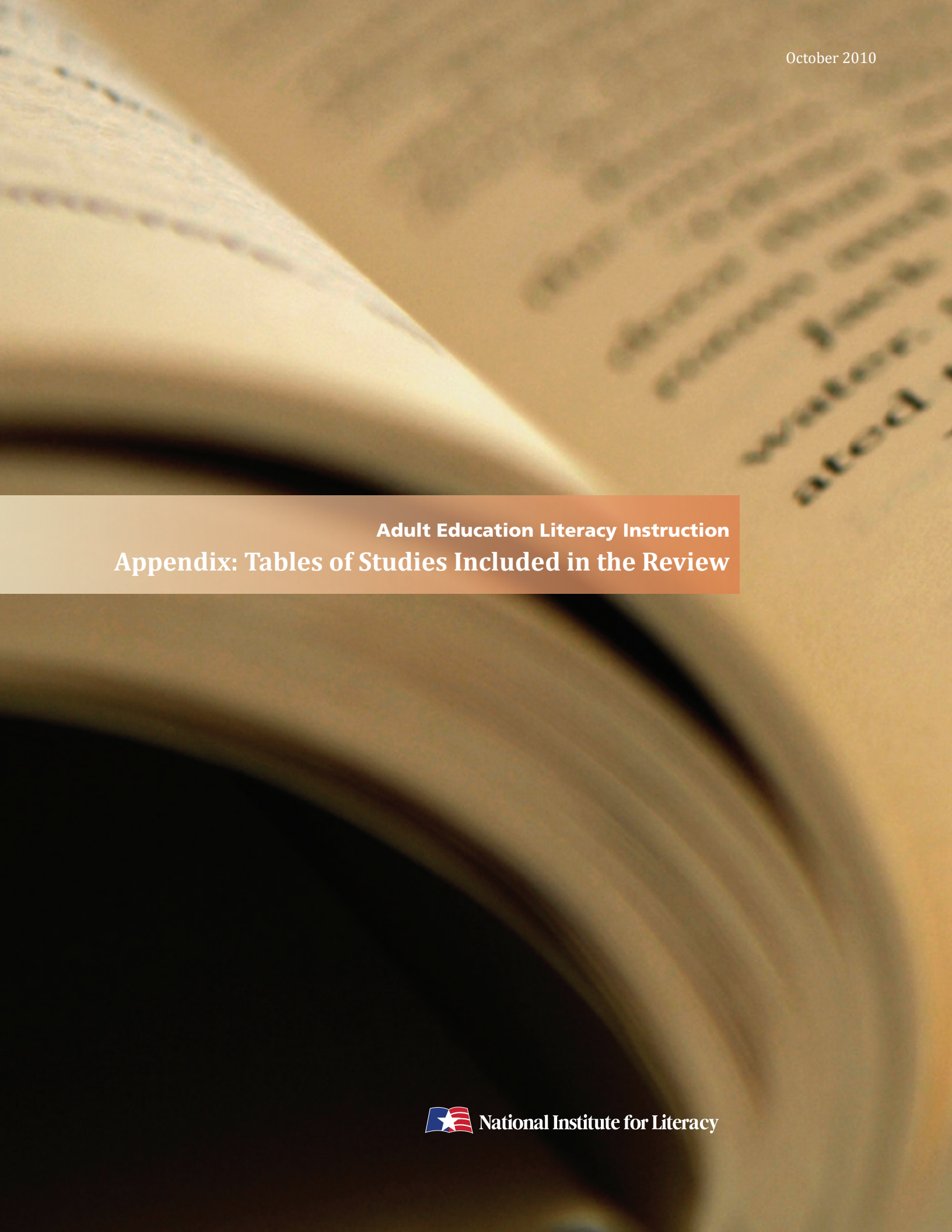

October 2010

Adult Education Literacy Instruction

Appendix: Tables of Studies Included in the Review

National Institute for Literacy

Contents

List of Table Abbreviations

Program Type

ABE	Adult Basic Education
ASE	Adult Secondary Education
ESOL	English for Speakers of Other Languages

Type of Study

Assessment-I	Assessment study using large sample or inferential statistics
Assessment-E	Assessment study using small sample and no inferential statistics

Study Design

Exp	Experimental
	True Experimental
TERPP	Random assignment, Pre-Post
TERP	Random assignment, Post (test for initial diffs.)
TESR	Stratified Random Sample
TRM	Repeated Measure with random assignment to condition
	Quasi-Experimental
QNPP	Non-random, pre-post
QPHPP	Post-hoc, pre-post
QRM	Repeated measure (non-random assignment to condition)
Desc	Descriptive
E-Stats	Experimental or Quasi-experimental design but no statistical tests for significant differences
PPNC	Pre-post, no control (one group)
PO	Post only (one group)
MS	Multiple groups, one time, with statistical tests for significant differences
MNS	Multiple groups, one time, no statistical tests for significant differences
CORR	Correlational
MB	Multiple Baseline (single subject)
NRP	If there is a check mark in this cell, the study was also included in the Report of the National Reading Panel (Adolescent Tables only)

