts and cultural productions; and observational, historical and visual texts. It is not defined by any distinct set of methods or practices. It includes ethnography, interviews, survey research and participant observation. It emphasizes the qualities of entities, and processes and meanings that are not experimentally examined or measured (if measured at all) in terms of quantity, amount, intensity or frequency. It emphasizes the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, the situational context that shapes the inquiry and the value-laden nature of inquiry. In contrast, quantitative research measures and analyzes causal relationships between variables, not processes, and claims a value-free framework.

Like quantitative-descriptive research, qualitative research may be used to support results from experimental studies (and vice versa). Qualitative research may employ multiple methods and so, as Denzin & Lincoln (2000) state, may include the use of quantitative measures, although these are not the focus of the research. In cases where a qualitative research study includes numerical analyses of data, these may be categorized according to the quantitative framework described above. The qualitative studies of the highest quality are those that collect data using multiple methods and use triangulation of these methods (cross verification) to support findings and any conclusions drawn from them. For techniques such as data coding (whether from transcripts, videotapes

or field notes), training and inter-rater/coder reliability should be performed.

Only a few qualitative studies have been selected and all are case studies of individual adult learners. Other nonexperimental intervention results selected include only those studies with comparisons made between two groups, or comparisons made of one group at two or more points in time.

I. Certain nonexperimental results are appropriate when considering studies in the Assessment category. Assessment studies may simply describe AE students' reading, unlike instructional studies that look for change over time resulting from some aspect of instruction. In assessment studies, planned comparisons between groups over time may not be appropriate. The most useful assessment studies use valid and reliable tests, those that measure what they are supposed to measure and that provide consistent results across administrations. Useful assessment studies also select participants who are representative of the AE population.

Assessment studies using large, representative samples or inferential statistics to analyze data are given highest priority and the same weight as experimental studies (two are needed for a ***stronger finding*** and one for a ***weaker finding***). The results from these studies can be generalized beyond the samples studied while those from studies with small sample sizes or that do not use inferential statistics cannot.

The Adolescent Reading and Reading-Writing Reviews

The reviews of adolescent reading instruction and adult writing instruction research conducted for this project followed the same procedures as those listed above with the following exceptions:

A. The adolescent review was restricted to studies of older adolescents in grades 9–12, ages 15–19 years old. Studies pooling results across grades 6–12, ages 13–19, were also included in areas where little other data existed.

B. The adolescent review did not include assessment studies or research related to the characteristics of adolescent learners. Although no systematic search for assessment studies in the adolescent research literature was conducted,

one study happened to address assessment in a way that might be useful to consider when working with adults and was included (in Chapter 9, Comprehension).

C. The writing review included only experimental studies (with the exception of assessment studies, no descriptive studies were included).

K–12 Research Reviews

As mentioned in the introduction, certain research syntheses of K–12 reading instruction research are used, when appropriate, to support and augment findings from the AE reading instruction research base. Criteria used for findings from these syntheses are listed below, roughly in the order they are used, with those listed first given a higher priority:

A. The instructional research at the K–12 level supports limited, research-based findings at the adult level.

B. The instructional approach derived from K–12 research can plausibly be used with adults. This "plausibility criterion" is needed so that research-based results that may be effective at the K–12 level are not blindly applied to adults. For example, research may demonstrate that a particular entry-level basal reader is extremely effective with children. However, because of design features like extremely large font sizes and childish illustrations, this research result may not necessarily lead to a recommendation that the basal reader be used in an adult workplace literacy program.

C. The instructional approach derived from K–12 research is based on a strong body of evidence. The stronger the result at the K–12 level, the more likely it is to eventually be shown to be effective at the adult level. Strength can be measured along two dimensions: depth and breadth. A finding has depth when it has been replicated and the effects summarized over replications are strong. The NRP, for example, defined a strong finding as one for which statistically derived effect sizes are moderate to large. A finding has breadth when it applies to a wide range of conditions. These conditions may be related to the learners, for example. A broad finding would be one that holds

for learners at different age or ability levels. A finding may hold for various instructional settings or conditions, such as in- or out-of-school settings; small group, classroom or tutoring situations; various subject or content areas; or different levels of teacher preparation or expertise. The same finding may result regardless of the types of assessment used (informal or formal, for example). A finding that has both depth and breadth is probably one that could be tried with adults, absent research-based direction at the adult level.

D. The instructional approach has been shown to work at the K–12 level with those who have not followed normal age and ability level development in their reading. Adults in AE programs are, in a sense, "out of grade level." They may be working on skills that others (and they themselves) worked on as elementary or high school students. They are older learners of specific reading skills. They may also be more likely to have a reading disability (Snow & Strucker, 2000). Therefore, those results at the K–12 level that apply to reading disabled or relatively older students may be of interest to adult educators. Instructional practices that work with younger disabled readers, those who have received instruction but whose reading is well below average, may be of use to adult educators working with adults who are also older and well below average in their reading ability.

Deriving Findings

Findings were derived from qualifying research studies by first placing the studies into the categories identified by the ALRWG, based on reading outcome measures and independent variables. Studies with common themes within each category were grouped together and their results were summarized as succinct findings. Results for each outcome measure in a study were labeled as either positive (supporting a finding) or negative (not supporting a finding). For example, the outcome from a study of a reading comprehension intervention might be positive if scores on a reading comprehension test (the outcome measure) were significantly higher for an experimental group receiving the intervention than for a control group.

Neutral results, or no difference between groups on the outcome measure, were counted as negative.

Findings from groups of studies that contained two or more experimental studies with compatible results (and any number of nonexperimental studies) were labeled stronger findings. Findings based on one experimental study were labeled weaker findings. Results from nonexperimental studies were used as convergent evidence for the findings. In the assessment categories, assessment studies using sound inferential statistical procedures or large, representative samples were given the same weight as experimental studies. Many of the stronger findings derived from the research might be considered "emerging findings" because they are based on a relatively small body of experimental research.

List of Stronger Findings, Weaker Findings and Findings From Other Populations

Research-based findings for adult education (AE) reading assessment and instruction are listed on the following pages, along with findings from other populations (adolescents and children). These findings are taken from the main sections of this report, where each is discussed and citations to relevant research are presented. This list serves as an index to findings in the report; definitions of terms and other relevant details are provided in the main text.

In the following list, as in the main section of the report, the findings are presented for each major component of reading instruction: alphabetics (phonemic awareness and word analysis), fluency, vocabulary and reading comprehension. Although each component of instruction has its own list of findings, it is assumed that teachers will address all major components in teaching sessions with students.

Findings from the research are divided into three categories: stronger findings from AE research studies, weaker findings from AE studies and findings from other populations of learners (most often children and adolescents with one finding from non-AE adults).

Stronger Finding: Stronger findings are based on results from at least two experimental studies and any number of nonexperimental studies. Because many are based on just a few experimental studies, they should be considered emerging findings.

Weaker Finding: Weaker findings related to instruction do not have as much support in the AE research base as stronger findings. They are based on fewer than two experimental studies and any number of nonexperimental studies.

Adolescent Reading Research Finding, K–12 Research Finding, K–12 Writing Research Finding and ***K–12 Second Language Research Finding:*** These findings are based on strong research with adolescents and children, including studies of reading instruction, reading-writing instruction and studies of reading instruction with English language learners. One finding,

labeled ***Other Adults Research Finding***, is based on a review of non-AE adults with learning disabilities.

Findings are grouped together by the reading topics in the lists that begin on the next page. Topics for which there are no findings are not listed.

Reading Assessment Profiles

Stronger Finding: When measures of achievement are obtained for each crucial aspect of reading instruction (alphabetics, fluency, vocabulary and comprehension), instructionally relevant patterns of scores, or profiles of adults' strengths and needs in reading, can be observed. These profiles suggest that AE readers, including those in ESOL programs and those with a reading disability, are very diverse and that any one measure of reading achievement may not be sufficient to identify strengths and needs for instruction.

Stronger Finding: Adults in ABE programs have assessment profiles that fall into at least two major groups, those just beginning to learn to read who must focus more on print-based skills and intermediate readers who rely on both print and meaning-based skills.

Stronger Finding: Knowledge of English affects English language learners' profiles in instructionally relevant ways.

Stronger Finding: Adults with a learning disability can be found in both ABE and ASE programs, and their profiles are usually characterized by relatively lower alphabetics and fluency scores and higher vocabulary and comprehension scores.

Alphabetics: Phonemic Awareness and Word Analysis

Alphabetics Assessment

Phonemic Awareness

Stronger Finding: Adult nonreaders have virtually no phonemic awareness ability and are unable to consistently perform, on their own, almost all phonemic awareness tasks.

Stronger Finding: Adult beginning readers, like all beginning readers including children, perform poorly on phonemic awareness tasks that require phoneme

manipulation. The ability to perform more complex operations with phonemes generally increases along with reading ability (in adults *without* a reading disability) until word analysis is established.

Word Analysis

Stronger Finding: Adult beginning readers, like other beginning readers, have difficulty applying letter-sound knowledge in order to figure out new or unfamiliar words while reading although word analysis is better as AE learners' reading improves.

Stronger Finding: Adult beginning readers, even more than other beginning readers, have poor spelling ability.

Stronger Finding: ASE-level readers without a reading disability have well-established phonemic awareness skills.

Stronger Finding: ESOL learners in adult education programs have better knowledge of letter-sound correspondences and rely more on this knowledge than AE native speakers of English.

Research With Other Populations: English Language Learners

K-8 Second Language Research Finding: The phonemic awareness, word analysis and spelling skills of language-minority learners and native-speaking peers are similar.

K-6 Second Language Research Finding: Measures of alphabetics help determine whether or not English language learners have difficulty with phonemic awareness and word analysis.

K-6 Second Language Research Finding: English language learners' phonemic awareness may be assessed in English or the learner's native language.

Learning Disability

Weaker Finding: While readers will typically develop phonemic awareness as they learn to read, adults with a learning disability in reading, such as dyslexia, may not; dyslexia tends to persist into adulthood and may be related to a functional disruption in the brain.

Weaker Finding: Adults with a learning disability in reading have poor word analysis abilities.

Other Topics

Age

Weaker Finding: On phonemic awareness tasks, adult beginning readers are not as good as reading-matched children (children progressing normally in their reading who are reading at the same level as the adults). Adult beginning readers' phonemic awareness abilities may be more like those of children who are poor readers.

Stronger Finding: When performing word analysis tasks, adults differ from reading-matched children in their reliance on past experience with print and sight word knowledge. Adults are generally better at recognizing familiar sight words than are children who are learning to read.

Weaker Finding: Nonnative speakers of English who learn English before age 12 are more like native speakers of English, relying somewhat less on letter-sound knowledge and somewhat more on their knowledge of word meanings when decoding.

Weaker Finding: The basic phonemic awareness abilities of nondisabled adults who learn to read at an older age are not different from adults who learn to read at a younger age.

Developmental Disability

Weaker Finding: While readers will typically develop phonemic awareness as they learn to read, adults with a developmental disability in reading, such as Down syndrome, may develop phonemic awareness more slowly.

Alphabetics Instruction

Overall

Stronger Finding: Participation in adult education may lead to increases in adult beginning readers' phonemic awareness.

Stronger Finding: Participation in adult education programs may lead to increases in adult beginning readers' word analysis abilities.

Stronger Finding: Alphabetics instruction may lead to increased achievement in alphabetics and other components of reading, especially reading comprehension.

Teaching Strategies

Weaker Finding: Phonemic awareness may be taught using direct instruction in phoneme manipulation and letter-sound correspondences.

Stronger Finding: Word analysis may be taught using approaches that include direct instruction in word analysis along with instruction in other aspects of reading.

Teaching Material

Weaker Finding: A few commercially available materials show some promise for teaching alphabetics to adults.

Research With Other Populations

Teaching Strategies

Adolescent Reading Research Finding: Focusing on alphabetics during instruction, especially the use of explicit instruction in phonics, increases skill in alphabetics.

K–12 Writing Research Finding: Use spelling instruction to improve beginning readers' word analysis skills.

K–12 Reading Research Finding: To teach phonemic awareness skills to beginning and intermediate readers, provide focused and explicit instruction on one or two PA skills rath   er than teaching a combination of three or more skills. Focusing on two skills in particular, blending and segmenting, may be most effective.

K–6 Reading Research Finding: To teach phonemic awareness skills to beginning and intermediate readers, teach students how to manipulate phonemes (e.g., how to blend and segment words) using letters rather than using only oral instruction.

K–6 Reading Research Finding: To improve beginning and intermediate readers' ability to decode regularly spelled words and read familiar sight words, teach phonemic awareness.

K–6 Reading Research Finding: To teach decoding of regularly spelled words and recognition of irregularly spelled sight words to beginning and intermediate readers, use systematic as opposed to nonsystematic phonics instruction.

K–6 Reading Research Finding: To teach decoding of regularly spelled words and recognition of irregularly spelled sight words to beginning and intermediate readers, use systematic programs that focus on individual phonemes or that focus on larger parts of words.

K–6 Reading Research Finding: To teach word recognition, use fluency instruction (repeated readings and guided oral reading, for example) to supplement regular word recognition instruction.

Teaching Material

K–6 Reading Research Finding: Computer programs may be useful in teaching phonemic awareness skills to beginning and intermediate readers.

Intensity and Duration

K–6 Reading Research Finding: To teach beginning and intermediate readers phonemic awareness, individual instruction, small group instruction and classroom instruction may be used, though small group instruction may be most effective.

K–6 Reading Research Finding: When teaching beginning and intermediate readers phonemic awareness, too much as well as too little PA instruction may be ineffective.

Other Populations Reading at the ABE Level

K–6 Reading Research: Phonemic awareness training may be most effective if provided immediately to nonreaders and those just beginning to learn to read. Special PA training may be needed for beginning readers who are a little more advanced in their reading (reading at or above Grade Equivalent 1).

Other Populations of ESOL Learners

Teaching Strategies

K–12 Second Language Research Finding: Bilingual education can have a beneficial effect on reading outcomes.

K–3 Second Language Research Finding: Alphabetics instruction leads to increased reading achievement for English language learners.

K–5 Second Language Research Finding: Direct, explicit instruction in each of the components of reading, provided in small-group settings, is effective in improving the reading achievement of English learners at risk for reading problems.

K–12 Second Language Research Finding: Peer-assisted learning, or heterogeneous groups of two to four English learners practicing reading material that has already been taught, can lead to improvement on measures of alphabetics (phonemic awareness and word analysis), oral reading fluency and reading comprehension.

Teaching Material

K–5 Second Language Research Finding: Several comprehensive reading programs available commercially have been shown through rigorous research to be effective in increasing English learners' alphabetics skills: Success for All, Enhanced Proactive Reading, Read Well and SRA Reading Mastery/SRA Corrective Reading.

AE Students With Learning Disabilities

Weaker Finding: It is possible to teach word analysis to adults with a learning disability.

Other Populations: Children and English Language Learners

K–6 Reading Research Finding: Although the same phonemic awareness training that is useful for non-disabled readers may be effective for disabled readers, special PA training may be needed for beginning and intermediate readers who have a reading disability.

K–6 Reading Research Finding: Systematic phonics programs may be used with reading disabled beginning readers, the same programs that are effective with nondisabled readers.

Other Topics

Age

Weaker Finding: Age is not a limiting factor in learning phonemic awareness.

Goals and Setting

Studies with positive results took place in both family literacy and general functional literacy settings, suggesting that these settings were not, at a minimum, limiting factors for alphabetics instruction.

Fluency

Fluency Assessment

Overall

Stronger Finding: Most AE learners have poor reading fluency, even when reading simple texts. Adult beginning readers' fluency is similar to the fluency of children who are beginning readers.

Stronger Finding: ABE learners' reading fluency ranges from very poor to poor compared with that of other adults and is on average lower than the fluency of ASE learners.

Stronger Finding: Adults in AE ESOL programs on average have poorer reading fluency than both ABE and ASE adult learners, unless they learned English at a young age.

Other Populations: English Language Learners

K–6 Second Language Research Finding: Use of fluency measures will help determine whether or not English language learners have difficulty with reading fluency.

Learning Disability

Stronger Finding: Adults with a learning disability in reading who continue to have poor phonemic awareness also have poor reading fluency.

Other Topics

Weaker Finding: Beginning readers, whether adults or children, have similar fluency abilities. However, adults use strategies that are more like those of children beginning to learn to read; they rely more on semantic cues than better child readers and less on letter-sound knowledge.

Fluency Instruction

Overall

Stronger Finding: Fluency may be taught to AE students and fluency practice may lead to increases in reading achievement.

Teaching Strategies

Stronger Finding: Fluency may be taught using approaches that include the repeated reading of passages of text, words from texts and other text units.

Teaching Material

Weaker Finding: *AutoSkill* may be an effective computer application for improving less-skilled readers' fluency.

Research With Other Populations

Adolescent Research Finding: Repeated oral reading of text may lead to increases in reading fluency.

K–12 Research Finding: To improve readers' fluency (as well as word recognition and reading comprehension achievement), use repeated guided oral reading procedures.

K–12 Research Finding: Simply encouraging learners to read independently more often may not lead to improvements in reading achievement without other forms of reading instruction.

K–12 Research Finding: Use systematic phonics instruction (as opposed to nonsystematic or incidental phonics instruction) to improve beginning readers' reading fluency.

Other Populations Reading at the ABE or GED Level

K–12 Reading Research Finding: Fluency instruction may be especially effective for improving poor readers' reading achievement, regardless of their reading grade equivalent.

Other Populations of ESOL Learners

Weaker K–6 Second Language Research Finding: Fluency instruction may lead to increased reading achievement for English language learners.

K–12 Second Language Research Finding: Bilingual education can have a beneficial effect on reading outcomes.

K–5 Second Language Research Finding: Direct, explicit instruction in each of the components of reading, provided in small-group settings, is effective in improving the reading achievement of English learners at risk for reading problems.

K–12 Second Language Research Finding: Peer-assisted learning, or heterogeneous groups of two to four English learners practicing reading material that has already been taught, can lead to improvement on measures of alphabetics (phonemic awareness and word analysis), oral reading fluency and reading comprehension.

AE Students With Learning Disabilities

Weaker Finding: Alphabetics instruction may lead to increases in at least one aspect of fluency: accuracy in reading connected text.

Vocabulary

Vocabulary Assessment

Overall

Weaker Finding: AE readers' vocabulary growth may depend on reading ability. Although their life experience may give them an advantage on vocabulary knowledge at beginning reading levels, this advantage may disappear as reading improves.

Weaker Finding: Beginning ABE readers' oral vocabulary knowledge is better on average than beginning ESOL readers' vocabulary.

Other Populations: English Language Learners

K–12 Second Language Research Finding: The strength of an English language learner's English vocabulary knowledge is of some importance in developing alphabetics abilities, but it is not nearly as important as phonological processing ability. Vocabulary knowledge is, however, extremely important in developing reading comprehension ability.

Vocabulary Instruction

Stronger Finding: Participation in AE may lead to increases in vocabulary achievement.

Teaching Strategies

Stronger Finding: Instruction that can lead to increased vocabulary achievement provides opportunities for

adult learners to (1) use new vocabulary words multiple times and (2) process them deeply by relating them to other concepts in a text and to prior knowledge.

Intensity and Duration

Weaker Finding: Provided that participation in a program produces gains in vocabulary achievement, instruction that is longer in duration may lead to increases in reading vocabulary achievement.

Research With Other Populations

Teaching Strategies

K–12 Research Finding: Repetition and supportive contexts increase vocabulary learning.

K–12 Research Finding: Learning tasks that promote the active engagement or participation of students increase vocabulary learning.

K–12 Research Finding: Pre-teach vocabulary words that learners will encounter in texts being used for instruction.

K–12 Research Finding: Restructure the tasks and procedures used for vocabulary instruction when necessary so that students understand what they need to do when reading and learning new words.

K–12 Research Finding: Encourage activities, such as listening and wide reading, that will expose learners to new vocabulary because vocabulary can be learned incidentally.

Teaching Material

K–12 Research Finding: Computer programs may be useful in teaching vocabulary.

Other Populations Reading at the ABE or GED Level

K–12 Research Finding: Vocabulary instruction should be appropriate for older students and tailored to their ability level.

Other Populations of ESOL Learners

K–6 Second Language Research Finding: When vocabulary is the focus of instruction for English language learners, vocabulary knowledge may increase.

K–12 Second Language Research Finding: Bilingual education can have a beneficial effect on reading outcomes.

K–5 Second Language Research Finding: Direct, explicit instruction in each of the components of reading, provided in small-group settings, is effective in improving the reading achievement of English learners at risk for reading problems.

K–12 Research Finding: Multimedia technology can be effective for vocabulary instruction with second language learners.

Other Topics: Goals and Setting

Weaker Finding: Teaching vocabulary along with other reading skills within a family literacy program may lead to a greater increase in vocabulary achievement than instruction in other settings.

Other Populations

K–12 Research Finding: To help provide repeated exposure to new vocabulary, teach AE learners new words that will be useful in multiple, authentic settings.

Reading Comprehension

Reading Comprehension Assessment

Overall

Stronger Finding: Most adults in AE programs have poor functional literacy comprehension achievement. Although they may be able to perform simple comprehension tasks such as recalling ideas from simple stories and locating a single piece of information in a simple text, they are often unable to combine (integrate or synthesize) information from longer or more complex texts.

Stronger Finding: Most adults in AE programs have poor health literacy comprehension.

Stronger Finding: When different assessment instruments are used to measure gain in reading comprehension achievement, or when the same instrument is used at several points over the course of instruction, results related to reading comprehension achievement may be extremely variable. Some comprehension measures may be more valid than others.

ABE

Stronger Finding: Adults in ABE classes have poor functional literacy comprehension achievement. Most are able to locate information in short texts and make

low-level inferences while reading but have difficulty locating and integrating information in longer texts. On average, their reading comprehension is much better than those in ESOL classes (reading English texts) but not quite as good as those in ASE classes.

Weaker Finding: ABE adults' knowledge about reading, or their meta-comprehension, is more like that of children who are beginning readers. They are less aware than good readers of strategies that can be used to monitor comprehension, view reading as decoding as opposed to comprehending text and are less aware of the general structure of paragraphs and stories. They are aware of the influence of motivation, interest and prior knowledge on reading.

ASE

Stronger Finding: Adults in ASE classes have poor functional literacy comprehension achievement, although it is better, on average, than that of adults in ABE and ESOL classes. Like ABE learners, most are able to locate information in short texts and make low-level inferences while reading but have difficulty locating and integrating information in longer texts.

ESOL

Stronger Finding: Adults in ESOL classes, on average, have poor functional literacy comprehension achievement in English, much poorer than ABE and ASE adults. However, ESOL adults have the same average comprehension achievement as other AE students when they read texts in their native language.

Stronger Finding: English language learners tend, on average, to have lower health literacy comprehension and are over represented in the AE target population.

Other Populations: English Language Learners

K–8 Second Language Research Finding: The reading comprehension achievement of language-minority learners is much lower than that of their native-speaking peers.

K–12 Writing Research Finding: Early development of writing in English is similar for English language learners (ELLs) and native speakers, writing processes are similar at later stages and ELLs may transfer knowledge about writing from their native language to English.

Learning Disability

Stronger Finding: Adults with a learning disability have, on average, lower literacy comprehension achievement and are overrepresented within the AE target population.

Other Topics

Age

Stronger Finding: The relationship between age and reading comprehension achievement is more complex among AE learners than it is in the general population.

Health

Stronger Finding: While higher literacy is associated with better health in the general population, the relationship between health and reading comprehension ability among AE learners is more complex.

Reading Comprehension Instruction

Overall

Stronger Finding: Participation in an adult literacy program may lead to an increase in reading comprehension achievement.

Teaching Strategies

Stronger Finding: Providing explicit instruction in reading comprehension strategies may lead to increased reading comprehension achievement.

Stronger Finding: Combined word analysis (WA) and fluency instruction, or WA, fluency and comprehension instruction, may lead to increased reading comprehension achievement.

Stronger Finding: Some teaching environments may work better with certain approaches to reading comprehension instruction, leading to improved reading comprehension achievement.

Weaker Finding: In programs where a teacher has assistance in the classroom, students may make greater gains in reading comprehension achievement.

Teaching Material

Stronger Finding: Integrating adult-oriented, contextually relevant material into literacy programs may lead to increased reading achievement.

Intensity and Duration

Stronger Finding: Reading comprehension achievement may increase as a learner stays longer in a literacy program, although progress may be extremely variable over time.

Weaker Finding: Spending a significant portion of classroom time practicing reading and writing, including the occasional but direct or deliberate discussion of reading strategies, may increase learners' metacomprehension abilities.

Teacher Preparation

Weaker Finding: Staff with more experience or training may have a better chance at improving reading comprehension achievement.

Research With Other Populations

Adolescent Reading Research Finding: Direct instruction in the use of specific comprehension strategies can lead to increased comprehension achievement.

Adolescent Reading Research Finding: When teachers want to explain or help students understand a specific text, effective teaching strategies include the use of analogies, cued note taking, semantic analyses, study guides, discussion and embedded comprehension questions.

Adolescent Reading Research Finding: Instruction in alphabetics and fluency may lead to increased reading comprehension achievement.

Adolescent Reading Research Finding: Using peer tutoring to teach comprehension strategies can be effective.

K–12 Research Finding: To improve learners' comprehension of texts used during instruction, teach them a strategy that can be used during the reading process and that enables them to become actively engaged in understanding a text. Eight effective strategies have been identified: comprehension monitoring, cooperative learning, graphic organizers, story structure, question answering, question generation, summarization and multiple strategies (using a combination of strategies when appropriate).

K–12 Research Finding: To improve reading comprehension, use a multi-components approach to instruction in which all aspects of the reading process are addressed, as needed, including phonemic awareness, word analysis and vocabulary as well as reading comprehension.

K–12 Research Finding: To improve learners' general reading comprehension achievement (those reading above Grade Equivalent 3), teach them to use a repertoire of several strategies that they can use consciously and flexibly as needed while reading and that enable them to become actively engaged in understanding a text. Combinations of the following strategies are suggested by the research: comprehension monitoring, cooperative learning, graphic organizers, story structure, question answering, question generation and summarization.

K–12 Writing Research Finding: Summary writing can increase reading comprehension achievement.

K–12 Writing Research Finding: Add writing assignments to content-area instruction to increase the amount of information learned about specific content.

K–12 Writing Research Finding: Given that writing instruction may improve reading (both alphabetics and comprehension), use the most effective approaches to teaching writing with students, such as strategy instruction and summarizing, and be aware of learner characteristics that may affect the choice of approaches to teaching writing (such as a student's native language or whether the student has a learning disability).

Weaker K–12 Writing Research Finding: Instruction in sentence combining can increase reading comprehension achievement.

Weaker K–12 Research Finding: To improve learners' general reading comprehension achievement, train their teachers to teach the awareness and use of multiple strategies for reading and understanding a text.

Learners in ABE, ASE and ESOL Programs

Stronger Finding: Findings from the research with AE learners related to comprehension instruction apply to ABE learners and, to a lesser extent, ASE and ESOL learners. While most approaches to comprehension instruction appear to work with adults in all of these programs, there is some evidence that differentiated comprehension instruction, instruction that takes into account the unique needs of learners in each group, is also effective.

Weaker Finding: Teaching comprehension strategies to ESOL students may lead to increased reading comprehension achievement.

Research With Other Populations

Other Populations Reading at ABE and GED Levels

K–6 Research Finding: Improve intermediate (Grade Equivalent 3–6) readers' comprehension of narrative texts by teaching story structure, or the typical content and organization of stories.

K–12 Research Finding: Improve the general reading comprehension achievement of intermediate and advanced readers by teaching the flexible use of multiple reading comprehension strategies.

Other Populations of ESOL Learners

K–5 Second Language Research Finding: Direct, explicit instruction in each of the components of reading, provided in small-group settings, is effective in improving the reading achievement of English learners at risk for reading problems.

K–12 Second Language Research Finding: Bilingual education can have a beneficial effect on reading outcomes.

K–12 Second Language Research Finding: Peer-assisted learning, or heterogeneous groups of two to four English learners practicing reading material that has already been taught, can lead to improvement on measures of alphabetics (phonemic awareness and word analysis), oral reading fluency and reading comprehension.

Students With Learning Disabilities

Research With Other Populations: Non-AE learners, Children and English Language Learners

Other Adults Research Finding: Explicit instruction and intensive instruction are both effective methods for teaching adults with a learning disability (LD).

Weaker K–12 Second Language Research Finding: Teaching strategies that work well with native language learners with LD may also be effective for English language learners with LD. In addition, teachers can use students' native language to make instruction more comprehensible.

K–12 Writing Research Finding: Effective writing instruction for learners with LD includes strategy instruction, instruction in self-regulation, the use of word processors, explicit modeling of the writing process, teaching of text structures and extensive feedback and scaffolding from teachers or peers.

Other Topics

Age

Weaker Finding: While younger ABE learners have higher word analysis and fluency achievement than older ABE learners, they are the same on measures of reading comprehension.

Goals and Setting

Weaker Finding: In some situations, participation in a workplace literacy or family literacy program may lead to greater increases in reading achievement than participation in other types of programs.

Stronger Finding: It may be possible to increase reading comprehension in workplace, family and general functional literacy programs.

Motivation

Weaker Finding: The direct or deliberate discussion of learners' literacy beliefs and plans in order to deal with issues of reading self-efficacy and motivation may increase reading comprehension achievement.

Other Populations

Motivation

K–12 Research: To improve learners' general reading comprehension achievement, increase their motivation to read by providing interesting texts to read; providing choices for reading; enabling readers to develop reading goals; and encouraging collaborative learning activities in reading.

Weaker K–12 Research Finding: To improve teachers' knowledge of reading comprehension instruction, use both pre-service and in-service training, and to improve their students' reading comprehension achievement directly, use in-service training.

Chapter 4
Introduction to ESOL and Writing Topics

There is very little research with AE adults in two topic areas that the Adult Literacy Research Working Group (ALRWG) selected as important for Adult Education: reading instruction for English language learners or those adults served in English for Speakers of Other Languages (ESOL) programs, and writing instruction, especially writing instruction that might be used to improve adults' reading. Because there is so little research with AE adults in these areas, this chapter presents important background information about these two topics.

Based on a review of second language reading instruction from the National Literacy Panel on Language-Minority Children and Youth (August & Shanahan, 2006), we know that instruction for second language learners can be very much like the instruction provided to native speakers except that it needs to be fine-tuned by taking into account important differences between the two populations. The description of these differences presented in this chapter should help adult educators accomplish this task.

Writing is not a component of reading and so it is not described in the chapters that follow. This chapter presents a formal definition of writing, along with a brief overview of writing research focusing on the connection between reading instruction and writing.

Special Characteristics of English Language Learners

More people came to the United States in the 1990s than in any other decade in the nation's history (see Wrigley, Richer, Martinson, Kubo, & Strawn, 2003). As a result, all across the country, more and more individuals who need to develop their English language and literacy skills are entering adult literacy programs. According to the most recent statistics from the U.S. Department of Education, almost half of the approximately 3 million students in federally funded adult education programs are English language learners (Center for Applied Linguistics, 2006). As a result of these

changing demographics, ESOL classes are the fastest-growing component of the federally funded adult education system. This article outlines some of the key differences between learners who grew up speaking English and immigrant learners new to English.

There are significant differences between adult education (AE) learners and English language learners (ELLs), the most significant of which are differences in schooling, with ELLs exhibiting a much wider range of backgrounds than AE learners born in the United States. While the majority of foreign-born students in the beginning levels of ESOL have few years of education, ESOL classes may also include those with much higher levels of schooling. Census data show that one-third of foreign-born adults have not completed high school—a proportion twice as high as that among U.S.-born adults. Among immigrant adults from Mexico those numbers are even higher: two-thirds do not have a high school diploma. Classes serving English language learners also include individuals who have at least some postsecondary education: one-quarter of immigrants have a bachelor's degree or higher—the same proportion as among the U.S.-born population (Schmidley, 2000, Fig. 14-1). Thus, while U.S.-born adults with higher-education experience are generally not eligible for AE services, the adult ESOL component of the system does include immigrants and refugees with high levels of education in their home country and strong literacy skills in their native language as long as their English is limited. Currently, there are few classes explicitly designed to take advantage of the knowledge and skills that educated immigrants bring to the process of learning English.

Differences in English Language Levels

The greatest difference in learning needs exists between immigrants and refugees who are absolutely new to English and AE learners who grew up speaking English. Although first-level AE learners may have difficulties with sophisticated academic language (even if presented orally) and may struggle with literacy, the fact remains that almost all U.S.-born adults can easily communicate in everyday situations, conversing easily with shopkeepers, social agency staff, nurses, police and supervisors at work. Informal conversations tend not to be a problem for AE students. In contrast, beginning ELLs still struggle with basic communication. For them, understanding and responding to a common

question such as "How long have you been living here?" can be quite challenging. These differences between ELL and AE learners demand different educational interventions. Non-English speakers need multiple opportunities to hear and use English. They need a chance to acquire the basic vocabulary and structure of English—including the fundamentals of spoken English that their AE counterparts acquired as children—and they need to do so while they are also learning to read and write in English. In other words, the burden on English language learners who are new to English is twice as high as it is for AE learners who have the oral communication skills to easily negotiate day-to-day conversations.

Advanced English Language Learners in AE Classes

Although there are significant differences between beginning English language learners and AE students, these differences tend to level off over time. As English language learners advance in their language skills, their profile begins to look similar to those who grew up speaking English, although there may still be marked differences in vocabulary, cultural background knowledge and use of syntax. Learners who have graduated from ELL classes into ABE or ASE classes may experience difficulties attributable to interference from the first language, from insufficient exposure to more sophisticated language structures and from lack of practice in more cognitively demanding academic forms of English.

Differences in Literacy Skills

In the United States, it is not very common to find native-born individuals who have never gone to school or who have only an elementary education. Among English language learners, however, this occurrence is widespread, particularly among refugees from Africa (the Sudan, Somalia, Eritrea), the Middle East (Afghanistan) and immigrants from Haiti, Central America and rural Mexico. While some of these adults may have some basic literacy skills in their native language—skills that might transfer to English—others enter adult literacy programs with little experience with print and/or writing skills.

Limited experience with literacy and schooling in the home language makes it difficult to deal with literacy of any kind, and students often struggle with understanding printed information that has been trans-

lated. Literacy students are often lost because most programs rely on the written word (in English and in translation) to get information out to students, and teachers commonly use print (board work, textbooks, hand-outs) in teaching. Non- or low-literate English learners face a special challenge: they need to develop three sets of skills simultaneously. They must (1) learn English (vocabulary, pronunciation and sentence structure, for example), (2) learn how to process print (read and write in any language) and (3) learn how to read in English, a language they are still trying to master. Given these challenges, English language learners who don't have foundation skills in reading and writing in their native language are likely to need a great deal more time, along with instruction that is geared toward their specific educational needs.

Differences in Writing Systems and Difficulties in Pronunciation

Even AE learners who face literacy challenges are generally familiar with the letters of the alphabet and have a store of sight words that they recognize. This is often not the case for English language learners, particularly those with low levels of education and those whose home languages use different writing systems. If these students come from a logographic (word- or morpheme-based) system that uses characters (e.g., Chinese), they may need to become familiar with the notion of the alphabetic system and learn that English uses a code in which *letters* rather than symbols represent the sounds of spoken words. For these students, acquisition of skills associated with alphabetics (phonemic awareness, decoding) is quite challenging. Even low literate English language learners who speak a language that uses an alphabet (e.g., Greek, Russian or Khmer) may be familiar with the notion that letters represent sounds. They will need practice in learning the names and recognizing and forming the shape of the letters of the Roman alphabet. As a recent study indicates, the story is somewhat different for learners who are highly literate in their first language, even if that language is logographic or uses a non-Roman script. Although these students may still face slightly greater challenges in acquiring phonemic awareness in English, they are often able to transfer some of the underlying literacy skills to processing print in English. In the end, learners who are *proficient* readers and writers in a non-alphabetic language are generally able to learn to read and write in English much

faster than students who have **low literacy** rates in the native language even if that language shares a Roman alphabet script with English (Condelli, Wrigley, & Yoon, 2009).

Managing the pronunciation of English words constitutes an additional challenge for English language learners. Recognizing and producing sounds that don't exist or don't carry meaning in one's own language can be very difficult. For example, most English language learners have difficulties with the **th** sound in English and cannot easily hear the difference between **ether** and **either**. Those whose languages don't distinguish between voiced and voiceless consonants (German, for example) don't easily hear the distinction between "he makes his money **raising** horses" and "he makes his money **racing** horses," a distinction easily made by a native speaker of English. These difficulties in **discriminating sounds** that don't exist in a learner's native language are quite common even among those who otherwise are highly English proficient; however, difficulties in discriminating sounds should not be confused with difficulties in **phonemic awareness** or the ability to segment and manipulate the sounds of any language. In the process of acquiring English as a second or another language, individuals are confronted with two important learning tasks: (1) they must understand sound-symbol relationships in English in order to decode and process print, and (2) they are expected to learn to produce the unique sounds and sound sequences of English so they can speak in ways that are comprehensible to others (Genesee & Geva, 2006). For low-literate ABE students only the former provides a significant challenge.

Conclusion

The special challenges faced by English language learners require programmatic and instructional interventions that take these differences into account. While commonalities exist between English language learners who have advanced to pre-GED (General Educational Development) levels and U.S.-born AE students, the differences between beginning ELL students and AE learners are substantial. The differences between learners who speak English and merely need literacy education and those who need English instruction plus literacy education call for specialized approaches not only in assessment and instruction but also in research, policy and program design.

The Reading-Writing Connection

Definition

This review uses a traditional definition of writing, limited to producing written language. The classic model of proficient writing developed by Hayes and Flower (1980) provides a framework of the components involved in writing. That model includes the social context for writing, knowledge about writing and content in the writer's long-term memory and a set of cognitive processes. The social context includes the audience and purpose for the writing task as well as social supports for writing. Proficient writers are aware of their audience and purpose and try to adapt their content, organization and language to communicate effectively. In addition, proficient writers know a great deal about writing itself—about the forms and purposes of writing and about criteria for effective writing.

The model organizes cognitive processes associated with writing into four components: planning, text production, evaluation and revision, and self-regulation. Planning processes include setting goals, generating content and organizing. Proficient writers set goals and subgoals based on the audience and purpose for their writing. They are skilled at generating content by searching their memories and by gathering information from reading and talking to others. They have knowledge of a variety of forms or genres for writing, and they use that knowledge to help them generate content and organize their writing.

Evaluation and revision processes draw on writers' reading comprehension, knowledge of evaluation criteria and specific revising strategies. Proficient writers evaluate and revise their work throughout the writing process. They are supported in their evaluation and revision processes by extensive knowledge about criteria for good writing and by good reading comprehension skills that help them detect potential problems.

Finally, the model includes a self-regulation component, which Hayes and Flower (1980) label the monitor. Writing is a very demanding problem-solving task that requires writers to consider both content and audience, plan the overall organization, choose words and generate sentences, evaluate the writing using multiple criteria and maintain motivation and persistence. Even proficient writers cannot do all of these things simultaneously, but they have self-regulation strategies that enable them to manage the demands.

Other researchers (Berninger & Swanson, 1994; McCutchen, 1995) have expanded the text production component of the model to include two subcomponents: transcription and sentence generation. Transcription skills include all the processes involved in getting sentences onto paper—spelling, handwriting or keyboarding and punctuation. For proficient writers, transcription processes are relatively automatic. Sentence generation is complicated by the fact that written language, in general, requires more complex syntax and vocabulary than everyday oral language.

Struggling writers have difficulty with all components of writing, from awareness of audience and purpose, to planning and revising processes, to transcription and sentence formation (McCutchen, 1995; Troia, 2006). They give little thought to goals or audience when planning, and have limited knowledge of forms for writing to guide them. Instead they often simply approach the writing task as one of telling whatever they currently know about a topic, in whatever order it occurs to them. They engage in little revision beyond correcting errors and making minor word changes. Their struggles with grammar, spelling and handwriting often interfere with their writing.

Rationale for the Importance of Writing Instruction in AE Programs: Reading-Writing Connections

It is hardly necessary to argue that writing is an important activity and skill that is highly valued in our culture. In our personal lives, writing is a means of personal expression and a way to communicate with friends and family across time and space. In addition, writing is important in many occupations and in a multitude of everyday functions. In a larger sense, writing is important for analytical thinking and development of knowledge as well as organization of society. The development of knowledge in academic, technical and business fields would be impossible without the ability to organize and communicate via writing. Writing is a fundamental part of the school curriculum both as a valued outcome in itself and as a critical means of gaining and demonstrating knowledge in other content areas. Business leaders regularly lament the poor writing skills of the products of our schools, and a recent report on national writing assessment declared that writing instruction has been neglected in our schools (National Commission on Writing, 2003).

Writing is very important as an aspect of adult basic education and, given limited time and resources, it is important relative to other types of knowledge and skill. A rationale for writing instruction in adult basic education can be based on arguments about the importance of writing as an integrated part of literacy that has connections with reading, as well as on the value of writing proficiency itself.

Writing skills are important to adult learners for employment, further education and personal fulfillment. First, writing is important in a wide range of occupations. Mikulecky (1998) found that significant percentages of workers in nearly all job categories, including employees without a college education, needed to write regularly as part of their job. The most common forms of on-the-job writing were memos, reports and forms. Only a quarter to a third of workers reported that they never wrote memos or reports. Second, writing ability is important in order for learners to advance educationally. For those learners working at the secondary level, the GED (General Educational Development) examination assesses writing skills with a multiple-choice skills section and an essay. For students who continue on to some form of postsecondary education, writing skills will be important in many of their classes. Finally, writing can be a significant source of personal satisfaction for adult education students (Gillespie, 2001).

In addition to the importance of writing outcomes, writing is connected to reading as an important part of an integrated literacy program. Writing instruction, or integrated instruction in reading and writing, may contribute to enhanced reading outcomes. Given the current emphasis on reading in adult basic education, it is necessary to consider the evidence of connections between reading and writing as part of any rationale for the importance of writing instruction.

In recent years, several research reviews have addressed the connections between reading and writing (Berninger, Abbott, Abbott, Graham, & Richards, 2002; Fitzgerald & Shanahan, 2000; Nelson & Calfee, 1998; Shanahan, 2006; Tierney & Shanahan, 1996). Shanahan and Tierney (Shanahan & Tierney, 1990; Tierney & Shanahan, 1996) proposed a useful framework for dividing the literature on reading-writing connections into three general perspectives. First, a pragmatic, or functional, perspective focuses on common tasks that require

integration of reading and writing, such as taking notes while reading, answering questions about texts and writing reports and memos. Second, a rhetorical perspective focuses on reading and writing as reciprocal aspects of communication, recognizing that writers have readers and books have authors. Third, a cognitive perspective focuses on the knowledge and cognitive processes shared by reading and writing as activities involving written language. The greatest amount of research has taken this cognitive perspective.

The Pragmatic Perspective

In school and out of school, most writing activities involve some reading, and many reading activities involve some writing. The most common forms of writing found by Mikulecky (1998) were memos, reports and forms, all of which involved reading. In schools, the most common forms of extended writing are book reports or literary analyses and research reports, all of which are based on reading. Applebee's (1993) survey of high school English teachers found that on average teachers assigned three to four pages of writing per week, mostly book reports and research reports. When students were surveyed about writing assignments as part of the National Assessment of Educational Progress (NAEP), 38 percent of fourth grade students said they wrote book reports weekly, and 70 percent of 11th grade students said they wrote some form of report weekly (Applebee, Langer, Mullis, Latham, & Gentile, 1994).

Writing can also be an important supplement to reading for learning in content-area classes. A recent meta-analysis of research on writing-to-learn reported modest positive effects of writing assignments in content-area learning in a wide range of disciplines, including math, sciences and social studies, from elementary school through college (Bangert-Drowns, Hurley, & Wilkinson, 2004).

In addition, the pragmatic connection between reading and writing is recognized in some large-scale assessments, including the NAEP reading tests and many state accountability tests, which require students to read a text and respond in writing. Such tasks are presented as more authentic than multiple-choice reading tests. Performance on these reading tasks correlates with both reading and writing skill. In fact, it correlates better with scores on essay-writing tasks than with scores on multiple-choice reading

items (Jenkins, Johnson, & Hileman, 2004). If these text-based reading items accurately represent the construct of reading, then writing instruction is probably important in order to improve reading.

The Rhetorical Perspective

Viewed as means of communication, reading and writing are reciprocal processes in that writing presupposes a reader and reading presupposes some author. Concern for the reader, or audience, has been a central concern of writing instruction as far back as the time of Aristotle's Rhetoric. Current theoretical models of writing recognize the importance of audience awareness in composing. Flower and Hayes (1980) contrasted writer-based prose, which is concerned primarily with content, with more mature reader-based prose, which takes into account goals for communication with an audience. Interaction between rhetorical concerns and content concerns is also critical to the mature knowledge-transforming mode of writing of Bereiter and Scardamalia (1987). Ample empirical evidence demonstrates that inducing audience awareness improves the writing of students from elementary (e.g., Wagner, 1987) to middle school (Midgette, Haria, & MacArthur, 2008) to college levels (Black, 1989; Roen & Willey, 1988).

Similarly, expert reading is characterized by attention to the author, and teaching students to consider the author (the writer) results in improved comprehension (Beck, McKeown, Worthy, Sandora, & Kucan, 1996; Shanahan, 1998). Research demonstrates that experts in disciplines think more about authors than do novices. For example, considering the authors of historical accounts and sourcing historical documents is critical for historians (Wineburg, 1991). Experts in philosophy, physics and literary criticism similarly focus on individual authors and their perspectives when reading in their fields.

Beck and her colleagues (Beck et al., 1996; Sandora, Beck, & McKeown, 1999) developed a reading comprehension strategy—Questioning the Author—that teaches students to become aware of authors rather than reading books as unquestionable authoritative sources. Students learn to interrogate the author, asking such critical questions as "What is the author trying to tell us? Why is the author telling us that? Is the idea clear? Does that make sense?" The strategy has led to more elaborated classroom discussions and

improved comprehension by middle school students (Beck et al., 1996; Sandora et al., 1999).

The Cognitive Perspective

The greatest amount of research on reading-writing connections has focused on similarities and differences in the knowledge and cognitive processes involved in reading and writing. Reading and writing share knowledge and processes across multiple levels, including the five components identified in the National Reading Panel (NICHD, 2000a) report. At the level of phonemic awareness and word analysis, decoding and spelling draw upon similar knowledge and processes, though spelling is more difficult than decoding (Ehri, 1996). Vocabulary knowledge is critical to both reading and writing. Fluency is important to both reading and writing though it draws on some different basic processes; handwriting fluency and simple length of composition explain substantial variance in the quality of writing at least through the elementary school years (Graham, Berninger, Abbott, Abbott, & Whitaker, 1997). Reading comprehension and composition both draw on domain knowledge, syntactic knowledge and knowledge about text organization (Fitzgerald & Shanahan, 2000); they may also draw on related strategic knowledge about constructing meaning. Most evidence on cognitive connections between reading and writing is based on research with K–12 students, though adults with reading disabilities have been included in some studies (e.g., Berninger et al., 2002), and one study of adult education learners (Perin, 1998) found that learners with lower reading skills made more spelling and grammatical errors than better readers.

There is ample evidence of relationships between reading and writing from correlational studies and studies using path analysis or structural equation modeling to model the effects of reading and writing on each other. Correlational studies typically show that 25–50 percent of the variance in reading and writing is explained by common factors. Correlations tend to be higher for lower-level factors (spelling and decoding, vocabulary), but significant correlations are also found between comprehension and composition factors (writing quality, cohesion, organization) (see reviews by Fitzgerald & Shanahan, 2000; Shanahan, 2006). Berninger et al. (2002) found considerably higher common variance in studies with dyslexic children and adults. Using multiple measures

for each word-level and text-level factor, they found shared variance of 77–85 percent for word-level measures and 65–66 percent for text-level measures. Furthermore, path analysis and structural equation modeling studies (Shanahan & Lomax, 1986; Berninger et al., 2002) show that models of reciprocal causation fit better than models showing just one-way effects of reading to writing or writing to reading.

The pattern of findings indicates that reading and writing are best seen as overlapping processes with both similarities and differences. These findings would suggest that integrated instruction in reading and writing would enhance learning in both areas. A few experimental studies have demonstrated transfer from teaching reading or writing to the other area. For example, two studies found transfer from reading instruction and practice to improved revising, supporting the theory that reading comprehension is a critical skill for effective revision. Beal and colleagues (Beal, Garrod, & Bonitatibus, 1990) found that instruction in a critical reading strategy with practice reading stories with coherence problems resulted in better identification of problems in stories and improved revision of those stories. Holliway and McCutchen (2004) reported that experience reading a particular type of expository text with coherence problems resulted in improved revising skills and improved transfer to students' own writing. Studies that found transfer in the other direction—from writing instruction to reading outcomes—form the basis for the K–12 Writing Research Findings presented in later chapters.

All three theoretical perspectives view reading and writing as related processes. From a pragmatic, or functional, perspective, they are related because reading and writing are often used together to complete tasks in school and the real world. From a rhetorical perspective, they are reciprocal communication processes in that writing presupposes a reader and vice versa. From a cognitive perspective, reading and writing share much of the same base of knowledge and cognitive processes. From all perspectives, reading and writing are sufficiently different that it is necessary to teach both, but sufficiently similar that learning one process supports learning the other.

In summary, a solid body of research demonstrates a connection between reading and writing from

multiple perspectives. The research on connections between the cognitive skills and processes involved in reading and writing is particularly strong. Thus, there is good reason to expect that teaching writing or teaching reading and writing in an integrated way could improve reading outcomes. Given that writing instruction may enhance reading performance, it is important to consider what research has to say about the characteristics of adult literacy learners' writing, about how writing instruction may affect reading and about effective instruction in writing.

Spelling is often used in tasks designed to improve word analysis (decoding and word recognition) and so findings related to spelling assessment and instruction are presented in the alphabetics chapter. Writing exercises, on the other hand, are often used in reading comprehension tasks. Writing summaries about what one has read, for example, is a common comprehension task. This review found no studies of writing instruction that had reading fluency or vocabulary outcome measures. For these reasons, writing assessment and instruction, other than spelling, are presented in the reading comprehension chapter, Chapter 9.

Unfortunately no experimental or quasi-experimental research was found on writing instruction with low-literacy or AE learners. Previous research reviews have reached similar conclusions about the lack of research on writing instruction in adult education. A review of research on adult writing (Gillespie, 2001) found qualitative studies and practitioner reports but no experimental research. A systematic review of experimental and quasi-experimental studies on literacy and numeracy in adult education (Torgerson, Porthouse, & Brooks, 2003, 2005) found 12 randomized controlled studies and 27 quasi-experimental studies, but none included any form of writing instruction. As was discussed in Chapter 1, Introduction, and Chapter 2, Method, research with K–12 learners was used to fill in the gaps in the adult research. Results from the review of K–12 writing research conducted for this report are presented in Chapter 6, Alphabetics, and Chapter 9, Comprehension.

Reading Assessment Profiles

Definition

Reading assessment is used to gather data to understand students' strengths and weaknesses in reading (Harris & Hodges, 1995, p. 12). The data are used to help design effective programs of instruction and to document the outcomes of instruction. Assessing a student's reading ability is important in programs where reading instruction is individualized or where growth in reading is monitored. The Test of Adult Basic Education (TABE) is an example of a widely used, standardized test in adult basic education that can provide teachers with information about at least two aspects of their students' reading: reading comprehension and vocabulary (CTB/McGraw-Hill, 1994). Teacher observations and informal reading inventories are examples of less formal measures of reading ability. Teachers, test makers and researchers have all developed ways to assess students' reading ability in each individual aspect of reading: alphabetics, fluency, vocabulary and comprehension. The characteristics of these methods are described separately in the major sections of this report.

Assessment profiles combine information from tests of several components to create profiles of learners' strengths and needs in reading for instructional purposes (Chall,1994; Chall & Curtis,1990; MacArthur, Konold, Glutting, Alamprese, 2010; Mellard, Fall, & Mark, 2008; Mellard, Fall, & Woods, 2010; Roswell & Chall, 1994; Strucker, 1997). Teachers create reading profiles by assessing a student in the major components of readings and using the same type of score from each assessment, such as grade equivalents, to create an outline of strengths and needs. Teachers can use profiles to prepare for instruction that addresses all of the components of reading together in an efficient way. When this technique is used, it is typically one of the first tasks a teacher completes and so it has been placed at the beginning of this report.

Rationale

Adult educators have traditionally used reading assessment for screening and placement, to measure student growth in reading achievement and to diagnose individual strengths and weaknesses in reading in order to plan for instruction (Askov, Van Horn, & Carman, 1997; Tamassia, Lennon, Yamamoto, & Kirsch, 2007). Common practice suggests that instruction is more efficient and effective when we determine as soon as possible what an individual learner or classroom of learners already knows and what they need to learn. Measuring growth also helps to determine whether a program of instruction has been effective (Askov et al., 1997; Joint Committee on Standards for Educational and Psychological Testing of the American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, 1999).

Assessment profiles result in a comprehensive view of learner strengths and needs across many aspects of the reading process and can be used to design a program of instruction that addresses all aspects of the reading process during instruction for all kinds of readers, including those with reading disabilities and English language learners. This ensures an approach to instruction in which no one aspect of the reading process is over- or underemphasized (National Institute of Child Health and Human Development, 2000b; Snow, Burns, & Griffin, 1998; Snow & Strucker, 2000).

Findings From Reading Assessment Studies

Summary of Findings

No research evaluating the effectiveness of assessment for instruction with adults was found, although research with children suggests that assessment that is used to guide instruction can lead to increases in reading achievement. It is generally assumed that good instructors assess students' strengths and weaknesses when instruction first begins. An important finding in the AE research suggests that assessing several components of reading in order to generate profiles of students' reading ability gives teachers much more instructionally relevant information than any test of a single component can.

Good readers, whether children or adults, tend to have flat profiles. Flat profiles occur when children are on grade level with each component and no one component is much stronger than another. Those working

on their reading in AE settings, however, are a more diverse group. They can be at just about any ability level on any of the major components of reading, from beginning through about the high school level, and may also have secondary conditions such as language or learning differences that affect their reading. Research suggests that there are groups of AE learners with distinct reading assessment profiles. Knowledge of these profiles may help teachers design instruction more efficiently and effectively.

Very beginning AE readers have fairly flat profiles with the exception of relatively high oral vocabulary scores. Their life experience gives them an advantage over younger beginning readers when it comes to their knowledge of concepts and word meanings. Advanced beginners and intermediate level readers at the Adult Basic Education (ABE) level also have relatively higher vocabulary scores. While they still have lower print skills (alphabetics and fluency), now that they have at least some decoding ability they are able score a little higher on comprehension.

English language learners (ELLs) at the intermediate level tend to have the opposite of the ABE profile. They have higher decoding scores and relatively lower fluency, vocabulary and comprehension scores because of their more limited knowledge of English. This difference may diminish as oral language proficiency improves, leading to improved reading vocabulary and comprehension.

For non-ELL Adult Secondary Education (ASE) learners, there may be less separation between print skills and meaning skills (vocabulary and comprehension) as they become better readers, as their print skills catch up to their meaning skills. This does not seem to be the case, however, for AE learners with a learning disability (LD) in reading. Learners with LD tend to have much higher vocabulary and comprehension scores than alphabetics and fluency scores at both the ABE and ASE levels.

Assessing Adult Learners

As noted above in the rationale section, assessment is often used to identify student strengths and needs in reading. So it is somewhat surprising that research has not addressed the following question: Does assessment of adult learners' strengths and needs in reading instruction lead to increased reading achieve-

ment? No findings related to this question were drawn from the research because there is very little experimental or nonexperimental research with adults that addresses the effects of assessment on reading achievement. Among experienced practitioners, however, it is widely assumed that assessment of learner strengths and needs is an important aspect of instruction. In order to effectively and efficiently teach reading, a teacher must accurately assess an adult learner's ability in one or more areas of reading instruction (alphabetics, fluency, vocabulary and comprehension). Reading assessment may be used to diagnose specific strengths and needs in reading for individual adults or for adults being taught in groups. It is also used to evaluate and modify instruction and to evaluate overall AE program effects on reading achievement.

Assessment Profiles

Do assessments that include more than one aspect of the reading process, such as profiles, provide useful additional information for reading instruction? Based upon assessment profiles, what are AE learners' strengths and needs in reading? The studies described in this section focus on the profiles or patterns found across test scores in each area of instruction. These studies are different from those that describe the strengths and needs of AE readers using more than one measure of reading ability without focusing explicitly on profiles (e.g., Durgunoglu & Oney, 2002; Greenberg, Ehri, & Perin, 1997; Pennington, Van Orden, Smith, Green, & Haith, 1990; Scarborough, 1984).

Stronger Finding: When measures of achievement are obtained for each crucial aspect of reading instruction (alphabetics, fluency, vocabulary and comprehension), instructionally relevant patterns of scores, or profiles of adults' strengths and needs in reading, can be observed. These profiles suggest that AE readers, including those in English for Speakers of Other Languages (ESOL) programs and those with a reading disability, are very diverse and that any one measure of reading achievement may not be sufficient to identify strengths and needs for instruction (Carver & Clark, 1998; Chall, 1994; MacArthur et al., 2010; Mellard, Fall, & Mark, 2008; Nanda, Greenberg, & Morris, 2010; Norman & Malicky, 1987 and Norman, Malicky, & Fagan, 1988; Sabatini, 2002; Sabatini, Sawaki, Shore, & Scarborough, 2010; Strucker, 1995).

Studies with children and adults have used factor analysis in attempts to identify fundamental or essential components of reading. These essential components or underlying factors may be good candidates for assessment prior to instruction.

Three recent studies with AE adults have used confirmatory factor analysis to develop and test reading components models (MacArthur et al., 2010; Nanda et al., 2010; Sabatini et al., 2010). One of these studies found that component models derived from previous research with children do not fit the adult data well (Nanda et al., 2010). This study tested 371 AE adults reading between Grade Equivalent (GE) 3 and 5 using 16 measures of reading achievement (word reading, nonword reading, fluency and comprehension) and reading subskills (phonological awareness, rapid automatic naming and oral vocabulary). Reading subskills are underlying processes that support reading and that have been found to be deficient in children who have difficulty with reading (core deficits). This study had difficulty obtaining models with good fit using either of these two models (reading achievement or core deficit) or a combination of the two (an integrated model).

The two other studies, however, did find component models of reading that fit their data well (MacArthur et al., 2010; Sabatini et al., 2010). Results from the first of these studies, of 482 adult learners in 23 ABE programs across 12 states, support the assessment of each major component of reading when developing reading assessment profiles. In a confirmatory factor analysis of 11 reading variables, this study found that a five-factor model, with each factor representing a reading component (decoding, spelling, word recognition, fluency and comprehension), accounted for more variance than either a two-factor or three-factor model. The two-factor model included decoding and meaning as factors and the three-factor model included decoding, fluency and meaning. The assessments used, even though they were not all normed on adults or AE learners, were found to be reliable and to have construct validity for use with AE learners (MacArthur et al., 2010).

The second study used confirmatory factor analysis to examine the relationships of 12 variables to reading comprehension in a group of 476 adults recruited from ABE programs in several mid-Atlantic and southern states. These ABE learners were beginning and intermediate level readers (reading at GE 7 or

lower on a measure of sight word recognition). Results from this study suggest, as does the study discussed above, that there are several separate factors in reading comprehension: word recognition, reading fluency (rate and speed of word, sentence and text reading), vocabulary and language comprehension. However, this study's analysis found that only word recognition and language comprehension were independently and substantially related to reading comprehension for the ABE population. This suggests that one print-based and one meaning-based factor are the primary factors in reading comprehension for this group (Sabatini et al., 2010).

It should be noted that the adult learners in all three of these studies were reading below about GE 7 (between GE 3 and 5 in one study, below GE 7 in another and between GE 4 and 7 in another) and included ELLs in two of the three studies. The addition of English language learners in one of the studies and ABE and ASE learners with higher reading scores in all three studies could potentially affect outcomes.

Several studies, including one of the three discussed above (MacArthur et al., 2010), have used assessments of multiple reading components to identify common patterns in AE learners' assessment profiles (Chall, 1994; Norman et al., 1988; Strucker, 1997; MacArthur et al., 2010; Mellard et al., 2008). Another group of studies has used assessment profiles to compare AE learners' reading to other populations, including average and advanced adult readers and children (Sabatini, 2002; Carver & Clark, 1998). Both groups of studies are described next.

An early descriptive study of AE learners found two main learner profiles. Later studies, using more sophisticated statistical analyses, have confirmed this finding. In this study, a group of approximately 100 AE learners were administered tests of word analysis and word recognition (alphabetics), oral reading (fluency), spelling, vocabulary and comprehension (Chall, 1994). The learner profiles, or patterns of grade equivalent scores across the six measures, were analyzed. Two common patterns were found. One pattern describes English language learners, and the other seems to be similar to the patterns of scores found among children with a reading disability. For the ESOL group, alphabetics and fluency scores are relatively high while vocabulary and comprehension scores are relatively

low. For the reading disabled group, a different common profile was found. Print-based aspects of reading (alphabetics and fluency) tend to be relatively low while meaning-based aspects of reading (vocabulary and sometimes comprehension) tend to be relatively high. These two profiles were observed across ability levels, from beginning to advanced levels of reading.

Four studies of AE learners' reading achievement profiles have used factor or cluster analyses to look for common patterns across learners. In one (Norman et al., 1988, with a descriptive presentation in Norman & Malicky, 1987), the following scores were used to generate profiles for over 100 adults reading at Grade Equivalent 1 through 8 (GE 1–8): reading comprehension and word recognition achievement scores on an informal reading inventory, the number of oral reading miscues in five miscue categories and the number of ideas (clauses) recalled in four separate categories. Miscue and clause categories were based on the degree to which miscues and clauses were either text-based or knowledge-based. An oral reading miscue that resembles a word in the original text (saying "bark" when the word in the text is "dark," for example) is text-based, while a miscue that does not is presumed to come from the reader's knowledge base. Similarly, a recalled idea that closely resembles one in the text is text-based, while one that does not is knowledge-based. Results from the analysis suggest that profiles cluster into two or three groups, based on developmental stages in reading ability. Beginning readers (GE 1–4) attend more to the print on a page than they do to their own knowledge as they read. More advanced readers (GE 5–7) rely on both print and knowledge and are better able to integrate the two. An intermediate or transition group at about GE 4 may also be present.

Another cluster analysis study is described in a widely cited nonpeer-reviewed study of adult learners' reading profiles (Strucker, 1995). Data from seven measures of reading for over 100 AE learners were used in this cluster analysis. These included measures of alphabetics (phonemic awareness, word analysis and word recognition), spelling, fluency (oral reading), oral vocabulary and reading comprehension. In general, two categories of profiles were identified, ESOL and reading disabled, supporting observations made in the descriptive study cited above (Chall, 1994). In addition, nine patterns of strengths and weaknesses

in reading that may be instructionally relevant were found across several developmental levels or stages. There were two profiles for beginning readers (GE 0–3): beginners and advanced beginners. There were four profiles at the intermediate level (GE 4–8): ESOL and inner city young adults, ESOL and reading disabled adults, reading disabled adults (with lower comprehension), and higher ability ESL and inner city young adults. The three remaining profiles were at the advanced AE level (GE 9–12): reading disabled adults (with higher comprehension); pre-GED (General Education Development) low vocabulary and GED high vocabulary.

A third cluster analysis of seven variables across three reading components (alphabetics, fluency and comprehension) used a stratified sample of adult learners from 13 AE programs and a confirmatory cross-validation procedure (Mellard et al., 2008). Sixty learners were selected from each of the six educational functional levels defined by the National Reporting System (NRS) that is used in all federally funded programs, including four ABE levels (1–4) and two ASE levels (5–6). Random selection was used for those in levels 4–6 but was not possible for those in levels 1–3 because there were so few learners at these levels. Sixty learners were initially selected at each level and 295 participated in the cluster analysis. Seven distinct profiles or subtypes were identified. While these seven subtypes represent a hierarchy from beginning to advanced AE learners, they do not correspond to the typical AE levels or groupings that are determined with a single measure of reading comprehension, such as the NRS's six levels of reading ability. AE learners in four of the profile groups, the two higher and two lower ability groups, tended to fall into the two high and low NRS groups (levels 1–2 and 4–6). However, those in the middle three profiles were distributed widely across the NRS groups. Many of the seven profiles are similar to those described in the cluster analysis discussed above (Strucker, 1995), although differences in the measures used may have led to some differences in the profiles. One used a measure of oral vocabulary, for example, while the other did not, and one used measures of rate for decoding and word recognition as well as for fluency in oral reading.

Group 7 had the highest scores on each set of measures: phonemic decoding (rate and accuracy in using letter-sound correspondences to identify pseudowords, for example), word recognition accuracy and

rate, fluency and comprehension. Word recognition rate was especially high for this group and the group scored close to or above the 50th percentile on all measures except phonemic decoding rate. Groups 6 and 5 had successively lower scores on all measures. In addition, both of these groups had relatively weaker word recognition rates. Groups 4 and 2 also had successively lower scores but a similar pattern of scores: both had low phonemic decoding rates relative to their accuracy scores, indicating problems with automaticity in decoding. Group 1 had extremely low rate or accuracy scores on all measures. Groups 1–4 scored well below the 10th percentile on all measures. For instruction, Groups 1 through 4 all need to focus on basic decoding along with work on other aspects of reading. Groups 5 and 6 need to focus on word recognition and fluency, and Group 7 on comprehension.

The confirmatory factor analysis discussed above also compared the profiles of different groups of AE learners using multivariate analyses of variance with follow-up univariate tests, controlling for age and gender when appropriate (MacArthur et al., 2010). Both nonnative learners (likely to be ELLs) and adults with LD had distinct profiles. These are discussed in more detail in the ESOL and LD sections below.

In contrast with the studies presented above, a second group of studies compared the reading profiles of AE learners to advanced adult readers or children. One study compared the accuracy, speed and rate (e.g., items per second) of college learners' and AE students' word analysis and comprehension at different levels of word recognition ability (measured by the Wide Range Achievement Test). It found that a consistent pattern emerges. High ability students are faster, more accurate and more efficient readers. Students of average word recognition ability are accurate but less efficient (slower and less fluent) on word analysis and comprehension tasks. Low literate adults are both inaccurate and slow on decoding and comprehension tasks (Sabatini, 2002).

A series of three studies allows a comparison of the reading profiles of AE students with those of children as well as advanced adult readers (Carver & Clark, 1998). Children finishing the 3rd, 4th and 5th grades, a group of normally achieving university freshman and a group of 128 average to poor readers from a community college were all assessed with the same computer-assisted assessment system that measures oral

and silent vocabulary, reading comprehension, oral reading rate, word recognition and the speed at which readers can name letters. Reading profiles derived from these scores suggest that the average scores of children and university freshman form flat profiles, with roughly the same GE scores for all components, while poorer adult readers have noticeable strengths and weaknesses (ups and downs) in their profiles. Average scores for the various components assessed were all in the GE 12 to GE 13 range for the university students and at GE 5 for the children. GE scores in the profiles of the poor readers from the community college were, on the other hand, variable, with rate (fluency) and word recognition (word analysis) scores usually being the lowest scores. A more qualitative description of the subset of the community college group with a reading disability, defined as having at least one GE score of 6 or lower, suggests that most (98 percent) of these reading disabled adults had low rate scores, or a rate disability. All also had low word recognition scores, and 67 percent scored below GE 6 on a measure of oral vocabulary knowledge.

Assessment Profiles and Learners in ABE, ASE and ESOL Programs

Several studies have examined the reading profiles of AE students in ABE programs and two have looked at the profiles of students in ESOL programs. Only one has examined profiles for adults in ASE programs and so no findings for this group were drawn from the research. All except one of these studies (Davidson and Strucker, 2002) are also discussed above.

ABE

Stronger Finding: Adults in ABE programs have assessment profiles that fall into at least two major groups, those just beginning to learn to read who must focus more on print-based skills and intermediate readers who rely on both print and meaning-based skills (Norman et al., 1988; Sabatini et al., 2010; Strucker, 1995).

Two studies have found that adults reading at the ABE level focus heavily on basic reading skills such as alphabetics and fluency (print-based skills) until they reach about GE 3–4 when they also begin to focus on reading comprehension and vocabulary, or meaning-based skills (Norman et al., 1988; Strucker, 1995). With the exception of their vocabulary scores, very beginning readers have flat profiles, with very low

alphabetics, fluency and reading comprehension scores (GE 0–1 with oral vocabulary at around GE 4). Slightly more advanced beginners have more irregular profiles, with somewhat higher alphabetics scores (around GE 2) and much higher comprehension now that some reading is possible (up to around GE 4, or roughly the same level as their vocabulary; Strucker, 1995).

Advanced ABE learners (reading at roughly GE 4–8) are better at integrating the print-based and meaning-based components of reading (Norman et al., 1988). Of the four reading assessment profiles that characterize these intermediate level readers, three have a relatively large proportion of English language learners and one is dominated by learners with a reading or learning disability (Strucker, 1995). The three profiles with large proportions of ELLs show progressively higher levels of achievement in alphabetics and fluency, with oral reading (accuracy) increasing from GE 4 to 7, for example, from the lower level to the higher level profile. While these print skills are relatively strong, vocabulary is fairly low in all three profiles (approximately GE 4), leading to relatively low comprehension scores (GE 4–5). The fourth profile in the intermediate group consists primarily of those intermediate readers with a learning disability. Those in this profile have weaker print-based skills (at about GE 2–3) and much higher vocabulary (GE 6).

This basic profile was also evident in the description of non-ELL advanced ABE readers found in another study (Sabatini et al., 2010). Descriptive results for these learners indicated that their oral comprehension and vocabulary were relatively high (GE 4) but their application of letter-sound knowledge (e.g., pseudoword decoding) was relatively low (around GE 2).

ASE

Only one study of ASE learner profiles was located and so no findings related to assessment profiles for ASE learners were derived from the research. This study of AE profiles (Strucker, 1995) identified two distinct profiles for ASE adults or those who may be ready to take the GED certificate test. The highest group had relatively high scores for AE learners across almost all components of reading (GE 10–12). A lower group had fairly good fluency (oral reading) and reading comprehension scores (GE 8–9) but somewhat lower vocabulary scores (GE 6). The final group represented higher functioning adults with a learning disability. While their vocabulary and comprehension scores were relatively high (GE 8–10), their print skills were fairly low (about GE 3.5).

ESOL

Stronger Finding: Knowledge of English affects English language learners' profiles in instructionally relevant ways (Davidson & Strucker, 2002; MacArthur et al., 2010; Strucker, 1995).

English language learners can have almost any of the reading profiles discussed above. They are numerous at the advanced beginner level, characterized by profiles with very low alphabetics and fluency scores. As noted in the ABE section above, however, they are most numerous in three of the advanced ABE profiles (GE 4–8), characterized by relatively better print-based than meaning-based skills (Strucker, 1995). Several studies have found that, at this level, adults' knowledge of English affects their profiles (patterns of scores) in instructionally relevant ways. Native speakers of English at this level have better vocabulary and comprehension scores while English language learners have better decoding or letter-sound knowledge, as measured by tests of nonword reading, for example (Davidson & Strucker, 2002; MacArthur et al., 2010; Nanda et al., 2010).

One of these studies provided additional evidence that learners' knowledge of English affects their reading profiles (Davidson & Strucker, 2002). An analysis of reading profiles from a group of 212 AE low-intermediate readers (GE 4–6) showed that native speakers of English in this group had higher oral reading, vocabulary and comprehension scores than nonnative speakers. However, nonnative speakers in this group who learned English before age 12 scored higher on oral reading and comprehension than nonnative speakers who learned English after age 12. Knowledge of English, therefore, seems to be reflected in students' profiles of strengths and needs in reading. Knowledge of English is also reflected in students' word analysis errors (the errors made when pronouncing phonetically regular nonsense words). More familiarity with English is associated with meaning-based errors (substituting real words for the nonsense words) while less

familiarity is associated with significantly more phonetically plausible errors. It should be noted that this study used multiple t-tests rather than ANOVAs and that different groups were used for each of the major analyses (of profiles and oral reading errors).

Assessment Profiles for Those With a Learning Disability

Stronger Finding: Adults with a learning disability can be found in both ABE and ASE programs and their profiles are usually characterized by relatively lower alphabetics and fluency scores and higher vocabulary and comprehension scores (Carver & Clark, 1998; Chiappe, Stringer, Siegel, & Stanovich, 2002; MacArthur et al., 2010; Strucker, 1995).

Adults with a learning disability (LD) in reading have lower average scores on all components of reading than non-LD adults (MacArthur et al., 2010; Chiappe et al., 2002). However, adults with LD can vary considerably in ability level and are usually characterized by profiles with lower alphabetics, higher vocabulary and higher than expected comprehension skills given their difficulty with alphabetics (Strucker, 1995).

As noted in the ASE section above, there appears to be a higher functioning group of adults with LD with profiles characterized by higher vocabulary and comprehension scores (GE 8–10) and very low alphabetics and fluency scores. As noted in the ABE section, the two lowest functioning groups, likely to have LD, have extremely low alphabetics and fluency scores (GE 0–2) and relatively higher vocabulary and/or comprehension scores (GE 4). There is also a middle group of adults with LD, between the higher and lower functioning groups. The profile for this group of ABE learners shows very low alphabetics scores, a higher fluency (oral reading) score and even higher comprehension and vocabulary scores of around GE 5 and 7 (Strucker, 1995). A qualitative analysis of data from another study, discussed in the ABE section, supports these findings. In this study, while all adults classified as reading disabled in a community college program had low rate scores and almost all (98 percent) had low word recognition scores, fewer (two-thirds) had low vocabulary scores (Carver & Clark, 1998).

Alphabetics: Phonemic Awareness and Word Analysis

Definition

English is an alphabetic language. The letters in its alphabet represent the sounds of spoken English. One aspect of reading is the ability to associate a written word with the spoken word it represents and, consequently, with the concepts or meanings associated with the word. The process of using the letters in a written alphabet to represent meaningful spoken words is called alphabetics.

Alphabetics includes both phonemic awareness (PA) and word analysis (WA). Word analysis is also known as phonics instruction or decoding. Phonemic awareness is the knowledge of the basic sounds (phonemes) of spoken language. Word analysis is the knowledge of the connection between written letters or letter combinations and the sounds they represent. Alphabetics is one of several components of reading instruction, along with fluency, vocabulary and comprehension. These are taught together and none, including alphabetics, should be the sole focus of instruction.

Phonemic Awareness

> Phonemic awareness refers to the ability to focus on and manipulate phonemes in spoken words…. Phonemes are the smallest units constituting spoken language. English consists of about 41 phonemes. Phonemes combine to form syllables and words. A few words have only one phoneme, such as *a* or *oh*. Most words consist of a blend of phonemes, such as *go* with two, or *check* with three phonemes, or *stop* with four phonemes (NICHD, 2000b, p. 2-1).

Phonemes are different from graphemes. Graphemes are the written letters used to represent phonemes in the spelling of words (NICHD, 2000a). A grapheme may be a single letter representing a single sound. *Go* consists of two graphemes, *g* and *o*. A grapheme may also consist of more than one letter. The word *check* consists of three graphemes, the two-letter combinations *ch* and *ck* and the single-letter grapheme *e*.

Although each grapheme represents a phoneme, English is a more complex alphabetic language because different graphemes may be used to represent the same phoneme. The sound corresponding to the grapheme *oh* may also be represented by the graphemes *oe*, *ough*, and *ow*, for example. Also, the same grapheme may represent different phonemes, depending on context. The grapheme *a* in *glad* represents a different sound than the *a* in *glade*.

Word Analysis

Word analysis instruction is commonly thought of as phonics instruction, especially with children. Beginning phonics focuses on simple one-letter graphemes representing consonants (*b*, *c*, *d*, *f*, *g*, *h*, and so on) and vowels (*a*, *e*, *i*, *o*, *u*) and blending them together to make simple words (*sat*, *met*, and so on). While phonics instruction, viewed narrowly, is restricted to teaching grapheme-phoneme (letter-sound) correspondences, word analysis instruction may also include other methods that students can use to figure out words. One of these, sight word recognition, is taught along with phonics. Students are taught to recognize common and irregularly spelled words (*was*, *want*, *to*) on sight as whole words rather than to analyze them into graphemes and phonemes and then blend them. Other word analysis techniques are the use of context, knowledge of prefixes, suffixes and their stems, and dictionary skills.

Phonics may be taught systematically or incidentally. Systematic phonics instruction is the direct, explicit teaching of a comprehensive set of grapheme-phoneme correspondences, including consonants, short and long vowels, two-letter graphemes (*oi*, *ea*, *ou*, *sh*, *ch*), and common blends consisting of more than one grapheme (*st*, *sm*, *bl*, *pr*) (NICHD, 2000b, p. 2-99). Students practice using this letter-sound knowledge when reading word lists and texts that are, to various degrees, controlled so that they contain words that are decodable using letter-sounds relations learned. Programs that do not emphasize phonics in this way, that teach it incidentally, include "whole word programs, whole language programs, and some basal reader programs" (NICHD, p. 2-89).

The NRP (NICHD, 2000b, p. 2-99) describes several types of systematic and explicit phonics programs:

Synthetic phonics programs teach children to convert letters into sounds or phonemes and then blend the sounds to form recognizable words.

Analytic phonics avoids having children pronounce sounds in isolation to figure out words. Rather children are taught to analyze letter-sound relations once the word is identified.

Phonics-through-spelling programs teach children to transform sounds into letters to write words.

Phonics in context approaches teach children to use sound-letter correspondences along with context cues to identify unfamiliar words they encounter in text.

Analogy phonics programs teach children to use parts of written words they already know to identify new words.

Mixed programs: The distinctions between systematic phonics approaches are not absolute, however, and some phonics programs combine two or more of these types of instruction.

A synthetic phonics program would teach the three graphemes ***t***, ***a***, ***p*** and their associated phonemes (often pronounced as ***tuh***, ***a***, and ***puh***) before teaching students to blend them (***tuh-a-puh*** or ***tap***). Through practice and direct instruction, some synthetic phonics programs teach letter-sound units that are larger than single grapheme-phoneme pairs. Common blends such as ***str*** (three phonemes that are blended together) and ***eam*** (two phonemes) are taught as one unit or become automatized through practice and become essentially one unit for the student. In this way, when decoding the word ***stream***, for example, students are not faced with blending ***s-tuh-er-ea-m***, which might tax short-term memory and requires getting rid of some extra sounds during the blending process, like the ***uh*** in ***tuh*** (NICHD, 2000b, p. 2-104).

Rationale

Alphabetics instruction is important because it is fundamental to developing basic reading skills. Grapheme-phoneme (letter-sound) correspondences in

English are more complex than in many other languages, and it is difficult for beginning readers to figure them out on their own (Ehri, 2004). Unlike speech, phonemic awareness and word analysis are not learned naturally but through instruction in reading and writing. Instruction in reading and writing contributes to developing basic reading skills:

- Decoding words or "transforming graphemes into phonemes and then blending the phonemes to form words."

- Recognizing the similarity between known and unknown words and reading by analogy. A learner might reason, for example, that the new, unknown word ***moat*** could sound like the old, known word ***goat***. Both have the same middle sound.

- Recalling learned words or sight words from memory. Recall is easier when sound (the way a word is pronounced) is associated with a printed word.

- Providing cues to help make guessing words from context more accurate. Knowing some sounds in an unknown word may help us figure out how to read it. Knowing how to say parts of the following word helps us figure out the rest: ***w a g _ n***. (NICHD, 2000b, p. 2-11).

Students with good phonemic awareness know how to manipulate the individual sounds (phonemes) of spoken English. They know, for example, that the spoken word ***cat*** is made up of three sounds: ***/k/ /a/ /t/***. (It is conventional that letters appearing between slashes are read as sounds; for example, /***b***/ is read as the first sound in ***bob***-not as ***bee***.) Students with good word analysis know how individual letters and combinations of letters are used to represent the sounds of spoken English (knowing, for example, that the string of written letters ***c***, ***a***, and ***t*** represent the spoken word ***/kat/***). They know how to blend sounds together to form regularly spelled words, and they know how to recognize irregularly spelled words by sight.

As beginning readers advance, more complex aspects of word analysis may contribute to word reading ability, such as knowledge of parts of words (prefixes, suffixes, stems and compounds, for example) and the use of tools such as the dictionary. Both phonemic awareness and word analysis contribute to word reading,

and word reading is necessary to reach the ultimate goal of reading, text comprehension.

Assessment

Phonemic awareness and word analysis are assessed by asking learners to complete tasks with words and parts of words. The NRP provides a good list of tasks used to assess PA *orally* (Ehri, 2004, p. 157; NICHD, 2000b, p. 2-10).

- Phoneme isolation: recognizing individual sounds in words, for example, "Tell me the first sound in paste." (/*p*/)

- Phoneme identity: recognizing the common sound in different words, for example, "Tell me the sound that is the same in bike, boy, and bell." (/*b*/)

- Phoneme categorization: recognizing the word with the odd sound in a sequence of three or four words, for example, "Which word does not belong? bus, bun, rig." (*rig*)

- Phoneme blending: listening to a sequence of separately spoken sounds and combining them to form a recognizable word, for example, "What word is /s/ /k/ /u/ /1/?" (*school*)

- Phoneme segmentation: breaking a word into its sounds by tapping out or counting the sounds or by pronouncing and positioning a marker for each sound, for example, "How many phonemes are there in ship?" (three: /*sh*/ /*i*/ /*p*/)

- Phoneme deletion: recognizing what word remains when a specified phoneme is removed, for example, "What is smile without the /s/?" (*mile*).

- Onset-rime manipulation: isolating, identifying, segmenting, blending or deleting onsets or rimes (the consonant or consonant blend before a vowel, or what follows the onset), for example, *j - ump*, *st - op*, and *str - ong*.

Word analysis assessment includes tasks that ask learners to say the sounds in written words or parts of words. Knowledge of word parts can be assessed by asking students to pronounce single-letter graphemes (a grapheme is a letter or letter combination that represents a phoneme), two-letter graphemes or digraphs, and blends with two or more graphemes.

- "What sounds do these letters make: *b, d, f*?"

- "What is the short vowel sound made by these letters: *a, e, i*?"

- "What sounds do these letters make: *ch, ck, oa, ee*?"

- "What sounds do these letters make: *br*, *st*, *str*, *at*, *am*?"

The ability to pronounce these word parts can also be assessed with whole word tasks. To find out if students can decode the short *a* vowel sound, for example, we might ask them to read the word *can*. Any response with a short *a* sound in the middle position would be correct (*can*, *cat*, or *ban*) because it contains the short *a* target phoneme.

To find out if someone can decode the whole word *can*, we would expect all of the sounds to be pronounced correctly and blended together into the word *can*. Problems can arise when using common words, such as *can*, to assess knowledge of letter-sound correspondences and blending. If the learner already knows *can* as a sight word, no decoding skills are needed to pronounce it. For this reason, word analysis assessments often use nonsense words, or words that a learner could not have already memorized as a whole word. The nonsense word *cag*, for example, would not have been memorized as a sight word.

Sight word knowledge is assessed with sets of words typically encountered at different reading levels. These sets contain both regular and irregular words (NICHD, 2000b, p. 2-90).

Findings From Alphabetics Assessment Studies

Summary of Findings

For programs that have beginning readers and that plan to teach PA, it is important to assess students' PA ability in order to identify PA skills that they may already possess as well as those they may need to work on. Assessment will also provide a benchmark against which teachers and learners can measure learner progress in the acquisition of PA. A strong body of research in this review indicated that adult nonreaders and those just beginning to learn to read have difficulty with alphabetics. PA among adult nonreaders in these studies was almost nonexistent and was only

a little better among adult beginning readers. Nevertheless, for adults without a learning disability in reading (LD), PA did seem to improve as reading ability improved. There did not appear to be a critical age after which PA does not develop; younger as well as older adults were able to develop PA. For adults with LD, however, PA was not found to develop rapidly as they learned to read. Adults with LD may need special PA instruction, or instruction that does not rely solely on oral PA instruction.

For the same reasons, adult beginning readers' word analysis ability should also be assessed, including, at least, letter-sound knowledge (decoding) and sight word knowledge. The research reviewed found that beginning adult readers, like children who are just beginning to read, had poor letter-sound or basic decoding knowledge, although their sight word knowledge was, on average, better than that of children reading at the same level. Teachers need to be aware of this strength in sight word knowledge as they teach letter-sound relationships. During WA assessment or instruction, for example, simple, low-frequency words and nonsense words are used to ensure that students demonstrate their knowledge of letter-sound relationships, not their sight word knowledge. WA ability was also reflected in AE learners' writing where their spelling was especially poor. WA is important for writing as well as reading words. Some studies noted that many ABE learners reported having a learning disability, which may account for the finding that ABE learners, on average, had relatively poorer PA and decoding than sight word skills, much like children who are poor readers.

All of the research results discussed comes from studies that included ABE learners. There was less alphabetics research with ASE learners, perhaps because it is assumed that those reading at GE 9–12 have adequate alphabetics skills. Although more research is needed, existing research confirmed that PA among ASE-level readers was well established. Cross-sectional research found that WA continued to improve across ABE and ASE levels.

Adults in ESOL programs were found to rely more on their knowledge and application of letter-sound correspondences (decoding) than their sight word knowledge. This difference was not as pronounced for those who learned English as children. Research with K–12 English learners has found that children, after about a year or more in an English-language school, have similar PA and WA skills as native speakers. English-language PA and WA assessments were found to be effective for children at all English-language ability levels. PA assessments do not require reading and so can be administered in a child's native language or in English if necessary (provided the directions are understood). This K–12 finding, that the same PA assessment instruments can be used with both native and non-native speakers, could be applied in AE ESOL settings.

Overall Findings: AE Learners' Strengths and Needs in Phonemic Awareness

This section presents overall assessment findings, without regard to factors represented by the subtopics. Research related to the subtopics is presented later in the chapter, including AE program type, language ability, disability status and age.

Stronger Finding*:* Adult nonreaders have virtually no phonemic awareness ability and are unable to consistently perform, on their own, almost all phonemic awareness tasks (Adrian, Alegrai, & Morais, 1995; Bertelson, Gelder, Tfouni & Morais, 1989; Cardoso-Martins & Frith, 2001; Jiménez & Venegas, 2004; Morais, Bertelson, Cary, & Alegria, 1986; Morais, Cary, Alegria, & Bertelson, 1979; Read, Zhang, Nie, & Ding, 1986; Scliar-Cabral, Morais, Nepomuceno, & Kolinsky, 1997).

Assessment results from seven studies that used inferential statistics (underlined above) and one descriptive study that did not (not underlined) demonstrate that nonreaders lack basic phonemic awareness, or the knowledge that words are made up of individual sounds. All of these studies except one evaluated nonreaders from countries other than the United States, presumably because it is difficult to find completely nonliterate groups of adults in the U.S. Each study used at least one group of nonliterate adults that had been exposed to a language that, like English, uses an alphabetic writing system. Although nonliterate adults may possess some rudimentary, practical knowledge of phonemes, each study found that they are unable to consistently perform almost all phonemic awareness tasks. This was true even for adults who were literate in a nonalphabetic language (Chinese) but illiterate in the alphabetic version of this language (Read et al., 1986). Nonreaders could not, for example, consistently delete a consonant from a word or nonword they heard

in order to produce a new word or nonsense syllable (for example, deleting the */b/* sound in the word **bat** to produce the word **at**, or deleting the */d/* sound in the nonword **dak** to produce the nonsense syllable **ak**).

Stronger Finding*:* Adult beginning readers, like all beginning readers including children, perform poorly on phonemic awareness tasks that require phoneme manipulation. The ability to perform more complex operations with phonemes generally increases along with reading ability (in adults *without* a reading disability) until word analysis is established (Adrian, Alegrai, & Morais, 1995; Byrne & Ledez, 1983; Greenberg, Ehri, & Perin, 1997; Jiménez & Venegas, 2000; Morais, Bertelson, Cary, & Alegria, 1986; Pratt & Brady, 1988; Read & Ruyter, 1985; Scliar-Cabral, Morais, Nepomuceno, & Kolinsky, 1997; Thompkins & Binder, 2003).

Assessment results from eight studies using inferential statistics(underlined above) and results from one study not using them (not underlined) show that beginning adult readers, like nonreaders, perform poorly on phonemic awareness tasks. All but four of these studies (Adrian et al., 1994; Jiménez & Venegas, 2000; Morais et al., 1986; Scliar-Cabral et al., 1997) involved adults who spoke English. Seven of the studies found that the ability to manipulate speech sounds gets better as an adult's reading ability improves (Adrian et al., 1994; Byrne & Ledez, 1983; Jiménez & Venegas, 2000; Morais et al., 1986; Pratt & Brady, 1988; Scliar-Cabral, et al., 1997; Thompkins & Binder, 2003). These studies found increases in phonemic awareness from nonreaders to those just beginning to read, from beginning readers to intermediate readers and from intermediate to advanced AE readers (those reading at the high school level, or working on their GEDs).

Overall Findings: AE Learners' Strengths and Needs Word Analysis

Stronger Finding*:* Adult beginning readers, like other beginning readers, have difficulty applying letter-sound knowledge in order to figure out new or unfamiliar words while reading, although word analysis is better as AE learners' reading improves (Baer, Kutner, & Sabatini, 2009; Byrne & Ledez, 1983; Gottesman, Bennett, Nathan, & Kelly, 1996; Greenberg, Ehri, & Perin, 1997; Greenberg, Ehri, & Perin, 2002; Mellard, Fall, & Mark, 2008; Read & Ruyter, 1985; Sabatini, Sawaki, Shore, & Scarborough, 2010).

With poor phonemic awareness, or the ability to manipulate speech sounds in words orally, adult beginning readers also have difficulty manipulating the written letters and letter-combinations that represent speech sounds (Byrne & Ledez, 1983; Gottesman et al., 1996; Greenberg et al., 1997, 2002; Read & Ruyter, 1985). Adults learning to read may tend not to use letter-sound knowledge to figure out unknown words as they read (Byrne & Ledez); they may be relatively better at sight word recognition or recognizing whole words (Greenberg et al., 1997; Read & Ruyter, 1985; Sabatini et al., 2010), using a more orthographic as opposed to phonological approach to reading and spelling (Greenberg et al., 2002).