Appendix A: Adult Studies

A1. Adult Studies: Assessment Profiles

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Carver & Clark, 1998	n: 294 rl: GE 5-11 age: 9-45 lang: English	ABE ASE	Assessment-I MNS Assessment-D	Children in grades 3-8 with average reading level of GE5, advanced readers enrolled at a University with average reading level of 12.7GE, and adult readers in four Community College remedial reading classes (with average reading GE scores of 6.8, 8.7, 9.9 and 10.9) given assessments across components of reading	Measures across components of reading: Overall (combined vocabulary and rate); Reading vocabulary; Reading rate; Listening vocabulary; Word recognition; Rapid letter-naming	Reading profiles of children and advanced readers were flat across the various components of reading (average scores the same for each component) while profiles of adult poor readers were not flat (varied across the components). Adults in two higher level reading classes had vocabulary scores comparable to advanced readers, but lower rate and word recognition scores. Adults in two lowest level reading classes had lower (and variable) scores across all components. Descriptive: Reading disabled Community College readers all had low word recognition scores, 98% had low rate scores, and 67% had low vocabulary scores.
Chall, 1994	n: 100 rl: GE 1-10 age: 18-60 lang: English and other	ABE ASE ESOL	Assessment-D MNS	Given print- and meaning-based assessments of reading to obtain reading profiles	Print: word analysis, spelling, isolated word recognition, oral reading Meaning: word meaning, silent reading comprehension	2 patterns predominate at all reading levels 1. ESL: relatively stronger in mechanics (or print aspects of reading) and weaker in meaning aspects; tend to score lowest on word meaning 2. LD: relatively stronger in word meaning aspects and weaker in print aspects (similar to children with LD)
Chiappe, Stringer, Siegel, & Stanovich, 2002	n: 93 rl: below 25th %ile on WRAT (controls: all levels for adults; above 25th %ile for children) age: 25 (controls: 25; 10) lang: English	ABE	Assessment-I	Phonemic awareness, word analysis, and comprehension tests given to reading disabled adults and two control groups (an age-matched group of non-disabled adults and a reading-matched group of non-disabled children)	WRAT3 word recognition (used for matching); Rosner: phoneme and syllable deletion; Woodcock: word recognition and psuedoword reading; WRAT3: spelling; WIAT listening comp.; Nelson Deny reading comp. (adults only)	Reading disabled adults significantly lower than non-disabled adults on phonemic awareness, pseudoword reading, word recognition, and reading comprehension but lower than reading-matched children on only phonemic awareness and pseudoword reading
Davidson & Strucker, 2002	n: 212 rl: GE 4-6 age: adult lang: English and other	ABE ESOL	Assessment-I MS	Adults in ABE classes with GE4-6 reading levels on DAR Word Recognition given assessments across components of reading	Print Measures: Word Recognition (Diagnostic Assessment of Reading–DAR); Woodcock Word Attack, DAR oral reading Comprehension Measures: DAR Silent Reading Comprehension, Peabody Picture Vocabulary (listening vocabulary)	Native speakers are stronger on comprehension than print measures. Nonnative speakers have more even levels of abilities across print and comprehension measures. Nonnative speakers have lower comprehension scores than native speakers but similar word recognition and word analysis scores.
Greenberg, Ehri, & Perin, 1997	n: 144 rl: GE 3-5 age: 33 and 10 lang: English	ABE	Assessment-I MS	Assessment of adults and children reading at GE 3, 4, and 5 on word recognition	Phoneme deletion, real words; phoneme segmentation, real words; non-word decoding (Woodcock Word Attack); sight word recognition, irregularly spelled words; wordlikeness choice task; spelling; rhyme word reading; oral vocabulary (PPVT)	Multiple regression analyses indicate that phonological and orthographic processing are both used in decoding regular and irregular words. Comparison of correlation coefficients indicates that these processes involved in word reading are more closely integrated in children than in adult literacy students.
MacArthur, Konold, Glutting & Alamprese, 2010	n: 486 rl: GE 4-7 age: 35 (16-71) lang: English and other	ABE	Assessment-I CORR (Factor Analysis)	Given assessments across components of reading to determine, through factor analysis, the best model for the component skills of reading (and the best set of measures for complete reading assessment profiles)	11 measures of five components: decoding (TOWRE Phon. Decod.; WJR Word Attack; Letter Sound Surv.), word recognition (WRAT3 Rdg; WJR Letter Word), spelling (WRAT3; Devlptmtl. Splg.), fluency (TOWRE-SWE; Passage Reading Test), and comprehension (Nelson Word Meaning and Comprehension)	Non-native adults higher on decoding than native adults, same on word recognition, and lower on fluency and comprehension. Adults with LD lower on all components.
Mellard, Fall, & Mark, 2008	n: 295 rl: 0-12 age: 24 (16-73) lang: English and other, but non-ELL	ABE ASE	Assessment-I CORR (Cluster Analysis with ANOVAs to test for significant diffs. among clusters)	Stratified random (and, when necessary, convenience) sample of AE learners across all NRS reading levels were given assessments of components of reading (word analysis, fluency, and comprehension) to determine, through cluster analysis, instructionally relevant profiles	Phonemic decoding (Woodcock Word Analysis; TOWRE Phonemic Decoding). Word Recognition (Woodcock Word ID; TOSWRF; TOWRE Sight Word Efficiency). Fluency (QRI words correct per min. in 6th grade passage). Comprehension (Woodcock Passage Comprehension)	Identified 7 reading ability subtypes (profiles) that do not all correspond to typical AE groupings based on a single measure of reading comprehension. Main instructional needs for the 7 profiles can be addressed by focusing on one of three components of reading: basic decoding, fluency, and comprehension.