Two studies demonstrate that AE learners' word analysis abilities improve as their reading improves. One is a cross-sectional analysis of data from the National Assessment of Adult Literacy (NAAL) (Baer et al., 2009), discussed in more detail in Chapter 9, Reading Comprehension. The other is a cluster analysis of learners at different reading levels from 13 AE programs (Mellard et al., 2008), discussed in more detail in Chapter 5, Assessment Profile. The NAAL was a large-scale survey of a nationally representative sample of more than 19,000 adults conducted in 2003 (Kutner, Greenberg, Jin, Boyle, Hsu, & Dunleavy, 2007). This survey included an assessment of adults' word analysis ability including word reading (from lists of words with one to four syllables) and nonsense word reading (Baer et al., 2009). The results describe the word analysis ability of adults at four literacy levels—Proficient, Intermediate, Basic, and Below Basic Literacy—based on a measure of functional reading comprehension of prose documents. Adults with a high school education had an average reading comprehension score at the high end of the Basic Literacy level (see chapter 9 for a more detailed description of these comprehension results from Kutner et al, 2007). Adults eligible for AE services (those without a high school diploma) scored predominantly at the Basic and Below Basic literacy levels.

The word analysis results for adults likely to qualify for AE (reading at the Below Basic and Basic levels) confirm that beginning readers struggle with word analysis and that, on average, better readers (those with better comprehension scores) have better word analysis skills. In a cross-sectional analysis of word analysis ability, the NAAL found that word reading increased

from 50 words correct per minute (wpm) among the bottom one-fifth of adults at the Below Basic level to 81 among the top one-fifth of Below Basic readers. The average for adults at the Basic level, also among those eligible for AE services, was 99 wpm. Those at the Intermediate and Proficient levels read 112 and 118 wpm, respectively. Nonsense word reading also increased, from 25 wpm among the lower one-fifth of Below Basic readers to 36 among the top one-fifth, and to 46 among those at the Basic level. Nonsense word reading among adults at the Intermediate and Proficient levels was 46 and 56 wpm, respectively.

The second study identified seven profiles of AE learners ranging from beginning ABE readers to advanced ASE readers (Mellard et al., 2008). Word analysis scores (five measures of nonsense word and real word reading accuracy and rate) improved across these profiles as other components of reading improved. However, the relationship between tasks requiring greater phonological awareness (nonsense word reading) and whole word or sight word recognition varied across profiles, as did the relationship between word analysis and other components of reading.

AE Learners' Strengths and Needs in Spelling

Stronger Finding: Adult beginning readers, even more than other beginning readers, have poor spelling ability (Greenberg, Ehri, & Perin, 1997, 2002; Pennington, Smith, Lefly, Bookman, Kimberling, et al., 1986; Thompkins & Binder, 2003; Worthy & Viise, 1996).

Spelling is sometimes used to assess knowledge of letter-sound correspondence, and spelling instruction can be used to improve reading outcomes (see Research With Other Populations in the Alphabetics Instruction section below).

Adults in AE programs, compared to children matched for word-reading level, have weaker spelling skills, with regard to both phonological and morphological features of words (Greenberg et al., 1997, 2002; Worthy & Viise, 1996). Greenberg et al. (1997, 2002) compared 72 adult literacy learners to 72 students in grades three through five (matched for word-identification ability) on a variety of phonemic awareness, word reading and spelling tasks. Adults were weaker on phonological tasks, including phonemic awareness and pseudoword reading. On orthographically complex tasks, adults were relatively better at reading sight words, but weaker on spelling. On the spelling tasks, they made more phonetic errors and more substitutions of other real words. Worthy and Viise (1996) compared adult literacy students with reading-matched children on spelling. The adults made more phonetic errors and more errors related to morphology, including inflections and other word endings. Pennington et al. (1986) compared adults with dyslexia to normal adults and reading-matched children. They reported that the adults with dyslexia made more phonetic errors than the children.

While Thompkins and Binder (2003) did not find that adults were poorer overall than reading-matched children on phonological or orthographic tasks, this may have been because their matching process used a word recognition measure for children and a reading comprehension measure for adults. Using this matching process, they found that more-skilled beginning readers (at GE 4–7), whether children or adults, used their knowledge or exposure to print more than less-skilled readers, spelling real words, but not nonwords, better than less-skilled readers.

The results of all these studies are consistent with an overall conclusion that adult literacy learners who are native speakers of English have poor phonological skills and tend to rely on knowledge of sight words. The findings are also consistent with findings reported above that adult beginning readers have poor phonemic awareness skills.

Strengths and Needs of Learners in ABE, ASE and ESOL Programs

All of the studies discussed above included ABE learners, or those who are beginning or intermediate readers (reading at the pre-GED or pre-ASE level). Consequently, all of the findings described above apply to ABE learners. The cross-sectional analysis of the NAAL word analysis data discussed above also indicates that word analysis (word reading and nonsense word reading) increases across ABE and ASE learners. There were a few findings specifically related to ASE and ESOL learners, and these findings are presented next.

ASE

Stronger Finding: ASE-level readers without a reading disability have well-established phonemic awareness skills (Byrne & Ledez, 1983; Pratt & Brady, 1988).

Five of the 21 studies discussed above included GED or ASE learners, those reading roughly at the high school level or GE 8–12. Three of these five studies investigated adults with a reading disability (Pennington et al., 1990; Scarborough, 1984; Shaywitz et al., 1998). The remaining two studies (Byrne & Ledez, 1983; Pratt & Brady, 1988) found that GED-level readers performed much better than beginning and intermediate level readers.

ESOL

While younger native and non-native speakers of English have similar PA and WA skills, adult English language learners appear to have better letter-sound knowledge (decoding) than native speakers, but slightly worse sight word knowledge. Letter-sound knowledge and sight word ability are both aspects of word analysis.

Stronger Finding: ESOL learners in adult education programs have better knowledge of letter-sound correspondences and rely more on this knowledge than AE native speakers of English (Davidson & Strucker, 2002; MacArthur, Konold, Glutting, & Alamprese, 2010;Nanda, Greenberg, & Morris, 2010).

In a study of 90 adult education students drawn from programs throughout the country, Davidson and Strucker (2002) found that non-native speakers of English relied more on their knowledge of letter-sound correspondences than native speakers. When reading unfamiliar words, they made more phonetically plausible substitutions than native speakers, who made more real-word substitutions. However, ESOL learners who were more familiar with English (learning it before age 12) were more like native speakers in their reading errors.

Two studies found that the skill English learners rely on when reading, their decoding ability or knowledge of letter-sound correspondences, is better than their sight word recognition, a complementary word analysis skill. Both studies are described in more detail in the Chapter 5, Reading Assessment Profiles. The first was a study of close to 500 ABE learners (reading at GE 4–7) from 23 programs in 12 states (MacArthur et al., 2010). English language learners in this study scored significantly higher on measures of letter-sound knowledge than native adults but the same on measures of sight word recognition. Two tests of sight word knowledge were administered; the measures of letter-sound knowledge included timed and untimed measures of nonsense word reading as well as a survey of letter-sound knowledge.

The second study included 371 AE learners (Nanda et al., 2010). In this study, those who were native speakers of English performed better on sight word recognition while English language learners performed better on a measure of nonword reading fluency (the TOWRE), although not on an untimed measure of nonword reading (WJIII Word Attack).

Research With Other Populations: English Language Learners

The findings presented below were derived from reviews conducted for the National Literacy Panel (NLP) (August & Shanahan, 2006) and the Institute of Education Sciences (IES) Practice Guides (Gersten et al., 2007). These reviews did not separate WA skills (decoding and sight word recognition) and so do not address AE findings like the one presented above. One review did find, however, that after children who are non-native speakers of English have been in school speaking English for a year or more, their alphabetics skills are similar to those of native English speakers. The same alphabetics assessment instruments can be used with both native and non-native speakers. PA assessments, which do not require reading, can be administered in either English or the student's native language. Test directions, however, need to be understood and this may require using a student's native language.

K–8 Second Language Research Finding: The PA, WA and spelling skills of language-minority learners and native speaking peers are similar.

The learners in the 10 studies supporting this finding were from a variety of countries and spoke a variety of home languages (Lesaux & Geva, 2006, p. 61-2). Language-minority students had been enrolled in school for a significant amount of time before being tested on PA and WA skills in their new language (those tested in kindergarten had been enrolled for at least several months and those in other grades at least one year). Learners were in grades K–8.

K–6 Second Language Research Finding: Measures of alphabetics help determine whether or not English language learners have difficulty with phonemic awareness and word analysis.

Research summarized in the What Works Clearinghouse IES Practice Guide for English language learn-

ers found 21 studies demonstrating that measures of alphabetics and fluency can be used effectively to help identify strengths and needs of English learners in reading. For beginners reading at the K–1 levels, measures of alphabetics (PA and WA), including measures of speed and accuracy, are effective in identifying learners who may need extra instruction (Gersten et al., 2007, p. 9).

K–6 Second Language Research Finding: English language learners' phonemic awareness may be assessed in English or the learner's native language.

Research from the IES Practice Guide also found that tests of phonemic awareness can be completed in English with English language learners because knowing the meaning of a word is not essential in phonological processing tasks, especially if the tasks use nonsense words. The Practice Guide points out, however, that learners must be given understandable directions and that this may best be accomplished by using the speaker's native language. Also, testing PA in an English learner's native language may not be necessary but may provide a "richer picture" of early reading ability (Gersten et al., 2007, pp. 12–13).

Strengths and Needs of AE Learners With a Learning Disability

Both findings in this section are weaker findings; more research specifically with AE learners identified as having a reading disability is needed. Results from current studies of AE learners suggest that adults with a learning disability in reading, like children with LD, have difficulty developing PA skills as they learn to read and, perhaps as a consequence, also have very poor WA skills.

Weaker Finding*:* While readers will typically develop phonemic awareness as they learn to read, adults with a learning disability in reading, such as dyslexia, may not; dyslexia tends to persist into adulthood and may be related to a functional disruption in the brain. (Bruck, 1992; Chiappe, Stringer, Siegel, & Stanovich, 2002; Edenet al., 2004; Pennington, Van Orden, Smith, Green, & Haith, 1990; Rubinsten & Henik, 2006; Scarborough, 1984; Shaywitz et al., 1998)

Most of the studies that support this finding are robust assessment studies using inferential statistics. This finding is labeled a weaker finding, however, because the studies do not specifically evaluate stu-

dents who qualify for AE programs. The studies do not distinguish between adults with a reading disability (dyslexics in this study) who have completed high school and those who have not, for example. The studies are included because there is no reason to believe that AE adults with a reading disability would perform any better on phonemic awareness tasks than the reading-disabled adults in these studies.

In a series of four experiments, phonemic awareness among adults diagnosed with a reading disability (dyslexia) was found to be significantly lower than reading-matched and age-matched controls (Pennington et al., 1990). In these studies, phonemic awareness was also found to be strongly related to word analysis ability among adult disabled readers, as measured by a nonword reading task. In a second study (Chiappe et al., 2002), reading-disabled adults were administered measures of phonemic awareness (the Rosner test of phoneme and syllable deletion) and word analysis (the Woodcock Word Attack using pseudowords). They scored significantly lower on these tasks than both a nondisabled, age-matched group of adults and a nondisabled group of children reading at the same level. A third study (Rubinsten & Henik, 2006) demonstrated that adults without a reading disability quickly and automatically associated letters with the phonemes they represented, while adults with a reading disability lacked an automatic association between letters and their sounds.

In an experimental, brain-imaging study of adults with a reading disability (dyslexia), they scored significantly lower than nondisabled adults on tasks that placed progressively greater demands on phonological processing ability, and their pattern of brain activity during these tasks indicated a disruption in the brain systems responsible for translating letters into sounds (Shaywitz et al., 1998). Another brain-imaging study supports and extends these results (Eden et al., 2004). In addition, this study demonstrated that intensive instruction in phonemic awareness and word analysis may lead to patterns of brain activity during reading that more closely resemble those of nondyslexic adult readers (increased activity in the left hemisphere areas associated with phonemic awareness), along with compensatory activity in the right hemisphere.

Two additional studies suggest that a reading disability is a phonologically based deficit. In these studies, one assessment study using inferential statistics

(Bruck, 1992) and one not (Scarborough, 1984), adults diagnosed with a reading disability (dyslexia) during childhood, or who remembered significant reading difficulties during childhood, were found to continue to have poor phonemic awareness into adulthood. For nondisabled good readers in one study, increased phonemic awareness was associated with increases in age and grade level, but was not for those with a reading disability (dyslexia) (Bruck, 1992). The low level of phonemic awareness attained by those with a reading disability (knowledge of onset-rime only) is similar to the rudimentary phonemic awareness that another study reports for nonreaders (Scliar-Cabral, Morais, Nepomuceno, & Kolinsky, 1997).

Weaker Finding: Adults with a learning disability in reading have poor word analysis abilities (MacArthur, Konold, Glutting, & Alamprese, 2010; Swanson & Hsieh, 2009).

In a study of close to 500 ABE learners (reading at GE 4–7) discussed above and in chapter 5, 48 percent of the participants reported that they had a learning disability when younger (MacArthur et al., 2010). These adults scored significantly lower than other participants on all components of reading, including word analysis.

A meta-analysis of 52 studies comparing adults with and without LD found that adults with LD had significantly lower scores on measures of both PA (phonological processing) and WA (word attack and word recognition), with moderate to high effect size measures (Swanson & Hsieh, 2009). Like some of the studies of LD adults discussed above, this meta-analysis did not distinguish between LD adults participating or not participating in AE programs.

Other Topics: Effects of Age and Developmental Disability

As noted above, adults with a learning disability in reading may not develop phonemic awareness as they learn to read, unlike adults without LD. Many AE learners in the U.S. report having a learning disability. Perhaps because of this, research studies find that adult beginning readers' average PA and WA abilities look a lot like those of children who are poor readers. Both groups score poorly on PA and WA assessments. An exception to this is that adult beginning readers, perhaps relying on their past experience with print, are better at sight word recognition than children matched for reading ability. In contrast, English lan-

guage learners rely more on letter-sound knowledge than sight word knowledge. Those who learn English at a younger age, however, are more like native speakers in their increased reliance on sight word knowledge while reading.

Effects of Age on Alphabetics

Weaker Finding: On phonemic awareness tasks, adult beginning readers are not as good as reading-matched children (children progressing normally in their reading who are reading at the same level as the adults). Adult beginning readers' PA abilities may be more like those of children who are poor readers (Greenberg, Ehri, & Perin, 1997).

In many of the studies discussed above, similarities between the level of phonemic awareness of adult beginning readers and of children beginning to learn to read were noted (Byrne & Ledez, 1983; Pratt & Brady, 1988; Read & Ruyter, 1985). Assessment results from one study, in which adult readers were compared directly to children reading at the same level (based on a test of word recognition), found that adult beginning readers had significantly lower scores on phoneme deletion and segmentation than these children (Greenberg et al., 1997).

Stronger Finding: When performing word analysis tasks, adults differ from reading-matched children in their reliance on past experience with print and sight word knowledge. Adults are generally better at recognizing familiar sight words than are children who are learning to read (Greenberg et al.,1997, 2002; Read & Ruyter, 1985; Thompkins & Binder, 2003).

The four studies cited above show that adults perform better than children on word analysis tasks that include real words as opposed to tasks that use pseudowords (nonwords that sound like or look like real words). One assessment result (from a study using inferential statistics) comparing children and adults at the same reading level finds that adult beginning readers are better at recognizing familiar words but are worse than the children in using letter-sound knowledge (Greenberg et al., 1997). Similar results were found in a descriptive study (Read & Ruyter, 1985). A follow-up study of adults' reading and spelling errors indicates that adult beginning readers (reading at GE 3 to GE 5 on a test of word recognition) use a more orthographic approach than children reading at the same level (Greenberg et al., 2002). Reading errors include the substitution

of real words for unknown words, for example. Children use a more phonological approach, substituting plausible-sounding words for a target word, for example. The analysis of spelling errors reflected the same pattern of differences. Thompkins and Binder (2003) also found that adult beginning readers (GE 0–3) recognize common words found on product labels faster than children who are beginners.

Weaker Finding: Non-native speakers of English who learn English before age 12 are more like native speakers of English, relying somewhat less on letter-sound knowledge and somewhat more on their knowledge of word meanings when decoding (Davidson & Strucker, 2002).

As noted above, one study found that non-native English speakers who learned English at a younger age have decoding strategies that are more similar to native speakers.

Weaker Finding: The basic phonemic awareness abilities of nondisabled adults who learn to read at an older age are not different from adults who learn to read at a younger age (Morais, Cary, Alegria, & Bertelson, 1979).

In one assessment study using inferential statistics, adults who learned to read after age 25 were compared with those who learned to read before age 25. There were no differences in PA ability between the two groups. Age does not seem to affect the ability to learn PA. The Portuguese adults in this study, however, were nonreaders because they had not attended a significant amount of school as children. Nonreaders and beginning readers in adult education programs in the U.S. are more likely to have a reading disability and, as shown in the Learning Disability section below, this result does not apply to those with a disability in reading.

Developmental Disability and Alphabetics

Weaker Finding: While readers will typically develop phonemic awareness as they learn to read, adults with a developmental disability in reading, such as Down syndrome, may develop phonemic awareness more slowly (Cardoso-Martins & Frith, 2001).

In one of two studies reported by Cardoso-Martins and Frith (2001), beginning adult readers with Down syndrome were compared with normally developing children matched on reading ability (both groups were reading at GE 1–2). The adults with Down syndrome showed evidence of phonemic awareness on a simpler phonemic awareness task (detecting phonemes) but not on a more difficult task (phoneme deletion).

Findings From Alphabetics Instruction Studies

Summary of Findings

Overall results from eight PA and 18 WA studies indicate that AE learners can be taught PA and WA. Effective teaching strategies include direct and explicit instruction in PA and WA. These findings from the AE research are supported by a more extensive body of research conducted with children and adolescents learning to read. In addition, K–12 research has identified a greater array of specific practices that can be used to teach alphabetics. These K–12 practices address topics that are especially important for AE learners: specific teaching strategies and instructional materials; the size of instructional groups; how long alphabetics instruction should last; and how to work with students at different ability levels. Specific teaching strategies identified by the K–12 research include teaching only a few PA skills, such as blending and segmenting phonemes, rather than three or more skills; using fluency instruction to improve WA; teaching PA and WA together; using small-group instruction; and avoiding too much, as well as too little, PA instruction.

Most of the participants in adult alphabetics instruction research are beginning and intermediate-level readers, so this research addresses those in ABE programs. No findings were derived from the research related to ASE and ESOL learners. In the absence of research with adult ESOL learners, reviews of alphabetics instruction with younger English language learners (ELLs) in grades K–12 provide useful suggestions for instruction. This research suggests that effective ELL alphabetics instruction is similar to approaches that work with native English speakers, with the following adjustments: bilingual instruction when possible; multicomponent instruction; cooperative learning; alphabetics instruction that takes into account similarities between the learner's native language and English; and taking into account learners' level of literacy in their native language.

Many adults report having a learning disability in reading (LD) and, as the assessment results in this

chapter indicate, such adults have difficulty learning PA and WA skills. The small amount of research in alphabetics instruction for adults with LD suggests that WA can be taught using direct and explicit instruction, the same approach that is effective for adults without LD. This is a weaker finding, based on one experimental study. A larger body of research with children also finds that the same approach works with both LD and non-LD youngsters but that children with LD need special PA instruction because, like adults with LD, they have more difficulty learning PA skills than non-LD learners. ELLs with LD benefit from direct and explicit alphabetics instruction as well, although they also benefit from interaction with other children during peer tutoring.

While it makes sense to try teaching techniques found to be very effective with children in areas where the AE research has not yet provided teachers with a broad array of techniques, AE teachers who borrow techniques from K–12 research should keep in mind the important differences between learners in elementary school and those in adult education programs discussed at the end of Chapter 1, Introduction. In addition, the AE alphabetics assessment research also identified additional differences that should be kept in mind. This research suggests that adult beginning readers are not as good at manipulating phonemes or at applying letter-sound correspondences (decoding) while reading as children at comparable levels. In this case, the adults' reading levels may be similar to those of children reading below grade level (i.e., poor readers). On the other hand, adult beginning readers are better at sight word recognition than children at comparable levels of development in reading. Implications for these adult-child differences are discussed below.

Effective K–12 Teaching Strategies

What are the most effective alphabetics teaching strategies at the K–12 level that can be tried with adults? For PA, the most effective strategies focus on teaching a few specific skills, especially blending (how to put individual phonemes or sounds together to form words) and segmenting (how to break a word into its individual phonemes). For word analysis (decoding and sight word recognition), effective strategies systematically teach letter-sound correspondences directly and explicitly. They focus on teaching students

how to convert individual graphemes (letters and letter combinations) into phonemes and then blend them together to form a word. Or, they focus on converting larger letter combinations such as common spelling patterns (e.g., *at*, *ing*, *able*, *un*) as well as individual graphemes.

K–12 research clearly suggests that PA and word analysis should be taught together. PA instruction is most effective when letters, not just sounds, are used for instruction, and this occurs during phonics instruction. PA training is most effective for those just beginning to read (those reading below GE 1) and for non-disabled readers. Those reading at higher levels and those with a reading disability can also benefit, but more research is needed with these students to identify the most effective approaches at both the K–12 and adult levels. As noted in the section on alphabetics assessment, it may be especially difficult for adult readers with a reading disability to learn PA. These difficulties may be related to a functional disruption in the brain that can be addressed only through special instruction.

K–12 research also demonstrates that computers can be useful in teaching PA, and that just about any group configuration during instruction will work, although small groups may be more effective than either individual tutoring or classroom instruction.

Overall Findings: AE and Alphabetics

The findings in this section look at the overall effects of participation in AE on adults' phonemic awareness and word analysis achievement. While some of these studies focused only on the overall effects of AE, others focused on specific instructional strategies. Those that focused on specific instructional strategies are described in detail in the Teaching Strategies section, later in this chapter. Taken together, these studies suggest that participation in adult education can lead to increased alphabetics achievement.

Stronger Finding: Participation in adult education may lead to increases in adult beginning readers' phonemic awareness (Bertelson, Gelder, Tfouni & Morais, 1989; Durgunoglu & Oney, 2002; Eden, et al., 2004; Gombert, 1994; Greenberg, 1998; Morais, Cary, Alegria, & Bertelson, 1979; Morais, Content, Bertelson, Cary, & Kolinsky, 1988; Truch, 1994).

Experimental results from two studies found that those who participated in adult education had better PA

ability than those who did not. In one, nonliterate adults who participated in an adult literacy program were compared to those who had not (Morais et al., 1979). Participants had significantly better scores on phonemic awareness tasks (addition and deletion of initial consonants in nonsense words) than nonparticipants.

In the other experimental study, adults participated in an intense program of phonemic awareness and word analysis instruction lasting for three hours a day over an eight-week period (Eden et al., 2004). This same program (based on the Lindamood-Bell approach) was found to be effective in a nonexperimental study (Truch, 1994). Similar results were found in a descriptive study of Turkish women with no formal schooling (Durgunoglu & Oney, 2002).

Nonexperimental results also suggest that focused phonemic awareness instruction by itself, or along with instruction in other aspects of reading, leads to increased phonemic awareness among both adult nonreaders (Bertelson et al., 1989; Gombert, 1994;Greenberg, 1998; Morais et al., 1979, 1988) and adult beginning readers (Gombert, 1994; Truch, 1994).

All of the approaches to instruction in these studies are described in more detail in the Teaching Strategies section below, except for one study that looked at the effects on phonemic awareness of adult literacy instruction generally (Morais et al., 1979). It should be noted that in one of these studies, the tested group included children, though age was used as a covariate in the analysis (Truch, 1994). Also, some of the studies involving adult nonreaders were conducted with non-English-speaking adults in their native language, which was an alphabetic language like English (Bertelson et al., 1989; Durgunoglu & Oney, 2002; Gombert, 1994; Morais et al., 1979, 1988).

Stronger Finding: Participation in adult education programs may lead to increases in adult beginning readers' word analysis abilities (Christenberry, Burns, & Dickinson, 1994; Curtis & Chmelka, 1994; Durgunoglu & Oney, 2002; Eden et al., 2004; Evans, Falconer, Goves, Rubin, & Mather, 1992; Gold & Horn, 1982, and Gold & Johnson, 1982; Greenberg, 1998; Greenberg, Frederick, Hughes, & Bunting, 2002; Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006; Hanlon & Cantrell, 1999; Idol-Maestas, 1981; Lavery, Townsend, & Wilton, 1998; Maclay & Askov, 1988; Massengill,

2003; McCarty, 2002; Scully & Johnston, 1991; Truch, 1994; Venezky, Bristow, & Sabatini, 1994).

Most evaluations of adult literacy programs have focused on reading comprehension and so have not assessed effects on phonemic awareness or word analysis. Experimental results from four studies that did assess effects on word analysis suggest that participation in AE programs can improve adult beginning readers' word analysis achievement (one study is reported in Gold & Horn, 1982, and Gold & Johnson, 1982, and the other three in Eden et al., 2004; Lavery et al., 1998; and Maclay & Askov, 1988). Although nonexperimental results from four studies (Greenberg, Frederick, Hughes, & Bunting, 2006; Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006; Hanlon & Cantrell, 1999; Venezky et al.,1994) found no evidence for growth in word analysis ability (decoding) following participation in AE, results from 11 other nonexperimental studies did (Christenberry et al., 1994; Curtis & Chmelka, 1994; Durgunoglu & Oney, 2002; Evans et al., 1992; Greenberg, 1998; Hanlon & Cantrell, 1999; Idol-Maestas, 1981; Massengill, 2003; McCarty, 2002; Scully & Johnston, 1991; Truch, 1994).

It was clear from the descriptions of all but one of these studies (Venezky et al., 1994) that word analysis was an important part of the instruction provided to adult learners. All but two of these studies focus specifically on the effects of word analysis instruction and are described in more detail in the Teaching Strategies section below. The Christianberry et al. (1994) study focused on the general effects of participation in AE and so does not provide information about the instructional methods used. In this study, a test of word recognition (the WRAT) was administered before and after a fairly extensive prison education program. Results suggested that inmates reading improved, on average, about 1.5 GEs. The other study (Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006) used sustained silent reading of authentic literature, teacher read-alouds and group discussion to teach reading to beginning readers (reading at GE 1–3). This approach did not lead to a significant increase in the adults' word analysis ability.

Stronger Finding: Alphabetics instruction may lead to increased achievement in alphabetics and other components of reading, especially reading comprehension (Curtis & Chmelka, 1994; Eden et al., 2004;

Gold & Horn, 1982, and Gold & Johnson, 1982; Greenberg, Frederick, Hughes, & Bunting, 2006; Hanlon & Cantrell, 1999; Lavery, Townsend, & Wilton, 1998; Massengill, 2003; McKane & Greene, 1996; Truch, 1994; Wood & McElhinney, 1990).

Of the studies presented with the first two findings above, nine looked at specific approaches to teaching alphabetics: four experimental studies (Eden et al., 2004; one study reported Gold & Horn, 1982, and Gold & Johnson, 1982; Lavery et al. 1998; and McKane & Greene, 1996) and five nonexperimental studies (Curtis & Chmelka, 1994; Greenberg, Frederick, Hughes, & Bunting, 2006; Hanlon & Cantrell, 1999; Massengill, 2003; Wood & McElhinney, 1990). All of these studies are described in more detail in the Teaching Strategies section below with the exception of McKane and Green (1996), which is described in Chapter 7, Fluency.

Taken together, these studies suggested that alphabetics instruction could lead to improved reading ability when reading was measured with a variety of outcome measures associated with the components of reading (alphabetics, fluency, vocabulary and comprehension). As the following discussion demonstrates, however, more research is needed to help isolate the individual effects of WA and PA instruction and to understand the effects of alphabetics instruction combined with instruction in other components of reading.

One experimental study (Eden et al., 2004) found that PA and WA instruction led to increased PA and WA achievement but not to increased fluency and comprehension achievement. A nonexperimental study using a similar approach (a Lindamood-Bell program) also found increased PA and WA achievement but did find improved fluency (Truch, 1994). Another nonexperimental study providing instruction in PA and WA, along with fluency, vocabulary and comprehension instruction (Greenberg et al., 2006), found no significant increase in WA ability.

Three experimental studies evaluated word analysis instruction combined with comprehension instruction (a study reported in Gold & Horn, 1982, and Gold & Johnson, 1982, and another in Lavery et al., 1996) or fluency instruction (McKane & Greene, 1996). All of these approaches led to significant improvement in reading comprehension. The first two also found pos-

itive effects for WA (the third looked only at reading comprehension). Gold and Horn (1982) and Gold and Johnson (1982) also found improvement in vocabulary, while Lavery et al. (1996) did not find a positive effect for fluency. Two nonexperimental studies also found positive effects for WA instruction combined with fluency instruction on measures of WA and comprehension (Curtis & Chmelka, 1994; Massengill, 2003).

Finally, two nonexperimental studies looked at the effect of WA instruction alone and found positive effects for WA, fluency and comprehension (Hanlon & Cantrell, 1999) and for total reading (measured with the ABLE) (Wood et al., 1990).

Effective Teaching Strategies

Given that alphabetics instruction in adult education programs can be effective, what approaches work best? While more research is needed, a weaker finding from the PA research suggests that direct and explicit instruction in PA is effective. All of the studies that support this finding include oral exercises in sound awareness, and some also include structured exercises involving reading, writing, tracing or visualizing letter-sound combinations by themselves or within words. Direct instruction in WA was also found to be effective. While this is a stronger finding because it is based on more experimental studies, it is also more complex. Some studies find that teaching PA and WA together leads to increased PA achievement, while others find that teaching WA in combination with other components of reading (fluency, vocabulary and comprehension) leads to increased achievement in WA and other components, especially comprehension.

Weaker Finding: Phonemic awareness may be taught using direct instruction in phoneme manipulation and letter-sound correspondences (Bertelson, Gelder, Tfouni, & Morais, 1989; Durgunoglu & Oney, 2002; Eden et al., 1994; Greenberg, 1998; Morais, Content, Bertelson, Cary, & Kolinsky, 1988; Truch, 1994).

One experimental study (Eden et al., 2004) and one nonexperimental study (Truch, 1994) used variations of a highly structured, sequential, multisensory approach to successfully teach phonemic awareness to adults with dyslexia (the Lindamood-Bell program). These programs taught sound awareness and the relationship between letters and sounds using a multisensory approach that included, for example, careful

attention to hearing sounds, producing or articulating sounds, and visualizing and writing the letters that represent sounds. Phoneme awareness exercises in the Truch (1994) study involved segmenting words into phonemes, blending phonemes, and adding, deleting, substituting and shifting phonemes. The programs were fairly intense. For example, in the experimental study (Eden et al., 2004), instruction lasted three hours a day for eight weeks. In the nonexperimental study (Truch, 1994), participants worked on fluency (oral reading accuracy) in addition to alphabetics. It should be noted that Eden et al. (2004) focused on brain imaging and, while *p* values and significant results were reported for the training, some means and standard deviations were not reported.

In three nonexperimental studies (Bertelson et al., 1989; Gombert, 1994; Morais et al., 1988), some simpler phonemic awareness tasks such as initial consonant deletion and rhyme detection were quickly taught to adult nonreaders and beginning readers using simple demonstration and corrective feedback. These adults were non-English speaking, but their native language was alphabetic, like English, and instruction took place in their native language.

Another study described a literacy program for adult Turkish women with no formal schooling, all of whom were nonreaders or beginning readers (Durgunoglu & Oney, 2002). Highly trained volunteers used spelling, explicit instruction in letter-sound correspondence, syllabication, blending, word recognition and comprehension activities to teach reading. This 90-hour program, which also emphasized functional reading (newspapers, bills and product labels), active and cooperative learning, and critical thinking, led to a significant increase in phonemic awareness.

Finally, a case study with a nonreader (Greenberg, 1998) found that a combination of phonemic awareness and word analysis instruction (teaching rhyme awareness, word families and letter-sound correspondences) along with elements of a whole language approach (student-selected and student-generated high-interest reading material) led to increased letter knowledge, phonemic awareness, spelling, sight word knowledge and general knowledge about printed material.

Stronger Finding: Word analysis may be taught using approaches that include direct instruction in word analysis along with instruction in other aspects of reading (Cheek & Lindsey, 1994; Curtis & Chmelka, 1994; Eden et al., 2004; Evans, Falconer, Goves, Rubin, & Mather, 1992; Gold & Horn, 1982, and Gold & Johnson, 1982; Greenberg, 1998; Greenberg, Frederick, Hughes, & Bunting, 2006; Hanlon & Cantrell, 1999; Idol-Maestas, 1981; Lavery, Townsend, & Wilton, 1998; Maclay & Askov, 1988; Massengill, 2003; McCarty, 2002; Scully & Johnston, 1991; Truch, 1994).

In one experimental study (Eden et al., 2004), intensive instruction in phonemic awareness that included instruction in single-word reading led to increases in word analysis on two measures (the Woodcock Word Attack subtest and a measure of transfer from phonemic awareness training to real-word decoding, the Phonemic Transfer Index) but not on another (WRAT word recognition).

In another study with experimental results (reported in Gold & Horn, 1982, and Gold & Johnson, 1982), word analysis was taught using "whole-word phonics" (phonics by analogy) and writing words while speaking the letters (VAKT or visual, auditory, kinesthetic and tactile approach). This took place within a larger context involving listening comprehension instruction and the use of student-generated texts (through a language experience approach). Results suggest that this approach increases word analysis ability (word recognition as measured on the WRAT and Woodcock, and word attack as measured on the Woodcock).

Results from a third experimental study (Maclay & Askov, 1988) suggested that adults receiving extensive practice in the recognition of 1,000 high-frequency and functional sight words increase their word recognition achievement (as measured on the SORT, a series of graded word lists at different levels of difficulty). The approach used in this study with adult beginning readers (reading below GE 4) was computer-based. The computer program assessed students' ability to recognize specific words and, when needed, provided word recognition practice using pictures and verbal descriptions (through voice synthesis). Although the students were taught whole words, some of the words taught included groups with common phonograms (such as the letter-sound combination ***ake***, as in ***make***).

Results from the final experimental study (Lavery et al., 1998) indicate that 18 one-hour sessions on a comprehensive, computer-based program including

instruction in word analysis, reading comprehension and vocabulary leads to significant increases in word recognition but not oral reading accuracy (fluency).

Seven nonexperimental studies support these results. In one, word analysis skills are taught after focusing on phonemic awareness (Truch, 1994). Instructional tasks include, for example, spelling and word identification using increasingly complex real and nonsense words. After both phonemic awareness and word analysis have been established, reading in connected text is introduced. Adult learners using this approach appeared to improve in their ability to recognize words with both regular and irregular spellings. In the second nonexperimental study (Curtis & Chmelka, 1994), four 15- to 16-year-old students increased the rate at which they were learning word analysis skills. These students used a Laubach phonics and sight word recognition program (a series of four structured workbooks for adults covering letter-sound correspondences) modified to include practice on more challenging words. Less challenging words may not be as effective because they may be a part of adults' sight word knowledge and, if so, there would be no need to use individual letter-sound correspondences to figure them out (cf. Greenberg, et al., 1997; Read & Ruyter, 1985).

An approach called Guided Reading (Massengill, 2003) followed by four weeks of independent reading was effective in increasing four AE students' sight word recognition and word analysis ability. Analysis using a single-subject multiple-baseline design showed changes from baseline to intervention and maintenance at follow-up in each student's reading. These results were supported by pre-post standardized test results. Guided reading is a structured program that includes rereading familiar texts (to work on word recognition and fluency), direct instruction in word analysis, sight word practice and reading passages at the learner's instructional level with teacher support to practice and apply new skills.

In another nonexperimental study (Evans et al., 1994), 27 students in an adult education program who used a computer-based system for word analysis instruction significantly improved their word recognition ability (as measured by the Woodcock Word Attack subtest). Although no control group was used, analysis of adults at three levels of reading ability rang-

ing from GE 1 to GE 7 suggested that those reading at GE 5 to GE 7 benefited most even though the program focused on word analysis. The program (IBM's Principles of Alphabetic Literacy) used voice synthesis to teach the sounds of individual letters and to read short stories aloud while students listened. The program also encouraged students to write words and sentences using newly learned letters.

In a study of nine adult learners in a correctional setting who received extensive tutoring over an 11-week period, a program called Phono-Graphix that provides direct and systematic instruction in letter-sound correspondence and blending and segmenting words led to increased achievement (from GE 2.5 to GE 3.9) on standardized measures of word analysis abilities (McCarty, 2002).

Four nonexperimental case studies of two nonreaders and two adults with a reading disability also support this finding. One of the nonreader case studies, described above (Greenberg, 1998), used a combination of phonemic awareness and word analysis instruction along with high-interest, student-selected reading material to increase a nonreader's phonemic awareness and word analysis abilities. The second nonreader case study (Scully & Johnston, 1991) reported using word analysis instruction (including picture cues for vowel sounds, word sorts, word families and word lists) along with therapy for anxiety associated with poor reading ability to improve word analysis skills.

A third case study, of an adult with a reading disability, describes a spelling-based approach involving word sorts, spelling and a homophone matching game that led to increases of several grade levels on a test of word recognition (Hanlon & Cantrell, 1999). The final case study describes an approach in which detailed, diagnostic assessment of word analysis ability is followed by targeted instruction in unknown letter-sound correspondences (Idol-Maestas, 1981). This approach, used with a student with a reading disability, led to increases in the student's knowledge of letter-sound correspondences and his oral reading ability.

However, two studies did not support this finding (Cheek & Lindsey, 1994; Greenberg et al., 2006). In a nonexperimental study with seven adults (Greenberg, Frederick, Hughes, & Bunting, 2006), systematic and explicit instruction in phoneme awareness, word analysis, fluency, vocabulary and comprehension

(Direct Instruction Corrective Reading program) did not lead to increased reading achievement.

The second, experimental study compared two contrasting teaching styles, meaning-based and programmed learning, and found that neither was more effective for teaching word analysis (Cheek & Lindsey, 1994). Both styles provided direct instruction in WA. There were no significant differences in the gains made by students taught with either of these styles on the Phonemic Analysis and the Structural Analysis subtests of the Stanford Diagnostic Reading Test. One style used a meaning-based, diagnostic-prescriptive approach, while the other used a programmed learning approach. The diagnostic-prescriptive approach had several important characteristics: formal and informal assessment to identify learner strengths, needs and interests in reading; use of assessment results to develop individualized teaching strategies, methods and materials for word analysis and reading comprehension instruction; and language-experience and literature-based instruction emphasizing regular student-teacher interaction, real-life reading material and reading as a meaning-making activity. The programmed learning approach, on the other hand, emphasized placing students at their current reading levels in computer-based or print-based programs where they could work independently, at their own pace and in a step-by-step manner toward a specific word analysis or reading comprehension learning objective.

Effective Teaching Material

Several studies used commercially available programs in their interventions. The following finding is labeled a weaker finding even though it is based on two experimental studies because each study involved a different product. In addition, most would not recommend adopting teaching material based on just one positive study (see the criteria used by the Department of Education's What Works Clearinghouse Web site, for example).

Weaker Finding: A few commercially available materials show some promise for teaching alphabetics to adults (Curtis & Chmelka, 1994; Eden et al., 2004; Evans, Falconer, Goves, Rubin, & Mather, 1992; Greenberg, Frederick, Hughes, & Bunting, 2006; Lavery, Townsend, & Wilton, 1998; Massengill, 2003; McCarty, 2002; Truch, 1994; Wood & McElhinney, 1990).

One finding related to two programs for teaching aspects of word analysis was drawn from the research, which included seven nonexperimental studies and two experimental studies evaluating specific instructional material. One experimental study (Eden, Jones, et al., 2004) evaluated the effects of the Lindamood-Bell program on adult learners' reading and found increases in targeted word analysis skills and oral reading accuracy (although not on the nontargeted skills of oral reading rate and reading comprehension). Positive results were also found in a nonexperimental study of the Lindamood-Bell approach (Truch, 1994). Another experimental study (Lavery et al., 1998) evaluated the comprehensive, computer-based Integrated Learning System. Compared to a traditional textbook and lecture approach to teaching word analysis, vocabulary and comprehension, the computer system was better at teaching word recognition.

Several nonexperimental studies had positive results for other specific reading programs: a modified Laubach phonics and sight word program (Curtis & Chmelka, 1994); the PALS computer program, designed to increase beginning readers' word analysis ability (Evans et al., 1992; Wood & McElhinney, 1990); a program based on the Reading Recovery model called Guided Reading (Massengill, 2003); and Phono-Graphix, a program that uses a systematic and direct approach to teaching alphabetics (McCarty, 2002).

One program that was not found to be effective in a descriptive study was the Direct Instruction Corrective Reading program described in the Teaching Strategies section above (Greenberg, Frederick, Hughes, & Bunting, 2006).

Effects of Intensity and Duration of Instruction on Alphabetics Achievement

No trends or principles were drawn from the research. Experimental results from one study, in which one group of students (those attending day classes) received three times the amount of instruction as those in another group (attending evening classes), suggest that word analysis achievement (decoding) does not increase as the total number of hours of instruction increases (Venezky, Bristow, & Sabatini, 1994).There were, however, only slight (but significant) gains overall in word analysis, so differential gains based on hours of instructional time might not be expected.

Research With Other Populations: Instructional Methods and Material, Intensity of Instruction and Teacher Preparation

Findings from research with other populations were drawn from two reviews conducted for this report—one of adolescent reading instruction research and one of K–12 reading-writing research—and from the report of the National Reading Panel (NRP) (NICHD, 2000a, 20000b). The reviews conducted for this report are described in more detail in Chapter 2, Method. The NRP report and the reading-writing report included children in grades K–12. The adolescent review included studies of older adolescents, aged 15–19. The adolescent findings are listed first because adolescents are more like adults, at least in age, than children are.

Summary of Findings

Findings from research with adolescents and children support and extend alphabetics instruction research with adults. Research with adolescent poor readers (reading below GE 4) found that explicit instruction in phonics increases alphabetics ability. The K–12 reading-writing research review found that spelling instruction can be used with children, as it can be with adults, to improve WA.

Research findings related to alphabetics instruction at the K–12 level are more numerous than the AE alphabetics research findings. In addition to finding that direct and explicit instruction in alphabetics improves alphabetics skills, the NRP review found that certain techniques for PA and WA instruction were very effective across a variety of settings, grade levels and types of learners (NICHD, 2000b, pp. 2-4–2-5).

Research with children found that teaching PA improves WA skills. It also found that teaching one or two PA skills, especially blending sounds to make words and segmenting words into their individual sounds, was more effective than teaching three or more skills. Research with children also found that fluency instruction, including repeated readings and guided oral reading, improved alphabetics ability and that PA and WA should be taught together. Oral PA instruction by itself was not as effective as PA instruction using letters. This approach may be especially useful for the large number of AE adults with a reading disability. Assessment studies have shown that these adults have difficulty learning PA with oral exercises.

The intensity and duration of instruction, how long it should last and how large instructional groups should be, for example, is an important topic for adult educators. PA research with children found that too much as well as too little instruction is ineffective, concluding that PA instruction should probably last less than 30 minutes daily. Small groups were more effective than either one-to-one or large-group instruction.

Teaching Strategies

Adolescent Reading Research Finding: Focusing on alphabetics during instruction, especially the use of explicit instruction in phonics, increases skill in alphabetics.

This finding is consistent with research findings with adults presented above and supports findings drawn from research with children in grades K–6 presented below, which emphasize systematic phonics instruction. Six studies focusing on alphabetics instruction with older adolescents were found in the review of adolescent reading instruction research. Two of these studies were experimental (Greene, 1996; Simpson, Swanson, & Kunkel, 1992) and four were nonexperimental (Curtis & Chmelka, 1994; Lenz & Hughes, 1990; Miller & Felton, 2001; Scheffel, Shroyer, & Strongin, 2003). In one of experimental studies, data from participants younger than age 15 were pooled with those from older learners (Greene, 1996). In all six of the studies, participants were reading at the beginning level—below the fourth-grade level or 20th percentile as measured by a test of word recognition.

Results from all six of the studies show that when alphabetics is a major focus of instruction, skill in alphabetics improves. In five of the studies, explicit instruction in phonics knowledge and skills was provided, while in the remaining study, using a less explicit approach, learners were taught to use a strategy for recognizing multisyllabic words in context.

The intervention in two of the studies providing explicit phonics instruction was the Language! Program, which included 90 minutes of daily direct instruction in phonemic awareness, letter/sound correspondences, and morphology and syntax (Greene, 1996; Scheffel et al., 2003). A third study combined Language! with the Lindamood Phoneme Sequencing Program for Reading, Spelling, and Speech (LiPS) and The Sentence Master software program (Miller & Felton, 2001). A fourth study used the Orton-Gillingham

program (Simpson et al., 1992), and a fifth used a modification of the Laubach Way to Reading program (Curtis & Chmelka, 1994).

In the study providing strategy instruction (Lenz & Hughes, 1990), participants were trained to use a word identification strategy called *DISSECT* (*D*iscover the stem, *I*solate the prefix, *S*eparate the suffix, *S*ay the stem, *E*xamine the stem, *C*heck with somebody, *T*ry the dictionary). After strategy training lasting 25 to 30 minutes a day for six weeks, oral reading errors decreased for all learners. Some of the learners also improved in comprehension.