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Nanda, Greenberg, & Morris, 2010	n: 371 rl: GE 3-5 age: 16+ lang: English and other	ABE ESOL	Assessment-I CORR (factor analysis)	Given assessments across components of reading to determine, through factor analysis, which child-based component model of reading fits AE readers: an achievement model of reading skills, a core deficit model of reading subskills, or an integrated model	Word reading (WJIII Letter-Word ID; Sight Word Reading Test); Word reading fluency (TOWRE Sight Word); Nonword reading (WJIII Word Attack); Nonword reading fluency (TOWRE Phonemic Decoding); Reading fluency (WJIII Reading Fluency; GORT-4); Reading Comprehension (WJIII Passage Comp; GORT-4); Phonological Awareness (CTOPP Elison and Blending); RAN (CTOPP Rapid Letter, and Color, Naming); Oral Vocab (PPVT; Boston Naming)	Overall: Difficulty obtaining models with good fit using child-based component models. ESOL vs Non-ESOL: Non-ESOL performed better on oral vocabulary, reading comp, and sight word recognition. ESOL performed better on nonword reading. No difference on fluency.
Norman, Malicky, & Fagan, 1988 (and Norman & Malicky, 1987)	n: 122 rl: GE 1-8 age: 16 - 63 lang: English	ABE	Assessment-I CORR (factor analysis)	Given assessments across components of reading	Classroom Reading Inventory: word recognition level, oral reading miscues (5 types based on degree to which they are derived from text or reader knowledge), comprehension level, and text units recalled during retelling (4 types based on degree to which are derived from original text)	Beginning readers (late GE 1 to beginning 4) attend more to print on page than to prior knowledge. High GE 3 and beginning 4 readers begin to integrate ideas from text with prior knowledge. At transition level (GE 4), integration not always successful (erroneous recall based on experience and elaborations). Advanced group (GE 5, 6, and 7) uses both knowledge and print information; better able to integrate the two. Nevertheless, individual readers' profiles differ within and across reading levels.
Sabatini, 2002	n: 95 rl: GE3-college age: 27 lang: English	ABE ASE	Assessment-I MS	Adults in adult education and college given assessments across components of reading. For analysis, divided into high, average, and low ability groups based on WRAT word recognition scores.	WIAT Reading Comprehension Subtest; accuracy and speed on sentence comprehension, word naming, pseudoword naming, single word decoding and paired-word decoding; speed on nonreadng tasks (digit and picture naming, perceptual-motor reaction time, rapid number naming)	Significant group differences were found for passage comprehension, sentence comprehension, and decoding accuracy. Significant group differences were also found for all speed tasks. High-ability group had rapid and efficient (fluent) word-analysis and comprehension skills; average-ability group had accurate but not as automatic processing skills; low-ability group struggled with both accuracy and efficiency in word-analysis and comprehension.
Sabatini, Sawaig; Shore, & Scarborough, 2010	n: 476 rl: GE 7 or lower age: 37 (16-76) lang: English and other (but intermediate or better English language skills)	ABE	Assessment-I CORR (Factor Analysis)	ABE learners given 13 assessments across components of reading.	Word Recognition/ Decoding (WJ Word Attack and Letter Word ID; WRAT3); Fluency/ Speed (TOWRE Sight Word; TOWRE Phonemic Decoding; WJ Reading Fluency; NAAL Oral Reading;) Oral Language Comp. (WJ Oral Comp., Understanding Directions, Story Recall); Oral Lang. Vocab. (WJ Picture Vocab., Boston Naming)	While word recognition, reading fluency (rate/speed), vocabulary, and language comprehension are all separate factors in reading comprehension, only word recognition and language comprehension are independently and substantially related to reading comprehension for the ABE population (implying that they are the primary factors in reading comprehension for this group).
Strucker, 1995	n: 100 rl: all age: adult lang: English and other	ABE ASE ESOL	Assessment-I CORR (Cluster Analysis)	Adults in adult education classes given assessments across components of reading	Phonemic awareness, word analysis, and word recognition, spelling, oral reading, oral vocabulary, and reading comprehension	Identified two basic categories of reading profiles or patterns of scores across components: ESL and reading disabled. In addition, nine instructionally relevant patterns of strengths and weaknesses in reading were found across several reading levels.