In the two experimental studies among the six (Greene, 1996; Simpson et al., 1992), explicit phonics instruction was found to be significantly better in improving reading ability than less explicit interventions. Less explicit instruction included an "eclectic approach" using whole-group instruction (Greene) and 45 minutes of daily reading in the regular classroom (Simpson et al.). It should be noted, however, that instructional time differed in one of the studies (90 minutes daily vs. 45 minutes daily in Scheffel et al.) and mode of instruction differed in the other (individualized vs. group in Greene).

K–12 Writing Research Finding: Use spelling instruction to improve beginning readers' word analysis skills.

This finding is based on two experimental studies of students in the first and second grades. Spelling instruction and the use of invented spelling have been found to enhance word recognition in the primary grades. In one experimental study (Graham, Harris, & Chorzempa, 2002), second-grade students received spelling instruction for 48 20-minute sessions. Compared to a mathematics control condition, the spelling treatment resulted in better spelling, writing fluency and reading word attack skills. For students with the lowest reading scores at pretest, gains in reading were maintained after six months. In the other study, Clarke (1988) compared two first-grade classes that used invented spelling to two classes in which teachers encouraged children to spell correctly using dictionaries, help from peers and word lists. Writing time was controlled. Children in the invented spelling classes performed better on tests of spelling and pseudoword reading, but not real-word reading. Initially low-achieving students benefited most.

K–12 Reading Research Finding: To teach phonemic awareness skills to beginning and intermediate readers, provide focused and explicit instruction on one or two PA skills rather than teaching a combination of three or more skills. Focusing on two skills in particular, blending and segmenting, may be most effective.

Children taught one or two PA skills, especially blending and segmenting, improved their PA abilities and other reading skills more than those who were taught three or more PA skills (NICHD, 2000b, pp. 2-4–2-5). Segmenting involves teaching students how to segment words into their individual phonemes (e.g., count the number of sounds in the word ***cat: /k/ /a/ /t/***). Blending involves teaching students how to put individual sounds together to form a word (e.g., say the word that has the sounds ***/k/ /a/ /t/: /kat/***).

K–6 Reading Research Finding: To teach phonemic awareness skills to beginning and intermediate readers, teach students how to manipulate phonemes (e.g., how to blend and segment words) using letters rather than using only oral instruction.

The NRP review found that "phoneme manipulation with letters" was more effective for normally developing readers and at-risk readers than "PA instruction without letters" (NICHD, 2000b, pp. 2-4–2-5). PA can be taught without reference to written words or letters. Students can play rhyming games, for example, that focus on the first sound in words (say a word that rhymes with cat: bat). Phoneme manipulation can be taught with oral phoneme deletion exercises (take away the first sound in the word ***/kat/: /at/***). In addition to these oral exercises, the manipulation of speech sounds can be practiced with exercises that use written words or letters. A simple exercise of this type is having students say the consonant sounds associated with written letters (e.g., ***b, t, m***). More complex exercises involve saying and blending the individual sounds in simple written words or pseudowords. Technically, because these exercises involve the use of letter-sound correspondences, they are phonics exercises, though the NRP treats any exercises at the word and subword level as phoneme manipulation exercises.

K–6 Reading Research Finding: To improve beginning and intermediate readers' ability to decode regularly spelled words and read familiar sight words, teach phonemic awareness.

The NRP review of research at the K–6 level found that teaching PA leads to improvement in children's ability to read regularly spelled new words (pseudowords) and sight words (NICHD, 2000b, p. 2-4). Although effective, PA training was not quite as strong an instructional approach for older, disabled readers (those in grades 1–6), suggesting that this group may be especially difficult to teach.

K–6 Reading Research Finding: To teach decoding of regularly spelled words and recognition of irregularly spelled sight words to beginning and intermediate readers, use systematic as opposed to nonsystematic phonics instruction.

Systematic phonics instruction is better than nonsystematic phonics instruction for improving children's ability to read regular words (and pseudowords) and irregularly spelled words (NICHD, 2000b, p. 2-92). The NRP review found that, on average, children's reading achievement is better when they are exposed to systematic phonics instruction as opposed to programs that teach phonics incidentally or "as needed" during reading instruction (as is done in many whole word or whole language programs).

K–6 Reading Research Finding: To teach decoding of regularly spelled words and recognition of irregularly spelled sight words to beginning and intermediate readers, use systematic programs that focus on individual phonemes or that focus on larger parts of words.

Three types of systematic phonics programs were compared in the NRP review, and all were found to be equally effective (NICHD, 2000b, p. 2-93):

(1) Synthetic phonics programs that emphasized teaching students to convert letters (graphemes) into sounds (phonemes) and then to blend the sounds to form recognizable words; (2) larger-unit phonics programs that emphasized the analysis and blending of larger subparts of words (i.e., onsets, rimes, phonograms, spelling patterns) as well as phonemes; (3) miscellaneous phonics programs that taught phonics systematically but did this in other ways not covered by the synthetic or larger-unit categories or were unclear about the nature of the approach.

K–6 Reading Research Finding: To teach word recognition, use fluency instruction (repeated readings and guided oral reading, for example) to supplement regular word recognition instruction.

The NRP review of research related to fluency instruction finds strong support for the use of repeated, guided oral readings and other types of fluency instruction to increase word recognition achievement (NICHD, 2000b, p. 3-3).

Teaching Material

K–6 Reading Research Finding: Computer programs may be useful in teaching PA skills to beginning and intermediate readers.

The NRP review did not evaluate specific instructional materials, although it did look at a few studies that used computers to teach PA skills (NICHD, 2000b, pp. 2-4, 2-44). It found that computer programs can be effective, although more research is needed.

Intensity and Duration

K–6 Reading Research Finding: To teach beginning and intermediate readers PA, individual instruction, small-group instruction, and classroom instruction may be used, though small-group instruction may be most effective.

The NRP review found that small-group PA instruction was more effective than teaching PA individually or in classrooms, although all approaches led to significant gains in PA ability (NICHD, 2000b, pp. 2-4–2-5). The report cautions, however, that these results are based on correlational data, not on the experimental manipulation of class size (NICHD, p. 2-44).

K–6 Reading Research Finding: When teaching beginning and intermediate readers PA, too much as well as too little PA instruction may be ineffective.

The NRP review of PA instruction research with children found that teaching PA from five to 18 hours total was most effective. Instruction that lasted a total of more than 18 hours or less than five was not as effective (NICHD, 2000b, pp. 2-4–2-5, 2-41–2-42). However, the NRP reports that it is wrong to conclude from its research exactly how long PA instruction should last beyond stating that sessions should probably not exceed 30 minutes.

Teacher Preparation

The NRP review did not examine the effects of teacher training on PA and word analysis instruction. The report does discuss this issue, however, and that discussion applies to AE instruction as well, where the level of teacher training is probably lower and teacher knowledge of effective practices may be poor (Bell,

Ziegler, & McCallum, 2004; Ziegler, McCallum, & Bell, 2007, 2009).

> …the role of the teacher needs to be better understood… Some phonics programs require a sophisticated understanding of spelling, structural linguistics, and word etymology. Teachers who are handed the programs but are not provided with sufficient in-service training to use these programs effectively may become frustrated. In view of the evidence showing the effectiveness of systematic phonics instruction, it is important to ensure that the issue of how best to prepare teachers to carry out this teaching effectively and creatively is given high priority (NICHD, 2000b, p. 2-135).

Instruction for Learners in ABE, ASE and ESOL Programs

All of the adult studies discussed above included ABE learners, or those who are beginning or intermediate readers (reading at the pre-GED level). Consequently, all of the stronger and weaker findings described above apply to ABE learners.

> No findings specific to ASE learners and alphabetics instruction can be drawn from the research. There are only two studies that include ASE learners, perhaps because alphabetics is taught primarily to beginning-level readers.

Only one study of alphabetics instruction with adult ESOL learners was located and, because this was a nonexperimental study, it did not lead to a finding. In this study, adults learning to read in a second language, after learning to speak the language, were easily able to learn a phonemic awareness task, initial consonant deletion (Gombert, 1994).

Research With Other Populations

Research reviewed by the NRP was done primarily with children reading below the high school level, so it would apply more to adults at the ABE level than to those at the ASE level. Adults at the ABE level read at GE 0-8, while those at the ASE level read at roughly GE 9-12. Research reviewed by the NLP also applies more to beginning ESOL readers, although research support for the use of bilingual instruction includes participants at all grade levels (K–12).

Research With Other Populations Reading at the ABE Level

The research with children presented above was conducted with those reading below the high school level, corresponding to the ABE level in AE classrooms. This research suggests that beginning readers of all ages and ability levels (at least those reading at or below GE 6) may benefit from PA and WA training, although PA training should begin as early as possible with new readers to be most effective.

K–6 Reading Research: PA training may be most effective if provided immediately to nonreaders and those just beginning to learn to read. Special PA training may be needed for beginning readers who are a little more advanced in their reading (reading at or above GE 1).

The NRP review found that younger readers, those in kindergarten, benefited more from PA training, although it was effective for children from kindergarten through grade six (NICHD, 2000b, p. 2-24).

Research With Other Populations of ESOL Learners

While very little alphabetics instruction research with ESOL learners exists, there are two reviews of ELL literacy instruction at the elementary and secondary levels: The National Literacy Panel on Language-Minority Children and Youth (NLP) (August & Shanahan, 2006) and an IES Practice Guide (Gersten, 2007) reviewed studies of reading instruction for English language learners. The findings listed below were drawn from these reviews. Approaches to reading instruction for ELLs found to work with children include bilingual instruction, multicomponent instruction, cooperative learning, and alphabetics instruction that takes into account similarities between the learner's native language and English and the learners' level of literacy in their native language.

Teaching Strategies

K–12 Second Language Research Finding: Bilingual education can have a beneficial effect on reading outcomes.

The NLP reviewed 20 experimental studies comparing English-only instruction with bilingual reading instruction for second language learners (Francis, Lesaux, & August, pp. 392, 397). Results from the

NLP meta-analysis found that bilingual reading instruction increases English reading achievement for English-language learners (a moderate effect size was found). The participants in most of the studies were beginning readers in early elementary school. Do these results occur only with younger second language learners? While more research is needed, two of the studies in the review involved secondary-age students, and results were very positive in one study (with large effect sizes) and slightly positive in another (with negligible to small effect sizes).

Special characteristics of bilingual programs that might be especially effective were not identified in this review. Also, specific reading outcome measures in these studies included measures for all components of reading (Francis et al., p. 411), but results were combined across outcome measures and broadly described as "reading achievement." For this reason, this finding is repeated for each of the components of reading.

K–3 Second Language Research Finding: Alphabetics instruction leads to increased reading achievement for English-language learners.

The NLP reviewed five experimental studies of the effects of phonemic awareness and phonics instruction (Shanahan & Beck, 2006, p. 427). All five studies found positive effects for alphabetics instruction. While the reviewers suggest that these studies need to be replicated, this finding is consistent with findings from the adult research, from the large body of studies of native English speakers in the NRP (NICHD, 2000a), and with the reviews of adolescent reading instruction and writing instruction research evaluated for this review. Although similar methods may be used with first (native) and second language learners, the reviewers point out that some adjustments to common instructional routines should be made. Instruction in reading should be combined with oral language instruction, for example. The learner's native language should be used when appropriate, and teachers should alter which skills are covered based on the similarity between English and the learner's first language and the level of literacy in their native language (Shanahan & Beck, 2006, p. 354). Certain letter-sounds correspondences common to English and the learner's first language, for example, may not need to be retaught. In general, knowledge about second language learners, such as the information presented in chapter 1 devoted to the ESOL and writing topics, should be useful for teachers.

K–5 Second Language Research Finding: Direct, explicit instruction in each of the components of reading, provided in small-group settings, is effective in improving the reading achievement of English learners at risk for reading problems.

The review for the IES Practice Guide found three programs that are effective for English learners in grades 1–5: Enhanced Proactive Reading, Read Well, and SRA Reading Mastery/SRA Corrective Reading (Gersten et al., 2007, p. 15). Similar programs should be just as effective if they include the same core or basic features: explicit instruction in each component of reading; clear error correction procedures; instruction that provides multiple opportunities for discussion, questions and practice; extensive, ongoing professional development for teachers and others involved in instruction; and small-group instruction (Gersten et al., 2007, p. 16).

K–12 Second Language Research Finding: Peer-assisted learning, or heterogeneous groups of two to four English learners practicing reading material that has already been taught, can lead to improvement on measures of alphabetics (phonemic awareness and word analysis), oral reading fluency and reading comprehension.

This finding is based on four experimental studies of peer tutoring that lasted for about 90 minutes a week. In two studies with beginning readers in grades K–1, peer tutoring was used to improve alphabetics. In the other studies it was used in grades 3–6 to improve reading comprehension (Gersten et al., 2007, pp. 28, 36).

Teaching Material

K–-5 Second Language Research Finding: Several comprehensive reading programs available commercially have been shown through rigorous research to be effective in increasing English learners' alphabetics skills: Success for All, Enhanced Proactive Reading, Read Well and SRA Reading Mastery/SRA Corrective Reading.

With the exception of Success for All, all of these programs (from the review by Gersten et al., 2007) are discussed above. Success for All is a comprehensive, schoolwide approach that addresses each component of reading and that also includes extensive professional development and student assessment, a set of instructional material and individual tutoring

when necessary. This program had positive results in three studies (described in technical reports) with beginning readers in first, second and third grade who were also English language learners. It had mixed results on other measures: word identification, fluency ("oral reading") and comprehension (Shanahan & Beck, 2006, pp. 437–439).

Effective Alphabetics Instruction for AE Students With Learning Disabilities

One weaker finding was derived from the AE research related to learners with LD, suggesting that WA can be taught to adults with LD. This is supported by research with children finding that systematic PA and WA instruction is effective for those with LD, although special PA training may be needed for these learners.

Weaker Finding: It is possible to teach word analysis to adults with a learning disability (Curtis & Chmelka, 1994; Eden et al., 2004; Hanlon & Cantrell, 1999; Idol-Maestas, 1981).

One experimental study and four descriptive studies found that programs including direct instruction in word analysis lead to increased word recognition.

An experimental study described above in the Teaching Strategies section found that adults with a learning disability in reading (dyslexia) improved their PA and word analysis abilities after intense PA and word analysis instruction using a version of the Lindamood-Bell program (Eden et al., 2004). Several studies of word analysis instruction with nonexperimental results, also described above, support this study (Curtis & Chmelka, 1994; Hanlon & Cantrell, 1999; Idol-Maestas, 1981).

Research With Other Populations: Children and English Language Learners

K–6 Reading Research Finding: Although the same PA training that is useful for nondisabled readers may be effective for disabled readers, special PA training may be needed for beginning and intermediate readers who have a reading disability.

The NRP review found that PA training is effective in improving PA for (a) at-risk readers (children in grade 1 with low reading scores), (b) disabled readers (those above grade 1 with low reading scores but normal cognitive ability), and (c) normally progressing readers. However, PA training is less effective in improving PA for disabled readers than for the other two groups. The

reason for lower effects with disabled readers was not investigated, although the NRP report speculated that older readers might already have some PA skills, and so may have less room to grow. Or, older readers may be learning more advanced forms of PA (NICHD, 2000b, pp. 2-4, 2-5, 2-23). It is also possible, of course, that the effects are due to a reading disability.

K–6 Reading Research Finding: Systematic phonics programs may be used with reading disabled beginning readers, the same programs that are effective with nondisabled readers.

The NRP review found that the same phonics programs that are most effective for normally progressing readers (systematic phonics programs) are also more effective for disabled readers (NICHD, 2000b, p. 2-94).

The NLP review found 12 studies of literacy instruction for language-minority students in special education settings (August & Siegel, 2006, p. 526ff.). Although alphabetics is a particular problem for those with reading disabilities, only one of these studies included an alphabetics outcome measure, so no finding was drawn from the research.

Other Topics: Age, Goals and Setting, Motivation and Developmental Disability

In the alphabetics instruction studies reviewed, age did not appear to be a limiting factor, at least for the PA development of nondisabled adult readers, and neither did a program's major goals or setting. Despite the importance of motivation in adult learning, no studies were found that investigated the effects of motivation on alphabetics instruction. Several nonexperimental studies looked at alphabetics instruction for adults with a developmental disability.

Effects of Age on Alphabetics Instruction

One finding related to age was drawn from the research.

Weaker Finding: Age is not a limiting factor in learning phonemic awareness.

Only one study was found that evaluated the effects of age on phonemic awareness, an experimental study of Portuguese adults who had completed various literacy programs (Morais, Cary, Alegria, & Bertelson, 1979). Adult education learners who learned to read after age 25 were compared with those who learned to read before age 25. There were no differences in the

PA abilities of the two groups. Age does not seem to affect the ability to learn PA.

Effects of Goals and Setting on Alphabetics Instruction

No research was found that compared the effects of alphabetics instruction in programs aligned with one of the four major AE goals or settings: general functional literacy, workplace literacy, family literacy and corrections. No program taking place in a particular setting, or addressing the goals associated with a setting, was found to be more effective than one associated with a different setting.

However, studies with positive results took place in both family literacy and general functional literacy settings, suggesting that these settings were not, at a minimum, limiting factors for alphabetics instruction. All except four of the research studies presented above, in the Overall section, were done in a general functional literacy setting. The principles in that section, then, apply to general functional literacy. Two studies with positive results took place in family literacy settings (Maclay & Askov, 1988; Scully & Johnson, 1991).

Developmental Disability and Alphabetics Instruction

No experimental studies were found in this category, so there are no findings. However, four descriptive studies of adults with special needs were identified (Burns & Kimosh, 2005; Delen & McLaughlin, 1984; Pershey & Gilbert, 2002; Gallaher, van Kraayenoord, Jobling, & Moni, 2002). Two of these studies (Burns & Kimosh, 2005; Delen & McLaughlin, 1984) used a single-subject, multiple-baseline design in order to examine word analysis instruction for adults with special needs such as Down syndrome. Burns & Kimosh (2005) used incremental rehearsal to teach sight words to two adults with moderate Down syndrome. Hygiene and "shopping list" words were successfully taught to the students using a practice method in which 10 words at a time were practiced with flash cards while maintaining a constant ratio of nine known words and one unknown.

In the second study (Delen & McLaughlin, 1984), two special needs students were also taught to recognize functional sight words. One student had an IQ of 54

(a score between 90 and 100 is in the average range) and another had a severe speech problem. Baseline consisted of tests on functional words (e.g., *exit*, *hospital*) and short sentences (e.g., *press down*). Treatment involved individual sessions to work from a special needs text that teaches functional words and group sessions that involved visiting places where the functional words could be found (for example, the word ***hospital*** on a sign outside a hospital) and explaining the word, using the word in a sentence and teaching the pronunciation of the word. Post-treatment involved several sessions where the words were tested. Both post-treatment and follow-up demonstrated that students had increased and were able to maintain the number of high-frequency, functional words they could read.

The remaining two studies were case studies. The first was a study of an adult with Down syndrome (Gallaher et al., 2002). After 12 tutoring sessions that included concepts of print, phoneme awareness, word analysis and repeated reading instruction, this adult was able to develop letter-sound and sight word knowledge. The second case study (Pershey & Gilbert, 2002) involved tutoring a nonliterate adult over an extended period of time (seven years) using echo reading of brief, authentic passages (sentences and stories) and eventually exploring letter-sound correspondences and writing. This adult, with an IQ of 40, increased to GE 1.5 on a standardized test of word recognition (the Slosson), was able to write letters of the alphabet and understand some print concepts, but was not able to answer many comprehension questions correctly or produce a story when given a picture.

Definition

Reading fluency is the ability to read with speed and ease. Fluent readers can read quickly and accurately and with appropriate rhythm, intonation and expression. Beginning readers often are not fluent. Their reading is choppy and filled with hesitations, mispronunciations and false starts. Even mature readers may read less fluently if they try to read texts than contain many unfamiliar words. Fast and accurate decoding are two elements of fluent reading. A third is prosody, or reading with the proper rhythm, intonation and expression (NICHD, 2000b, p. 3-1).

> …fluency may also include the ability to group words appropriately into meaningful grammatical units for interpretation… Fluency requires the rapid use of punctuation and the determination of where to place emphasis or where to pause to make sense of a text. Readers must carry out these aspects of interpretation rapidly—and usually without conscious attention. Thus, fluency helps enable reading comprehension by freeing cognitive resources for interpretation, but it is also implicated in the process of comprehension as it necessarily includes preliminary interpretive steps (NICHD, 2000b, p. 3-6).

Detailed studies of the way the eyes move during reading suggest that fluent reading is not the same as skimming or scanning a text, where a reader ignores or skips over words and sentences. The development of fluent reading involves learning to look at each word more quickly or efficiently. The eye movements of poor readers or those with a reading disability reflect their lack of fluency(NICHD, 2000b, p. 3-9).

Guided oral reading and frequent independent reading are the major instructional techniques used to increase reading fluency. When teachers use guided oral reading, they listen to students read aloud and give them support and advice as they read. Some names of guided oral reading procedures are repeated reading, neurological impress, paired reading, shared read-

ing, collaborative oral reading and assisted reading (NICHD, 2000b, p. 3-1).

> Newer guided repeated oral reading techniques share several key features. First, most of these procedures require students to read and reread a text over and over. This repeated reading usually is done some number of times or until a prespecified level of proficiency has been reached. Second, many of these procedures increase the amount of oral reading practice that is available through the use of one-to-one instruction, tutors, audiotapes, peer guidance, or other means…. Third, some of the procedures have carefully designed feedback routines for guiding the reader's performance (NICHD, 2000b, p. 3-11).

Encouraging frequent reading is a less explicit approach to teaching fluency than guided oral reading. Students are encouraged to read more on their own in order to increase their reading fluency. Some programs that encourage frequent reading are Sustained Silent Reading (SSR), Drop Everything and Read and Accelerated Reader (AR) (NICHD, 2000b, pp. 3-1–3-2).

Rationale

Students who are not fluent readers spend more time on decoding than they do on understanding the meaning of a text. Choppy, inaccurate reading will impede reading comprehension (Snow, Burns, & Griffin, 1998, cited in NICHD, 2000b, p. 3-1). Fluency promotes comprehension by freeing cognitive resources for interpretation. Fluent reading also signals that readers are pausing at appropriate points to make sense of the text. Readers who can reproduce the rhythm intended by the author can grasp the meaning more easily.

Accurate word recognition or decoding is not enough to ensure comprehension of a text. Those "who do not develop reading fluency, no matter how bright they are, will continue to read slowly and with great effort" (NICHD, 2000b, p. 3-3). Fluency, therefore, is essential for reading success.

Assessment

Fluency assessment usually includes measures of reading accuracy and reading rate or speed. Reading accuracy is the number or percentage of words read

correctly. Reading rate or speed is the number of words read in a given amount of time, such as the number of words read in a minute, or the average number of words read per minute. Sometimes measures of oral reading accuracy and rate are combined, as in determining the average number of words read correctly in a minute. Typically, a student reads aloud while the teacher observes and records reading accuracy and reading rate. Measures of rate can also be obtained by timing how long it takes to read a passage of text silently.

Reading fluency can be measured formally with standardized tests such as the Gray Oral Reading Test (Weiderholt & Bryant, 1992) or informally with Informal Reading Inventories, miscue analysis, pausing indices or measures of rate (NICHD, 2000b, p. 3-18).

> For example, informal reading inventories (IRI) require students to read grade-level passages aloud and silently. The teacher determines a reading level by calculating the proportion of words read accurately in the passage. To ensure that students do not focus solely on fluency—at the expense of comprehension—the student is expected to summarize or answer questions about the text.

> The National Assessment of Educational Progress fluency study… calculated speed and accuracy but performed most analyses on the basis of a four-point pausing scale. This scale provided a description of four levels of pausing efficiency with one point assigned to readings that were primarily word by word with no attention to the author's meaning, to four points for readings that attended to comprehension and that paused only at the boundaries of meaningful phrases and clauses (NICHD, 2000b, pp. 3-9–3-10).

Findings From Fluency Assessment Studies

Summary of Findings

Until fairly recently, there was very little research reporting results from the assessment of AE learners' fluency. Large-scale surveys of adult literacy in the United States, for example, relied solely on measures of reading comprehension. The most recent survey, however, did include a measure of reading fluency. This survey provided information about the fluency of adults who qualify for adult education, those reading below the 12th grade level on a measure of reading comprehension. Several other recent studies have looked directly at the reading fluency of adults enrolled in adult education programs. Together, results from these studies show that the reading fluency of those in adult education is, on average, significantly lower than that of other adults, even when reading simple texts.

ABE learners who are beginning to learn to read are very slow and inaccurate readers, much like all beginning readers. Their fluency improves gradually as they learn to read, along with their reading comprehension. Some studies suggest that ASE learners' fluency may approach that of adults generally, but more research is needed to confirm this. The fluency of English language learners is dependent upon the age at which they learn English. ELLs overall have lower fluency scores than native speakers of English. Those learning English before the age of 10, however, or those learning English and another language before starting school, do not have lower fluency scores. Finally, adults with a learning disability in reading also have lower reading fluency on average than other AE learners.

Overall Findings: AE Learners' Strengths and Needs in Fluency

Stronger Finding: Most AE learners have poor reading fluency, even when reading simple texts. Adult beginning readers' fluency is similar to the fluency of children who are beginning readers. (Baer, Kutner, & Sabatini, 2009; Gallo, 1972; MacArthur, Konold, Glutting & Alamprese, 2010; Mellard, Fall, & Mark, 2008; Mudd, 1987; Sabatini, 2002; Sabatini, Sawaki, Shore, & Scarborough, 2010)

The National Assessment of Adult Literacy (NAAL) is a large-scale survey conducted in 2003 of a nationally representative sample of more than 19,000 adults (Kutner, Greenberg, Jin, Boyle, Hsu, & Dunleavy, 2007). This survey, unlike previous national surveys of adult literacy, included an assessment of reading fluency (Baer et al., 2009). The results describe the fluency ability of adults at four literacy levels. These levels are based on a measure of functional reading

comprehension of prose documents: Proficient, Intermediate, Basic, and Below Basic Literacy. Adults with a high school education had an average reading comprehension score at the high end of the Basic Literacy level (see Chapter 9, Reading Comprehension, for a more detailed description of these comprehension results from Kutner et al.). Adults eligible for AE services (those without a high school diploma) scored predominantly at the Basic and Below Basic literacy levels.

The fluency results for adults at these levels show that they have a much slower reading rate than adults at the Intermediate and Proficient levels. To measure fluency, adults were given two simple passages to read aloud, one written at GE 2–6 (a reading level somewhere between the second and sixth grade level) and another at GE 7–8. The average passage reading rates for all adults was 156 words read correctly per minute (wcpm). The averages for Proficient and Intermediate-level readers were 178 wcpm and 166 wcpm, respectively. Adults eligible for AE services, those reading at the Basic and Below Basic levels, had passage fluency rates that were significantly slower. The average rate for those at the Basic level was 143 wcpm. The rate for those at the lowest literacy level, Below Basic, ranged from 0 to a little over 113 wcpm.

A study of 95 adults, roughly half enrolled AE programs and half in community colleges, also found that those reading below the high school level (GE 12 on a test of word recognition) had poorer fluency. Their reading rate and speed on both word analysis and comprehension tasks were below those of adults reading above the high school level (GE 12 and above) (Sabatini, 2002).

The NAAL fluency results are similar to those found in three additional studies of AE learners. A study of 295 learners selected from adult education programs used cluster analysis to identify seven distinct groups of adult learners, from lower-literate to higher-literate AE learners (Mellard et al., 2008). Reading a passage written at the sixth grade level, fluency scores increased gradually from an average of 21 wcpm (for those in the lower-literate group) to an average of 186 wcpm (for those in the higher-literate group). The overall average for all AE learners in this study was 106 wcpm. In the second and third studies, only low-intermediate AE readers were selected, those reading at the GE 4–7 level (MacArthur et al., 2010) or below GE 7 (Sabatini et al., 2010). Their average reading rates were, respectively, 111 wcpm (on

a passage written at GE 4) and 95 wcpm (on the NAAL passages, written at between GE 2 and 8).

The NAAL fluency assessment also included rates for reading individual real words, nonsense words (a measure of decoding ability), letters and digits. The rates for those at the Basic and Below Basic levels, like the rates for passage reading, were significantly lower than the rates for those at the Intermediate and Advanced levels on all of these measures. In addition, while adults at the Intermediate and Proficient levels read words in context (passages) faster than they read letters and digits, those at the Below Basic level read letters and digits faster than words in context. There was no difference in average letter-digit and passage reading rates for adults at the Basic level. This is one indication that low-literate adults, like children who are beginning readers, focus more on lower level word analysis skills. As adults become better readers, they are able to focus on higher level skills like passage fluency. This is supported by results from an earlier study (using inferential statistics) that compared ABE beginning readers directly with reading-level matched children (approximately GE 1–2) and found their fluency (oral reading rate and accuracy) to be similar (Mudd, 1987).

Another earlier study also supports the NAAL findings presented above. A large-scale NAEP study of young adults' literacy measured the silent reading rates of 26- to 35-year-olds as they read passages written at the 10th grade and college levels (Gallo, 1972). The average silent reading rate (speed) for those adults with poor fluency (those at the 25th percentile) was 145 words per minute, close to 100 words per minute slower than the rate for those with good fluency (75th percentile), and 40 words per minute slower than those with average fluency (50th percentile).

Strengths and Needs of Learners in ABE, ASE and ESOL Programs

ABE and ASE Learners

Stronger Finding: ABE learners' reading fluency ranges from very poor to poor compared with that of other adults and is on average lower than the fluency of ASE learners (Baer, Kutner, & Sabatini, 2009; MacArthur, Konold, Glutting & Alamprese, 2010; Mellard, Fall, & Mark, 2008).

Results from the NAAL suggest that oral reading fluency will be better for relatively more advanced readers, like those in ASE programs studying for their GED certificate, than it is for relatively less advanced readers, like those in ABE programs (Baer et al., 2009). The NAAL fluency assessment found that fluency (oral reading rate for passages, as well as for digits, letters and words) gradually increased along with reading comprehension scores for adults at the Below Basic and Basic levels (those eligible for AE services). The NAAL analysis of fluency data broke the Below Basic level into five equal parts (with midpoint scores on the 500-point NAAL functional literacy comprehension scale of 21, 63, 105, 146 and 188, respectively). The average passage-reading score for adults at each of these five Below Basic levels was, from the lowest to the highest level, 53, 60, 68, 85 and 113 wcpm. The average for adults at the next higher NAAL level, the Basic Literacy level, was 143 wcpm.

As noted above, these NAAL fluency findings are supported by studies evaluating AE learners' fluency (MacArthur et al., 2010; Mellard et al., 2008; Sabatini et al., 2010). Mellard et al. found that fluency generally increases across seven distinct groups ranging from low- to high-literate groups of AE learners. Passage-reading fluency increased from 21 wcpm in group 1 (low-literate) to 66, 67, 102 and 126 wcpm in other ABE groups (2–5) and 156 and 186 wcpm in ASE groups (6 and 7). While these ASE groups appear to have passage-reading rates comparable to those of Proficient readers on the NAAL (156 and 186 wcpm versus 178 wcpm on the NAAL), these rates come from different studies, so comparing them may be misleading. For example, the NAAL asked readers to read two fluency passages written at two different reading levels (between GE 2–6 and 7–8), while adults in the other study read one passage written at the sixth grade level. Additional research comparing ASE learners directly to other adults is needed.

ESOL Learners

Stronger Finding: Adults in AE ESOL programs on average have poorer reading fluency than both ABE and ASE adult learners, unless they learned English at a young age (Baer, Kutner, & Sabatini, 2009; Mellard, Fall, & Mark, 2008).

The NAAL constructed a Basic Reading Skills score (BRS) by averaging adults' reading rates for passage,

word and nonsense word reading at the four NAAL reading levels. Using the BRS score, the NAAL found that adult ELLs overall had lower fluency than non-ELL adults, including those adults eligible for AE (those reading at the Below Basic and Basic levels on the NAAL). In a study of AE learners (Mellard et al., 2008), English language learners had significantly lower fluency scores on a measure that included both passage and word reading rates.

The NAAL also found that Below Basic and Basic readers who spoke only English before starting school had average BRS scores of 73 and 92 wcpm, respectively. Those adult ELLs who spoke only Spanish before starting school had significantly lower average BRS fluency scores of 49 and 82. Those who spoke a language other than Spanish or English had scores of 65 and 84 wcpm. Bilingual adults, however, or those learning English and another language before starting school, did not have lower fluency than English speakers. In fact, those learning English before age 10 (roughly the fourth grade in the U.S.) did not have lower BRS scores at any of the four NAAL levels (Below Basic, Basic, Intermediate and Proficient).

Research With Other Populations: English Language Learners

K–6 Second Language Research Finding: Use of fluency measures will help determine whether or not English language learners have difficulty with reading fluency.

Research summarized in the What Works Clearinghouse IES Practice Guide for English language learners found 21 studies demonstrating that measures of alphabetics and fluency can be used effectively to help identify the reading strengths and needs of English learners. For beginners reading at GE 2–5, oral reading accuracy and rate when reading connected text are effective measures (Gersten et al., 2007, p. 9).

Strengths and Needs of AE Learners With a Learning Disability

Stronger Finding: Adults with a learning disability in reading who continue to have poor phonemic awareness also have poor reading fluency (Eden et al., 2004; MacArthur, Konold, Glutting & Alamprese, 2010).

This finding is supported by two studies. In one, adults with dyslexia had lower achievement on measures of fluency (accuracy and rate during oral reading

as measured by the Gray Oral Reading Test) than adults without dyslexia (Eden et al., 2004). In the other, a factor analysis discussed above, learners in AE programs who reported having a learning disability scored lower on a fluency component measure—a factor incorporating measures of word and passage reading rates (MacArthur et al., 2010).

Other Topics: Effects of Age on Fluency

Of all the other topics considered in this review, only one study, addressing age, was found.

Weaker Finding: Beginning readers, whether adults or children, have similar fluency abilities. However, adults use strategies that are more like those of children beginning to learn to read; they rely more on semantic cues than better child readers and less on letter-sound knowledge (Mudd, 1987).

In a study of adult beginning readers (with an average reading level of GE 1) and a group of children matched on reading level, both groups were found to have similar fluency, or oral reading rate and accuracy (number of hesitations, corrections and omissions). When the children were divided into better and poorer reader groups, however, and all groups' oral reading errors were analyzed, adults were found to resemble the less-able children in their relatively greater reliance on semantic cues (making errors that are semantically plausible) as opposed to phonological cues (making errors that are phonologically plausible). As they read, the better child readers relied more on their letter-sound knowledge to figure out the pronunciation of unknown words, while the poorer readers and the adult readers were more likely to use context to predict an unknown word (Mudd, 1987).

Findings From Fluency Instruction Studies

Summary of Findings

Findings from the AE research indicate that fluency can be taught to adults who qualify for AE programs, that teaching fluency leads to increases in reading achievement and that a technique called repeated reading is an effective instructional technique for increasing reading fluency in adults. For adults with poor decoding or word analysis abilities, such as those with a learning disability in reading, direct instruction in word analysis can also lead to improved reading fluency.

The use of repeated reading is also supported by a much larger body of research with adolescents and children. This research finds that fluency can be taught and teaching fluency leads to increased reading achievement, especially reading comprehension. In addition, K–12 results indicate that fluency instruction is useful for students with reading problems through the 12th grade, not just for beginning readers. The teaching strategy found most effective for children was guided, repeated oral reading of passages of text, similar to approaches found to be effective with adults. Using this strategy, students read a passage many times while a teacher provides feedback about rate and accuracy levels, helps with difficult words and models fluent reading. This approach is effective for English language learners as well as native speakers of English.

Research with children has also found that direct and explicit instruction, peer-assisted learning and bilingual education are more general approaches to reading instruction, not specific to any one component of reading, that are effective with those whose native language is not English.

Fluency instruction that focuses on smaller units of text, such as individual letters, parts of words, or word lists, is not addressed in the NRP review of fluency research, although the NRP found that repeated reading of isolated words is probably not as effective as repeated reading of connected text in improving fluency in passage reading (Stahl, 2004). The NRP also found that systematic phonics instruction improves reading fluency, as was found for adults with a learning disability in reading.

Of special importance for AE teachers, perhaps, is the effect that fluency instruction may have on motivation. When repeated reading is used with children, they immediately experience improvement in their fluency on the texts being used for repeated reading instruction. For adults who may have struggled with reading for years, this could be a very positive, motivating experience.

No additional findings related to types of adult education programs or other topics were identified. One study identified effective instructional material—a computer application that seemed to improve less-

skilled readers' fluency—although additional studies are needed to support this finding.

Overall Findings: AE and Fluency Instruction

Two overall issues are addressed in this section: whether participation in AE leads to increases in students' reading fluency and whether fluency instruction leads to gains in reading achievement. Three findings related to fluency instruction were identified from the AE reading instruction research. One is a general finding and the others are findings related to teaching strategies and material.

Stronger Finding: Fluency may be taught to AE students, and fluency practice may lead to increases in reading achievement (Brock, 1998; Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006; McKane & Greene, 1996; Lavery, Townsend, & Wilton, 1998; Meyer, 1982; Tan, Moore, Dixon, & Nicholson, 1994; Venezky, Bristow, & Sabatini, 1994; Winn, Skinner, Oliver, Hale, & Ziegler, 2006).

Results from three experimental studies suggest that teaching fluency leads to increases in reading achievement. In two of the studies, fluency instruction was effective with intermediate adult readers attending a technical school (Meyer, 1982) and a program in an adult education center (Winn et al., 2004). In the third study, fluency instruction was effective with beginning adult readers in a prison setting (McKane & Greene, 1996). These studies are described in the Teaching Strategies section below.

Results from a fourth experimental study with 12 adult education students (average age 33) compared traditional instruction (textbook and lecture) with instruction using Successmaker, a computer-based integrated learning system focusing on literacy and interpretive comprehension, word meaning, and reference skills, along with word analysis. After 18 one-hour sessions, the group using Successmaker scored higher on tests of word recognition and comprehension (controlling for initial differences between groups) but not on a measure of fluency (oral reading accuracy). While the study included a measure of oral reading accuracy, it did not include any direct fluency instruction such as repeated reading (Lavery et al., 1998).

Four nonexperimental studies support the finding that fluency instruction improves AE students' reading. Three of these studies are described in the Teaching Strategies section (Brock, 1998; Greenberg, Rodrigo,

Berry, Brinck, & Joseph, 2006; Tan et al., 1994). Results from the fourth study, which directly addresses the first issue posed above, suggest that participation in a large AE program utilizing trained teachers leads to statistically significant, but small increases in oral reading fluency (Venezky et al., 1994).

Effective Teaching Strategies

Stronger Finding: Fluency may be taught using approaches that include the repeated reading of passages of text, words from texts and other text units (Brock, 1998; Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006; Meyer, 1982; McKane & Greene, 1996; Tan, Moore, Dixon, & Nicholson, 1994; Winn, Skinner, Oliver, Hale, & Ziegler, 2006).

As noted above, several studies used repeated reading to improve student fluency. Students read the same text several times until they are able to read it rapidly and accurately (Brock, 1998; Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006; Meyer, 1982; McKane & Greene, 1996; Tan et al., 1994; Winn et al., 2006). These studies, three experimental and two nonexperimental, differ in the type of text they focus on during fluency instruction: whole passages of text, isolated words or a mixture of text types. The repeated reading procedures also differ. They include reading a text out loud several times and reading along while listening (to a recording or a teacher). More research is needed to determine which of these procedures may be more effective.

In one of the three experimental studies, in a technical school setting, fluency instruction consisted of seven hours of instruction over a period of two or more weeks (Meyer, 1982). Instruction included listening to taped versions of passages while simultaneously reading them aloud using typed transcripts. The difficulty level of the passages was one grade level above the GE score a student received on a standardized test of reading comprehension ability (the Tests of Adult Basic Education, or TABE). Students practiced rereading the passage while listening until they felt they could read it aloud on their own to the instructor. When they could read two passages with 90 percent accuracy (mispronouncing no more than 10 percent of the words in a passage), they were given the next highest grade level passages to work with. Students using this approach significantly increased their vocabulary and total reading scores (comprehension

and vocabulary combined) on the TABE, but not their comprehension scores. (It should be noted that GEs were used in the analysis.) The study's author suggests that fluency practice improved students' word recognition, implying that it helped them to recognize words whose meanings they already knew, and that this led to the increase in the vocabulary and combined vocabulary-comprehension scores.

The second experimental study (Winn et al., 2004) evaluated the two approaches to repeated reading mentioned above, noting that they have been successful with children: silent reading followed by oral reading, and listening followed by oral reading. Twelve participants in an adult literacy program read nine short passages, three in each of the following conditions: reading a passage silently and then reading it aloud; reading along silently while the text is read aloud and then reading the passage aloud; and reading three different passages aloud (control). In each condition, an experimenter/teacher records the time it takes the student to read each passage during oral reading, records the number of reading errors (mispronunciations, omissions, additions and so on) and provides prompts when the student needs help. For this study, the order of the conditions and the passages were randomly assigned. A repeated measures ANOVA using wcpm for each passage as the dependent variable was used to determine which condition produced the best reading rate (fluency). Both the listening while reading and repeated reading conditions were better than the control condition. Reading rates for the two repeated reading conditions were not significantly different. Winn et al. noted that this study demonstrates that an approach known to work with children can also be used effectively with adults. It also demonstrates that adults can experience increases in reading rate almost immediately when repeated reading is used. Obvious questions to ask are whether larger effects might be obtained if students were to practice repeated reading over an extended period of time, and whether transfer of fluency gains to unread passages might occur.

In an approach that focused on a mixture of text types, a components strategy toward fluency instruction was taken (McKane & Greene, 1996). Adult learners used a computer software program, Autoskill, that first identifies areas or components of reading in which students lack automaticity (adequate accuracy and rate). The program then provides audiovisual practice in the weakest areas. Practice starts with lower level processes or smaller units and progresses to larger units as accuracy and rate criteria are met. These units include letters, regular letter combinations representing real and nonsense syllables, real words and nonsense words. Practice in fluently reading phrases, sentences and paragraphs follows. Targeting areas in which automaticity is weak in this way led to increases in reading comprehension for these beginning adult readers (those reading below GE 3; non-equal-interval GE scores may have been used in this analysis).

In the approach that focuses on rereading single words from a text, used with beginning readers who were also English-language learners, potentially difficult words in a reading passage are identified and then these isolated words are practiced until students can read all the words accurately at a rate of about 1.5 seconds per word. Passage reading is then practiced with oral reading followed by comprehension questions. For the three beginning ELL readers (reading at GE 0–3) in this nonexperimental study, this approach led to an increase in word recognition rate and accuracy, and oral reading accuracy, but not to sustained increases in comprehension (Tan et al., 1994).

A case study (Brock, 1998) illustrates how repeated reading might be used in a tutoring situation. In this study of an adult receiving one-to-one tutoring, increases in fluency were observed following instruction that included repeated readings and focused on the adult's strengths in oral language. Instruction began with language experience exercises. The student looked at a picture book, discussed the story depicted in the book, and then dictated a story based on the pictures. Instruction also included word recognition practice using the limited number of words that appeared in the picture book, and repeated readings using the student's dictated story.

A final, nonexperimental study used a less direct approach to fluency instruction—extensive reading—and found that it led to improvement in adult beginning readers' fluency based on the Woodcock-Johnson reading fluency subtest (Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006). This approach included sustained silent reading of authentic literature, teacher read-alouds and group discussion. Because this is a single, nonexperimental study, additional research

with AE learners is needed to determine with more certainty the effectiveness of the approach.

Effective Teaching Material

Weaker Finding: AutoSkill may be an effective computer application for improving less-skilled readers' fluency (McKane & Greene, 1996).

The Autoskill program is described above. Another study, also described above, used fluency to measure the effects of the Computer Curriculum Corporation's Successmaker integrated learning system, but this program did not teach fluency directly (Lavery et al., 1998).

Effects of Intensity and Duration of Instruction on Fluency Achievement

No trends could be drawn from the research related to the intensity and duration of fluency instruction. Only one study attempted to relate the duration of instruction to changes in students' reading fluency (Venezky, Bristow, & Sabatini, 1994). Experimental results from this study, in which one group of students (those attending day classes) received three times the amount of instruction as those in another group (attending evening classes), suggest that oral reading fluency (accuracy) does not increase as the number of hours of instruction increases. However, learners made only very slight gains in reading fluency overall (from an average of 104 to 111 words read per minute after 120 or 360 hours of instruction). These somewhat small gains suggest that instruction may not have been effective in improving fluency and, in this case, differential gains based on hours of instructional time would not be expected.

Research With Other Populations: Instructional Methods and Material

Summary of Findings

Research with other populations, including children and older adolescents, supports findings from the adult reading instruction research regarding the effectiveness of repeated reading for improving fluency. Findings from this research are based on a much larger set of studies than exist in the AE fluency research base. The major AE research results are supported by research with other populations, although findings from this other research extend beyond those from the AE research base.

AE research related to fluency assessment suggests that beginning adult readers lack fluency, as do children learning to read. Emerging findings from the AE research base related to fluency instruction suggest that fluency can be taught to adults using approaches that include repeated readings of text, and that developing fluency can lead to increases in reading achievement. Research with other populations also finds that fluency can be taught, but this research has found a much stronger relationship between fluency instruction and increased reading comprehension achievement. Also, a few additional approaches to repeated reading, not addressed in the adult research, have been evaluated at the K–12 level.

Most of the adult fluency instruction studies have included ABE learners (those reading at GE 1–8) as opposed to ASE learners. While the adult fluency research, therefore, applies to beginning readers, results from research with children suggest that fluency instruction is beneficial for students with reading problems through grade 12, not just for beginning readers.

Finally, the National Literacy Panel (NLP) report has found that fluency instruction can also lead to increased reading achievement for English language learners. General approaches to effective reading instruction reported by the NLP include direct and explicit instruction, peer-assisted learning and bilingual instruction.

Teaching Strategies

Adolescent Research Finding: Repeated oral reading of text may lead to increases in reading fluency.

This finding supports findings from reading instruction research with adults and young children where repeated reading of passages of text, words from text and other text units was found to improve fluency. It is also compatible with research with children that also emphasizes oral as opposed to silent repeated reading.

This finding is based on one experimental study (Thomas & Clapp, 1989), five studies using a multiple baseline design (Carver & Hoffman, 1981; Freeland, Skinner, Jackson, McDaniel, & Smith, 2000; Freeman & McLaughlin, 1984; Shapiro & McCurdy, 1989; Valleley & Shriver, 2003), and four additional descriptive studies (Beers, 1986; Harris, Marchand-Martella, & Martella, 2000; Howe, 1982; Marchand-Martella, Martella, Orlob & Ebey, 2000).

A variant of repeated oral reading was used in all of these studies. In one, repeated reading of lists of words occurs (Freeman & McLaughlin, 1984). In two, (Howe, 1982; Shapiro & McCurdy, 1989), repeated reading of both words and texts occurs. In four, (Beers, 1986; Carver & Hoffman, 1981; Freeland et al., 2000; Valleley & Shriver, 2003), repeated reading of text occurred. In two, (Harris et al., 2000; Marchand-Martella et al., 2000), peer-assisted repeated reading of text was combined with the Corrective Reading program. In Thomas and Clapp (1989), repeated reading of text was compared with repeated reading of letters, syllables and words; learners in both conditions demonstrated significant gains in rate of oral reading of text, with no difference found between the two. Both approaches to fluency instruction were effective.

One experimental study found that fluency is not improved with repeated reading instruction (Skinner et al., 1993), but the fluency intervention in this study did not involve participants reading aloud (they read silently and then listened, which may account for why improvement was not found in learners' oral reading rates).

The NRP review supports trends from the AE research base suggesting that fluency can be taught to adults and that developing fluency can sometimes lead to increases in reading achievement. Of the topics important to adult education, the NRP data address teaching strategies directly.

K–12 Research Finding: To improve readers' fluency (as well as word recognition and reading comprehension achievement), use repeated guided oral reading procedures.

The NRP review of research at the K–12 level found that "procedures that have students reading passages orally multiple times while receiving guidance or feedback from peers, parents, or teachers are effective in improving a variety of reading skills" (NICHD, 2000b, p. 3-20).These repeated reading procedures accompanied by guidance from others lead to increases in reading fluency as well as increased word recognition and reading comprehension achievement (NICHD, p. 3-18). Many procedures, such as repeated reading (with and without feedback), paired reading, shared reading, and collaborative or assisted oral reading, seem to be effective although there was not enough information to compare their relative effectiveness (NICHD, p. 3-19).

K–12 Research Finding: Simply encouraging learners to read independently more often may not lead to improvements in reading achievement without other forms of reading instruction.

The NRP review of procedures such as Sustained Silent Reading and others that encourage students to read more (and thus perhaps develop their reading fluency) does not find that these approaches are effective in improving students' reading (NICHD, 2000b, p. 3-27). In Sustained Silent Reading programs, students and teachers read silently from a book of their own choosing at regular intervals (once a day or once a week, for example).

K–12 Research Finding: Use systematic phonics instruction (as opposed to nonsystematic or incidental phonics instruction) to improve beginning readers' reading fluency.

The NRP review of research related to phonics instruction found that children's reading fluency improves when they are taught decoding using systematic approaches to phonics instruction (NICHD, 2000b, p. 2-113).

Teaching Material

The NRP review did not evaluate specific learning materials or packages used for fluency instruction, but rather evaluated the principles necessary for successful development of fluency skills. It did note, however, that repeated and guided reading is a relatively simple procedure that uses text as opposed to other special equipment or material (NICHD, 2000b, p. 3-20).

Instruction for Learners in ABE, GED and ESOL Programs

All except three of the studies with adults listed above in the Teaching Strategy section are studies of ABE learners, those reading at roughly GE 0–8. No studies of fluency instruction in ASE programs were found, and only one, nonexperimental study of reading fluency instruction involving ELLs was found (Tan et al., 1994). Therefore, no specific findings are reported for learners in ASE and ESOL programs.

For adults who qualify for ABE programs, the results from three studies are somewhat contradictory. One suggests that developing automaticity (accuracy and rate) in areas of the reading process where an adult learner's fluency is diagnosed as weakest (letter, syl-

lable, word, phrase, sentence and/or paragraph reading) leads to increases in reading achievement for beginning readers (those at GE 0–3 based on the TABE total reading score), but not for better readers (those reading between GE 3.1 to 6.1 or between 6.1 to 9.0) (McKane & Greene, 1996). However, two other studies, while not comparing the effectiveness of fluency instruction across reading levels, nevertheless found it to be effective with learners reading at about GE 4–6 (Meyer, 1982; Winn et al., 2006). More fluency studies are needed to determine whether fluency instruction is more or less effective for adults at different reading levels.

Research With Other Populations

While research results with adults are mixed when it comes to whether fluency instruction is most effective with those just beginning to learn to read, results with children are not. In addition, research with children suggests that fluency instruction may be useful for those in ESOL programs.

Research With Other Populations Reading at the ABE or GED Level

K–12 Reading Research Finding: Fluency instruction may be especially effective for improving poor readers' reading achievement, regardless of their reading grade equivalent.

The NRP review found that fluency instruction is effective for normally achieving readers at least through the fourth grade. This supports AE research suggesting that adult beginning readers (those reading, roughly, up to about the third or fourth grade level) also benefit from fluency instruction. The NRP also found that poor readers at all grade levels benefit from fluency instruction, suggesting that adults reading above the GE 3–4 in reading may also benefit. More research is needed at the K–12 level to separate the effects of grade level in school (age) and reading grade level (reading ability) on fluency instruction.

Research With Other Populations of ESOL Learners

Only one AE study focused on fluency instruction for English-language learners, and a recent review by the National Literacy Panel found only two studies with younger ELLs.

Weaker K–6 Second Language Research Finding: Fluency instruction may lead to increased reading achievement for English-language learners.

The National Literacy Panel on Language Minority Children and Youth (Shanahan & Beck, 2006, p. 429) identified two experimental studies of the effects of fluency. Both found positive effects for instruction that used repeated reading of text. The focus for one study was fluency on English texts for second language learners, while the focus for the other was fluency on Spanish language texts for Spanish-speaking students learning English. While more studies are needed, this finding is consistent with findings from the adult research with native language learners and from the large body of studies in the Report of the National Reading Panel (NICHD, 2000b).

K–12 Second Language Research Finding: Bilingual education can have a beneficial effect on reading outcomes.

Results from the NLP meta-analysis suggest that bilingual education can have a positive effect on reading achievement generally (Francis, Lesaux, & August, 2006, pp. 392, 397). This finding is described in Chapter 6, Alphabetics, in the section Teaching Strategies, Research With Other Populations of ESOL Learners.

K–5 Second Language Research Finding: Direct, explicit instruction in each of the components of reading, provided in small-group settings, is effective in improving the reading achievement of English learners at risk for reading problems.

The review for the IES Practice Guide found three programs that are effective for English learners in grades one through five: Enhanced Proactive Reading, Read Well and SRA Reading Mastery/SRA Corrective Reading (Gersten et al., 2007, p. 15). Similar programs should be just as effective if they include the same core or basic features: extensive, ongoing professional development for teachers and others involved in instruction; small-group instruction; instruction that provides multiple opportunities for discussion, questions and practice; clear error correction procedures; and explicit instruction in each component of reading (Gersten et al., 2007, p. 16).

K–12 Second Language Research Finding: Peer-assisted learning, or heterogeneous groups of two to four English learners practicing reading material that has already been taught, can lead to improvement on

measures of alphabetics (phonemic awareness and word analysis), oral reading fluency and reading comprehension (Gersten et al., 2007, p. 28).

This finding is based on four experimental studies of peer tutoring that lasted for about 90 minutes a week. In two studies with beginning readers in grades K–1, peer tutoring was used to improve alphabetics. In the other studies it was used in grades three through six to improve reading comprehension (Gersten et al., 2007, pp. 28, 36).

Effective Fluency Instruction for AE Students With Learning Disabilities

Weaker Finding: Alphabetics instruction may lead to increases in at least one aspect of fluency: accuracy in reading connected text. (Eden et al., 2004; Hanlon & Cantrell, 1999; Idol-Maestas, 1981; Truch, 1994)

One experimental and three nonexperimental studies support this Finding (Eden et al., 2004; Hanlon & Cantrell, 1999; Idol-Maestas, 1981; Truch, 1994). Two studies found that intensive use of a highly structured, multisensory approach to teaching phonemic awareness and word analysis (variations of the Lindamood-Bell program) can lead to increased fluency for adults diagnosed with dyslexia (Eden et al.; Truch). A case study also used a multisensory approach to teaching word analysis to an adult with a learning disability in reading, spelling with a focus on letter-sound correspondence (Hanlon & Cantrell). Another case study focused on teaching unknown letter-sound correspondences (Idol-Maestas). All of these studies found increases on measures of fluency that included both accuracy and rate except for Eden et al.), in which students improved on a measure of oral reading accuracy but not on a measure of rate. These programs are described in more detail in Chapter 6, Alphabetics, in the Effective Teaching Strategies section.

Research With Other Populations

As noted above, the NRP results also suggest that fluency instruction is beneficial for students with reading problems through grade 12, not just for beginning readers. The K–12 Reading Research Finding presented above is also applicable here: Fluency instruction may be especially effective for improving poor readers' reading achievement, regardless of their reading grade equivalent.

The National Literacy Panel identified 10 studies of reading instruction for English-language learners with learning disabilities (August & Siegel, 2006, p. 526ff.). Two of these, both using multiple-baseline designs with several students, investigated variants of repeated reading and found that it was effective in improving oral reading accuracy (in both studies) and also reading rate (in one study). One approach included multiple readings: listening while reading, oral reading, and three silent readings followed by another oral reading. The other involved only one repeated reading, listening while reading, followed by a discussion of key vocabulary. Both approaches improved reading comprehension as well as fluency.

Although more research is needed in order to draw firm conclusions, these results are consistent with those found with children and adults without reading difficulties. The results support the first of the general conclusions of the National Literacy Panel, listed below.

- Some specific strategies that work well with native-language learners might also be effective with English-language learners, such as reciprocal teaching and repeated reading.

- Teachers can use students' native language to help them learn in a second language. Being taught initially in a native language and then transitioned to English was effective, for example. This is similar to the finding with ELL students generally that bilingual instruction can be effective.

- Making instruction more comprehensible through extensive, teacher-led conversation about text in both English and the native language is helpful.

While several of the studies reviewed by the NLP were experimental studies, many were also non-experimental case studies, ethnographies, and studies with multiple-baseline designs with small numbers of participants and, therefore, limited generalizability. The general conclusions drawn by the NLP were, therefore, tentative.

Other Topics: Goals and Setting, Developmental Disability and Motivation

Of all the other topics considered, this review found studies only in the Goals and Setting and Developmental Disability categories, and there were not enough

experimental studies to draw any findings. No research was found that compared the effects of fluency instruction in programs aligned with one of the three major AE goals or settings: general functional literacy, workplace literacy or family literacy. However, all of the research described above, with one exception, took place in general functional literacy programs. The Meyer (1982) research took place in a vocational-technical setting.

One descriptive study reported positive results from reading instruction on the reading fluency of beginning adult readers with Down syndrome. This study found that adults with Down syndrome gained an average of three years on a measure of fluency (rate and accuracy) after only one year of reading instruction (Moni & Jobling, 2001).

Research With Other Populations

Most of the topics important to AE instruction are not addressed by the NRP review of fluency research. Unlike the large research base used in the NRP review of alphabetics research, the fluency research base at the K–12 level is relatively small. Fourteen studies were available for the NRP fluency meta-analysis. Separating out the various factors related to the AE topics was not possible with such a small set of studies.

Although the NRP review does not address motivation directly, one major finding may be relevant to this topic, which is especially important in AE settings, where attrition is often a problem. When looking at the immediate effects of fluency instruction on students' ability to read passages that were used during instruction, the NRP review found that reading improves from the first passage read to the final passage read. Fluency instruction immediately improves the reading rate, accuracy and comprehension of passages read (NICHD 2000b, pp. 3-15–3-16). Assuming that, based on the research discussed above, transfer to other passages that are not a part of instruction will occur after fluency practice of some length of time, the immediate benefits to adults may be motivational. Adult readers should see improvement in their reading fairly quickly, at least over the passages that they are practicing. Practice leading to proficiency can be motivational, as has been shown at the K–12 level in research on the relationship between motivation and reading comprehension achievement (Guthrie & Humenick, 2004).

Vocabulary

Definition

Our vocabulary consists of the individual words we understand or whose meanings we know. Our reading vocabulary consists of words that we understand as we read. It is possible to know the meaning of a word when we hear it spoken but still not be able to read it. This is common for beginning readers, whose oral vocabulary (their speaking and listening vocabulary) is often larger than their reading vocabulary. The depth of our knowledge for individual words can also vary. We may have a deep understanding for words that we use a lot, knowing all of the different definitions given in a dictionary, for example. Or our knowledge may be shallow when we know only one of the several meanings for a word, or when we have heard a word only a few times but have never used it ourselves or checked on its definition (McKeown & Curtis, 1987).

Vocabulary is one of several components of reading instruction, along with alphabetics, fluency and comprehension. These are taught together, and none, including vocabulary, should be the sole focus for instruction. Teaching the meanings of individual words will not ensure that learners can decode fluently or read passages of text with understanding. All of the components must work well together for reading to be successful.

Rationale

Vocabulary is crucial for getting meaning from text. Without knowledge of the key vocabulary in a text, a reader will struggle to understand the writer's message. As the report of the National Reading Panel (NRP) pointed out, vocabulary is not only crucial for the reading comprehension of skilled readers, it is also very important in learning to read (NICHD, 2000b, p. 4-3). Beginning readers decode text with the expectation that they will understand the words once they have translated the text into speech. If they cannot— if most of the words are not in their oral vocabulary— decoding will be difficult.

Assessment

Vocabulary knowledge can be assessed in many ways, each of which may influence an instructor's view of a student's vocabulary ability. The structure of a test determines the type of vocabulary knowledge being measured, such as receptive vocabulary (listening and reading) or expressive vocabulary (speaking and writing). The nature of the test also determines how much knowledge a reader needs about an individual word (vocabulary depth) to respond correctly.

For example, some tasks ask the learner to respond with oral answers: "Tell me what the word *lift* means." Responses scored as correct could require very little knowledge (*to pick something up*) or more depth of knowledge (*power available for raising; take back or cease; cosmetic surgery; elevator; ride; assistance*). Another more common task is the written multiple-choice question. Multiple-choice items can also be structured to require more or less depth of knowledge.

A written multiple-choice question, like other tasks that require students to read a test item, can measure abilities other than vocabulary knowledge, such as alphabetics or fluency. For instance, learners who cannot decode the words in a vocabulary test item may not be able to respond correctly even if they know the word when hearing it. For this reason, oral vocabulary tests may be more accurate measures of learners' general knowledge of word meanings because they do not require decoding.

Vocabulary tests can also be formal and standardized, such as the vocabulary subtest of the Adult Basic Learning Exam (ABLE) (Karlsen & Gardner, 1986). Or they can be less formal, as may be the case when teachers make up a vocabulary test for their class. Informal tests can be used to measure mastery of vocabulary words from classroom lessons. Formal tests are often used to estimate the size of a person's vocabulary, although it should be remembered that these are only estimates, not precise measures (NICHD, 2000b, p. 4-16).

Findings From Vocabulary Assessment Studies

Summary of Findings

Very little research reports results from the assessment of AE students' vocabulary knowledge;

consequently, there are only two findings related to the assessment of AE readers' vocabulary. One finding suggests that AE learners' vocabulary knowledge is dependent on reading ability. As might be expected, their life experience can give them an advantage over children as they begin to learn to read: Their experience or knowledge of the world and consequently their vocabulary knowledge is much better than their knowledge of alphabetics. This advantage, however, may disappear at higher reading levels. Another finding confirms what might be expected: ABE beginning readers' oral vocabulary is better than that of ESOL beginning readers.

While there is very little vocabulary research with English language learners in AE programs, research with children suggests that vocabulary knowledge is very important in developing their reading comprehension.

Overall Findings: AE Learners' Strengths and Needs in Vocabulary

Although a few research studies describe adults' general level of vocabulary development, no studies were found that investigate the vocabulary knowledge of AE learners with a learning disability in reading (LD), and only one study was found that describes the relationship between vocabulary knowledge and language ability. Consequently, one weaker assessment finding for AE English language learners and none related to AE learners with a learning disability were derived from the research. One meta-analysis of 52 studies comparing adults with and without LD found that adults with LD scored significantly lower on a measure of vocabulary knowledge. This study, however, did not distinguish between adults participating or not participating in AE programs (Swanson & Hsieh, 2009).

Weaker Finding: AE readers' vocabulary growth may depend on reading ability. Although their life experience may give them an advantage on vocabulary knowledge at beginning reading levels, this advantage may disappear as reading improves (Greenberg, Ehri, & Perin, 1997).

Assessment results from a study using inferential statistics that compared the vocabulary achievement of AE readers to that of children matched for reading ability suggest that adults' vocabulary knowledge is better than children's at reading levels GE 3 and 4, but not at GE 5. Even though adults have more life ex-

perience than children, their vocabulary knowledge appears to be no better on average than children's (matched for reading level) by the time both are able to read (decode) text written at about the fifth grade level (GE 5). It is around the fourth or fifth grade level that children begin to use their reading to learn new concepts in content-oriented texts.

The authors note that the measure of oral vocabulary knowledge used in this study (the Peabody Picture Vocabulary Test) might not contain as much adult-oriented content as a test developed specifically for adults (such as the ABLE Reading Vocabulary test). Adults may perform better on a vocabulary measure containing more adult-oriented items.

Strengths and Needs of Learners in ABE, ASE and ESOL Programs

Weaker Finding: Beginning ABE readers' oral vocabulary knowledge is better on average than beginning ESOL readers' vocabulary (Nanda, Greenberg, & Morris, 2010).

No studies were found that investigated the vocabulary ability of adults in ASE programs. One study reported results from an assessment of beginning ABE and ESOL readers' vocabulary (those reading at GE 3–5). In this study, beginning readers who were native English speakers had higher average English oral vocabulary scores than English language learners (Nanda et al., 2010).

Assessment Research With Other Populations

Although the research reviewed by the NRP did not directly address issues related to vocabulary assessment, the NRP completed a qualitative analysis of the ways in which researchers measure vocabulary and presented some tentative conclusions: (a) many measures of vocabulary are used and there is no one standard, so relying on only one measure may not provide sound results; (b) standardized tests may not be sensitive enough to measure the effects of some forms of instruction, so informal tests that more closely match instruction may be needed (NICHD, 2000b, p. 4-26).

The National Literacy Panel (NLP) summarized research looking at the relationship between vocabulary knowledge and reading ability for English language learners. As expected, vocabulary knowledge is

more important for reading comprehension than alphabetics.

English Language Learners

K–12 Second Language Research Finding: The strength of an English language learner's English vocabulary knowledge is of some importance in developing alphabetics abilities, but it is not nearly as important as phonological processing ability. Vocabulary knowledge is, however, extremely important in developing reading comprehension ability.

The National Literacy Panel looked at the relationship between oral language proficiency in English and reading ability. Vocabulary knowledge is a key component of oral proficiency, along with knowledge of English syntax and listening comprehension. A large number of studies, mostly with elementary-age students, have shown that oral proficiency generally, and vocabulary knowledge particularly, is not strongly related to word-level reading skills or alphabetics, which are more closely related to phonological processing ability (Geva, 2006, p. 127). This is true for spelling as well. English vocabulary knowledge and other components of oral language proficiency are very important to both the comprehension and composition of English text (Geva, p.139).

Findings From Vocabulary Instruction Studies

Summary of Findings

Overall results from vocabulary instruction research with adults suggest that AE reading instruction can lead to increases in vocabulary achievement and that the longer AE students remain in effective programs, the more their vocabularies will improve. While more research on specific methods or approaches for improving vocabulary is needed, results from three studies suggest that promising approaches to instruction encourage adults to use new vocabulary words multiple times and to relate them to concepts that they already know. This is consistent with the larger body of research with children, which has identified several promising approaches: listening and wide reading, repetition and the use of multiple contexts, and active engagement during instruction.

A weaker finding from the vocabulary instruction research with adults, supported by research with children, is that contexts that are more interesting or engaging, such as workplace or family contexts for adults, may be especially useful for vocabulary instruction. Initial research suggests that reading vocabulary can be improved in general functional literacy settings, although a weaker finding from the adult research suggests that teaching vocabulary in a specific setting, such as a family literacy or workplace setting, may be more effective.

More research is needed before teaching practices emerge that are specifically related to the common AE program types: ABE, ASE and ESOL. Research with children suggests that learners at different ability levels, like adults in ABE and ASE programs, might benefit from different kinds of vocabulary instruction. Research with children finds that ELLs benefit from the same approaches to vocabulary instruction that are effective with native speakers, along with the use of their native language, when appropriate, in discussions of new vocabulary.

No studies of vocabulary instruction for AE learners with a learning disability were found, although research with children has found that clarifying or restructuring vocabulary learning tasks may be especially useful for at-risk learners. Restructuring is done to help students understand what they need to do when reading and learning new words.

Overall Findings: AE and Vocabulary Instruction

Stronger Finding: Participation in AE may lead to increases in vocabulary achievement (Byrne, Crowe, Hale, Meek & Epps, 1996; Gold & Horn, 1982, and Gold & Johnson, 1982; Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006; Joe, 1998; Lazar, Bean, & Van Horn, 1998; Messemer & Valentine, 2004; Nickse, 1988; Philliber, Spillman, & King, 1996; Roberts, Cheek, & Mumm, 1994; Venezky, Bristow, & Sabatini, 1994).

Ten studies were found that address the effects of instruction on vocabulary achievement. Four of these were experimental studies in which instruction in an AE program was compared to either a no-instruction control (Gold & Horn, 1982, and Gold & Johnson, 1982; Joe, 1998; and Roberts, Cheek, & Mumm, 1994) or instruction in a different type of AE program (Philliber et al., 1996). Two of the experimental studies used two vocabulary measures rather than just one (Gold & Horn, 1982; Joe, 1998), so there were a total of six

results from the four studies. These results were mixed, four positive and two neutral, favoring AE instruction. Only one of these studies focused specifically on a vocabulary intervention (Joe, 1998). The intervention included prereading, retelling and generative strategies, which resulted in significant improvement on two vocabulary measures, one a multiple-choice test and the other a measure of depth of vocabulary knowledge. This intervention is described in more detail in the Teaching Strategies section below.

The other three experimental studies evaluated comprehensive approaches to literacy instruction but did not describe the vocabulary or other reading instruction in detail. Results were mixed within one study of a specific approach to teaching reading that integrates listening, language and basic reading skills instruction (reported in Gold & Horn, 1982, and Gold & Johnson, 1982). Learners demonstrated increased vocabulary knowledge on one measure (that used analogies) but not on another (knowledge of verbal opposites). In another experimental study, use of programmed learning materials to teach reading comprehension in two types of cooperative learning situations did not lead to increased achievement on a standardized measure of vocabulary knowledge (Roberts et al., 1994). In the final experimental study, participation in a family literacy program increased achievement on a combined measure of vocabulary and comprehension (Philliber et al., 1996). It should be noted that the design for this study included a post-hoc analysis with no control for initial group differences (and, possibly, the use of grade equivalent scores in the analysis).

Nonexperimental results from the research were also mixed. Six nonexperimental studies yielded 11 results, one for each outcome measure. Two studies used two measures of vocabulary knowledge (Greenberg et al., 2006; Lazar et al., 1998), one used four (Byrne et al., 1996), and the remaining three used one measure each (Messemer & Valentine, 2004; Nickse, 1988; Venezky et al., 1994). Of the 11 results, six were positive, finding that vocabulary achievement improved. As with the experimental studies, only one nonexperimental study focused specifically on vocabulary instruction. In this study, described in more detail in the Teaching Strategies section, workplace vocabulary instruction led to significant growth on both general functional vocabulary (as measured by the TABE) as well as content-specific workplace vocabu-

lary (Lazar et al., 1998). Two other studies with positive pre-post test results focused on two AE settings, correctional and family literacy programs, using either the TABE Total Reading score (combined vocabulary and reading comprehension score) or the TABE Vocabulary score as measures (Messemer & Valentine, 2004; Nickse, 1988). In one, effective instruction included a mixture of instructional settings (lecture, small group and independent study) and media (videos, computer-assisted instruction and distance learning) (Messemer & Valentine). In the other, parent literacy training within a family literacy program led to increases in vocabulary of about one GE (on the vocabulary subtest of the TABE) after 40 to 50 hours of instruction (Nickse). Instruction was given one-on-one by highly trained tutors who received 112 total hours of training before and during the course of instruction. Instruction focused on decoding, vocabulary, reading/listening comprehension, study skills, and writing and modeling of learning activities to use with children. It was structured to include demonstration, guided and independent practice, and evaluation activities.

Studies with negative results (finding no differences between groups) included one study of AE programs using experienced teachers that did not, overall, lead to increased vocabulary achievement (Venezky et al., 1994). In another program, literacy and workplace communication instruction did not lead to increased ability on three types of vocabulary tasks (defining words, understanding figurative language and using words in multiple contexts), although they did on another type (recognizing synonyms) (Byrne et al. 1996). In another study with mixed results, authentic literature was chosen by students for sustained silent reading, teacher read-alouds and group discussion. This led to significant increases on a measure of expressive vocabulary but not receptive vocabulary (Greenberg et al., 2006).

Effective Teaching Strategies

Stronger Finding: Instruction that can lead to increased vocabulary achievement provides opportunities for adult learners to (1) use new vocabulary words multiple times and (2) process them deeply by relating them to other concepts in a text and to prior knowledge (Gold & Horn, 1982, and Gold & Johnson, 1982; Joe, 1998; Lazar, Bean, & Van Horn, 1998).

Most of the studies with vocabulary outcome measures described above did not look closely at specific approaches to teaching vocabulary but focused instead on program evaluation or comprehensive approaches to literacy instruction. Three studies that have described vocabulary interventions in some detail have reported generally positive results (Gold & Horn, 1982; Joe, 1998; Lazar et al., 1998). A common feature among these interventions is that new concepts and vocabulary are used multiple times during focused discussions or other activities, including writing, demonstrations and simulations. These activities are often motivating and engaging. They provide adult learners with the opportunity to connect new concepts or vocabulary to other concepts in a text, or to concepts they already know.

In a study with experimental results (reported in Gold & Horn, 1982, and Gold & Johnson, 1982), trained tutors used a specific teaching strategy called the Directed Listening—Language Experience Approach. In this approach, used with adults reading below the fifth grade level (average GE between 2 and 3), tutors introduced new concepts with motivating, tutor-directed discussions about what the learners knew and did not know about a topic. The tutor then read aloud information about the topic and guided the learners as they constructed a coherent summary. Next, this summary was used to teach other reading skills and to practice reading. Additional instruction included word recognition practice using a multisensory approach (VAKT), whole-word phonics (phonics by analogy) and comprehension strategies. This approach resulted in an increase in adults' reading vocabulary achievement on the word comprehension subtest of the Woodcock Reading Mastery Test. The program did not lead to an increase in oral vocabulary or language ability (as measured with the Detroit Test of Verbal Opposites).The Directed Listening approach was eclectic and included the discussion of topics of interest to adults, focusing on understanding; language experience; alphabetics; comprehension strategies; and a recreational reading program. It should be noted that improved decoding from the word analysis instruction could account for some of the observed improvement on the reading vocabulary measure. It is possible that it enabled these beginning adult readers to read words that they previously understood but could not decode. One-to-one instruction by trained tutors might also have been a factor.

In another experimental study that involved only vocabulary instruction, a group of second-language learners were given questions to read in order to activate their background knowledge and guide them while they read a passage containing new vocabulary words and concepts. Following their reading, they were asked to talk about (retell) the key concepts in the passage and to use think-aloud phrases to further discuss concepts they were not familiar with. (e.g., ***I'm not sure, but I think...***). After one practice session, these English-language learners improved significantly on two vocabulary measures: a multiple-choice test and a measure of depth of vocabulary knowledge for targeted words in the passage (Joe, 1998).

One nonexperimental study supports these findings. Over 54 hours of instruction, hospital staff members were taught work-specific content such as infection control. Instruction included demonstrations, discussion and simulations of specific tasks associated with the content. Document literacy was addressed through the extensive use of charts, forms and lists as reading material. Issues related to job-based communication were also addressed, including attitude, problem-solving and motivation. Vocabulary achievement increased on a general measure of vocabulary (the TABE Vocabulary subtest) as well as on a measure of specific job-related vocabulary knowledge (Lazar et al., 1998).

Effective Teaching Material

Only one study was found that evaluated the effects of a commercially available product, an early test of the popular PLATO learning system (Diem & Fairweather, 1980). This experimental study, using random assignment to groups and lasting eight weeks in a correctional setting, found that inmates using an extensive, individualized computer-based program for reading, spelling and vocabulary instruction (as well as math) performed as well as, but no better than, a group covering the same content using a classroom lecture format.

Effects of Intensity and Duration of Instruction on Vocabulary Achievement

Weaker Finding: Provided that participation in a program produces gains in vocabulary achievement, instruction that is longer in duration may lead to increases in reading vocabulary achievement (Philliber,

Spillman, & King, 1996; Nickse, 1988; Venezky, Bristow, & Sabatini, 1994).

The results were mixed from three studies in which the duration of instruction varied across groups (Philliber et al., 1996; Nickse, 1988; Venezky et al., 1994). Experimental results from one study, in which one group of students received three times the amount of instruction as those in another group, suggest that reading vocabulary achievement does not increase as the total number of hours of instruction increases (Venezky et al.). However, there were no gains overall in reading vocabulary, so differential gains based on hours of instructional time might not be expected.

Two results suggest that as adults stay longer in a program, their vocabulary achievement does increase. An analysis of 32 family literacy programs found gains in vocabulary achievement (on a combined vocabulary-comprehension measure) to be related to length of stay in the programs (Philliber et al., 1996). Those staying less than 50 hours gained very little, those staying 51 to 100 hours gained an average of 1.1 GE and those staying more than 150 hours gained an average of 1.4 GE. A similar relationship between duration of instruction and gain in vocabulary achievement is seen in the results from the analysis of another family literacy program (Nickse, 1988). Average gains in vocabulary achievement increased from no gain for those receiving 25 to 30 hours of instruction to a gain of 0.8 GE for those attending for 41 to 50 hours. It should be noted that both of these studies used GE scores, which are not equal-interval scores, as the unit of analysis.

None of these studies described specific approaches to vocabulary instruction. Vocabulary achievement was simply one measure used to evaluate overall program effects.

Research With Other Populations: Instructional Methods and Material

Summary of Findings

Evidence from K–12 vocabulary instruction studies supports and extends findings from studies with AE learners. Findings from the NRP review (NICHD, 2000b) and a follow-up to the NRP (Kamil, 2004) highlight the importance of repetition and the use of multiple contexts in vocabulary instruction, the importance of active engagement and the possibility that restructuring tasks may be especially useful for at-risk learners.

Teaching Strategies

As the following findings suggest, the meanings of individual words can be taught directly. However, we learn many thousands of words as our reading develops, and it is not possible to teach all of these words individually, one at a time (Nagy & Scott, 2000). In addition to direct instruction, we must learn many vocabulary words incidentally, when reading texts or conversing with others.

K--12 Research Finding: Repetition and supportive contexts increase vocabulary learning.

Students learn vocabulary words when they encounter them often. Words being taught should occur frequently in instructional texts and should also be useful words that are likely to appear in other contexts, including independent reading. Using instructional texts that provide sufficient context for students to infer words may be more helpful than simply giving definitions to students (Kamil, 2004, p. 218).

K–12 Research Finding: Learning tasks that promote the active engagement or participation of students increase vocabulary learning.

Examples of tasks that promote active engagement in vocabulary learning include making mental pictures of definitions, acting out definitions of words, using context to understand new words, and writing tasks (Kamil, 2004, p. 219).

K–12 Research Finding: Preteach vocabulary words that learners will encounter in texts being used for instruction.

Preteaching vocabulary words that occur in a text, before students begin reading, improves vocabulary acquisition (NICHD, 2000b, p. 4-4).

K–12 Research Finding: Restructure the tasks and procedures used for vocabulary instruction when necessary so that students understand what they need to do when reading and learning new words.

Simply asking a student to write the definition of a word may be too complicated. Examples of restructuring include substituting easy words for hard ones in a text, explaining what a good definition consists of, working in pairs and selecting especially relevant words. Restructuring may be most effective with low-achieving students. In addition to working in pairs, other group learning formats are also helpful, including peer tutoring and reciprocal teaching. The NRP

review suggests that restructuring vocabulary tasks when needed can improve vocabulary acquisition (Kamil, 2008, pp. 218–219; NICHD, 2000b, pp. 4-4, 4-22).

K–12 Research Finding: Encourage activities, such as listening and wide reading, that will expose learners to new vocabulary, because vocabulary can be learned incidentally.

> While it has long been assumed that much of our vocabulary must be learned incidentally through reading and listening as opposed to direct instruction from teachers, recent research has shown that indirect learning definitely occurs (NICHD, 2000b, p. 4-21). Encouraging independent reading, however, assumes that what is read is read fluently (i.e., is at an appropriate reading level). It is important for teachers and learners to choose appropriate material.

Teaching Material

K–12 Research Finding: Computer programs may be useful in teaching vocabulary.

The NRP review did not evaluate specific instructional materials; this was not part of its mission. It did, however, identify four studies that suggest that computers may be effective either as supplements to regular instruction or to provide multimedia vocabulary instruction. The use of computer animation, for example, was found to be effective in teaching vocabulary (Kamil, 2004, p. 219).

Instruction for Learners in ABE, ASE and ESOL Programs

ABE

All of the vocabulary studies found for this review include ABE learners or those who would qualify for ABE (adults reading below the high school level, or roughly GE 8 and lower). One possible exception is the study of English language learners in which the reading level of participants is not given (Joe, 1998). However, it is likely that many of the 48 participants in this study, described as low-intermediate to advanced in English language ability, were reading below the high school level. Most were well below mastery on a test of their knowledge of the first three thousand general words of English.

Each AE finding described above, then, applies to ABE learners. Participation in ABE can lead to increases in vocabulary achievement, and effective vocabulary instruction includes opportunities to use new words multiple times and process them deeply.

ASE

Two of the experimental vocabulary studies included ASE as well as ABE learners (Philliber, Spillman, & King, 1996; Venezky, Bristow, & Sabatini, 1994). Both studies evaluated AE literacy programs rather than specific approaches to teaching vocabulary. In addition, as discussed in the Overall Findings section above, results from these studies were mixed. Philliber et al. reported positive results and Venezky et al. did not. Therefore, no separate conclusions can be made about vocabulary instruction for ASE learners.

ESOL

An experimental study of learners in an ESOL setting found that the type of vocabulary instruction described above is effective: using guided discussion to provide multiple opportunities to use new words and to relate them to prior knowledge and other concepts in the text being read (Joe, 1998). This is described in more detail in the Teaching Strategies section above.

Research With Other Populations

ABE and ASE learners are at different levels of ability in their reading. Research with other populations suggests that those at different ability levels in their reading might benefit from differential instruction. Also, research with younger ELLs is beginning to identify specific approaches that are effective for ELLs. Instruction that uses a student's native language to present and explain new words is effective. As with native speakers, effective approaches use direct and explicit instruction, engaging contexts, and opportunities to use words in varied contexts.

K–12 Research Finding: Vocabulary instruction should be appropriate for older students and tailored to their ability level.

The NRP review found that the effects from various methods of vocabulary instruction are affected by student age and ability level (NICHD, 2000b, p. 4-18). If this result were to carry over to adults, it would suggest using somewhat different approaches to vocabulary instruction in ABE, GED and ESOL programs.

Research With Other Populations of ESOL Learners

K–6 Second Language Research Finding: When vocabulary is the focus of instruction for English-language learners, vocabulary knowledge may increase.

The National Literacy Panel on Language Minority Children and Youth (August & Shanahan, 2006) identified three experimental studies of the effects of vocabulary instruction on second language learners' reading. While more studies are needed, findings from these three studies were consistent with findings from studies of native English-speaking children (NICHD, 2000b) and learners in AE programs (Shanahan & Beck, 2006, p. 431). In addition to presenting words in Spanish first, effective approaches included presenting words in engaging and varied contexts; presenting multiple meanings; and instruction focusing on the relationships between words such as compounds, antonyms and synonyms. Although similar methods may be used with first (native) and second language learners, the reviewers point out that some adjustments to common instructional routines were made for second language learners. Instructors presented new words and definitions orally in the learners' native language. They noted similarities between words in students' native language and English, paraphrased student responses, and encouraged students to expand on their remarks. Finally, they used a lot of repetition and plenty of gestures and visual cues to clarify meaning (August & Shanahan, p. 354). In general, the NLP concluded that knowledge about second language learners and their first language, such as the information presented in the Introduction to this review, should be useful for teachers.

K–12 Second Language Research Finding: Bilingual education can have a beneficial effect on reading outcomes.

K–5 Second Language Research Finding: Direct, explicit instruction in each of the components of reading, provided in small-group settings, is effective in improving the reading achievement of English learners at risk for reading problems.

The two findings listed above are general findings and apply to each reading component (Francis et al., pp. 392, 397; Gersten et al., 2007, p. 15). They are described in detail in Chapter 6, Alpahbetics.

K–12 Research Finding: Multimedia technology can be effective for vocabulary instruction with second language learners.

Although the NRP did not look specifically at literacy instruction for English language learners, it did find studies indicating that multimedia technology could be effective with second language learners (Kamil, 2004, p. 219).

Learning Disabilities: Research With Other Populations

There is very little research related to vocabulary instruction for adults or children with a learning disability in reading. One of the K–12 research findings from the NRP, presented above, suggests that restructuring vocabulary tasks is especially useful for low-achieving students.

The National Literacy Panel also found 10 studies of reading instruction for English-language learners with learning disabilities (August & Siegel, 2006, p. 526ff.). Two of these, one using a multiple baseline design and the other an experimental design, investigated vocabulary instruction. The first found that students learned English vocabulary faster when it was first taught in their native language. The second is similar to findings with non-LD children: Active processing facilitates vocabulary learning. In this study, instruction including the construction of relationship maps and completion of cloze sentences was more effective than pronunciation help and memorizing the meanings of new words. These findings were among the studies used by the NLP to arrive at some fairly general conclusions (August & Siegel, p. 526ff.).

- Teachers can use students' native language to help them learn in a second language. Being taught initially in a native language and then transitioned to English was effective, for example. This is similar to the finding with ELL students generally that bilingual instruction can be effective.

- Making instruction more comprehensible through extensive, teacher-led conversation about text in both English and the native language is helpful.

- Some specific strategies that work well with native-language learners might also be effective with English-language learners, such as reciprocal teaching and repeated reading.

While several of these were experimental studies, many were nonexperimental case studies, ethnographies, or studies with multiple-baseline designs

with limited generalizability. The general conclusions drawn by the NLP were, therefore, tentative.

Other Topics: Effects of Goals and Setting

The Goals and Setting topic was the only other topic area in which this review found vocabulary studies involving AE learners. Although much more research is needed, two studies suggest that vocabulary instruction may be especially effective in a family literacy setting. Research with children suggests that authentic and engaging contexts can provide opportunities for repeated exposure to new vocabulary, an important ingredient in learning new words.

Studies of vocabulary instruction have taken place in programs aligned with each of the major AE goals or settings: family, workplace, correctional and general functional literacy. Most studies have taken place in general functional literacy settings, and results have been mixed (Gold & Horn, 1982, and Gold & Johnson, 1982; Greenberg et al., 2006; Joe, 1998; Venezky et al., 1994). Three studies took place in correctional settings: two experimental studies with neutral results (no significant differences between groups) (Diem & Fairweather, 1908; Roberts et al., 1994) and one descriptive study with positive results (Messemer & Valentine, 2004). Two descriptive studies, also with mixed results, were work-oriented (Bryne et al, 1996; Lazar et al., 1998). Positive results were found in two studies of family literacy programs (Nickse, 1988; Philliber et al., 1996). Taken together, these studies suggest that, at a minimum, setting is not a limiting factor in vocabulary instruction. This finding is consistent with vocabulary research suggesting that engaging and motivating materials are helpful; family, workplace and functional literacy settings and material are all potentially engaging and motivating for adults.

Can setting facilitate vocabulary instruction? Only two studies were found that address this question directly by comparing setting effects. Both studies focus on family literacy.

Weaker Finding: Teaching vocabulary along with other reading skills within a family literacy program may lead to a greater increase in vocabulary achievement than instruction in other settings (Nickse, 1988; Philliber, Spillman, & King, 1996).

Experimental results from one study of 32 family literacy programs in 10 cities suggest that participation in a family literacy program leads to greater increases in "total reading" (vocabulary and comprehension scores on a standardized test combined) than nonfamily literacy programs (Philliber et al., 1996). It should be noted that the design for this study included a post-hoc analysis with no control for initial group differences and may have used grade equivalent scores as the unit of analysis. Results from a nonexperimental study of a family literacy program that included intensive reading instruction for adults also found that participation led to improved reading vocabulary (Nickse, 1988).

Research With Other Populations

Research with children suggests that authentic and engaging contexts can provide opportunities for repeated exposure to new vocabulary, an important ingredient in learning new words. This is compatible with findings from the AE research literature, described above, suggesting that vocabulary instruction in workplace and family literacy settings is effective. Both are authentic and engaging settings for adults.

K–12 Research Finding: To help provide repeated exposure to new vocabulary, teach AE learners new words that will be useful in multiple, authentic settings.

Some of the K–12 research on vocabulary instruction with children might explain why vocabulary instruction in family literacy settings with adults seems promising. This research suggests that repeated exposure to new vocabulary in rich contexts is important for learning.

> Repeated exposure to vocabulary items is important for learning gains. The best gains were made in instruction that extended beyond single class periods and involved multiple exposures in authentic contexts beyond the classroom... [Therefore] vocabulary words should be those that the learner will find useful in many contexts (NICHD, 2000b, p. 4-4).

Definition

Reading comprehension is the process of constructing meaning from a text, or understanding what we read (NICHD, 2000b, p.4-5). Comprehension is a *construction process* because, first of all, it involves all of the elements of the reading process working together. To comprehend, we must decode words and associate them with their meanings in memory. Phrases and sentences must be processed fluently enough so that their meanings are not lost before the next ones are processed.

Second, the writer who composed the text being read put together a whole, hopefully coherent, network of thoughts for the reader. This more or less coherent whole is recreated as needed, piece by piece, in the reader's memory without the benefit of live conversation, relying only on what is derived from the text and the reader's own prior knowledge or past experiences, also stored in memory. This complex network of ideas that represents a text in memory is constantly modified as the reading progresses. Problems in creating this representation, or understanding a specific text, may be encountered as the text is processed.

Finally, the reader must constantly monitor the process of constructing meaning in order to recognize these problems and reason through and resolve them. Comprehension is an active process, and the reader must interact and be engaged with the text for it to work well.

Rationale

Why should reading comprehension be taught? Comprehension is the reason or purpose for reading. In order to get information from a text, remember it later and use it effectively, whether for work or for pleasure, reading comprehension is essential. Effective readers use strategies to interact and engage with texts. Less effective readers are not aware of comprehension strategies and are not likely to develop them on their own. Comprehension is a strategic process, and these strategies can be taught.

Strategies are procedures that guide students as they attempt to read and write. For example, a reader may be taught to generate questions about the text as it is read. These questions are of the why, what, how, when, or where variety; and by generating and trying to answer them, the reader processes the text more actively (NICHD, 2000b, p. 4-40).

Assessment

Students read extended texts when their reading comprehension is assessed. Texts may range from just a few sentences for beginning readers to long passages for more advanced readers. Students who have constructed good representations of a text they have read will be able to recall and make inferences from specific ideas in the text. The most common form of assessment is question-asking, although many other tasks may be used. Multiple-choice questions, short-answer questions, cloze tests and summarizing are examples of tasks used to assess comprehension.