A2. Adult Studies: Alphabetics

Alphabetics Assessment-Phonemic Awareness

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Adrian, Alegrai, & Morais, 1995	n: 47 rl: nonreaders to beginning readers age: 47 (mean) lang: Spanish (all testing in Spanish)	ABE	Assessment-I MS	Nonreaders, poor beginning readers, and better beginning readers in Spain given tests of phonemic awareness	Phonetic discrimination, rhyme detection, syllable deletion, phoneme deletion, phoneme reversal	PA better as reading level increases: Nonreaders very poor on PA tasks; poorer beginning readers have some phonemic awareness but not as good as better beginning readers
Bertelson, Gelder, Tfouni, & Morais, 1989	n: 25 rl: nonreaders to beginning readers age: 30 (mean) lang: Spanish (all testing in Spanish)	ABE	Assessment-I MS	For one session, simple instruction in phonemic awareness (examples given followed by instruction until 6 consecutive responses or 20 trials; provide correct response if necessary)	Phonemic awareness: rhyme detection, vowel deletion, consonant deletion	With simple instruction, nonreader and reader groups not significantly different on rhyme detection and vowel deletion, but readers significantly better on consonant deletion

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Bruck, 1992	n: 118 rl: GE 1-12 age: 20-23 (mean) lang: English	ABE	Assessment-I MS	Dyslexic and non-dyslexic children and adults at various reading levels given phonemic awareness tasks	Phoneme deletion (onset and other phonemes), phoneme counting	Non-dyslexic children and adults increase in PA ability through GE3 while dyslexic adults (and children) do not consistently show PA growth as age and grade increase (PA difficulties persist into adulthood)
B. Byrne & Ledez, 1983	n: 50 rl: GE 0-7 or higher age: 23 (mean) lang: English	ABE ASE	Assessment-I MS	Adults at three reading levels (mean GE1, mean GE4, and GE 7 or higher) on word recognition test given phonemic awareness task	Phoneme reversal	Nonreaders and beginning readers have very poor phonemic awareness; advanced beginners are better, but still poor relative to high-intermediate and advanced readers
Cardoso-Martins & Frith, 2001, Study 1	n: 66 rl: 0-? age: 23.5 (10-49); [controls: 7.1 (6-9)] lang: Portuguese	ABE	Assessment-I MS	Adults with Down syndrome and group of reading-matched children without DS given phonemic awareness tasks	Phoneme detection (matching), phoneme deletion	Adults with Down syndrome significantly worse on difficult phoneme awareness task (deletion) but not significantly different on easier phoneme awareness task (phoneme detection)
Cardoso-Martins & Frith, 2001, Study 2	n: 93 rl: 0-? age: 20.1 (6-50) lang: Portuguese	ABE	Assessment-I MS	Adults and children with Down syndrome divided into reader and nonreader groups and given simple phoneme awareness task	Phoneme detection (matching)	Controlling for age, letter knowledge, and intelligence, down syndrome readers perform significantly better on simple phonemic awareness task (phoneme detection); only 11% of nonreaders performed above chance
Chiappe, Stringer, Siegel, & Stanovich, 2002	n: 93 rl: below 25th %ile on WRAT (controls: above 29th %ile for adults; above 30th %ile for children) age: 25 (controls: 25; 10) lang: English	ABE	Assessment-I	Phonemic awareness, word analysis, and comprehension tests given to reading disabled adults and two control groups (an age-matched group of non-disabled adults and a reading-matched group of non-disabled children)	WRAT3 word recognition (used for matching); Rosner phoneme and syllable deletion; Woodcock word recognition and pseudo-word reading; WRAT3 spelling; WIAT listening comp.; Nelson Deny reading comp. (adults only)	Reading disabled adults significantly lower than non-disabled adults on phonemic awareness, pseudoword reading, word recognition, and reading comprehension but lower than reading-matched children on only phonemic awareness and pseudoword reading
Eden, Jones, et al., 2004	n: 28 rl: age: 43 lang: English	ABE	Assessment-I MS	Assessments across components of reading given to (a) dyslexic adults who had attended reading clinics and continued to have poor phonemic awareness and (b) non-dyslexic adults (typical readers). Brain images (fMRI data) collected while adults in both groups completed a very simple phonemic awareness task (initial consonant deletion).	Word analysis (Woodcock Johnson Word Attack); word recognition (WRAT); fluency (Gray Oral Reading Test , Accuracy and Rate), and comprehension (GORT)	Dyslexic group significantly lower on measures of all components. While both groups performed adequately on the simple phonemic awareness task, the patterns of brain activity during the task were different. The dyslexic group exhibited less activity in some areas of the brain associated PA activity in typical readers.
Greenberg, Ehri, & Perin, 1997	n:144 rl: GE 3-5 age: 33 and 10 lang: English	ABE	Assessment-I MS	Assessment of adults and children reading at GE 3, 4, and 5 on word recognition	Phoneme deletion, real words; phoneme segmentation, real words; non-word decoding (Woodcock Word Attack); sight word recognition, irregularly spelled words; wordlikeness choice task; spelling; rhyme word reading; oral vocabulary (PPVT)	Children's phonemic awareness is better than adults' at all three levels.
Jiménez & Venegas, 2004	n: 103 rl: readers (GE 1) and nonreaders age: 53 (mean) lang: Spanish	ABE	Assessment-I MS	Adult nonreaders and beginning readers (GE 1) given tests of phonemic awareness	Reading skills: Letter and word recognition (words and pseudowords) Phoneme awareness: phoneme blending; phoneme isolation (e.g., Say first sound of word); segmenting (word into phonemes); and deleting phonemes in syllables with varying degrees of complexity (CVC, CV, CCV)	PA is necessary for reading; nonreaders lack PA. Controlling for task type and difficulty, nonreaders significantly poorer on easiest PA task, phoneme isolation, and all readers (but no nonreaders) able to perform adequately on segmentation and blending tasks. The complexity rather than the type of PA task is the best determinant of task difficulty.

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Morais, Bertelson, Cary, & Alegria, 1986	n: 41 rl: nonreaders and ex-nonreaders	ABE	Assessment-I Assessment-D	Nonreaders and ex-nonreaders given phoneme awareness tasks. Ex-nonreaders divided into better and poorer groups (able to read word list at greater than or less than 60 words per minute)	Phoneme deletion (initial consonant and vowel deletion in pseudowords); progressive segmentation (sentences to phonemes); syllable and phoneme detection	Readers better than nonreaders on phoneme awareness tasks (initial consonant and vowel deletion). Among readers, vowel deletion easier than consonant deletion, and better readers better at consonant deletion than poorer readers. Descriptive results: Readers better than nonreaders on phoneme detection and progressive segmentation (most nonreaders have difficulty segmenting syllables into phonemes)
Morais, Cary, Alegria, & Bertelson, 1979	n: 60 rl: nonreaders and beginning readers who learned to read as adults age: 26-60 lang: Portuguese	ABE	Assessment-D MNS	Nonreaders and readers given phoneme awareness task	Phoneme addition/deletion, initial consonant, nonsense words	Nonreaders cannot consistently add or delete phonemes at beginning of nonwords but beginning readers can.
Morais, Cary, Alegria, & Bertelson, 1979	n: 30 rl: beginning readers age: 26-60 lang: Portuguese	ABE	Assessment-I MS	Phoneme awareness ability of beginning readers who learned to read before age 25 versus those who learned to read after age 25	Phoneme addition/deletion, initial consonant, nonsense words	No difference between groups
Pennington, Orden, Smith, Green, & Haith, 1990	n: 60 rl: GE 8-12 age: 24 (mean) lang: English	ABE ASE	Assessment-I MS	Group of familial dyslexics and clinical dyslexics, along with reading-matched and age-matched controls for each group (6 groups total) given phonemic awareness tasks	Phoneme manipulation (pig latin) using 1- and 2-syllable words, and words with and without initial consonant cluster. Production, recognition, and latency.	Familial and clinical groups significantly worse than reading- and age-matched controls on production, recognition accuracy, and latency (less accurate and slower)
Pratt & Brady, 1988	n: 26 rl: all age: 34 (mean) lang: English	ABE ASE	Assessment-I MS	Readers in advanced or GED prep classes versus poorer readers (beginning and intermediate) on phonemic awareness tasks	Phoneme or syllable deletion (Rosner); phoneme manipulation (Lindamood Auditory Conceptualization); word length judgment (word and nonword)	Better adult education readers perform significantly better on phonemic awareness tasks
Read & Ruyter, 1985	n: 55 rl: 3.8 age: adult lang: English	ABE	Assessment-I CORR Factor analysis, correlations	Battery of phonemic awareness and word analysis tasks given to low-literate men in correctional facility.	Phonemic awareness: P1: Produce 1- and 2-syllable rhymes; judge rhymes; produce alliterating word; repeat initial consonant; add initial consonant; monitor phonemes; locate phonemes; count phonemes and syllables	Performed well on phonetic similarities. Easiest tasks (forming one factor) include rhyming tasks, along with monitoring phonemes and counting syllables. Harder tasks (2nd factor) require awareness of location of phoneme (repeat initial and final consonant; locate phoneme; add consonant). Counting phonemes was hardest task (3rd factor).
Read, Zhang, Nie, & Ding, 1986	n: 30 rl: Readers and nonreaders age: 43 lang: Chinese	ABE	Assessment-I MS	Group that reads Chinese characters, but not alphabetic Chinese versus group that reads both Chinese characters and alphabetic Chinese	Phoneme addition and deletion (initial consonant, nonsense words)	Group that reads alphabetic Chinese better on phonemic awareness task than group that does not
Rubinsten & Henik, 2006	n: 51 rl: diagnosed with dyslexia, dyscalculia, or neither (those with dyslexia had standard scores in the 70s and 80s on reading tests; other groups had average standard of around 100) age: 23.4 lang: Hebrew	ABE	Assessment-I MS	Letter naming task given to adults with dyslexia, adults with dyscalculia, and controls. Stroop-like task (using Navon figures) in which a large letter or non-alphabetic symbol was constructed using many tiny versions of the same letter, a different letter, or the symbol, and participants were asked to name either the large letter or the small letters.	Letter naming speed (reaction time) when the tasks consisted of letters (a) representing the same phoneme (interference condition); (b) representing different sounds (facilitation condition); or (c) paired with a non-alphabetic symbol (neutral)	Adults without dyslexia showed significant interference effects (longer RTs) and facilitation effects (shorter RTs), with RTs in neutral condition in between. Adults with dyslexia showed no significant interference or facilitation effect (indicating lack of automatic association of letters and their phonemes.)
Scarborough, 1984	n: 156 rl: all age: 32 lang: English	ABE ASE	Assessment-D	Adults with and without self-reported childhood reading problems tested for dyslexia.	Woodcock word recognition, comprehension, total reading; WRAT, spelling (regular, irregular, and pseudowords), GORT oral reading, Iowa Silent Reading	Self-reports of childhood reading problems are good indicators of the existence of a reading disability in adulthood. Dyslexia reported in childhood persists into adulthood.