Teachers use these tasks to determine whether students can recall and make inferences from a text they have read. As noted above, students develop comprehension strategies or procedures in order to be able to recall and use information in a text. Teachers use other measures to determine whether students have learned specific comprehension strategies such as question generation (asking yourself questions while reading), error detection (knowing when you do not understand something while reading), and other forms of comprehension monitoring. They may observe students as they read or ask them to think aloud, or talk about what they are reading as they read it.

There are two broad types of assessment: standardized tests and informal tests (NICHD, 2000b). Standardized tests are usually developed by a test publisher and come with detailed, standard procedures for administering and scoring the test to help ensure that it is administered consistently. Informal tests are usually developed by teachers or researchers for a specific purpose. Just as a teacher may use either teacher-designed tasks or published tests, or both, to assess student reading comprehension, researchers conducting experiments may use both researcher-designed and standardized tests. For both teachers

and researchers, the assessments that they design may be more closely related than standardized tests to what they are teaching or investigating. Teachers in a workplace literacy class in a factory, for example, might teach and construct informal comprehension tests using books, pamphlets, memorandums and other reading material actually encountered by workers in the factory.

Writing may be used to improve reading achievement, and teachers can assess the quality of their students' writing using common writing assessments: (1) holistic and analytic ratings of complete compositions; (2) standardized, norm-referenced tests of spelling, conventions, sentence writing and composing; and (3) curriculum-based measurement (CBM) tasks based on fluency and accuracy of text production. In addition, research on writing applies other analytic measures to describe written compositions (e.g., sentence or T-unit length, text structure elements, cohesion, spelling errors). Of tests commonly used in ABE, the CASAS (Comprehensive Adult Student Assessment System) has an optional essay-writing test. The General Educational Development (GED) includes both an essay-writing test and a writing section based on multiple-choice questions.

Large-scale writing assessments use holistic or primary trait ratings to evaluate the quality of written compositions. The National Assessment of Educational Progress (NAEP) writing assessment is a typical example (Persky, Daane, & Jin, 2003). Participants write compositions in response to a prompt that specifies a topic, audience and purpose (e.g., to persuade). Raters evaluate the overall quality of the compositions using a six-point rubric and anchor papers that represent typical performance at each level. The rubric considers development of ideas, organization of thoughts and grammatical correctness. Holistic quality ratings are widely used in research and in high-stakes assessments, although there is continuing controversy about whether their reliability is adequate for making consequential decisions about individuals (Huot & Neal, 2006). A relatively recent development is automated essay scoring, in which computers score compositions. The research shows levels of interrater reliability between computers and human scorers that equal reliability between two human raters (Shermis, Burstein, & Leacock, 2006).

For instructional purposes, holistic quality ratings have limited value because they do not indicate which aspects of writing need improvement. Analytic ratings are similar to holistic ratings except that compositions are rated on a series of separate traits, typically including content, organization, style or voice, word choice, sentence fluency and conventions (Diederich, 1966). Research shows that raters can distinguish and separately rate multiple traits (Diederich; Huot, 1990) and that individual compositions show different patterns of strengths and weaknesses on the traits (Roid, 1994).

Standardized, norm-referenced tests are available to assess a range of writing skills. A number of common achievement tests include measures of spelling and written expression (e.g., Peabody Individual Achievement Test; Woodcock-Johnson Tests of Achievement; Kaufman Test of Educational Achievement). In addition, a few tests focus entirely on written expression. The Test of Written Language (Hammill & Larsen, 1996), for example, includes a story-writing task that is scored for story elements, language use, and conventions, as well as separate tests of spelling, vocabulary, grammar/conventions, logical sentences and sentence combining.

CBM is an approach to designing assessments that are short enough to be used for regular monitoring of learners' progress, usually weekly (Espin, Sierka, Skare, & Halverson, 1999). CBM measures are based on fluency and involve short, timed performances. For writing, learners are given a writing prompt and allowed to write for three to five minutes. The resulting composition is scored for combined fluency and accuracy by counting the number of correctly spelled words or the number of correct word sequences, considering grammar, spelling and meaning. At low levels of writing skill, CBM measures correlate reasonably well with other measures of writing, though they are somewhat less reliable and valid with students functioning at a secondary school level (McMaster & Espin, 2007).

Of the measures commonly used in adult education, only a few include assessments of writing. The GED examination does include assessments of writing. The examination includes a writing sample scored holistically for overall quality. It also includes a multiple-choice section focused on specific writing skills. Below that level, most ABE literacy tests (e.g., Test of Adult Basic Education; Adult Basic Learning Examination) do not include writing assessment.

However, the Comprehensive Adult Student Assessment System (CASAS) does have an optional writing section that asks students to write a complete essay. The national reporting system for adult education programs does not require writing assessment. However, some states do assess writing in their adult literacy programs, generally using holistic or analytic scoring.

Findings From Reading Comprehension Assessment Studies

Summary of Findings

Several large-scale studies provide reliable information about adults' reading comprehension. Results indicate that most AE learners have poor functional literacy comprehension, including health literacy comprehension. While they can perform simple comprehension tasks such as locating a single piece of information in a simple text, they have difficulty integrating and synthesizing information from longer, more complex texts.

One of the large-scale surveys, the Adult Education Program Survey, found that adults in each of the major AE program areas (ABE, ASE and ESOL) have poor reading comprehension. The average reading levels of adults in all three programs are below what is considered necessary for success in today's labor market.

As expected, learners in ASE programs have significantly better average comprehension scores than adults in the other programs. Adults in ESOL programs have significantly lower comprehension of English texts than ABE learners. ESOL learners tested in their native language score at roughly the same level as other AE learners. This suggests that poor English language proficiency is an important factor for ESOL learners, in addition to poor reading comprehension.

While language is a secondary issue for those in ESOL programs, assessment research described in earlier chapters suggests that enabling skills such as alphabetics or fluency may be important secondary issues for adults with a learning disability in reading. Adults with LD have, on average, lower reading comprehension achievement and are over-represented in the AE target population.

Additional research suggests that learners reading at the ABE level are less aware of comprehension strategies than skilled readers. Also, the relationship between age and comprehension is more complicated for those in AE than for those in the general population. Overall, reading comprehension declines after age 60, but this trend does not hold for ELLs, ASE learners, and adults with LD. Younger ELLs have lower scores than other ELLs; there is no relationship between age and comprehension ability for ASE learners and adults with LD.

It is important for instructors to assess their AE learners' ability to acquire and use information from text in order to prepare for instruction and to measure progress. Assessment should also be used to help determine to what extent secondary issues related to reading comprehension difficulties need to be addressed. Some research suggests that results from comprehension assessment may vary quite a bit depending on the test used and when it is administered, so instructors need to choose comprehension tests carefully.

Overall Findings: AE Learners' Strengths and Needs in Reading Comprehension

Several studies evaluate AE students' reading comprehension ability. One of them has also looked at the health literacy of adults who qualify for AE. Comprehension is the only major topic area where research was found that begins to consider questions related to the quality of the tests used for assessment.

Stronger Finding: Most adults in AE programs have poor functional literacy comprehension achievement. Although they may be able to perform simple comprehension tasks such as recalling ideas from simple stories and locating a single piece of information in a simple text, they are often unable to combine (integrate or synthesize) information from longer or more complex texts. (Gold, 1983; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; Kutner et al., 2007; Mellard, Fall, & Mark, 2008; Tamassia, Lennon, Yamamoto, & Kirsch, 2007)

In 2003, the Adult Education Program Study (AEPS) assessed the prose, document and quantitative literacy of 6,100 adults, a representative sample of all adults in federally funded adult education programs (Tamassia et al., 2007). This study found that, on average, adults in AE programs have poor functional literacy comprehension. While they are able to locate a single piece of information in a short text, they are unable to locate information in longer texts when distractors are present or when low-level inferences are required. Adults

in the general non-AE population are able, on average, to successfully complete this type of reading task.

The AEPS literacy assessment was derived from the Adult Literacy and Life Skills Survey (ALL), an assessment used internationally in seven countries, including the U.S., allowing AEPS results to be compared directly to ALL results from the general population. AEPS and ALL scores in prose, document and quantitative literacy are arranged on a 500-point scale across five levels, with Level 1 scores ranging from 0 to 225, Level 2 scores from 226 to 275, Level 3 scores from 276 to 325, Level 4 scores from 326 to 375 and Level 5 scores from 376 to 500.

Those scoring at Level 1 range from those who are unable to demonstrate an understanding of simple texts to those who are able to perform simple tasks such as locating a single piece of easily identifiable information in a short text. Those at Level 2 are able to locate information in a simple text when distractors are present and integrate two or more pieces of information in simpler texts. Level 3 is the minimum level adults need for coping with the literacy demands of today's labor market (Tamassia et al., 2007, p. 67). Comprehension tasks as this level require adults to use low-level inferences to identify appropriate information, and to combine (integrate or synthesize) information from longer or more complex texts. Readers at Levels 4 and 5 can identify appropriate information in increasingly longer, more dense and complex texts with many distractors and respond to tasks that require higher-level inferences or specialized background knowledge.

The average score for those taking the ALL is roughly 267, or the high end of Level 2 (averages of 269, 270 and 261 on the Prose, Document and Quantitative scales, respectively). This is about the same as the average score for those in the general population who have completed high school (266), just below Level 3. The average AEPS prose and document scores for AE learners were at the high end of Level 1 (219 and 228, respectively), well below minimum labor market standards. Forty-nine percent of AE learners are at Level 1 on the AEPS, 36 percent at level 2, 14 percent at Level 3 and only 1 percent at Levels 4 and 5.

Findings from the AEPS are supported by two other large-scale adult literacy surveys, the National Adult Literacy Survey (NALS) conducted in 1992 and the National Assessment of Adult Literacy (NAAL) conducted in 2003 (Kirsch et al., 1993; Kutner et al.,

2007). Results from both are based on large, nationally representative samples of all adults in the U.S., about 26,000 respondents to the NALS and 21,000 to the NAAL. Like the AEPS, both of these literacy assessments used a 500-point scale across multiple levels (five levels for the NALS and four for the NAAL). Although neither survey looked specifically at AE students, both found that those with a high school education had average scores at the high end of Level 2, as was found with the AEPS. Adults eligible for AE services (those without a high school degree) scored predominantly in the bottom two levels. The tasks required at the two lower levels on these assessments (Levels 1 and 2 on the NALS and the Below Basic and Basic levels on the NAAL) were virtually identical to those required for Levels 1 and 2 of the AEPS. Examples of tasks at different levels are listed below (from Kutner et al., p. 5).

- Below Basic, Level 1: Finding out how long an event lasted, based on a newspaper article, or finding information in a short, simple prose passage.

- Basic, Level 2: Explaining the meaning of a metaphor in a narrative, or finding information in a pamphlet for jurors explaining how people are selected for jury duty.

- Intermediate, Level 3: Summarizing the work experience required for a job based on a newspaper ad, or inferring the meaning of a metaphor in a poem.

- Proficient, Levels 4–5: Evaluating information to figure out which legal document applies to a health care situation, or inferring the purpose of an event described in a magazine article.

Two additional studies support these findings from large-scale surveys. The first investigated a stratified sample of 295 learners from each of the six National Reporting System literacy levels. These levels are used in all federally funded programs and include four ABE levels (1 through 4) and two ASE levels (5 and 6). This study, described in more detail in Chapter 5, Reading Assessment Profiles, used cluster analysis to identify seven distinct groups of adult learners, from lower-literate to higher-literate AE learners (Mellard et al., 2008). Reading comprehension scores increased at each successive level, with adults in the first four levels scoring below the 10th percentile on comprehension, those in the next two levels scoring below the 50th

percentile and only those in the highest group scoring above average (above the 50th percentile).

Another study of 95 adults, roughly half enrolled in AE programs and half in community colleges, also found that those reading below the high school level (GE 12 on a test of word recognition) had poorer reading comprehension. Their reading rate and speed on comprehension tasks was significantly below that of adults reading above the high school level (GE 12 and above) (Sabatini, 2002).

In addition to the findings presented above, research suggests that intermediate adult readers (those scoring at GE 4–6 on a standardized reading comprehension test) are able to recall information from simple stories (Gold, 1983).

Stronger Finding: Most adults in AE programs have poor health literacy comprehension (Kutner, Greenberg, Jin, & Paulsen, 2006).

The NAAL found that adults most likely to qualify for AE, those scoring at the lower two levels on the NAAL assessment instrument (Below Basic and Basic), had difficulty completing tasks that required them to make low-level inferences and to integrate information from more complex texts. Here are two examples of these tasks, from the NAAL Intermediate level (the third level of four) (Kutner et al, 2006, p. 6):

- Read a drug label and identify three substances that may interact with the drug to cause a side effect.

- Use a vaccination chart to find the appropriate age for children to receive a particular vaccine.

Most were able to complete simple comprehension tasks that required locating a single piece of information in a short health text, such as reading a short set of instructions and then identifying what is permissible to drink before a medical test. However, 39 percent of these adults (those at the Below Basic level) were unable to complete tasks that required the integration of easily identifiable information in a short health text such as the following: After reading a clearly written pamphlet, give two reasons why a person without symptoms should be tested for a specific disease.

Stronger Finding: When different assessment instruments are used to measure gain in reading comprehension achievement, or when the same instrument is used at several points over the course of instruction,

results related to reading comprehension achievement may be extremely variable. Some comprehension measures may be more valid than others (Greenberg, Pae, Morris, Calhoon, & Nanda, 2009; Perin & Greenberg, 1993; Venezky, Bristow, & Sabatini, 1994).

One assessment study using inferential statistics, in which ABE students' reading comprehension was measured with two different tests at three and four points in time during instruction, found significantly larger gains for one group on one measure after about 20 weeks, but not on another (Perin & Greenberg, 1993). In addition, one group's gain from pretest to posttest was significant on only one of the two measures. Growth on both measures was extremely variable over time. In a descriptive study involving one group of ABE learners who were administered three tests of reading comprehension at three points in time, learners showed gain on all three measures from time one to time two, but gain on only one from time two to time three (Venezky et al., 1994). The three measures used were the TABE Reading Comprehension and the TALS Document and Quantitative tests. An analysis of the TABE and TALS found the TALS to be a more reliable measure of reading comprehension.

A descriptive study looked at the use of the Gray Oral Reading Test-4 (GORT-4), a test normed on children, with adults reading at GE 3–5 on a measure of word recognition (WJIII Letter-Word Identification). This analysis found that adults' reading comprehension (answers to questions following oral reading) was better on harder passages (at Levels 3–5) than on easier passages (Levels 1–2). Although these differences were not tested for statistical significance, the result suggests that GORT-4, and perhaps other tests normed on children, should be used cautiously with adults (Greenberg et al., 2009).

AE Learners' Strengths and Needs in Writing

Writing instruction can be used to improve reading comprehension outcomes. This research is described in the Teaching Strategies section of this chapter. Because writing instruction can be used to improve reading achievement, it would be useful to know what AE students' strengths and needs are in writing. Unfortunately, little research was found on adult education and writing assessment or on the characteristics of the writing of adult education learners. A few qualitative studies of the writing of underprepared college

students, or basic writers, have been reported (for a review, see Gillespie, 2001). Gregg and her colleagues have published several quantitative descriptive studies focused on college students with learning disabilities and basic writers (e.g., Gregg, Coleman, Stennett, & Davis, 2002). The only writing topic for which descriptive information was available for low-literate adults as defined for this review was spelling, which is reviewed in chapter 6. Research describing the writing and writing processes of adult literacy learners is much needed.

Strengths and Needs of Learners in ABE, ASE and ESOL Programs

The AEPS compared the comprehension of students across the major AE program areas: ABE, ASE and ESOL programs. Several additional studies, including the NAAL and NALS, provide more information about the unique characteristics of students who qualify for ABE and ESOL programs.

ABE

Stronger Finding: Adults in ABE classes have poor functional literacy comprehension achievement. Most are able to locate information in short texts and make low-level inferences while reading but have difficulty locating and integrating information in longer texts. On average, their reading comprehension is much better than those in ESOL classes (reading English texts) but not quite as good as those in ASE classes (Gold, 1983; Tamassia, Lennon, Yamamoto, & Kirsch, 2007).

The average prose score on the AEPS for adult learners in ABE classes was 240 on a 500-point scale, roughly in the middle of Level 2 on the five AEPS reading comprehension levels (Tamassia et al., 2007). This was significantly lower than those in ASE classes, who were also in the mid-Level 2 range but with a higher average score of 255. It was, however, significantly higher than those in ESOL classes, who had an average score of 175, in Level 1. The average of those graduating from high school on the AEPS was 266, for example, at the high end of Level 2. Only 16 percent of ABE learners were at Level 3, and only 1 percent were at Levels 4 or 5. Forty-seven percent were at Level 2 and 36 percent at Level 1. As noted above, intermediate ABE learners are able to recall information from simple stories (Gold, 1983).

Weaker Finding: ABE adults' knowledge about reading, or their meta-comprehension, is more like that

of children who are beginning readers. They are less aware than good readers of strategies that can be used to monitor comprehension, view reading as decoding as opposed to comprehending text and are less aware of the general structure of paragraphs and stories. They are aware of the influence of motivation, interest, and prior knowledge on reading. (Gambrel & Heathington, 1981).

Assessment results from one study using inferential statistics suggest that ABE readers' metacomprehension ability is more like that of beginning readers described in the literature (Gambrel & Heathington, 1981). In this study, learners reading at the ABE level (with reading levels below GE 6) and skilled college readers were interviewed about their knowledge of reading comprehension. Interview results suggest that both groups are aware of the influence of motivation, interest and prior knowledge on comprehension. ABE readers, however, are less aware of text structure, or how paragraphs and stories are organized, and of strategies that can be used to resolve comprehension failure. Like younger beginning readers, they are more likely to associate reading with decoding as opposed to comprehending text.

ASE

Stronger Finding: Adults in ASE classes have poor functional literacy comprehension achievement, although it is better, on average, than that of adults in ABE and ESOL classes. Like ABE learners, most are able to locate information in short texts and make low level inferences while reading but have difficulty locating and integrating information in longer texts (Tamassia, Lennon, Yamamoto, & Kirsch, 2007).

On the AEPS, the average prose literacy score for adults in ASE programs was 255, significantly higher than the average for ABE learners but still falling within the same, mid-Level 2 range (Tamassia et al., 2007). Twenty-four percent of ASE learners scored at Level 1 and 45 percent at Level 2 compared with 36 and 47 percent, respectively, for ABE learners. Twenty-eight percent of ASE learners performed at Level 3, the minimum standard for workplace literacy. Only 3 percent performed at Levels 4 and 5.

ESOL

Stronger Finding: Adults in ESOL classes, on average, have poor functional literacy comprehension

achievement in English, much poorer than ABE and ASE adults. However, ESOL adults have the same average comprehension achievement as other AE students when they read texts in their native language (Fang, 1994; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; Kutner et al., 2007; MacArthur, Konold, Glutting, & Alamprese, 2010; Nanda, Greenberg, & Morris, 2010; Tamassia, Lennon, Yamamoto, & Kirsch, 2007).

The reading comprehension of adults in ESOL programs may suffer because of their lack of English oral language proficiency. On the AEPS assessment of functional reading comprehension, learners in ESOL classes had a much lower average score (175) than those in ABE and ASE classes. A large majority of ESOL learners, 79 percent, scored at the lowest level (Level 1) on the AEPS. Learners at this level range from those who are unable to comprehend simple passages in everyday texts to those who can locate information in simple texts. Seventeen percent scored at Level 2, and only 4 to 5 percent scored at Levels 3 to 5 (Tamassia et al.). Two additional studies support these AEPS findings. In a study of close to 500 ABE learners (reading at GE 4–7) from 23 programs in 12 states, English language learners scored significantly lower on a measure of reading comprehension than native speakers of English (MacArthur et al., 2010). The same results were reported in another study of 371 AE learners. In this study, ESOL learners scored lower on oral vocabulary as well as reading comprehension (Nanda et al., 2010).

Both language proficiency and background knowledge interact to affect reading comprehension among ELLs (Fang, 1994). ESOL learners' comprehension of English prose texts is limited by both language differences and poor overall literacy. When Spanish-speaking AE students read Spanish prose texts, their comprehension achievement is roughly the same, overall, as that of native speakers reading the same texts in English. Both groups have the same, limited prose literacy comprehension achievement in their native languages. The ELLs have the added burden of limited English language skills.

The overall AEPS results are also supported by results from both the NAAL and NALS (Kirsch et al., 1993; Kutner et al., 2007). As a group, the ELL population is overrepresented at the two lowest levels on the NALS and NAAL, which closely correspond to Levels 1 and 2 on the AEPS. Adults born outside the U.S., and likely to have learned a language other than English as their first language (adult ELLs), score lower on the NAAL and NALS than those born in the United States. For the 2003 NAAL, 35 percent of adults who spoke only Spanish prior to entering school—indicating that they are ELLs—scored at the Below Basic (Level 1) prose proficiency level.

Stronger Finding: English language learners tend, on average, to have lower health literacy comprehension and are overrepresented in the AE target population (Kutner, Greenberg, Jin, & Paulsen, 2006).

The NAAL found that those who spoke languages other than English before starting school had lower average health literacy than adults who spoke only English (Kutner et al, 2006, p. 6).

Research With Other Populations: English Language Learners

Research with younger second language learners supports the findings from the studies of adult ELLs presented above. It also suggests that writing develops similarly in ELL and native speakers.

K–8 Second Language Research Finding: The reading comprehension achievement of language-minority learners is much lower than that of their native-speaking peers.

Most of the studies that support this finding, from the report of the National Literacy Panel, took place in the Netherlands. The NLP report noted that language-minority learners' difficulty with comprehension was most likely the result of their poor oral language ability in their new language (Lesaux & Geva, 2006, p. 62; Lesaux, Koda, Siegel, & Shanahan, 2006, p. 100).

K–12 Writing Research Finding: Early development of writing in English is similar for ELLs and native speakers, writing processes are similar at later stages and ELLs may transfer knowledge about writing from their native language to English.

An increasing proportion of learners in adult literacy programs are English language learners or native speakers of a language other than English. Thus, this area is of considerable importance. Unfortunately, there is little research on it even with adolescent students. Fitzgerald (2006), in a review of research on multilingual writing in grades K–12, presented three tentative conclusions based on five to seven studies each. First, for beginning readers in the primary

grades, development of English writing by ELL children and native English speakers is similar in many ways. For example, emergent writing and spelling development may go through similar stages for ELLs and native English speakers. Second, for elementary school students, knowledge about writing in a native language, such as knowledge of phonetic spelling, may transfer to writing in English. Third, at the middle and high school levels, writing processes may be similar in many ways in the native language and English. For example, processes for planning and making choices about syntax and vocabulary may be similar. Taken together, there is evidence for similar developmental processes and transfer of knowledge between writing in a native language and English.

Strengths and Needs of AE Learners With a Learning Disability

Stronger Finding: Adults with a learning disability have, on average, lower literacy comprehension achievement and are overrepresented within the AE target population.(Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; Kutner et al., 2007; MacArthur, Konold, Glutting, & Alamprese, 2010; Mellard & Patterson, 2008; Swanson & Hsieh, 2009; Tamassia, Lennon, Yamamoto, & Kirsch, 2007).

Three studies have found that adults with LD, including adults in AE, have lower reading comprehension achievement than other AE learners and other adults without LD. In a study of close to 500 ABE learners (reading at GE 4–7), discussed above and in chapter 5, close to one-half reported that they had a learning disability when younger (MacArthur et al., 2010). These ABE adults scored significantly lower than ABE learners without LD on all components of reading, including reading comprehension. The second study compared 311 AE learners with and without LD (also self-reported) on measures of academic and functional reading comprehension (Mellard & Patterson, 2008). These learners came from 13 Midwestern AE programs, and 29 percent reported having a learning disability. Controlling for differences in IQ and age, adults with LD scored significantly lower adults without LD on both academic reading comprehension (10 to 25 percent lower, or GE 3 vs. 5) and functional reading comprehension (15 to 30 percent lower). The third study was a meta-analysis of 52 studies involving more than 1,000 adults with a learning dis-

ability (Swanson & Hsieh, 2009). It also reported that adults with LD scored significantly lower than adults without LD on measures of reading comprehension achievement. This study did not distinguish between AE and non-AE adults.

Several large-scale surveys of adult learners have found that adults with LD are overrepresented in the AE target population (adults who qualify for AE or are in an AE program). AE learners taking the AEPS were asked if they had a learning disability. Sixteen percent of AE learners scoring at Level 1 on the AEPS and 15 percent scoring at Level 2 reported having a learning disability (Tamassia et al., 2007). This finding is also supported by data from both the NAAL (Kutner et al., 2007) and NALS (Kirsch et al., 1993), and by a recent meta-analysis of studies of adults with a learning disability (Swanson & Hsieh, 2009).

Both the NAAL and NALS looked at the literacy of all adults, not just those in AE. On both of these assessments of large, representative samples of adults throughout the U.S., adults found to be reading at Levels 1 and 2 (Below Basic and Basic literacy levels) were those who would be most likely to qualify for adult education services (those reading below a high school level). On the NAAL, 58 percent of adults who said that they had been diagnosed or identified with a learning disability scored at Levels 1 and 2; only 41 percent of adults without LD scored at these levels (Kutner et al., 2007). On the NALS, more than 80 percent of all adults reporting that they had a learning disability scored at Levels 1 or 2. While only 3 percent of adults overall reported having a learning disability in this survey, 8 percent of those scoring at Level 1 reported having a learning disability, along with 14 percent of those who were unable to complete any of the literacy tasks on the assessment (Kirsch et al., 1993).

Other Topics: Relationships Between Reading Comprehension and Age and Health

Age

Stronger Finding: The relationship between age and reading comprehension achievement is more complex among AE learners that it is in the general population (Kutner et al., 2007; Swanson & Hsieh, 2009; Tamassia, Lennon, Yamamoto, & Kirsch, 2007).

As in the general population, ABE and ESOL adults' reading comprehension ability decreases after about

age 60. However, younger ELL adults in AE also have lower comprehension scores, and there is no relationship between ASE and LD adults' scores and age.

The NAAL found that, in the general population, prose literacy scores increase for adults through age 40, hold steady through age 64 and then decline (Kutner et al., 2007). The AEPS found that this was also true for AE learners in ABE and ESOL programs. Their average scores decrease after age 60. However, the AEPS found that very young learners in ESOL programs also have lower average scores, and it found no relationship between age and literacy ability among ASE learners (Tamassia et al.,2007). The meta-analysis of 52 studies, mentioned above, also found no relationship between age and reading ability among adults with a learning disability (Swanson & Hseih, 2009).

Health

Stronger Finding: While higher literacy is associated with better health in the general population, the relationship between health and reading comprehension ability among AE learners is more complex (Kutner, Greenberg, Jin, & Paulsen, 2006; Tamassia, Lennon, Yamamoto, & Kirsch, 2007).

Results from the NAAL suggest that, within the general population, adults with better health literacy are healthier overall. Those who reported poorer overall health had lower average health literacy scores (Kutner et al., 2006, p. 6). In addition, adults most likely to qualify for AE, those at the Basic and Below Basic levels on the NAAL health literacy assessment, scored lower than other adults. Sixty-nine percent of these adults reported that they were in poor health, compared to 32 percent of those reading at higher levels. When looking specifically at the AE population, however, the AEPS did not find a strong relationship between health literacy and level of health. In fact, those who reported the poorest health scored higher on the AEPS literacy assessment than groups reporting fair to excellent health (Tamassia et al., 2007). The authors of this report note that other factors appear to interact with health and literacy ability, including gender, employment status and language. It is also important to note that only 4 percent of AE learners were in the lowest health group and that they reported that their health was "fair" (the remainder reported being in good, very good or excellent health).

Findings From Reading Comprehension Instruction Studies

Summary of Findings

There are more findings related to AE reading comprehension instruction than for alphabetics, fluency or vocabulary instruction. The research related to reading comprehension addresses issues related to most of the subtopics considered in this review, although not always in depth. Quite a few studies have measured adult learners' reading comprehension in order to evaluate the effects of literacy instruction or participation in an AE program. One important finding from this research is that participation in AE programs can lead to improved reading comprehension. Although specific instructional practices that lead to improvement are only beginning to be identified, results point to some general approaches that may be effective.

Direct instruction in the use of reading comprehension strategies is one of these effective approaches. Direct instruction in reading comprehension with adults includes guided practice in specific strategies, with students gradually assuming more responsibility for implementing the strategies. Some of the strategies beginning to be identified include question asking, question answering, summarizing, organizing information by focusing on topics and monitoring comprehension. The studies supporting the use of most of these strategies, however, need to be replicated.

Multicomponent instruction is another approach that is beginning to emerge, based on several studies with positive results. Findings from these studies suggest teaching comprehension along with instruction in other components of reading, such as alphabetics and fluency. Teaching alphabetics or other components of reading may be effective because they enable reading comprehension. Comprehension is difficult when readers are struggling with decoding, for example.

A third group of studies indicates that reading comprehension can be improved by manipulating the classroom environment to enable comprehension. Enabling factors include providing more learner-centered activities for students and more assistance for teachers with volunteers or paid assistants.

While there are no findings from evaluations of commercially available teaching materials, a few experi-

mental studies and several nonexperimental studies found that integrating adult-oriented or contextually relevant material into instruction leads to increased comprehension achievement. Also, instruction that is more intense and lasts longer is effective.

There is one finding in the last category under methods and materials: teacher preparation. This finding suggests that AE staff with more experience or training are more effective. A relatively small set of studies examined by the NRP suggests that teachers can learn how to teach reading comprehension to students and that their students can become aware of comprehension strategies, use them and improve their reading. Although this is encouraging, the NRP also notes that even experienced teachers may have trouble implementing strategy instruction. This may be especially important for ABE settings, where teachers are frequently less experienced than their counterparts at the K–12 level and perhaps have less knowledge than might be expected about implementing research-based practices (Bell, Ziegler, & McCallum, 2004; Ziegler, McCallum, & Bell, 2007, 2009).

A much larger body of comprehension instruction studies with both adolescents and children supports and extends these AE findings. The adolescent and NRP reviews found very strong support for the direct instruction of specific comprehension strategies. The NRP described direct strategy instruction as the development of an awareness and understanding of comprehension or cognitive processes; teacher guidance and modeling; and independent mastery as teacher support is removed (NICHD, 2000b, p. 4-40). Going beyond what has been found in studies with adults, studies with adolescents or children have confirmed several specific strategies that are effective: question answering, question asking, summary writing, comprehension monitoring, use of graphic and semantic organizers, use of story structure and cooperative learning (where students work together while learning strategies or act as peer tutors). In addition to these individual comprehension strategies, the NRP found that teaching students how to flexibly apply combinations of these strategies is an especially effective approach.

The adolescent and NRP reviews both report strong support for another finding from the smaller set of studies with adults, multicomponent instruction. Al-

phabetics, fluency and vocabulary instruction with children all lead to increased reading comprehension achievement. Finally, the review of K–12 reading-writing instruction research provides several ideas for using writing to improve reading comprehension.

Additional topics covered in this review include instruction for specific groups of learners, including those in ABE, ASE and ESOL programs and AE learners with a learning disability. Most of the results that support the findings about AE instruction include learners in ABE, ASE and ESOL programs. Overall, reading comprehension instruction that is effective with one group appears to be effective with all three groups. However, very little research compares the effects of specific approaches to comprehension instruction across the three groups.

Some of the K–12 research addresses the issue of reading level, or how effective various approaches to teaching reading comprehension are with learners at different ability levels. While the NRP did not focus on learners at different reading levels, it did report that learning about the structure of stories and then using this knowledge to understand them is a strategy that works best with poor readers. Also, those in the seventh grade and higher, and good readers in the lower grades, benefit most from multiple strategy instruction.

Research with children learning English provides strong support for comprehension instruction that includes direct and explicit instruction in each component of reading, supporting a weaker finding from studies with AE learners. Other approaches that seem to work well with children include providing support in the learner's native language (bilingual instruction) and peer-assisted learning (in heterogeneous groups of English learners) with reading material that has already been taught. Approaches that work with children may provide ideas for reading instruction with ELLs in adult education until more research with AE learners is completed.

No experimental studies of comprehension instruction for AE learners with a learning disability were found. However, there is a fair amount of research with other populations from which to draw ideas until more AE research completed. A recent review of research with adults in the general population who have a learning disability found that explicit comprehension instruction is effective, similar to a key finding

from research with AE learners, children and English language learners. In addition, this research supports intensive instruction for adults with LD, including engaging one-to-one and small-group instruction. Research with children suggests that teaching strategies that work well with English speakers with a learning disability will also work well with ELLs with LD and that bilingual instruction that makes regular instruction more comprehensible is also effective.

The two remaining topics examined for this review are goals and settings and motivation. Results so far suggest that reading comprehension can be improved in most AE settings, including workplace, family and general functional literacy settings. One finding suggests that participation in workplace and family literacy programs might lead to better reading comprehension achievement than participation in general functional literacy programs, although much more comparative research is needed before this becomes a firm conclusion. A weaker finding related to motivation suggests that addressing adults' issues related to motivation can lead to improvements in comprehension.

A follow-up analysis to the NRP review investigated the effects of improved motivation on reading comprehension (Guthrie & Humenick, 2004). This meta-analysis suggests several successful strategies for improving both motivation and reading comprehension achievement: using interesting texts; providing readers with choices; developing reading goals; and encouraging collaborative learning.

Overall Findings: AE and Reading Comprehension Instruction

There is more AE instruction research with reading comprehension as an outcome measure than there is for any of the other components of reading. Studies were found for each of the major subtopics. Overall, studies using measures of reading comprehension indicate that AE is effective in improving learners' comprehension.

Stronger Finding: Participation in an adult literacy program may lead to an increase in reading comprehension achievement (Aderman, Nitzke, Pingree, & Voichick, 1987; Alessi, Siegel, Silver, & Barnes,1982; Askov & Brown, 1992; Boudett & Friedlander 1997, and Friedlander & Martinson, 1996; Brooks et al., 2001; Cheek & Lindsey, 1994; Conti 1985; Curtis & Chmelka, 1994; Darkenwald & Valentine, 1985; Diem & Fairweather, 1980; Dirkx & Crawford, 1993; Fitzgerald & Young, 1997; Gerber & Finn, 1998; Gold & Horn, 1982, and Gold & Johnson, 1982; Gorman, 1981; Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006; Gretes & Green, 1994; Hanlon & Cantrell, 1999; Lazar, Bean, & Van Horn, 1998; Messemer & Valentine, 2004; Mikulecky & Lloyd, 1997; Nickse, 1988; Perin & Greenberg, 1993; Philliber, Spillman, & King, 1996; Purcell-Gates, 1993; Rich & Shepherd, 1993; Roberts, Cheek, & Mumm, 1994; Sheehan-Holt & Smith, 2000; Smith, 1996; Sticht, 1989, 1997, and Sticht, Armstrong, Hickey, & Caylor, 1987; Venezky, Bristow, & Sabatini, 1994; Wood & McElhinney, 1990).

Is it possible to increase the reading comprehension achievement of adults who qualify for adult education? Overall, results from experimental studies that use measures of reading comprehension to evaluate the effectiveness of various interventions with AE learners are very positive. Thirteen experimental studies were identified, containing a total of 21 results, 15 positive and six negative (neutral results are counted as negative). Most of these studies evaluated specific interventions for improving reading comprehension and are described in more detail later in this chapter. Results having to do with the length of time spent in a program (duration) or the amount of time spent on reading instruction in a teaching session (intensity) are not included in this section on overall results, although they are discussed later.

Three studies included in the overall results in this section did not focus on a specific approach to teaching reading comprehension or did not provide much detail about an approach. These studies are not included below in the sections focusing on instructional interventions. One of these studies, reporting a positive result, found an overall gain in reading comprehension across 32 programs in 10 cities. It should be noted that the measure used was "total reading" from a standardized test, which included tests of vocabulary and comprehension; the design for this study included a post-hoc analysis with no control for initial group differences; and grade equivalent gain scores may have been used as the unit of analysis (Philliber et al., 1996). The second study, reporting a negative result, evaluated five ABE programs in a large metropolitan area and found overall increases in reading comprehension in only one of the programs (Boudett & Friedlander 1997, and Friedlander & Martinson, 1996). The third study, also reporting a negative result for an in-

tervention, evaluated an early version of the PLATO computer program (Diem & Fairweather, 1980).

Of the remaining experimental studies involving instructional interventions, two had one positive result (Conti 1985; Gretes & Green, 1994), three had two positive results from two different measures or conditions (Mikulecky & Lloyd, 1997; Rich & Shepherd, 1993; Roberts et al., 1994), and the remainder had mixed results—two with one positive and one negative result (Askov & Brown, 1992; Gold & Horn, 1982, and Gold & Johnson, 1982), and two with two positive results and one negative result (Alessi et al., 1982; Cheek & Lindsey, 1994).

Overall results from nonexperimental research, consisting of 21 studies with 26 positive results and only six negative, support the generally positive findings from the experimental studies. One study mentioned above is also counted here because it contains both nonexperimental and experimental results (Mikulecky & Lloyd, 1997). With the exception of three program evaluations that do not describe specific instructional interventions, all of these studies are discussed in more detail below in the section on instruction.

Of the three program evaluations, the strongest positive result comes from a large-scale study of AE programs in Britain (Brooks et al., 2001). Using a test of functional literacy comprehension with 1,224 adults in 71 basic skills programs, the study found significant increases in reading comprehension after an average of approximately 30 hours of instruction. Another program evaluation is an early study that found positive effects for an adult education program in the United Kingdom (Gorman, 1981). The third is a more recent report on progress in a representative sample of all federally funded adult education programs (Tamassia et al., 2007). Looking at progress made across the six levels of the adult education system's National Reporting System (from nonreaders through advanced readers), the AEPS found that AE programs overall reported that 33 percent of their learners completed one education level, while 20 percent completed one level and advanced one or more levels. At the time of this survey, adult education programs used a variety of assessments to measure student progress across literacy levels.

Of the other nonexperimental studies, 11 had one positive result (Brooks et al., 2001; Curtis & Chmelka, 1994; Darkenwald & Valentine, 1985, Dirkx & Craw-

ford, 1993; Gerber & Finn, 1998, Hanlon & Cantrell, 1999; Messemer & Valentine, 2004; Purcell-Gates, 1993; Smith, 1996; Sticht, 1989, 1997, and Sticht, Armstrong, Hickey, & Caylor, 1987; Wood & McElhinney, 1990). One study had two positive results (Mikulecky & Lloyd, 1997), one had three positive results (Fitzgerald & Young, 1997), and another had four (Lazar, Bean, & Van Horn, 1998). Most of the remaining studies had mixed results: one study with three positive and one negative result (Aderman, Nitzke, Pingree, & Voichick, 1987), two studies with one positive and one negative result (Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006; Perin & Greenberg, 1993), and one study with one positive and two negative results (Venezky, Bristow, & Sabatini, 1994). One study had a single negative result (Smith, 1996).

Effective Teaching Strategies

Thirteen experimental studies deal directly with reading comprehension teaching strategies. The results from these studies fall into three categories: (1) direct reading comprehension instruction, (2) multicomponent instruction and (3) enabling instruction or setting. Studies in the direct instruction category focus on specific approaches to teaching or learning about reading comprehension. These studies suggest that direct or explicit reading comprehension strategy instruction is an effective way to improve AE learners' reading comprehension. Studies in the multicomponent category suggest that comprehension can also be improved by teaching other components of the reading process along with reading comprehension. Much of the research related to comprehension instruction fits into the enabling category. Rather than addressing reading comprehension directly, other variables are manipulated in order to enhance instruction. Examples of enabling activities include modifying the teaching environment and providing teachers with assistants in the classroom.

Direct Reading Comprehension Instruction

Stronger Finding: Providing explicit instruction in reading comprehension strategies may lead to increased reading comprehension achievement (Alessi, Siegel, Silver, & Barnes, 1982; Askov & Brown, 1992; Mikulecky & Lloyd, 1997; Rich & Shepherd, 1993).

This finding is supported by four studies with eight experimental results, six positive and two neutral or negative. One of these studies also has two positive,

nonexperimental results (Mikulecky & Lloyd, 1997, has both experimental and nonexperimental results).

In one experimental study, instruction in the self-regulated use of reading comprehension strategies was found to be effective in improving intermediate adult readers' comprehension (Rich & Shepherd, 1993). Students in one group were taught how to ask themselves questions about a text as they read (who, what, when, where, how, and why questions). Students in another group were taught how to verbally summarize a text as they read. A third group was taught how to use both strategies as they read. All students worked in small groups, receiving guided instruction from a teacher who gradually had students take on the teacher's role by having them lead questioning or summarizing exercises during practice sessions. Students were told how to use the strategies, the rationale for using them and how to check on or monitor their understanding as they used them. In addition to small-group work, students spent a significant portion of each lesson working on their own applying a strategy as they took practice comprehension tests. Those in the group that learned how to use both strategies outperformed control groups that read the same texts or took the practice tests but did not receive strategy instruction.

The combined approach was found to be effective with two measures of comprehension: free recall (the number of ideas from the text that were mentioned as the passage was recalled) and questions (multiple choice and short answer). The summarizing and questioning strategies were effective by themselves on the questions measure. Contrary to what the researchers had predicted, the combined summarizing and questioning strategy was not more effective than the use of either strategy by itself. The total number of sessions, six in all, was small, and more time to learn the combined strategy may have been needed.

Experimental results from another study found that direct or deliberate instruction in the use of reading comprehension strategies (metacomprehension instruction), as opposed to more incidental instruction, leads to increased reading comprehension achievement (Mikulecky & Lloyd, 1997). In this post-hoc analysis of instructional strategies used in workplace literacy settings with adult learners at the intermediate reading level or higher, the comprehension strategies taught included skimming, reading more carefully in order

to monitor comprehension, using headings and focusing on topics. Nonexperimental results from this study found that the strategies taught led to significant increases in both comprehension and metacomprehension, or knowledge of reading processes and strategies.

In another experimental study, an early but fairly sophisticated form of computer-based instruction was found to improve adults' performance on two comprehension tasks: locating and paraphrasing information in texts (Alessi et al., 1982). Using this program, intermediate adult readers completed 40 self-paced reading comprehension lessons in 20 hours over a two-month period. Follow-up testing one month later showed that initial gains had been maintained. During instruction, comprehension tasks and concepts were presented clearly and overtly, and students read and reread passages and answered questions. They learned how to locate information in order to answer literal comprehension questions (who, what, when, where, why, and how questions that could be answered by looking back at the text) and how to recognize paraphrases of sentences in the passages that were read. The computer kept track of progress, and simpler tasks were mastered before more difficult ones were presented. Passages and questions were sometimes presented more than once, with the computer making small changes in the text to draw student attention to important information and text features. Specific feedback was given, and computer graphics such as boxes, arrows and underlining were used to direct student attention and model correct responses. Although students improved their ability to locate and paraphrase information, their new skills did not transfer to a comprehension task that was not taught—recognizing main ideas in passages.

A fourth experimental study took a functional context approach to developing a reading comprehension curriculum, offering literacy instruction in the context of the work environment (Askov & Brown, 1992). An interactive computer program and matching classroom program provided instruction on vocabulary, main ideas, details, and paraphrasing skills using material developed from a commercial driver's license manual for state employees reading below the ninth grade level. These students needed to develop the skills necessary to pass a commercial license exam. The focus of the curriculum was on integrating basic skills instruction with technical training, using job-related tasks and highlighting the learner's role as worker. Those

participating in the program significantly increased reading comprehension achievement on a short version of the driver's license exam, but not on a criterion-referenced test using content from the driver's license manual.

Multicomponent Instruction

Components other than comprehension must work well for comprehension to be effective. If readers have difficulty reading individual words, reading fluently, or understanding the meanings of individual words, comprehension will not be optimal. The studies described in this section investigate the effects of working on multiple components of reading concurrently.

Stronger Finding: Combined word analysis (WA) and fluency instruction, or WA, fluency and comprehension instruction, may lead to increased reading comprehension achievement (Gretes & Green, 1994; Gold & Horn, 1982, and Gold & Johnson, 1982; Hanlon & Cantrell, 1999; Massengill, 2003; McKane & Greene, 1996).

One experimental study (McKane & Green, 1996) and two nonexperimental studies (Hanlon & Cantrell, 1999; Massengill, 2003) found that combined instruction in WA and fluency led to increases in reading comprehension achievement. In the experimental study, word analysis instruction was supplemented with a computer application that taught alphabetics and fluency. This application evaluated and placed students at the appropriate level and then provided instruction to increase accuracy and rate of letter, syllable and nonsense syllable, and word and nonsense word recognition. Practice reading of two- and three-word phrases, sentences and paragraphs followed. Compared to a control group receiving traditional instruction, this approach led to significantly higher gain scores on the reading comprehension measure for beginning readers (GE 0–3) but not for advanced beginners (GE 3–6) or intermediate readers (GE 6–9). Those who had the greatest need for alphabetics and fluency instruction benefited the most (McKane & Greene, 2003).

In one of the nonexperimental studies, four AE learners were taught word analysis and fluency using an approach called Guided Reading followed by four weeks of independent reading (Massengill, 2003). This approach led to a significant increase in reading comprehension achievement. Guided reading is a structured program that includes direct instruction in word analysis, sight word practice, and silent and oral reading and rereading to practice and apply new skills. The third study was a case study in which intense WA instruction with an adult beginning reader led to very strong gains in reading comprehension (Hanlon & Cantrell, 1999).

While these studies found that WA and fluency instruction can improve reading comprehension, two other experimental studies found that combining comprehension instruction with help or instruction in WA or fluency is also effective. In both studies, decoding or fluency work helped to ensure that students could read (decode) passages that were used for comprehension instruction. One multicomponents strategy (reported in Gold and Horn, 1982, and Gold and Johnson, 1982) included many elements, and any one or combination of elements could have been responsible for the increase in reading comprehension found for beginning readers. These elements include (a) one-to-one instruction by (b) trained tutors that includes (c) Directed Listening (the instructor reads a text aloud and students answer questions and discuss the passage), followed by (d) the generation of student texts based on the previous discussions, using a Language Experience Approach (students dictate to the instructor, who produces the texts), followed by (e) basic reading skills instruction using the student-generated texts, including "whole-word phonics" (phonics by analogy), a multisensory approach to word recognition (the VAKT method), and reading comprehension instruction. The authors stress the use of listening comprehension instruction followed by basic skills instruction using texts in the content area of interest to adults.

In the second study, a computer-based program for teaching reading comprehension used a multicomponent approach that included comprehension strategy instruction along with vocabulary instruction and word recognition or fluency practice (Gretes & Green, 1994). Intermediate ABE readers using the program increased their reading comprehension achievement as measured by a standardized comprehension test. This self-paced program presented instruction and practice in several specific comprehension strategies: scanning a text for information, making inferences from information in a text, organizing information, summarizing information and answering questions about a text. Before beginning the comprehension

exercises, however, learners could choose to listen to the text while reading along and to study key vocabulary in the passage. A natural-sounding (digitized) voice read text presented on the computer screen, including the passages used for comprehension instruction, individual words, vocabulary definitions and instructions for exercises. In this experimental study, the effects of comprehension strategy instruction were not separated from the effects of the vocabulary instruction and what may amount to word recognition and fluency practice using the spoken text.

Enabling Instruction or Setting

In several studies, reading strategies were not the focus for the interventions being tested. All of these studies involved modifications to the classroom environment designed to improve students' reading comprehension achievement. Three of these studies looked at teaching styles or methods, and one looked at the use of classroom aides.

Stronger Finding: Some teaching environments may work better with certain approaches to reading comprehension instruction, leading to improved reading comprehension achievement (Cheek & Lindsey, 1994; Conti, 1985; Dirkx & Crawford, 1993; Fitzgerald & Young, 1997; Purcell-Gates, 1993; Roberts, Cheek, & Mumm, 1994).

The studies supporting this finding all have more to do with the way teachers organize instruction than with a specific strategy. In one experimental study, 29 ABE, ESOL and ASE teachers completing a survey were found to use a more teacher-centered approach as opposed to a more "traditional" AE learner-centered approach (Conti, 1985). Results from the study suggest that the degree to which these teachers' classes are learner-centered (or collaborative) affects students differently depending on their level of reading and math ability (the measure used tested math as well as reading ability). Weaker teacher-centered approaches, those that incorporate more learner-centered activities, appear to lead to increased comprehension and math ability among adults who score below about GE 9, and among ESOL adults. Stronger teacher-centered approaches appear to be more effective with adult students in ASE classrooms (those working on high school level reading tasks).

One nonexperimental study appears to support this result. In an exploratory correlational study based on students in AE programs in 20 states, a relationship was found between the use of a highly individualized (as opposed to prestructured and fixed) curriculum and increases in adults' reading comprehension (Fitzgerald & Young, 1997). This result may have been mediated by the use of experienced, full-time instructors, who typically use a more individualized approach. Individualized approaches might be equated with learner-centered approaches.

In another experimental study of two contrasting teaching styles, one style was found to be more effective for teaching inferential reading comprehension skills, but not for teaching literal reading comprehension skills (Roberts et al., 1994). Three measures of reading comprehension were used: the Literal, Inferential and Total Comprehension subtests of the Stanford Diagnostic Reading Test. Literal comprehension tests measure a learner's ability to recall specific ideas or pieces of information from a text that has been read. Inferential tests measure a learner's ability to draw valid inferences from the ideas or information presented in the text.

The style found to be more effective for teaching inferential reading comprehension used a meaning-based, diagnostic-prescriptive approach. The less effective style used a programmed learning approach. The diagnostic-prescriptive approach had several important characteristics: formal and informal assessment to identify learner strengths, needs and interests in reading; use of these assessment results to develop individualized teaching strategies, methods, and materials for word analysis and reading comprehension instruction; and language-experience and literature-based instruction emphasizing regular student-teacher interaction, real-life reading material, and reading as a meaning-making activity. The programmed learning approach, on the other hand, emphasized placing students at their current reading levels in computer-based or print-based programs where they could work independently, at their own pace and in a step-by-step manner toward a specific word analysis or reading comprehension learning objective. There was no significant difference between groups on the literal comprehension measure.

A final experimental study, described in more detail in Chapter 8, Vocabulary, tested a group process approach—community building—designed to reduce personnel and organizational problems in a prison setting in an effort to increase the effectiveness of a

reading program. Community building enabled an SRA reading program that relies on cooperative learning to work effectively. Comprehension achievement on the Gates-MacGinitie Reading Test was significantly better for a community-building group using the SRA program than for a group using the SRA program by itself (Roberts et al., 1994).

Two final nonexperimental studies looked at the effects of a contextual approach and a language experience approach on reading comprehension. In the study evaluating a contextual approach to teaching, a group using highly engaging nature and science content performed better on a measure of reading than a control group that used a more regular AE approach (Dirkx & Crawford, 1993). In the other, a case study, a student who had received regular AE tutoring was found to read at about the fourth grade level in academic material but was not able to read and understand the functional material that most adults encounter every day. After an intervention relying extensively on a language experience approach, the student's functional reading comprehension improved (Purcell-Gates, 1993).

Weaker Finding: In programs where a teacher has assistance in the classroom, students may make greater gains in reading comprehension achievement (Brooks et al., 2001).

An experimental study of 71 programs in Britain found that, when the main teacher in a classroom has assistance from either volunteers or paid assistants, reading comprehension achievement is significantly greater than in classrooms where no assistance is available (Brooks et al., 2001).

Other Instruction Studies: Editing to Improve Comprehension

One study investigated the effects of instruction in editing on reading comprehension achievement. In this study, adults reading at a high intermediate level (just below a beginning GED level) were taught how to correct common writing errors presented in short essays (Batchelder & Rachal, 2000). Along with their regular program of classes, they used a self-paced, diagnostic/prescriptive computer program that presented lessons and exercises in locating and correcting writing errors in short essays. On a test of reading comprehension (the CASAS) they performed no bet-

ter than students receiving regular classroom instruction (in English, math and science). While some writing instruction may have a positive impact on reading comprehension, such as summary writing following reading, other writing instruction that is not as closely connected to reading comprehension may not. This result seems to support the finding, presented above, that direct instruction in comprehension, such as summary writing, is more effective.

Effective Teaching Material

Only one study of commercially available material for comprehension instruction was found (Wood & McElhinney, 1990). This was a descriptive study, so no findings related to commercial programs were derived from the research. On the other hand, several studies did look at the effects of different types of instructional material on comprehension achievement.

Stronger Finding: Integrating adult-oriented, contextually relevant material into literacy programs may lead to increased reading achievement (Aderman, Nitzke, Pingree, & Voichick, 1987; Askov & Brown, 1992; Curtis & Chmelka, 1994; Dirkx & Crawford, 1993; Mikulecky & Lloyd, 1997; Sticht, 1989, 1997, and Sticht, Armstrong, Hickey, & Caylor, 1987).

Experimental results from two studies discussed above support the use of adult-oriented, contextually relevant material during reading instruction. Both studies focus on the use of relevant workplace content. One found, through a post-hoc analysis, that programs using workplace-oriented material at least 20 to 30 percent of the time during classroom instruction improved students' comprehension of work-related material significantly more than programs that did not (Mikulecky & Lloyd, 1997). Another study used material developed from a commercial driver's license manual for government employees who needed to develop the skills necessary to pass a commercial license exam. Focusing on work-oriented tasks led to better scores for participants than for those in a no-instruction control group on one of two comprehension measures. A weakness in the study, perhaps, was the use of a no-instruction control group as opposed to a group using less relevant material during instruction (Askov & Brown, 1992).

This finding is also supported by nonexperimental results from several studies. One of these studies focuses on work-oriented material, as do both of the

studies presented above, while the others focus on the use of material that is relevant for adults in other ways. The study focusing on work-oriented material is frequently cited in the literature (although not published in a peer-reviewed journal). It found that work-related literacy programs using job-specific content during instruction appear to increase job-specific reading comprehension achievement. These programs may also increase non-job-specific reading comprehension achievement (as measured by tests that do not use work-oriented comprehension passages, for example) (Sticht, 1989, 1997, and Sticht et al., 1987).

A study using control groups but no statistical comparison of outcomes was conducted in a prison setting where it was difficult for the researchers to determine what material might be contextually relevant (Dirkx & Crawford, 1993). After settling on science and the natural world and developing an engaging curriculum, researchers found that students taught with the new curriculum increased their reading comprehension slightly more than students in the regular AE program using more traditional content. The contextually relevant approach seemed to be more engaging for the students: they attended 54 percent more hours, and results from structured observations indicated that they spent most of their time working together with the instructor, while those in the control group spent most of their time working alone. Unfortunately, neither group made as much progress as might be expected after more than 100 hours of instruction.

A third nonexperimental study supports the use of material that is relevant to adults. In this study, researchers modified a popular adult literacy phonics and sight word instructional program (Laubach) so that it included practice with more challenging, adult-oriented words incorporating the letter-sound correspondences being taught. The modified program led to a faster rate of growth in reading comprehension (Curtis & Chmelka, 1994). Although the use of adult-oriented content may be more motivating and relevant for adults, its effectiveness in this program was attributed to its complexity. In programs teaching word recognition, adults may rely on their sight word knowledge to read simpler words instead of applying word analysis strategies, such as sounding out. Using more complex words during instruction—words that are not a part of an adult's sight word knowledge—means that these words will need to be sounded out,

which requires the application, and therefore practice, of letter-sound knowledge.

Results from another descriptive study suggest that adult-oriented material can be created from almost any content. This study compared participants' recall of information in two versions of a nutrition pamphlet. In one version, the pamphlet was written for low-literate adults by a nutritionist, while in the other it was rewritten by adults who had read, discussed and restated the information in the pamphlet in their own words. The pamphlet using AE students' language resulted in increased recall for beginning-level readers compared with the standard version of the pamphlet. This was true even though the readability levels of the passages were the same (Aderman, Nitzke, Pingree, & Voichick, 1987).

Effects of Intensity and Duration on Reading Comprehension Instruction

Ideally, to judge to what degree the intensity or duration of instruction leads to gains in reading comprehension, learners would be assigned to groups that varied in either the intensity of instruction or the length of time they received instruction. Practically, this is a difficult criterion to meet, and the studies reported here have used intact or existing groups, comparing, for example, those who have participated for a certain length of time in an ABE program with those who have not. Selection bias, therefore, cannot be ruled out. Those who stay for a short period in a program may share an important characteristic, such as initial level of reading ability, which those who stay for a longer period do not share.

Briefly, results from studies related to this topic suggest that intensity and duration may both be important for improving reading comprehension. The longer learners stay in a literacy program, the more their comprehension will improve. Sufficient intensity, or spending a significant amount of classroom time on direct instruction of reading strategies, also improves adults' comprehension.

Stronger Finding: Reading comprehension achievement may increase as a learner stays longer in a literacy program, although progress may be extremely variable over time (Brooks et al., 2001; Boudett & Friedlander 1997 and Friedlander & Martinson, 1996; Fitzgerald & Young, 1997; Gretes & Green, 1994; Perin & Greenberg, 1993; Philliber, Spillman, & King, 1996; Venezky, Bristow, & Sabatini, 1994).

Studies comparing groups of learners receiving a different number of hours of instruction in reading find, overall, that those who stay longer in AE programs have higher levels of reading comprehension achievement. These studies also suggest, however, that progress over time may not be steady and that separating the effects of duration and other factors can be complicated.

Three studies, two experimental and one nonexperimental, suggest that those staying longer in a literacy program make significantly greater gains, and that around 50 to 60 hours of instruction are needed to significantly boost reading comprehension achievement. One experimental study found that 51 or more hours of attendance were needed to produce significantly greater gains on a combined comprehension and vocabulary score (Philliber et al., 1996); GE gain scores were used in the analysis. Another found that those who received more than 60 hours of instruction had significantly higher reading comprehension achievement (Boudett & Friedlander, 1997, and Friedlander & Martinson, 1996). In a larger, nonexperimental study based on a national evaluation of literacy programs in Britain, those who attended for more than 50 hours benefited most. These were also the students who attended regularly (Brooks et al., 2001).

In another experimental study, adults who completed more than a single lesson in a computer-based reading comprehension program had greater gains on a measure of comprehension achievement, although there was no difference between those completing two to three lessons and those completing four to six (Gretes & Green, 1994). A nonexperimental study with mixed results found that the number of hours of instruction AE students received was positively associated with gains only for ESL students, and that this effect was very small (Fitzgerald & Young, 1997).

A final study with positive experimental results illustrates the difficulty in separating the effects of duration from other factors. In this study, student achievement was measured after seven, 14, 21 and 28 weeks. At 21 weeks, those who were to complete the program (attend for the full 28 weeks) had higher gain scores over the first 21 weeks than those who would not. In this case, those who were doing better stayed longer (Perin & Greenberg, 1993). Other results from this study suggest that growth over time can be extremely variable, as do results from a second study in which measures were taken at three points in time. This second study also had negative results related to length of stay, find-ing no difference between those attending ABE and ASE programs for 120 or 360 hours (Venezky et al., 1994).

Weaker Finding: Spending a significant portion of classroom time practicing reading and writing, including the occasional but direct or deliberate discussion of reading strategies, may increase learners' metacomprehension abilities (Fitzgerald & Young, 1997; Mikulecky & Lloyd, 1997).

Only one experimental study has looked at the effects of intensity of instruction on reading comprehension (Mikulecky & Lloyd, 1997). Results from the study suggest that, up to a point, more intense instruction leads to increases in reading metacomprehension ability. Spending 70 percent or more of classroom time on literacy practice (reading and writing) leads to an increase in reading metacomprehension abilities, or the ability to deliberately use strategies such as skimming, reading more carefully or monitoring, using headings and focusing on topics. Classes in the programs studied in this post-hoc analysis typically lasted for about one and a half hours, and total class time per week ranged from two to five hours.

Results from a nonexperimental study suggest that increasing the intensity of instruction by simply increasing the total number of classroom hours per week does not necessarily have a positive effect on reading comprehension. Class time of nine or more hours per week was associated with declines in reading achievement (Fitzgerald & Young, 1997).

Effects of Teacher Preparation on Reading Comprehension Instruction

Weaker Finding: Staff with more experience or training may have a better chance of improving reading comprehension achievement (Brooks et al., 2001; Fitzgerald & Young 1997).

Although several studies mention teacher preparation, only two studies were found that addressed it directly, one nonexperimental and one experimental. An exploratory path analysis of AE program data from 20 states found that the amount of staff teaching experience is positively associated with reading comprehension achievement (Fitzgerald & Young 1997). A national study of basic skills programs in Britain (Brooks et al., 2001) found that for those programs in which all teachers are qualified (with certification or a bachelor's degree in education), students make significantly greater gains in reading comprehension.

Research With Other Populations: Instructional Methods and Material

Summary of Findings

There is a much larger body of comprehension research with adolescents and children than with adults. This research supports and extends the major findings from studies of reading comprehension instruction with AE learners. Both the adolescent and NRP reviews found that direct instruction in comprehension strategies is effective, as was found from the smaller set of AE studies. In addition, research with adolescents and children has identified a large set of effective comprehension strategies that can be taught, corroborating some of the emerging evidence from AE research. The NRP review found that teaching readers to use a repertoire of several strategies is especially effective. A follow-up to the NRP review suggests that multiple-strategy instruction along with instruction in how to monitor or regulate several aspects of the reading process can also be effective in improving student comprehension and metacomprehension abilities.

Research with adolescents and children also finds, as does research with AE learners, that instruction in other components of reading, along with comprehension instruction, is an effective way to increase reading comprehension achievement. While the adolescent and NRP reviews did not find the same enabling factors as those found in the AE research, such as the use of assistants in the classroom, the adolescent review did find that peer tutoring can be an effective instructional tool.

The review of reading-writing research conducted with children supports the use of summarization as a strategy that can be used to improve reading comprehension, one of the strategies identified in the adolescent and NRP reviews of reading instruction. This research also found that adding writing assignments to content-area instruction, such as social studies, increases the amount of information learned. Knowing more about social studies will improve our understanding or comprehension of the social studies texts we read. Given that writing can be used to improve general comprehension (information learned), it is important to use the most effective writing strategies. Research with children has identified several effective approaches to teaching writing. It has also identified learner characteristics that may affect the choice of approaches to teach, such as students' native language or whether they have a learning disability.

Teaching Strategies

The findings listed below are based on (a) results from a summary of the adolescent reading instruction research conducted for this review (these findings are listed first), (b) the NRP review of research with children (listed next) and (c) results from a summary of reading-writing research with children conducted for this review. These findings from non-AE populations were used as a check on the findings derived from the much smaller set of adult reading comprehension instruction studies and as possible ideas for use in AE instruction until additional relevant research with AE learners is completed.

Adolescent Reading Research Finding: Direct instruction in the use of specific comprehension strategies can lead to increased comprehension achievement.

Eight studies evaluated the effects of teaching learners to use strategies to improve their comprehension, six experimental (Alfassi, 1998; Dimino, Gersten, Carnine, & Blake, 1990; Faber, Morris & Lieberman, 2000; Gallini, Spires, Terry, & Gleaton, 1993; Sjostrom & Hare, 1984; Wood, Winne, & Carney, 1995) and two nonexperimental (Gurney, Gersten, Kimino, & Carnine, 1990; Swanson, Kozleski, & Stegink, 1987). In all but one of the studies (Swanson et al., 1987), strategy use resulted in significant improvements in comprehension. Participants in Swanson et al. practiced distinguishing main ideas and details while listening, a strategy that improved their recall of what they heard but did not generalize to improving their understanding when they read.

In three other studies, effects were dependent on the nature of the material and the comprehension test. In one study, teaching learners how to preview text, take notes, and ask themselves questions improved their comprehension of low-interest texts, but not high-interest ones (Faber et al., 2000). In another study, learning how to summarize improved comprehension of texts containing details but not texts containing main ideas (Wood et al., 1995). In a third study (Gurney et al., 1990), learning to use elements of story grammar (e.g., distinguishing the main problem/conflict, recognizing character clues, identifying theme) facilitated comprehension when test questions were story grammar questions but not when the

questions involved other aspects of the text (e.g., recalling details, making inferences).

Effective learner strategies included question generation, summarization, clarification, and prediction (Alfassi, 1998); use of text structures (Dimino et al., 1990; Gallini et al., 1993; Gurney et al., 1990); prereading and self-questioning activities, along with a system for organizing main ideas and details (Faber et al., 2000); main idea identification (Sjostrom & Hare, 1984) and summarizing (Wood et al., 1995). A strategy not found to be effective involved recognition and use of anaphoric relations and connectives (Gallini et al., 1993).

Adolescent Reading Research Finding: When teachers want to explain or help students understand a specific text, effective teaching strategies include the use of analogies, cued note taking, semantic analyses, study guides, discussion and embedded comprehension questions.

Six experimental studies identified successful and less successful strategies teachers can use to help increase their students understanding of texts. Successful teaching strategies included teachers' use of visual and verbal analogies (Bean, Searles, Singer, & Cowen, 1990); cued note taking (Boyle & Weishaar, 2001); semantic analyses of sentences and texts (Hafner & Palmer, 1980); study guides (Horton, Boone, & Lovitt, 1990); group talk involving verbal play (Lee, 1995); and comprehension questions inserted in text (Peverly & Wood, 2001). Less successful strategies included use of textbook reading (Bean et al., 1990); prompting learners to take notes (Boyle & Weishaar, 2001); general vocabulary exercises (Hafner & Palmer, 1908); and comprehension questions asked after a text has been read (Peverly & Wood, 2001).

Adolescent Reading Research Finding: Instruction in alphabetics and fluency may lead to increased reading comprehension achievement.

As discussed in Chapter 6, Alphabetics, alphabetics instruction with adolescents can lead to gains in reading comprehension. This is supported by one experimental (Simpson, Swanson, & Kunkel, 1992) and three nonexperimental studies (Curtis & Chmelka, 1994; Greene, 1996; Scheffel, Shroyer, & Strongin, 2003).

Research with adolescents also supports the use of fluency instruction to improve comprehension. Fluency instruction using repeated oral readings of text is supported by seven studies discussed in Chapter 7, Fluency,

including one experimental study (Thomas & Clapp, 1989), four studies using a multiple-baseline design (Carver & Hoffman, 1981; Freeland et al., 2000; Harris, Marchand-Martella, & Martella, 2000; Valleley & Shriver, 2003), and three other nonexperimental studies (Beers, 1986; Howe, 1982; Marchand-Martella et al., 2000). One nonexperimental study found no benefit for comprehension from repeated reading instruction.

Fluency instruction focusing on prosody can also lead to increased reading comprehension achievement. This is supported by two experimental studies on prosody with adolescents (Casteel, 1988; Stevens, 1981). In both studies, learners were presented with passages where words were grouped, or chunked, into short, meaningful phrases. In both of these studies, participants' comprehension improved significantly. In Casteel, experimenter-designed multiple-choice comprehension questions were used; in Stevens, a standardized comprehension test was used.

Adolescent Reading Research Finding: Using peer tutoring to teach comprehension strategies can be effective.

In two of the experimental studies already noted (Alfassi, 1998; Lee, 1995), along with two additional experimental (Fuchs, Fuchs, & Kazden, 1999; Mastropieri, Scruggs, Spencer, & Fontana, 2003) and two nonexperimental studies (Greenleaf, Schoenbach, Cziko, & Mueller, 2001; Harris, Marchand-Martella, & Martella, 2000), learners practiced applying strategies with peers as teachers. Interventions included group problem-solving activities involving guided practice (Alfassi; Fuchs at al.; Greenleaf et al.; Mastropieri et al.); group talk involving verbal play (Lee); and Corrective Reading (Harris et al.). In all six studies, comprehension improved. In two studies (Greenleaf et al.; Harris et al.), gains were found on a standardized test of reading comprehension. Neither of the two studies included a comparison group, however.

K–12 Research Finding: To improve learners' comprehension of texts used during instruction, teach them a strategy that can be used during the reading process and that enables them to become actively engaged in understanding a text. Eight effective strategies have been identified: comprehension monitoring, cooperative learning, graphic organizers, story structure, question answering, question generation, summarization, and multiple strategies (using a combination of strategies when appropriate).

The NRP identifies 16 categories of instruction and finds that eight appear to have "a firm scientific basis for concluding that they improve comprehension of normal readers" (NICHD, 2000b, p. 4-42). These eight include seven specific strategies and a multiple-strategy approach. All of these strategies appear to improve students' comprehension of texts they read in the classroom while practicing comprehension, as measured on tests of recall, question answering, question generation, and summarizing (NICHD, p. 4-6).

The eight kinds of instruction that appear to be effective and most promising for classroom instruction are (NICHD, 2000b, p. 4-6):

1. Comprehension monitoring in which the reader learns how to be aware or conscious of his or her understanding during reading and learns procedures to deal with problems in understanding as they arise.

2. Cooperative learning in which readers work together to learn strategies in the context of reading.

3. Graphic and semantic organizers that allow the reader to represent graphically (write or draw) the meanings and relationships of the ideas that underlie the words in the text.

4. Story structure from which the reader learns to ask and answer who, what, where, when, and why questions about the plot and, in some cases, maps out the time line, characters, and events in stories.

5. Question answering in which the reader answers questions posed by the teacher and is given feedback on the correctness of their answers.

6. Question generation in which the reader asks himself or herself what, when, where, why, what will happen, how, and who questions.

7. Summarization in which the reader attempts to identify and write the main or most important ideas that integrate or unite the other ideas or meanings of the text into a coherent whole.

8. Multiple-strategy teaching in which the reader uses several of the procedures in interaction with the teacher over the text. Multiple-strategy teaching is effective when the procedures are used flexibly and appropriately by the reader or the teacher in naturalistic contexts.

K–12 Research Finding: To improve reading comprehension, use a multicomponents approach to instruction in which all aspects of the reading process are addressed as needed, including phonemic awareness, word analysis, and vocabulary, as well as reading comprehension.

The NRP review also found that reading comprehension achievement can be improved indirectly by teaching skills that enable comprehension. Teaching phonemic awareness to beginning readers leads to improved reading comprehension (NICHD, 2000b, pp. 2-4, 2-5). Small-group instruction is especially effective (NICHD, pp. 2-4, 2-5, 2-20). PA training is also effective in improving comprehension for disabled readers at higher reading levels (through at least GE 6) (NICHD, p. 2-94). Systematic, as opposed to non-systematic, phonics instruction improves reading comprehension for beginning readers (NICHD, p.2-94), and for older readers with a reading disability (NICHD, p. 2-116). Teaching fluency using repeated and guided oral reading leads to increases in reading comprehension (NICHD, p. 3-3). Finally, preteaching important vocabulary words before reading can also improve reading comprehension.

K–12 Research Finding: To improve learners' general reading comprehension achievement (those reading above GE 3), teach them to use a repertoire of several strategies that they can use consciously and flexibly as needed while reading and that enable them to become actively engaged in understanding a text. Combinations of the following strategies are suggested by the research: comprehension monitoring, cooperative learning, graphic organizers, story structure, question answering, question generation, and summarization.

Based on studies of students in grades 3 and up, several specific strategies (comprehension monitoring, cooperative learning, graphic organizers, story structure, question answering, question generation, and summarization) appear to improve students' comprehension of texts they read in the classroom while practicing comprehension, as measured by nonstandardized, researcher-made tests of recall, question answering, question generation, and summarizing (NICHD, 2000b, p. 4-6). Teaching the use of more than one strategy for reading comprehension can lead to increases on standardized measures of reading comprehension, or general reading comprehension achievement that is not tied to the specific texts used during

instruction (NICHD, pp. 4-6, 4-47). This suggests that teaching a multiple-strategy approach to comprehension generalizes to reading outside the classroom for children. This is an especially important goal for adult literacy programs.

A review of metacomprehension instruction studies conducted since the NRP review found multiple-strategy instruction along with instruction in regulating the reading process to be effective in increasing reading comprehension for both good and poor readers in three of four experimental studies. Strategies shown to be effective in previous research, such as those presented above, were combined with various self-regulating strategies including, for example, comprehension monitoring, monitoring vocabulary, monitoring summarizing, and regulating motivation (Baker, 2008).

K–12 Writing Research Finding: Summary writing can increase reading comprehension achievement.

Three studies demonstrate that instruction in summary writing can have positive effects on reading comprehension. Summary writing connects reading and writing through knowledge about text structure and identification of main ideas. Any study of summary writing, of course, involves instruction that includes both reading and writing. The control conditions in these studies involved either some form of reading instruction without writing or summary-writing practice without feedback.

Taylor & Beach (1984), in a quasi-experimental study, compared a group of middle school students that learned to write summaries of expository texts, a group that answered questions about the texts and a control group that read and studied the texts. The summary-writing group performed better on reading comprehension of a new passage and on an expository writing task.

Bean and Steenwyk (1984) randomly assigned 60 sixth-graders to two different summarization instruction conditions and a main idea instruction control without writing. Both summarization treatments resulted in better writing and reading comprehension.

Franzke, Kintsch, Caccamise, Johnson, and Dooley (2005) used a computer program—Summary Street—that uses latent semantic analysis to analyze the content of a text and compare it to a source text. The software provided students with feedback about whether their summaries had covered the content of each

section of the source text. Students were randomly assigned to use Summary Street for eight sessions or to practice writing summaries using just a word processor; both groups received general instruction on summary writing. On posttests without support, the treatment group wrote higher-quality summaries and received higher reading comprehension scores on items taken from a statewide reading test.

K–12 Writing Research Finding: Add writing assignments to content-area instruction to increase the amount of information learned about specific content.

Another area of research that provides general support for the effects of writing on other learning outcomes is research on writing-to-learn. These studies investigate the value of adding writing assignments to other instruction, which almost always involves reading. The studies demonstrate the value of adding writing to content-area instruction. A meta-analysis (Bangert-Drowns, Hurley, & Wilkinson, 2004) found modest positive effects of writing assignments in content-area learning in a wide range of disciplines, including math, sciences and social studies, from elementary school through college. The outcome measures in the studies focused on content learning or comprehension rather than reading comprehension per se, but the measures often required at least some reading comprehension activity. For example, in a study of the effects of writing responses to literature, the outcome assessment asked community college students to read short stories and answer questions about them (Becker, 1996). One measure in a study of journal writing in third-grade social studies required students to read a textbook section and complete a written response (Hyser, 1992). Thus, the findings lend support to the claim that writing contributes to improved content-area learning and, therefore, content-area reading comprehension.

K–12 Writing Research Finding: Given that writing instruction may improve reading (both alphabetics and comprehension), use the most effective approaches to teaching writing with students, such as strategy instruction and summarizing, and be aware of learner characteristics that may affect the choice of approaches to teaching writing (such as a student's native language or whether the student has a learning disability).

Given that writing instruction may improve reading outcomes, it is important to know which approaches

to writing instruction are effective. As noted above, conclusions about effective writing instruction are based on research with students in grades K–12. Several meta-analyses have looked at writing instruction methods. Hillocks (1986) conducted a meta-analysis of writing instruction research in grades six through 12. Bangert-Drowns (1993) and Goldberg, Russell, and Cook (2003) conducted meta-analyses of the effects of word processing on writing. Graham (2006) analyzed research on strategy instruction in writing.

Graham and Perin (2006) completed a comprehensive meta-analysis of experimental and quasi-experimental research on writing instruction for adolescent students (defined as grades four to 12). They included all of the studies in the prior analyses. Based on 123 reports, they found 10 instruction methods that had positive effect sizes based on at least four studies. In order of average effect size, those 10 methods are strategy instruction, summarization, peer assistance, setting product goals, word processing, sentence combining, process writing with professional development, inquiry, prewriting activities, and study of models. These methods are listed below (ordered by effect size, in parentheses):

- Strategy instruction for planning, revising, and/or editing their compositions (.82)

- Summarizing reading passages (.82)

- Peer assistance in planning, drafting, and revising their compositions (.75)

- Setting clear, specific goals for purposes or characteristics of the writing (.70)

- Using word processing regularly (.56)

- Sentence-combining instruction (instruction in combining short sentences into more complex sentences, usually including exercises and application to real writing) (.50)

- Process approach to writing with professional development (.46)

- Inquiry approach (including clear goals, analysis of data, using specified strategies, and applying the analysis to writing) (.32)

- Prewriting activities (teaching students activities to generate content prior to writing) (.32)

- Analyzing models of good writing (discussing the features of good essays and learning to imitate those features) (.25)

Note that only three of these methods included at least 10 effect sizes (strategy instruction, word processing, process-writing approach). Results for the other methods were based on fewer, although at least four, studies. Although further research is needed, the field has accumulated a substantial database of studies on effective writing instruction for adolescents that might form an initial set of recommendations for teaching writing to adult literacy students and for planning research on how writing instruction can improve reading outcomes.

Weaker K–12 Writing Research Finding: Instruction in sentence combining can increase reading comprehension achievement.

One study in the review of writing research found that sentence combining, a frequently studied writing-instruction method, can improve reading comprehension as well as writing (Straw & Schreiner, 1982). In a quasi-experimental design, researchers compared sentence combining, sentence decomposition, and traditional grammar instruction with fourth-grade students. Students in the sentence-combining treatment performed better than the control on writing measures (T-unit length and complexity), listening comprehension, and a cloze reading comprehension measure, though not on a standardized reading comprehension test.

Teacher Preparation

One note of caution raised in the NRP report (NICHD, 2000b, p. 4-49) may be relevant for ABE settings, where teachers may be volunteers, paraprofessionals or otherwise lack training:

> In spite of heavy emphasis on modeling and metacognitive instruction, even very good teachers may have trouble implementing, and may even omit, crucial aspects of strategic reasoning. The research suggests that, when partially implemented, students of strategy teachers will still improve. But it is not easy for teachers or readers to develop readers' conceptions about what it means to be strategic. It takes time and ongoing monitoring of success to evolve readers into becoming good strategy users.

Weaker K–12 Research Finding: To improve learners' general reading comprehension achievement, train their teachers to teach the awareness and use of multiple strategies for reading and understanding a text.

The NRP review of reading comprehension instruction presented four studies having to do with the preparation of teachers for reading comprehension instruction. Although these studies represent a relatively small body of research compared with other areas reviewed by the NRP, several trends were observed. The most important trend is that teachers can be taught to teach reading comprehension to students and, when they are, their students become aware of comprehension strategies, use the strategies, and improve their reading (NICHD, 2000b, p. 4-8).

Weaker K–12 Research Finding: To improve teachers' knowledge of reading comprehension instruction, use both preservice and inservice training, and to improve their students' reading comprehension achievement directly, use inservice training.

The NRP also reviewed correlational and experimental studies to examine the effects of preservice and inservice teacher education. Preservice education typically occurs before teachers are certified, while inservice education typically involves professional development opportunities that occur after a teacher has begun teaching (NICHD, 2000b, p. 5-4). Trends from this research suggest that (1) teachers learn the reading instruction strategies and techniques that they are taught during preservice education (NICHD, p. 5-1) and (2) inservice education appears to lead to improved teacher knowledge and improved reading achievement for the teachers' students.

Instruction for Learners in ABE, ASE and ESOL Programs

Stronger Finding: Findings from the research with AE learners related to comprehension instruction apply to ABE learners and, to a lesser extent, ASE and ESOL learners. While most approaches to comprehension instruction appear to work with adults in all of these programs, there is some evidence that differentiated comprehension instruction—instruction that takes into account the unique needs of learners in each group—is also effective.

All of the experimental studies supporting the findings in the Teaching Strategies and Materials sections above included ABE learners; fewer included ASE learners; and fewer still included ESOL learners. Findings can be applied with the most confidence to learners who are similar to those included in the studies.

The degree to which findings apply to each group will be discussed below.

Several experimental studies used program type as an independent variable, looking at ABE, ASE and ESOL learners separately to see how study results applied to each group. There is some evidence from these studies that differentiated comprehension instruction, or different instruction for those in different groups, can be effective. However, more AE research is needed that looks at the effects of specific approaches to instruction for specific groups of AE learners, and, because of the small number of studies, findings from this research are tentative.

ABE

All of the findings listed above from studies with adults are based on one or more experimental studies that included ABE learners, so all of these findings apply to learners in ABE settings. Most of the findings are also supported by nonexperimental studies with ABE learners. Some of the experimental studies included separate groups of ABE learners and direct comparisons to those in ASE and ESOL settings. One study of an enabling factor, the teaching environment in classrooms, found that those in ABE and ESOL classes perform better with teachers who incorporate relatively less student-teacher collaboration, unlike learners in ASE classrooms (Conti, 1985). Another experimental study found that *all* learners benefited from staying longer in their reading programs; ABE learners were no different from ASE and ESOL learners (Boudett & Friedlander 1997 and Friedlander & Martinson, 1996). Similarly, a study discussed in more detail above in the section on teacher preparation found that learners in all three types of programs benefited from experienced, full-time teachers (Fitzgerald & Young, 1997).

ASE

There are somewhat fewer studies involving ASE learners than ABE learners. Still, all but one of the above findings from studies with adults (the study with results related to teacher assistance in the classroom) included ASE learners, so they apply to this group. Many of these finding are also supported by nonexperimental studies with ASE learners. As noted above, some of the experimental studies included separate groups of ABE, ASE and ESOL learners. The study of the teaching environment in classrooms

found that those in ASE programs perform better on a reading comprehension measure when teachers include relatively more student-teacher cooperation. This was not found with ABE and ESOL learners (Conti, 1985). As noted above, two additional experimental studies found that learners in all three types of programs benefited from staying longer in reading programs and from experienced, full-time teachers.

ESOL

Despite the fact that ELLs, those who attend adult education ESOL classes, make up a large proportion of learners in AE programs overall, very few experimental studies of reading comprehension instruction focus on ELLs. However, many of the reading comprehension instruction findings presented in the Teaching Strategies and Materials section above are supported by experimental and nonexperimental studies that at least include ELLs in the populations studied. One of the three experimental studies supporting the use of explicit instruction in reading comprehension strategies included students in ESOL classes (Conti, 1985), as did one of the four studies supporting the importance of spending a significant portion of classroom time on direct instruction in reading (Mikulecky & Lloyd, 1997). ELLs were also included in one of three studies supporting the integration of adult-oriented, contextually relevant material into reading instruction (Mikulecky & Lloyd).

A few experimental studies made direct comparisons between ELLs and other AE learners. One study of an enabling factor, the teaching environment in classrooms, found that those in ESOL and ABE classes perform better with teachers who incorporate relatively less student-teacher collaboration, unlike learners in ASE classrooms (Conti, 1985). Again, as noted above, ESOL learners, like other adult learners, benefit from staying longer in reading programs and from experienced, full-time teachers.

Weaker Finding: Teaching comprehension strategies to ESOL students may lead to increased reading comprehension achievement. (Carrell, 1985; Kasper, 1995)

Two studies were found that focused solely on English language learners. One experimental study found that explicitly teaching common text structures to ELLs increases their ability to recognize, recall and produce these text structures (Carrell, 1985). The top-level, orga-

nizational structures taught during five one-hour training sessions included comparison, causation, problem/solution and description. A follow-up posttest found that that the positive effects of the training persisted after three weeks. It should be noted that students in this study were reasonably proficient in English (at the high-intermediate level of proficiency), were participating in a college preparatory ESOL class and so were probably proficient readers in their native language. Their English language reading level was not given.

A second, nonexperimental study found positive results for a content-oriented program for advanced ELLs in a community college program (Kasper, 1995). A control group in a more general, literature-based reading class did not perform as well on an end-of-semester reading comprehension test as students who focused on a specific topic (psychology). Students engaged in a variety of reading, writing and audiovisual activities focusing on course content, but the differences in the conditions were not clearly described.

Research With Other Populations

Research at the K–12 level can help fill in gaps in the AE research related to instruction for those at different reading levels and for English language learners. Research with younger learners provides some support for differentiated instruction with those reading at the K–8 level (the reading level of ABE learners) and those reading at the nine through 12 level (the reading level of ASE learners). Research with K–12 English language learners supports using some of the same instructional methods with both native and non-native English speakers but also suggests using some bilingual instruction. Effective K–12 ELL instruction includes direct, intensive and multicomponent instruction; collaborative learning; and the use of bilingual instruction.

Research With Other Populations Reading at ABE and GED Levels

K–6 Research Finding: Improve intermediate (Grade Equivalent 3–6) readers' comprehension of narrative texts by teaching story structure, or the typical content and organization of stories.

The NRP review found that poor readers (in grades 3 through 6) benefited more from instruction in story structure than good readers (NICHD, 2000b, p. 4-45).

K–12 Research Finding: Improve the general reading comprehension achievement of intermediate and

advanced readers by teaching the flexible use of multiple reading comprehension strategies.

The NRP review found that good readers and students in the seventh grade or higher benefited most from multiple-strategy instruction (NICHD, 2000b, p. 4-46). This corroborates findings from studies with adults and adolescents and supports similar results from studies with AE learners.

Research With Other Populations of ESOL Learners

K–5 Second Language Research Finding: Direct, explicit instruction in each of the components of reading, provided in small-group settings, is effective in improving the reading achievement of English learners at risk for reading problems.

The review for the IES Practice Guide found three programs that are effective for English learners at GE 1–5: Enhanced Proactive Reading, Read Well and SRA Reading Mastery/SRA Corrective Reading. Similar programs should be just as effective if they include the same core or basic features: extensive, ongoing professional development for teachers and others involved in instruction; small-group instruction; instruction that provides multiple opportunities for discussion, questions, and practice; clear error correction procedures; and explicit instruction in each component of reading (Gersten et al., pp. 15–16).

K–12 Second Language Research Finding: Bilingual education can have a beneficial effect on reading outcomes.

This finding (Francis, Lesaux, & August, 2006, pp. 392, 397) is described in Chapter 6, Alphabetics.

K--12 Second Language Research Finding: Peer-assisted learning, or heterogeneous groups of two to four English learners practicing reading material that has already been taught, can lead to improvement on measures of alphabetics (phonemic awareness and word analysis), oral reading fluency and reading comprehension.

This finding is based on four experimental studies of peer tutoring that lasted for about 90 minutes a week (Gersten et al., p. 28). In two studies with beginning readers in grades K–1, peer tutoring was used to improve alphabetics. In the other studies it was used in grades three through six to improve reading comprehension (Gersten et al., p. 36).

Comprehension Instruction for AE Students With Learning Disabilities

Only two studies of comprehension instruction for AE learners with learning disabilities were found, and both were descriptive (Curtis & Chmelka, 1994; Hanlon & Cantrell, 1999). No findings were drawn from the research. There is more research with other adults, however—those in college or other postsecondary programs—as well as with children. This research can provide ideas for working with AE learners with a learning disability in reading until more research with the AE population is completed.

Research With Other Populations: Non-AE learners, Children and English Language Learners

The NRP did not look specifically at comprehension instruction for students with learning disabilities. However, a review of research with adults with LD in the general population did look at instruction in reading; the NLP reviewed studies of reading instruction for K-12 ELLs with LD; and the review of research on the reading-writing connection conducted for this review also looked at results from studies of children with LD. These reviews found that explicit and intensive instruction is effective with LD adults; younger ELLs with LD benefit from instruction that incorporates their native language; younger ELLs with LD benefit from the same instruction that is effective with native language learners with LD (although this was a tentative conclusion); and several specific strategies are effective for teaching writing to children with LD.

Other Adults Research Finding: Explicit instruction and intensive instruction are both effective methods for teaching adults with LD.

A recent, comprehensive review of research on teaching adults with learning disabilities found only 19 studies of adults with LD, including 10 studies of college students and nine of adults in other postsecondary settings (Taymans, Swanson, Schwarz, Gregg, & Gerber, 2009). Ten of the studies were experimental. Of the 19 studies, only one included adults in a typical adult education setting (Rich & Shepherd, 1993, described in the Teaching Strategies section above). Eleven studies looked at reading instruction. The 19 studies suggest that explicit instruction is effective for adults with LD in the general population: providing clear explanations; modeling learning behaviors;

collaborating with students in constructing effective learning strategies; extensive guided and independent practice with feedback; and support for generalizing what has been learned. The studies also found that intensive practice is effective. This includes engaging, one-to-one or small-group instruction that allows targeted instruction and extensive practice along with individualized feedback (Taymans et al. pp. 188–9).

Weaker K–12 Second Language Research Finding: Teaching strategies that work well with native-language learners with LD may also be effective for ELLs with LD. In addition, teachers can use students' native language to make instruction more comprehensible.

Ten studies of reading instruction for English-language learners with learning disabilities were identified by the National Literacy Panel (August & Siegel, 2006, p. 526ff.). Two of these studies investigated approaches to teaching comprehension. In one, using a multiple-baseline design, students taught in Spanish improved their comprehension of Spanish texts through extensive teacher-directed conversation about the texts. In the second, a descriptive study, teachers successfully used reciprocal teaching to model and gradually give control to students as they learned six strategies for comprehending text. Two other studies, described in Chapter 7, Fluency, found that fluency instruction also can increase reading comprehension achievement. These findings come from the 10 studies the NLP used to arrive at some fairly general conclusions.

- Some specific strategies that work well with native-language learners might also be effective with English-language learners, such as reciprocal teaching and repeated reading.

- Teachers can use students' native language to help them learn in a second language. Being taught initially in a native language and then transitioned to English was effective, for example. This is similar to the finding with ELL students generally that bilingual instruction can be effective.

- Making instruction more comprehensible through extensive, teacher-led conversation about text in both English and the native language is helpful.

While several of these were experimental studies, many were also nonexperimental case studies, ethnographies or studies with multiple-baseline designs. More experimental studies are needed to confirm these findings.

K–12 Writing Research Finding: Effective writing instruction for learners with LD includes strategy instruction, instruction in self-regulation, the use of word processors, explicit modeling or the writing process, teaching of text structures, and extensive feedback and scaffolding from teachers or peers.

Students with LD are well represented in the research on writing instruction for school-age students. One meta-analysis of research on strategy instruction for writing found 39 studies, of which 64 percent included students with LD. Strategy instruction was very effective with students with LD (with an effect size [ES] of 1.03) and other poor writers (ES of 1.88) as well as with average writers (ES of 0.82) (Graham, 2006).

Word processing, another method with a substantial number of studies, also appears to be especially effective with struggling writers. The meta-analysis by Graham and Perin (2006) mentioned above included 19 studies of word processing; they found an ES of 0.51 for writers in general but a larger ES of 0.70 for low-achieving writers. Similarly, an earlier meta-analysis (Bangert-Drowns, 1993) of studies of word processing and writing instruction found a larger ES for struggling writers (0.49) than for average writers (0.06).