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Scliar-Cabral, Morais, Nepomuceno, & Kolinsky, 1997	n: 91 rl: 0-4+ age: 27 lang: Spanish	ABE	Assessment-I	Nonreaders, beginning readers (with 2 years of schooling), and readers (with 4-11 years of schooling) given phonemic awareness tasks.	Phonemic awareness tasks: vowel and consonant classification (same/different), vowel and consonant deletion in nonsense words	Readers did well on all tasks, better than beginning and nonreaders. On vowel classification, beginning readers and nonreaders did better than chance. On vowel deletion, roughly equal numbers of beginning readers and nonreaders did either very well or very poorly. On consonant classification, beginning readers did better than nonreaders, who did no better than chance. On consonant deletion, 90% of beginning and nonreaders could not complete task.
Shaywitz et al., 1998	n: 61 rl: age: 16-63 lang: English	ABE ASE	Assessment-I MS	Groups of dyslexic and non-impaired adults given increasingly more complex phonological awareness and word analysis tasks during fMRI (functional magnetic resonance imaging).	Matching tasks: line orientation, letter case judgment, single letter rhymes, nonword rhymes, semantic category judgment. FMRI used to measure location of brain activation during each task.	Non-impaired better on all tasks except line judgment. Nonimpaired showed increase in activation of visual and language processing areas of brain as tasks became more difficult, while dyslexic group did not.
Swanson & Hsieh, 2009	n: 3686 (52 studies) rl: all age: 18-44 lang: English	ABE ASE	Assessment-I Meta-Analysis with Effect Sizes	Meta-analysis of 52 studies of adults with and without a learning disability in reading	Various measures of reading achievement and cognition including classification measures (comprehension, word recognition, and verbal IQ) and comparative measures (naming speed, phonological processing, verbal memory, word attack, vocablary, and spelling	LD adults significantly worse than non-LD adults on reading related classification measures (comprehension and word recognition) and reading related comparison measures (word attack, vocabulary, and spelling). Differences do not change with age in adults. As with children, phonological processing, naming speed, and verbal memory characterize adults with LD, although problems extend beyond a phonological core for adults.
Thompkins & Binder, 2003	n: 60 adults, 99 children rl: 2.6 & 5.0 (skilled and less-skilled) age: 17-55 (children: 5-8) Lang: English and other (but all fluent in English)	ABE	Assessment-I MS	Adults from local literacy program and children from grades K-2 were divided into groups of skilled (GE 4-7) and less-skilled readers (GE 0-3) based on the TABE for adults (reading, language, and spelling measures combined) and the WRAT for children (reading and spelling measures) and given assessments of phonemic awareness and word analysis.	Phoneme recognition at beginning, middle, and end of words (Do tree and try begin with the same sound?); phoneme deletion at beginning, middle, and end of words.	PA skills develop as reading develops. More-skilled adults better than less-skilled adults on all phoneme awareness tasks. Children better than adults on some tasks (recognition at beginning and end of word) but not on others (recognition at middle of word and phoneme deletion)

Alphabetics Assessment-Word Analysis

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Baer, Kutner, & Sabatini, 2009	n: 19,000 rl: all age: 16+ lang: English and other	ABE ASE ESOL	Assessment-I MS	Fluency Addition to the NAAL (FAN) given to all adults, including those unable to take the National Assessment of Adult Literacy (6% of all adults).	Word reading (lists containing one, two, three, and four syllable words); Decoding (nonsense words)	Adults who qualify for AE (primarily Below Basic and Basic Readers on NAAL comprehension task) have lower word reading (WR) and decoding (DC) than more skilled readers (at the Intermediate and Proficient Levels). WR ranged from 50 words correct per minute (wpm) among those in the bottom one-fifth of the NAAL Basic Literacy Level, to 81 in the top one-fifth, 99 at the Basic Level, 112 at the Intermediate Level, and 118 at the Proficient Level. DC scores at these same levels were 25, 36, 46, 56, and 62 wpm.
Byrne & Ledez, 1983	n: 50 rl: GE 0-7 or higher age: 23 (mean) lang: English	ABE ASE	Assessment-I MS	Adults at three reading levels (mean GE1, mean GE4, and GE 7 or higher) on word recognition test given word analysis task	Nonword reading	Nonreaders and beginning readers have very poor word analysis ability; advanced beginners are better, but still poor relative to high-intermediate and advanced readers

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Chiappe, Stringer, Siegel, & Stanovich, 2002	n: 93 rl: below 25th %ile on WRAT (controls: above 29th %ile for adults; above 30th %ile for children) age: 25 (controls: 25; 10) lang: English	ABE	Assessment-I	Phonemic awareness, word analysis, and comprehension tests given to reading disabled adults and two control groups (an age-matched group of non-disabled adults and a reading-matched group of non-disabled children)	WRAT3 word recognition (used for matching); Rosner: phoneme and syllable deletion; Woodcock: word recognition and psuedo-word reading; WRAT3: spelling; WIAT listening comp.; Nelson Deny reading comp. (adults only)	Reading disabled adults significantly lower than non-disabled adults on phonemic awareness, pseudoword reading, word recognition, and reading comprehension but lower than reading-matched children on only phonemic awareness and pseudoword reading
Davidson & Strucker, 2002	n: 90 rl: GE 4 - 6 age: adult lang: English and other	ABE ESOL	Assessment-I MS	Word Recognition errors of three groups of ABE learners analyzed: native speakers of English, nonnative speakers who learned English before age 12, and native speakers who learned English after 12. Groups were matched on word analysis ability (pseudoword reading).	Reading miscues on DAR Word Recognition subtest (Diagnostic Assessments of Reading): Phonetically plausible substitutions, Phonetically implausible substitutions, Substitutions of real words	Native speakers made more real-word substitutions. Nonnative speakers made more phonetically plausible substitutions, although those who were more familiar with English (learning it before age 12) were more like native speakers.
Gottesman, Bennett, Nathan, & Kelly, 1996	n: 270 rl: very low (mean is 2 SDs below norm) age: 33 (mean) lang: English and other	ABE	Assessment-I MS	Assessment of adults in inner-city literacy program focusing on those with severe reading difficulties (divided into high, middle, and low groups based on Woodcock word recognition)	Word analysis (Roswell-Chall), blending (Roswell-Chall)	Better readers have better word analysis ability. Scores on word analysis and blending decreased significantly across groups (from high to middle to low group).
Greenberg, Ehri, & Perin, 1997	n: 144 rl: GE 3 - 5 age: 33 and 10 lang: English	ABE	Assessment-I MS	Assessment of adults and children reading at GE 3, 4, and 5 on word recognition	Phoneme deletion, real words; phoneme segmentation, real words; non-word decoding (Woodcock Word Attack); sight word recognition, irregularly spelled words; wordlikeness choice task; spelling; rhyme word reading; oral vocabulary (PPVT)	Children's spelling and non-word decoding better than adults at all three levels, but adults' sight word recognition (of irregularly spelled words) better than children's.
Greenberg, Ehri, & Perin, 2002	n: 144 rl: GE 3-5 age: 33 and 10 lang: English	ABE	Assessment-I MS	Assessment of adults and children reading at GE 3, 4, and 5 on word recognition	Spelling errors: phonetic, semiphonetic, nonphonetic, substitution of another real word spelled correctly, another word spelling incorrectly.	Spelling: Spelling errors mirror decoding errors (adults have weaker letter-sound knowledge). Children made more phonetic errors (and errors increased as words became more difficult for both groups). More children produced semiphonetic errors and more adults produced nonphonetic errors. More adults produced real-word errors. Adults had more errors than children (are poorer spellers).
Greenberg, Ehri, & Perin, 2002	n: 144 rl: GE 3-5 age: 33 and 10 lang: English	ABE	Assessment-I MS	Assessment of adults and children reading at GE 3, 4, and 5 on word recognition	Sight word reading errors: Percent real-word responses, nonword responses, and nonword responses using spelling-sound correspondence rules. Nonword reading errors: Percent real word errors.	Children more likely to use letter-sound knowledge and adults rely more than children on sight word knowledge. Sight word reading errors: Adults had more real-word errors and children had more nonword errors. On nonword errors, children followed letter-sound correspondence rules more often. Nonword reading errors: Adults more likely to read nonwords as real words.
MacArthur, Konold, Glutting & Alamprese, 2010	n: 486 rl: GE 4-7 age: 35 (16-71) lang: English and other	ABE	Assessment-I CORR (Factor Analysis)	Given assessments across components of reading to determine, through factor analysis, the best model for the component skills of reading (and the best set of measures for complete reading assessment profiles)	11 measures of five components, including the following word analysis measures: (a) decoding (TOWRE Phon. Decod.; WJR Word Attack; Letter Sound Surv.); (b) word recognition (WRAT3 Rdg; WJR Letter Word); (c) spelling (WRAT3; Devlptmtl. Splg.),	ESOL: ELLs same on word recognition but higher on decoding LD: Those with LD significantly lower on all components, including word recognition, decoding, and spelling.