A meta-analysis of 13 studies of writing instruction for students with LD found moderate to large effect sizes (average ES of 0.81) across all studies (Gersten & Baker, 2001). In addition, it reported that three components were common to nearly all of the interventions: explicit modeling of the writing process, explicit teaching of the text structures of genres and extensive feedback or scaffolding from teachers and/or peers. Other reviewers of the research on writing instruction for students with LD (De La Paz, 2007; Troia, 2006) have concluded that, in addition to explicit instruction and scaffolding, students with LD benefit from instruction in self-regulation procedures, such as goal setting and self-evaluation.

Other Topics: Age, Goals and Setting, Developmental Disability and Motivation

A few additional topics are very important for adult learners and teachers: the major goals or settings for AE and the effects of motivation on comprehension. There is some adult research related to each of these topics although it is limited. There is a solid body of K–12 research on student motivation. In addition, one study was related to adults with a developmental disability. This

study reported positive results from reading instruction on the reading comprehension of beginning adult readers with Down syndrome. The study found that adults with Down syndrome gained an average of about one year on a measure of reading comprehension after one year of reading instruction, substantial gains for those with a developmental disability (Moni & Jobling, 2001).

Age

Weaker Finding: While younger ABE learners have higher word analysis and fluency achievement than older ABE learners, they are the same on measures of reading comprehension.

Only one study of the effects of age on reading comprehension was found (MacArthur, Konold, Glutting, & Alamprese, 2010). In this study, younger ABE level adults (reading at GE 4–7) scored higher on measures of word analysis and fluency than older adults but were not significantly better on reading comprehension.

Effects of Goals and Setting on Reading Comprehension Instruction

The three major AE goals or settings are general functional literacy, family literacy, and workplace literacy. Several research studies have compared the reading comprehension achievement of adults in one type of setting to that in another. A finding from these studies will be discussed first. Whether reading comprehension can be improved within any one of these types of programs, without regard to any other type of program, is a different question that will be addressed in the finding that follows.

Weaker Finding: In some situations, participation in a workplace literacy or family literacy program may lead to greater increases in reading achievement than participation in other types of programs (Philliber, Spillman, & King, 1996; Sheehan-Holt & Smith, 2000; Sticht, 1989, 1997, and Sticht, Armstrong, Hickey, & Caylor, 1987).

Experimental results from one study suggest that adult learners in family literacy programs at 32 locations in 10 cities increased their reading comprehension achievement more than those in non-family literacy programs in another city's program that used the same measure of comprehension (the measure used was "total reading" from a standardized test, which included tests of vocabulary and comprehension) (Philliber et al., 1996). It should be noted that the design for this study included a post-hoc analysis with no control for initial group differences

(and might have used grade equivalent gain scores as the unit of analysis). One strand of influential research, not published in a peer-reviewed journal but included here because it is widely cited in the AE literature, finds that some work-related literacy programs that use job-specific content during instruction lead to (a) the same increase in general literacy as those using noncontent-based instruction and (b) a much higher increase in the comprehension of work-related material (Sticht, 1989, 1997, and Sticht et al., 1987).

In contrast to the above, one nonexperimental study (Sheehan-Holt & Smith, 2000), an ex post facto regression analysis using the NALS data, compares adults who report participating in job-related programs with those reporting participation in community-based tutoring programs and finds no relationship between reading comprehension achievement and type of program.

Stronger Finding: It may be possible to increase reading comprehension in workplace, family, and general functional literacy programs.

(Workplace literacy program studies: Askov & Brown, 1992; Lazar, Bean, & Van Horn, 1998; Mikulecky & Lloyd, 1997; Perin & Greenberg, 1993; Sticht, 1989, 1997, Sticht, Armstrong, Hickey, & Caylor, 1987).

(Family literacy program studies: Nickse, 1988; Philliber, Spillman, & King, 1996).

(General functional literacy program studies: Brooks et al., 2001; Darkenwald & Valentine, 1985; Dirkx & Crawford, 1993; Gretes & Green, 1994; Purcell-Gates, 1993; Scully & Johnson, 1991; Venezky, Bristow, & Sabatini, 1994).

(Corrections studies: McKane & Greene, 1996).

Workplace Literacy

One experimental study, discussed in more detail in the Teaching Strategies section, found workplace literacy instruction to be better than a no-instruction control condition (Askov & Brown, 1992). Four studies with non-experimental results also suggest that it is possible to increase reading comprehension in workplace settings. Two of these studies are discussed in more detail in the Teaching Strategies section. One found significant increases on measures of comprehension and meta-comprehension for adults in 10 workplace literacy programs at six workplace sites (Mikulecky & Lloyd, 1997). The other found that the overall reading comprehension of

adults completing a work-related program of instruction was better than that of those who do not attend as long (Perin & Greenberg, 1993).

Of the two remaining studies, one is discussed immediately above (Sticht, 1989, 1997, and Sticht et al., 1987), and the other found significant increases on several comprehension measures following 12 weeks of reading, writing and discussion related to workplace texts, tasks, problem solving and attitude. All together, these studies suggest that it is possible to increase AE learners' reading comprehension in a wide variety of work-related literacy programs, including hospital settings, a vocational classroom, military job-training programs, manufacturing plants, an insurance company and a women's prison.

Family Literacy

One nonexperimental and one experimental study found that literacy training in family literacy settings can lead to increases in reading comprehension ability. Each study reports gains of about one GE for anywhere from approximately 40 to 130 hours of instruction (Nickse, 1988; Philliber et al., 1996, discussed above).

Corrections

One experimental study found that use of a supplemental computer application that taught word analysis and fluency led to improved reading comprehension (McKane & Greene, 1996). This program is described in more detail in the multicomponents instruction section above.

General Functional Literacy

One experimental and virtually all of the nonexperimental studies conducted within functional literacy programs report positive results on measures of reading comprehension. An experimental study of a computer-based program for intermediate AE readers (reading at GE 4–9 based on TABE total reading scores) finds that reading comprehension can be increased with instruction in several specific comprehension strategies using functional reading material, such as texts that provide health, consumer and voting information for adults (Gretes & Green, 1994).

Four nonexperimental studies reporting results from single groups receiving pretests and posttests find that on five out of six measures (one study used two measures), adult ABE learners' reading comprehension increased after they participated in functional literacy programs.

An analysis of 71 basic skills programs in Britain suggests that AE learners, especially those attending for more than 50 hours, benefit slightly from instruction in general functional literacy programs (Brooks et al., 2001).

In a survey conducted by telephone, a large percentage of a random sample of adults who had participated in one state's AE programs reported that their reading was better after having participated (Darkenwald & Valentine, 1985). A fourth nonexperimental study looked at one program in more detail and found that, overall, students' reading comprehension increased on a measure of functional reading comprehension (the TALS Document test) but not on a measure focusing more on basic reading skills (the TABE) (Venezky et al., 1994). The final study compared a control group with a group using highly engaging and practical nature and science content and found that the approach focusing on functional material led to slightly better reading comprehension achievement (Dirkx & Crawford, 1993).

In addition to studies of large AE programs, two case studies report that one-to-one tutoring by experienced teachers leads to increases in adults' ability to read and understand functional texts based on a variety of measures, including teacher observation (Purcell-Gates, 1993; Scully & Johnson, 1991).

Effects of Motivation on Reading Comprehension Instruction

Weaker Finding: The direct or deliberate discussion of learners' literacy beliefs and plans in order to deal with issues of reading self-efficacy and motivation may increase reading comprehension achievement. (Boudett & Friedlander, 1997, and Friedlander & Martinson, 1996; Mikulecky & Lloyd, 1997)

Most AE programs assume that adult learners' motivation and feelings of self-efficacy are important issues. However, very few studies investigate whether or not attempting to improve motivation and feelings of self-efficacy will have a positive effect on adult learners' reading ability. Mikulecky and Lloyd (1997) describe workplace literacy programs for intermediate and advanced AE readers in which learners' feelings of literacy self-efficacy, or how good they perceive their reading and writing to be, and how important reading and education are in their future plans, are evaluated and then dealt with briefly, but directly, during classroom literacy instruction. A post-hoc analysis found that learners who participated in these classroom discussions had much greater gains in their ability to comprehend workplace-

related texts than those in classrooms where a less direct, more incidental approach to motivation was taken.

Another study (reported in Boudett & Friedlander, 1997, and Friedlander & Martinson, 1996) attempted to increase ABE students' motivation indirectly by requiring attendance in an ABE program to receive welfare benefits. However, even though those required to attend did attend more often, they did not have a greater increase in reading comprehension achievement than those who did not attend.

An additional factor that may affect reading achievement is the amount of reading practice adults engage in, although this is supported only by nonexperimental studies and so no findings were drawn from the studies. Reading practices are one indication of the degree to which adults are engaged in reading, and engagement is generally associated with motivation. Three studies have reported a strong association between practicing reading in natural settings and increases in reading achievement for AE learners or those who qualify for AE (low-literate adults) (Gerber & Finn, 1998; Smith, 1996; Tamassia, Lennon, Yamamoto, & Kirsch, 2007).

A nationally representative sample of AE learners found that learners who were engaged and motivated—those who read more widely and frequently—are better readers. (Tamassia et al., 2007). This survey used latent class analysis to associate levels of AE learners' reading engagement with literacy ability. They identified four classes of AE learners, from highly engaged readers who frequently read a variety of print materials (newspapers, books, magazines, e-mails and so on) to the least engaged readers, who rarely or never read print materials. The results showed that more engaged readers had higher functional health literacy than those who were less engaged, especially when compared with those who were least engaged.

Smith (1996) found a relationship between all types of everyday reading activities and higher reading achievement, and Gerber and Finn (1998) found a relationship between the amount of work-related documents adults read and higher document literacy. A more direct study of extensive reading found mixed results. In this study, authentic literature was chosen by students for sustained silent reading, teacher read-alouds, and group discussion. Students reported reading more and understanding more of what they read but did not significantly increase their scores on a measure of reading comprehension (Greenberg et al., 2006).

Research With Other Populations

The NRP did not address topics related to goals and setting and motivation, but a follow-up to the NRP analysis does address motivation, how to increase it and the effects of increased motivation on reading comprehension achievement.

Motivation

K–12 Research: To improve learners' general reading comprehension achievement, increase their motivation to read by providing interesting texts to read; providing choices for reading; enabling readers to develop reading goals; and encouraging collaborative learning activities in reading.

A meta-analysis of randomized controlled trials investigating instruction that motivates students to read and increases reading comprehension was conducted for a follow-up to the NRP report (Guthrie & Humenick, 2004). Results from this analysis of 22 studies and 131 experimental comparisons are important because they demonstrate that teachers, when they provide motivational settings in the classroom while teaching reading, will at the same time increase reading comprehension achievement. These studies suggest that four instructional practices are effective in increasing motivation and comprehension. These are listed below with the most effective instructional practices, those with the largest effect sizes, listed first (with effect sizes in parentheses).

- Provide readers with interesting texts to read (1.64).
- Provide choices for reading activities and content (choosing books) (1.20).
- Enable students to develop goals and purposes for reading (0.87).
- Encourage collaborative learning during reading and writing activities (0.48).

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Chapter 10
Conclusion

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The work of the Adult Literacy Research Working Group (ALRWG) has provided a framework for addressing three critical questions:

- What does the research published in peer reviewed journals say about adult education (AE) reading instruction?

- What are the strengths and weaknesses in the AE reading instruction research base?

- What research is needed in order to provide the best possible tools for teaching reading to adults in AE settings?

The ALRWG identified topic areas that are most important for adult reading instruction. Research is needed in each of these areas before a complete set of evidence-based practices can be recommended to those responsible for teaching reading to adults. In what follows, the distribution of research studies across the topic areas will be presented. This is a simple, straightforward way to see which topics have been the focus of research and which have not. This is followed by a summary of the AE literacy instruction research, and research with other populations used to fill in the gaps in the AE research, based on the summaries presented in previous chapters. The final section in this chapter presents suggestions for an AE reading assessment and instruction research agenda.

The Number and Distribution of Studies Across Topic Areas

The main topic areas identified by the ALRWG represent the major aspects of reading instruction: assessment of reading ability, alphabetics instruction (phonemic awareness and word analysis), fluency instruction, and vocabulary and comprehension instruction. Assessment is one of the first tasks completed by reading teachers. Those involved in AE reading instruction, whether they are teaching, creating models for instruction or publishing materials that are used for instruction, need to have knowledge of AE students' strengths and needs in reading in order to ensure the most effective instruction possible. We can use reading assessment tools to help to identi-

fy strengths and needs in each individual aspect of the reading process (alphabetics, fluency, vocabulary and comprehension). An assessment instrument may also measure more than one aspect of reading at a time, such as a test that includes both vocabulary and comprehension questions. Because instruction should involve all aspects of the reading process, some assessment techniques, such as assessment profiles, provide information about students' relative strengths and needs in each aspect of reading.

Most assessment research is used to describe AE learners' reading abilities and the specific abilities of subgroups in the AE population, including students in ABE, ASE or ESOL programs and students with learning disabilities in reading (LD). It has also been used to look at the relationship between reading and other significant factors, including age and health. However, some assessment research is also concerned with the nature or quality of the assessment procedures or tests themselves, answering questions such as, "How effective or how valid are common AE assessment instruments?"

Within each of the main topic areas, the ALRWG identified several subtopics common to most: instructional methods and material (teaching strategies and materials, intensity and duration of instruction, and teacher preparation), AE program type (ABE, ASE, ESOL), adults with LD, and other topics related to age, goals and setting, and motivation. The developmental disabilities subtopic was added later when several studies with reading outcomes measures in this category were found. Table 1 lists all subtopics and shows how they are related to the major components. Although additional categories or topics that are important to AE reading instruction may be identified in the future, research is definitely needed in each of the subtopics identified so far by the ALRWG (those areas shown in the shaded parts of the table).

For this review, research studies were located through a literature search and evaluated using criteria derived, with some important modifications, from the evidence-based methodological standards developed by the National Reading Panel (NRP) in its review of K–12 reading research (NICHD, 2000b). The ALRWG made several modifications to the approach used by the NRP. Important modifications included the addition of topics especially important to adult literacy professionals, the inclusion of studies related to the

Table 1: Stronger (S) and Weaker (W) Findings by Topic

Topics	Assessment Profiles	Alphabetics PA	WA	Fluency	Vocab	Comp
Assessment of Component						
All adults	S	S+	S+	S	W	S+
ABE	S	(S+)	(S+)	S		S
ASE		W		(S)		S
ESOL	S	S	S	S		S+
Adults with LD	S	W	W			S
Other Topics						
Age		W+	S	W		S
Health						S
Developmental Disab.		W				
Instruction						
Overall		S	S+	S	S	S
Methods & Material						
Teaching strategies		W	S	S	S	S+
Instructional materials			W	W		S
Intensity and duration					W	S
Teacher preparation						W
ABE		(S)	(S+)	(S)	(S)	(S+)
ASE						(S+)
ESOL					(W)	W
Adults with LD			W	S		
Other Topics						
Age		W				W
Goals and Setting		(S)	(S+)		W	S

PA=Phonemic Awareness, WA=Word Analysis and Spelling, Vocab=Vocabulary, Comp=Comprehension, ABE=Adult Basic Education, ASE=Adult Secondary Education, ESOL=English for Speakers of Other Languages, LD=Learning Disabilities, S=Stronger Finding, W=Weaker Finding, K=K-12 Finding,

( )=Finding repeated from above, + = more than 1 finding.

assessment of reading ability, and the inclusion of nonexperimental studies as well as those involving the use of control groups. Qualifying studies were placed into one or more of the topics areas described above and summarized as stronger or weaker findings. Because of the relatively small size of the research base and the small number of studies associated with most topic areas, the findings were labeled "emerging findings." With some exceptions, stronger emerging findings were based on at least two experimental studies and any number of nonexperimental studies, while weaker findings were based on at least one experimental study and any number of nonexperimental studies.

One way to look at the distribution of research studies across topic areas is to note which topics are associated with emerging findings derived from the research. Overall, there were 30 main assessment subtopics and 15 other assessment topics. In table 1, these are represented by the cells in the first eight shaded rows. The remaining 65 subtopics are associated with instruction. Cells in the table containing the letter S indicate subtopics that have enough qualifying research to have generated one stronger emerging finding and perhaps some weaker findings. Subtopics with the letter S+ had more than one stronger finding. Subtopics with the letter W had only enough research to generate one (W) or more (W+) weaker findings.

Distribution of Assessment Studies

There were enough research studies in almost three-fourths of the main assessment subtopics (excluding Other Topics) to generate at least one finding per subtopic. Six of these assessment subtopics had two or more stronger findings (S+), and 12 had one stronger finding. The alphabetics and comprehension subtopics had the greatest number of stronger findings. Of the three major program types, there were more assessment findings related to adults in ABE programs than to adults in ASE or ESOL programs. Assessment research in ABE programs, which serve beginning and intermediate adult readers, has focused more on alphabetics than on other components. There was much less research with ASE adults and much less research that describes the vocabulary levels or abilities of AE adults. There was some assessment research that described the component reading abilities and assessment profiles of adults with LD and also research

that compared the reading ability of adults with children or, on the other hand, younger adults with older adults. Research looking at the relationship between the reading ability of AE learners and their self-reported health has focused on reading comprehension. Finally, there was a little research on the reading ability of adults with developmental disabilities (such as Down syndrome).

Distribution of Instructional Studies

The instruction research covered a smaller percentage of its main subtopics than the assessment research. Of the 45 main instruction subtopics (excluding Other Topics), between one-half and two-thirds (26)were associated with findings. There was one strong finding in the teaching strategies subtopic for each of three of the components—alphabetics, fluency and vocabulary—and multiple findings for comprehension. There were also more findings in the comprehension component across most of the other instruction subtopics. There were more instruction findings for ABE learners than for ASE or ESOL learners. Outside of comprehension, there were very few findings in the instructional materials, intensity and duration, teacher preparation, adults with LD, age and motivation subtopics.

Research With Other Populations

Research with reading outcome measures was thin or nonexistent across most of the AE topic areas identified for study by the ALRWG. One strong recommendation from the ALRWG was that results from research with adolescents and children be used, when feasible, to at least temporarily fill in the gaps in the research across the AE topic areas. In table 2, a K within a cell indicates that there was one K–12 finding for this subtopic; a K+ indicates that there was more than one. As the table shows, research with adolescents and children did help fill in many of the gaps in the AE research, especially in the teaching strategies and ESOL categories. Where there is overlap between AE research and research with other populations, this research also provided opportunities to corroborate some of the emerging AE findings.

Only one of the reviews of K–12 research used for this study, the review of the National Literacy Panel (NLP) (August & Shanahan, 2006), was designed to look at results from the assessment of reading ability. The

Table 2: Stronger (S), Weaker (W), and K-12 (K) Findings by Topic

Topics	Assessment Profiles	Alphabetics PA	Alphabetics WA	Fluency	Vocab	Comp
Assessment of Component						
All adults	S	S+	S+	S	W	S+
ABE	S	(S+)	(S+)	S K		S W
ASE		W		(S)		S
ESOL	S	SK	S K+	S K	K	S+ K+
Adults with LD	S	W	W			S
Other Topics						
Age		W+	S W	W		S
Health						S
Developmental Disab.		W				
Instruction						
Overall		S	S+	S	S	S
Methods & Material						
Teaching strategies		W K+	S K+	S K+	S K+	S+ W K+
Instructional materials		K	W	W	K	S
Intensity and duration		K+			1W	S W
Teacher preparation						W K+
ABE		(S W) K	(S+ W)	(S) K	(S W)	(S+ W+) K
ASE						(S+ W) K
ESOL		K	K+	K+	(W) K+	(W+) W K+
Adults with LD			W K+	S		K+
Other Topics						
Age		W				W
Goals and Setting		(S)	(S+)		W	S W
Developmental Disab.						
Motivation						W K

PA=Phonemic Awareness, WA=Word Analysis and Spelling, Vocab=Vocabulary, Comp=Comprehension, ABE=Adult Basic Education, ASE=Adult Secondary Education, ESOL=English for Speakers of Other Languages, LD=Learning Disabilities. S=Stronger Finding, W=Weaker Finding, K=K-12 Finding,

( )=Finding repeated from above, + = more than 1 finding

purpose for most of the reviews was to summarize results from studies of reading instruction. For this reason almost all of the K–12 findings related to assessment were in the ESOL topic areas covered by the NLP review. For the instruction subtopics, research with adolescents and children was used to supplement results from AE teaching strategies research. It also supplemented comprehension instruction research across the teacher preparation, program type (ABE, ASE, ESOL), and LD subtopics. Findings from K–12 research also filled in gaps in the AE research related to alphabetics instruction, instruction for ESOL learners in each component of reading, and alphabetics and comprehension instruction for adults with LD.

Summary of Findings From AE Studies and Studies With Other Populations

While more research is needed across almost all topic areas, this review identified many emerging findings and several established or fairly robust findings from the AE literacy assessment and instruction research. A summary of these assessment and instruction findings for each component of reading is presented next, along with findings from research with adolescents and children that can be used to help fill in the gaps in the AE research and supplement or support existing findings.

Assessment Profiles

While there appears to be no experimental research at the adult or K–12 level demonstrating that reading assessment leads directly to increased reading achievement (Gersten, 2007), it is widely assumed that assessment is necessary in order to teach reading effectively and efficiently. Adult readers can be at just about any level in each component of reading, and assessment is needed to diagnose specific strengths and needs and devise a plan for instruction to meet those needs. Assessment is also used to evaluate the effects of instruction for both individuals and programs so that it can be modified if necessary.

An important finding from the review suggested that assessing several components of reading in order to generate profiles of students' reading ability gives teachers much more instructionally relevant information than a test of a single component. Reading profiles list a student's standard scores, such as grade equivalent scores, from tests of each reading component in order to compare relative strengths and needs in al-

phabetics, fluency, vocabulary and comprehension. The research identified for this review suggested that there were distinct groups of AE learners with unique profiles or patterns of scores across components and that knowledge of these assessment profiles may help teachers design more effective instruction.

The research found that good readers, whether children or adults, tended to have flat profiles. Children were at grade level in each component assessed, for example, and no one component was very much stronger than another. AE readers and children having difficulty with their reading were a more diverse group. AE beginning readers had fairly flat profiles with very low scores except for their oral vocabulary scores, which were relatively high. Adults' higher vocabulary scores may be the result of their larger world knowledge when compared to younger beginning readers. While these adults' vocabulary scores were higher than their other component reading scores, it is important to remember that their vocabulary knowledge was still well below average.

More advanced ABE readers (advanced beginners and intermediate-level readers) also had vocabulary scores that were higher than other component scores. However, while their print skills (represented by their alphabetics and fluency scores) were still relatively low, they had at least some decoding ability, so their comprehension scores were somewhat higher than beginning readers'.

Studies of AE English language learners (ELLs) found that they tended to have the opposite of the typical ABE profile; their decoding scores were relatively high compared to their fluency, vocabulary and comprehension scores. The research suggested that this difference diminished as ELLs' oral language ability and, consequently, their vocabulary and comprehension, improved.

For non-ELL ASE learners in the studies reviewed, there was less separation between print skills and meaning skills (represented by their vocabulary and comprehension scores); print skills had caught up to meaning skills for better AE readers. This was not true for the average AE learner with LD, however. Adults with LD tended to have much higher vocabulary and comprehension scores than alphabetics and fluency scores at both the ABE and ASE levels. As noted in the next section on alphabetics assessment, adults with a learning disability in reading typically have a disability

that negatively affects phonemic awareness and, consequently, word analysis and fluency.

Alphabetics

Assessment

A strong body of research found that adult nonreaders and those just beginning to learn to read have poor alphabetics skills. These findings are stronger than most other findings in this review in the sense that they have been replicated over time across multiple studies and consequently are established as opposed to emerging findings. This research found that phonemic awareness (PA) among adult nonreaders was almost nonexistent and only a little better among adult beginning readers. PA did seem to improve as reading ability improved, and there did not appear to be a critical age after which PA did not develop. Both younger and older adults were able to develop PA. This finding did not hold for adults with LD, however. Studies found that PA did not develop rapidly among these adults and that they may need special PA instruction or instruction that does not rely solely on oral PA exercises. This is a fairly robust finding among adults with LD generally, but more research is needed with AE adults specifically to confirm that it applies in AE settings. Results related to adults with LD are important in AE because many AE adults report having a learning disability.

Word analysis consists both of letter-sound knowledge, or basic decoding skills, and sight word knowledge, or the ability to recognize words on sight as whole words rather than having to sound them out. AE beginning readers, like children who are beginning to learn to read, had poor decoding knowledge, although their sight word knowledge was better than children reading at the same level. This is similar to what was found in the assessment profiles research described above and is an important factor in AE alphabetics assessment and instruction. Because of adults' greater experience with print and enhanced sight word knowledge relative to children, teachers may need to use simple, low-frequency words or nonsense words instead of high-frequency real words during WA assessment and instruction to make sure that adults are demonstrating their decoding ability, not their sight word knowledge.

WA can also be assessed with spelling (a production task) as well as reading (a recognition task). Research with AE adults found that their spelling ability, or their ability to encode as opposed to decode, was especially poor.

All of the conclusions discussed above came from findings based on studies that included ABE learners and, consequently, the conclusions all apply to those in ABE programs. There were fewer studies with ASE learners, but stronger findings from the research indicated that ASE learners had good PA skills and that WA continued to improve across ABE and ASE levels. As noted in the summary of the assessment profiles research, ESOL learners had less knowledge of English vocabulary and relied less on their sight word knowledge than on their ability to sound out words (their knowledge of letter-sound correspondences). A weaker finding (based on less research) suggested that ELLs who learned English before the age of 12 were more like native speakers, relying less on letter-sound knowledge and more on sight word knowledge. This finding was supported by research with English language learners at the K–12 level. After these non-native English speakers had been in an English-speaking school for a year or more, their PA and WA skills were similar to native speakers' skills. Two additional K–12 findings provided support for similar findings with adults as well as ideas for assessing AE English language learners' alphabetics skills. Research at the K–12 level found that PA assessments can be administered either in a child's native language or in English and that measures of alphabetics could be used effectively to identify ELLs' PA, WA and spelling skills.

Instruction

The review of alphabetics instruction research with adults found that alphabetics can be taught to AE learners using direct and explicit instruction in PA and WA. These findings were supported by a much larger body of research with children indicating that effective alphabetics instruction includes systematically teaching letter-sound correspondences directly and explicitly. Students learn how to convert individual letters or letter combinations into phonemes and how to blend these together to form words, and how to develop rapid recognition of sight words. K–12 research also found that PA and WA should be taught together, an especially important finding if applied in AE settings, where the assessment research showed that many adults with LD had difficulty learning PA when oral PA exercises alone were used. Additional approaches found to be effective with children included the use of fluency and spelling instruction to improve alphabetics, small-group instruction,

and alphabetics instruction that does not last longer than approximately 30 minutes per day.

The AE alphabetics instruction findings were based on research with beginning and intermediate readers. These findings, therefore, apply to learners in ABE programs. There were no findings related to learners in ASE programs, probably because they are relatively more advanced readers (reading above approximately GE 8). Also, no findings related to alphabetics instruction for AE ESOL learners were identified. Without AE research with English learners, research at the K–12 level may provide some direction for alphabetics instruction. ELL research at the K–12 level found that the approaches discussed above that worked with native speakers also worked with ELLs, with some important modifications because of language differences. Reviews of ELL alphabetics instruction found that it was improved by the interaction that occurs during peer tutoring in heterogeneous groups and by the use of bilingual instruction when possible. Taking into account the similarities and differences between English and a native speaker's language also improved instruction, as did knowledge of a learner's level of literacy in his or her native language. Both of these factors could be used to alter instruction based on what a learner already knows.

As noted above, in studies that asked whether adults had a learning disability, many reported that they did have a learning disability in reading. These adults had difficulty learning WA and, especially, PA skills. It is surprising, then, that only one, weaker finding related to instruction for adults with LD was generated from the research, based on a single experimental study. The results from this study were compatible with results from a much greater number of studies of children with LD. Both adults and children benefit from direct and explicit instruction in alphabetics, the same approach that works with non-LD learners. The program used in the adult study was especially intense, with several hours of instruction in alphabetics daily.

Fluency

Assessment

A stronger, well-established finding based on several studies, including two national surveys of adults, indicated that AE learners on average have poor reading fluency. Beginning readers in ABE programs, like all beginning readers, were found to be especially slow and inaccurate readers. AE learners with LD also had low-er than average reading fluency. Cross-sectional studies found that nondisabled adults' fluency improved as their reading improved, along with their reading comprehension. Some research suggested that better ASE readers' fluency may approach or equal that of average adult readers, but more research is needed to confirm this. The fluency of learners in ESOL programs was poorer on average than those in ABE and ASE programs unless they learned English at a young age. Research with children suggested that, at least for those reading at GE 2 or higher, the same fluency measures used with native speakers could be used with English learners to identify their fluency needs.

Instruction

The major findings for fluency instruction indicated that fluency, or reading accuracy and rate, can be taught to AE adults; teaching fluency leads to improved fluency ability and reading achievement; and repeated reading of text is an effective approach for teaching fluency. These findings were also supported by extensive research with adolescents and children. While the technique of repeated reading in AE studies included reading text at various levels, including letters, words, and sentences as well as passages, K–12 research found that guided, repeated oral reading of passages of text was most effective. K–12 research also found that fluency instruction can lead to increased reading comprehension as well as improved fluency.

The adult fluency research was conducted with lower-level readers, those in ABE programs, and so these findings applied to ABE as opposed to ASE learners. Research with children, however, suggested that fluency instruction was effective for all students with reading problems through grade 12. There was only one, nonexperimental study of fluency instruction with ELLs, so these findings could not be applied to ESOL programs. However, a small amount of research with children (two experimental studies) did suggest that repeated reading was effective with ELLs. While this finding was compatible with the adult and K–12 research with native speakers, more research is needed to confirm it. General approaches found to be effective in teaching reading to English learners that could be applied when teaching fluency to English learners include bilingual instruction, direct and explicit instruction, and peer-assisted learning.

A weaker finding from the adult research, based on one experimental and three nonexperimental studies, was that teaching alphabetics to adults with LD

improved their reading accuracy on passages of text. Reading accuracy is one aspect of reading fluency, along with reading rate. The experimental study did not find an increase in reading rate following effective alphabetics instruction (although each of the nonexperimental studies did).

Vocabulary

Assessment

Only two, weaker findings (weaker because they were based on less research) were derived from the AE research related to vocabulary assessment. One study compared the vocabulary achievement of AE learners and children at the same reading level (matched for reading ability on a measure of word recognition). AE learners had better vocabulary at lower reading levels (GE 3–4) but not at higher levels (GE 5). AE readers' vocabulary appeared to be dependent on reading ability. While their life experience may have given them an advantage at beginning reading levels, this advantage disappeared at higher reading levels.

No research was found investigating the vocabulary of ASE learners or AE adults with a learning disability. One study did report results from a comparison of ABE and ESOL learners' oral vocabulary knowledge. As would be expected, average ESOL beginning readers' vocabulary knowledge was not as good as beginning ABE learners' vocabulary. In addition, research with children confirmed that vocabulary knowledge is important for developing reading comprehension ability but not as important as phonological processing ability in developing alphabetics ability.

Instruction

Two stronger and two weaker findings were derived from the AE vocabulary instruction research. Both of the stronger findings could be characterized as emerging findings, with one based on four experimental studies and the other on two. The stronger findings suggested that AE reading instruction can lead to increased vocabulary achievement and that effective instruction included the opportunity to (a) use new words many times and (b) process them deeply by relating them to other concepts in texts used for instruction and to a learner's prior knowledge. The last finding was supported by more extensive research with children. Effective approaches to vocabulary instruction identified by K–12 research included active engagement during instruction, repetition and the use of multiple contexts, and listening and wide reading that increases exposure to new concepts.

The weaker AE findings (those based on fewer studies) suggested that the longer adults stay in effective programs, the more their vocabulary increases. They also suggested that highly engaging programs or content, such as those that focus on family literacy, may lead to better vocabulary achievement. The last finding was consistent with the K–12 research indicating that learners needed to be actively engaged during vocabulary instruction and that repeated exposure to new vocabulary in multiple, authentic contexts was effective. Additional effective approaches with children included preteaching new vocabulary words that learners will encounter in instructional texts and restructuring instructional procedures so that individual steps and tasks are understood and easily accomplished.

Most of the studies from which the adult findings were drawn included ABE learners, so all four vocabulary findings apply to those in ABE settings. Only one of the studies included ESOL learners (supporting the finding that multiple exposures and deep processing were effective approaches to vocabulary instruction). Results from this study were supported by research with children which found that English learners benefited from the same approaches that were effective with native speakers. ELL research with children also found that bilingual discussion of new vocabulary and the use of computers and multimedia were effective approaches to vocabulary instruction. While vocabulary learning is an important task for those in ASE programs, especially those working on the GED, none of the teaching strategies studies included ASE learners. Finally, no AE studies looked at the effectiveness of approaches to vocabulary instruction across ABE, ASE and ESOL settings, but K–12 research did find that different strategies might be more effective for learners at different reading levels.

Although no studies of AE learners with LD were identified, the restructuring approach to vocabulary instruction described above is effective with children at risk for reading failure.

Comprehension

Assessment

Findings from studies with adults indicated that AE learners have poor functional literacy comprehension, including health literacy. These findings are established, robust findings as opposed to emerging findings. They are based on several large-scale surveys of adults, including the Adult Education Program Survey (AEPS), the National Assessment of Adult Literacy (NAAL) and the National Adult Literacy Survey

(NALS). While AE learners can perform simple comprehension tasks such as locating a single piece of information in a text, they have difficulty integrating information from longer, more complex texts.

The AEPS found that adults in ABE, ASE and ESOL programs had poor reading comprehension, below what is required in today's job market. The average ASE learner had the highest comprehension scores among the three program types. The average ESOL learner, with both poor language and poor alphabetics and fluency abilities, scored even lower on the AEPS comprehension assessment than the average ABE learner. This finding was supported by research with children which found that English learners' average comprehension scores were much lower than native speakers'. Another adult study, however, found that when ESOL learners were tested in their native language on the same measure used with native speakers, they scored at roughly the same level as other AE learners. This indicated that language ability as well as reading difficulties affected their comprehension of English texts.

Studies of adults with LD found that they also have lower reading comprehension scores than other AE learners. Assessment research described in other chapters suggested that poor alphabetics and fluency abilities may contribute to their poor reading comprehension.

As reported in the comprehension instruction chapter, writing can be used to improve reading comprehension. It would be useful when preparing for instruction, therefore, to know what AE students' strengths and needs are in writing. Unfortunately, not enough research on AE students writing ability was found to derive any findings for this report.

Finally, the comprehension topic was the only topic area in which the quality of assessment instruments was evaluated. Findings from this research suggested that results from different assessment instruments varied considerably, so instructors needed to choose comprehension tests carefully.

Instruction

Comprehension is the ultimate goal in reading and, perhaps because of this, there were more comprehension studies, and consequently more comprehension findings, than alphabetics, fluency or vocabulary findings. The comprehension research, in fact, covered almost all of the subtopics in the review. A robust, stronger finding, supported by a fairly large number of studies, was that participation in AE can lead to increased reading comprehension achievement. The research suggested that specific approaches to effective comprehension instruction were just beginning to be identified. These included (a) direct reading comprehension instruction, (b) multiple-component instruction and (c) enabling instruction or settings.

Direct instruction in reading comprehension included guided practice in specific strategies, with learners gradually taking responsibility for implementing the strategies. While more studies were needed to replicate the findings, several strategies were beginning to be identified: question asking, question answering, summarizing, organizing information by focusing on topics, and monitoring comprehension. A much larger body research with adolescents and children, both native and non-native speakers of English, supported and extended these findings, confirming the effectiveness of several specific strategies. Strategies shown to work with adolescents or children included question asking, question answering, summary writing, use of graphic and semantic organizers, comprehension monitoring, use of story structure, and cooperative learning (working together or acting as a tutor).

Summary writing as a strategy to improve comprehension was supported by both the review of reading comprehension instruction and the review of reading-writing research. The reading-writing review also found that writing about content-area instructional material improved learners' comprehension of content-area information. Given that writing can be used to improve reading comprehension, it would be useful to know the most effective approaches to writing instruction. While there is very little research on the best ways to teach adults how to write well, research at the K–12 level has identified 10 effective approaches: strategy instruction, summarizing (already mentioned for both adults and children), peer assistance, setting goals for the written product, word processing, sentence combining, process writing with professional development, inquiry, prewriting activities and study of models.

Multicomponent instruction was another emerging approach identified in the research on reading comprehension with AE learners. Combining WA and fluency instruction, or WA, fluency and comprehension instruction, led to improved comprehension. WA and fluency instruction may have been effective in improving comprehension because decoding a text is

a prerequisite for understanding it. This finding was supported by research with adolescents and children. In addition, research with children supported the combination of vocabulary instruction and other components of reading to improve comprehension.

A third group of studies from which two findings were derived indicated that comprehension can be improved by manipulating the classroom environment to enable reading comprehension. Two enabling factors were learner-centered activities for students, supported by one experimental and one non-experimental study, and community building to improve cooperation in a prison setting in order to facilitate the use a reading program that relied on cooperative learning. Another enabling activity included more assistance for teachers in the classroom.

The intensity and duration of reading instruction was also found to affect comprehension. One stronger finding suggested that the longer learners stayed in an effective program, the more their comprehension improved. A weaker finding (based on one experimental study) indicated that sufficient intensity (spending a significant portion of classroom time on direct instruction of reading strategies) improved comprehension.

Effective teaching materials were also identified in the research. These included adult-oriented, contextually relevant materials. No findings related to commercially available materials were derived from the research. Adult-oriented or contextually relevant materials may have been effective because they increased students' motivation and engagement. This reasoning is supported by research with children that investigated the effects of motivation on reading comprehension. This research found that comprehension can be improved by improving motivation and that this can be accomplished by providing interesting texts to read, providing choices for reading, enabling readers to develop reading goals and encouraging collaborative learning activities in reading.

The last category in this review under instructional methods and materials is teacher preparation. A weaker finding from studies with adults (based on one experimental and one nonexperimental study) suggested that AE staff with more training or experience were more effective and had a better chance of improving reading comprehension.

Most of the studies that supported the AE findings discussed above included learners in ABE, ASE and ESOL

programs, so most of these findings apply to learners in each type of program. Very little research compared the effects of specific approaches across program types. The research that did, however, suggested that different approaches may, in some cases, be better for learners in different programs. The findings from the enabling instruction research discussed above, for example, suggested that different teaching environments may be more effective for learners in different types of AE programs. Research with children tended to support the use of differentiated instruction for learners at different reading levels. Those in the upper elementary grades or better readers in the lower grades, for example, seemed to benefit more from reading comprehension strategy instruction. As noted in each of the chapters devoted to a component of reading, there were general approaches that could be used with English language learners to help teach each component: direct, explicit instruction; peer-assisted learning; heterogeneous small groups; and bilingual instruction when possible.

In addition to research that included learners in the different program types (ABE, ASE and ESOL), research looked at learners in programs with different types of goals or settings, including workplace, family, and general functional literacy settings. One finding suggested that participation in workplace and family literacy programs led to better reading comprehension achievement than participation in general functional literacy programs, presumably because these programs would use relevant and engaging instructional material. More research is needed to confirm this weaker finding (based on one experimental and two descriptive studies).

Finally, no experimental studies of comprehension instruction for AE learners with a learning disability in reading were found. However, a recent review of research with adults in the general population who have a learning disability found that explicit comprehension instruction was effective with LD learners, just as it was with AE learners, children, and English learners. This review also found that more intensive instruction is needed to teach LD learners, including one-to-one and small-group instruction. Research with children found that English learners with LD benefited from the same approaches to instruction that were used with native speakers, with the modifications for ELLs mentioned above. Effective writing instruction for LD learners included some of the same approaches that worked well with non-LD learners, including strategy instruction, word processing, and summarizing, as well additional

approaches, including instruction in self-regulation, explicit modeling of the writing process, teaching of text structures and extensive feedback and scaffolding from teachers or peers.

Recommendations for a Research Agenda

Recommendations for AE reading instruction research were drawn from both the review of the distribution of studies across topics and the summary of findings presented above. The distribution of studies and their findings showed which topics had been addressed by the research and which had not. The findings themselves showed how well questions and hypotheses important to AE had been addressed by the research and what new hypotheses might be tested. Research with children and adolescents also suggest approaches that might be tested with adults.

Recommendations Based on the Distribution of Studies Across Topics

The distribution of studies and findings across subtopics indicated that most assessment studies were alphabetics studies conducted with ABE learners. Until fairly recently, ABE adults were the largest of the three AE groupings and, for beginning readers, alphabetics was a major need. More reading assessment research is needed with the growing number of learners in ESOL programs, with adults in ASE programs and with adults with a learning disability in reading. Of the three remaining components of reading, studies assessed learners' strengths and needs in reading comprehension more often than they assessed learners' vocabulary and fluency. This was true for adults in all three types of AE programs. More fluency and vocabulary assessment research is needed. Only one, weaker finding related to vocabulary assessment was identified.

While assessment research focused more on alphabetics, the distribution of findings across subtopics showed that instruction research focused more on comprehension. As with the assessment research, most of this research was conducted with ABE learners; much more instruction research is needed with ESOL and ASE learners, as well as those with LD. With the exception of the comprehension topic, there were very few studies with AE learners in most of the subtopics: instructional materials, the effects of intensity and duration of instruction, teacher preparation, age and motivation.

Recommendations Suggested by Findings From the Reading Instruction Research

In the absence of research with AE learners, research with other populations helped fill in some of the gaps noted above, especially in the teaching strategies and ESOL categories. Research with children and adolescents supplemented AE teaching strategy findings across each component of reading. It also supplemented the adult teacher preparation research, the instruction research across AE program type (ABE, ESOL and ASE) and research on instruction for adults with LD.

The findings from the reading instruction research with adolescents and children used throughout this report to fill in gaps and supplement AE research need to be tested directly with adults. Studies that determine whether successful approaches to reading instruction with adolescents and children can also be applied successfully in AE settings are very important (e.g., Winn, Skinner, Oliver, Hale, & Ziegler, 2006). Equally important are studies that determine whether (and how) effective K–12 approaches might need to be modified because of age differences (e.g., Curtis & Chelmka, 1994).

Existing reading instruction research with adults also provided direction for future research. Two important areas of research were suggested by weaker alphabetics assessment findings (weak because they were based on a small number of studies). More research was needed to confirm that AE adults with a learning disability in reading were like non-AE adults with LD in that they needed specialized alphabetics instruction because of phonological processing deficits. Also needing confirmation was research with AE second language learners indicating that the age at which they learn to speak English had a direct impact on their English alphabetics ability.

Research with children found that guided repeated oral reading of passages of text was an effective method for improving reading fluency. Some research had successfully applied this method to adults, but more research was needed to replicate or confirm this finding and to show that reading fluency in general improved, not just fluency on practiced passages. More research was also needed to determine whether instruction in single-word reading fluency could improve alphabetics ability or reading achievement generally; whether teaching alphabetics improved fluency, as found in one study with adults; and whether fluency instruction was beneficial for ASE and ESOL learners.

More research was needed describing the vocabulary ability of all AE adults, including those in ESOL, ABE and ASE programs and those with LD. While some research investigated the comprehension or combined comprehension and vocabulary ability of AE adults, more research that separated oral vocabulary assessment from comprehension assessment was needed. Some vocabulary instruction research found that frequent exposure to new vocabulary and deep processing of new words improved vocabulary knowledge, but more research was needed to confirm this and to determine whether similar approaches used with children would be effective with adults. Similar approaches included active engagement during vocabulary instruction, repetition and the use of multiple contexts, and listening and wide reading that increase exposure to new concepts. More vocabulary research was needed with ESOL and ASE learners. Vocabulary instruction is an important component of English language learning for adults in ESOL programs. It is also crucial for ASE learners as well as they study information necessary to pass the high school equivalency test (GED).

There were several robust, stronger findings related to reading comprehension assessment and instruction. However, while writing can be an important tool in teaching reading, very little research described AE learners' strengths and needs in writing (with the exception of spelling). More research was needed on the use of summary writing and other forms of writing instruction to improve adult reading comprehension. Research that applies approaches found to be effective with children might be especially promising, assuming that the approaches are modified when necessary to take into account relevant adult-child differences.

More research was needed to confirm and expand the types of comprehension instruction found to be effective with adults, including direct instruction in reading comprehension strategies. Again, additional strategies found to be effective in the relatively more extensive research with children might be tested with adults. Integrating adult-oriented, contextually relevant material into comprehension instruction was found to be effective and might be tested more thoroughly, along with the effects of motivation and engagement generally on reading comprehension achievement. Finally, more research was needed to see which reading comprehension strategies worked best for AE learners in each of the three types of AE programs (ABE, ESOL and ASE), as well as AE learners with LD.

Teacher preparation was a topic that received very little attention in the AE reading instruction research, regardless of the reading component being studied. Much more research was needed on the effects of various forms of teacher preparation and professional development on AE learners' reading achievement. Measures of teacher knowledge (e.g., Ziegler et al., 2009) may be especially useful in this research, helping to determine the effectiveness of professional development activities and whether these activities lead directly to increased reading achievement for AE learners.

References

References are arranged by category. Background references are presented first, followed by references for the studies used to support the various findings. The study references are divided into four categories: adult reading studies, adolescent studies, writing studies and K–12 reading reviews.

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