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Mellard, Fall, & Mark, 2008	n: 295 rl: 0-12 age: 24 (16-73) lang: English and other, but non-ELL	ABE ASE	Assessment-I CORR (Cluster Analysis with ANOVAs to test for significant diffs. among clusters)	Stratified random (and, when necessary, convenience) sample of AE learners across all NRS reading levels were given assessments of components of reading (word analysis, fluency, and comprehension) to determine, through cluster analysis, instructionally relevant profiles	Phonemic decoding (nonsense word reading): Woodcock Word Analysis (untimed); TOWRE Phonemic Decoding (timed). Word Recognition: Woodcock Word ID (untimed); TOSWRF (silent, timed); TOWRE Sight Word Efficiency (timed). Fluency: QRI words correct per min. on 6th grade passage. Comprehension: Woodcock Passage Comprehension	Word analysis scores improve as reading comprehension and fluency improve.
Nanda, Greenberg, & Morris, 2010	n: 371 rl: GE 3-5 age: 16+ lang: English and other	ABE ESOL	Assessment-I CORR (factor analysis)	Given assessments across components of reading to determine, through factor analysis, which child-based component model of reading fits AE readers: an achievement model of reading skills, a core deficit model of reading subskills, or an integrated model	Numerous measures across components of reading: phonological awareness, word reading, nonword reading, fluency, vocabulary, and reading comprehension. Fluency measures included: word reading fluency (TOWRE Sight Word); Nonword reading fluency (TOWRE Phonemic Decoding); Reading fluency (WJIII Reading Fluency; GORT-4); RAN (CTOPP Rapid Letter, and Color, Naming).	While there was difficulty obtaining models with good fit using child-based component models, differences were observed between native speakers of English and English Speakers of Other Languages (ESOL). While native speakers performed better on oral vocabulary, reading comprehension, and sight word recognition, and ESOL performed better on nonword reading fluency, there were not significant differences overall on other fluency measures.
Read & Ruyter, 1985	n: 55 rl: 3.8 age: adult lang: English	ABE	Assessment-D Factor analysis, correlations	Battery of phonemic awareness and word analysis tasks given to men in correctional facility.	Decoding Skills Test (recognition of familiar words, less familiar words, and nonsense words). Test comparing performance on regular, exceptional, and nonsense words.	At GE 5 on recognition of familiar words on DST, but much lower on less familiar and nonsense words (like children who are poor readers). Like children learning to read, rely more on recognition than sound-spelling correspondence (better at reading exception words than regularly spelled nonsense words), although better than children on exception words.
Sabatini, Sawaki, Shore, & Scarborough, 2010	n: 476 rl: GE 7 or lower age: 37 (16-76) lang: English and other (but intermediate or better English language skills)	ABE	Assessment-D	ABE learners given 13 assessments across components of reading to determine, through factor analysis, the best model for the component skills of reading	In addition to tests of word analysis, vocabulary, comprehension, and language, also given tests of word analysis. Untimed tests included reading nonsense words (WJ Word Attach) and real words (WJ Letter/Word ID; WRAT3). Timed tests included nonsense words (TOWRE Phonemic Decoding) and real words (TOWRE Sight Word)	Descriptive results suggest that sight word knowledge is better than letter-sound knowledge. While average oral language skills were at about GE 4, and comprehension and word recognition between about GE 3-4, letter-sound knowledge (based on nonsense word reading) was below GE 2.
Shaywitz et al., 1998	n: 61 rl: age: 16-63 lang: English	ABE	Assessment-I MS	Groups of dyslexic and non-impaired adults given increasingly more complex phonological awareness and word analysis tasks during fMRI (functional magnetic resonance imaging).	Matching tasks: line orientation, letter case judgment, single letter rhymes, nonword rhymes, semantic category judgment. FMRI used to measure location of brain activation during each task.	Non-impaired better on all tasks except line judgment. Nonimpaired showed increase in activation of visual and language processing areas of brain as tasks became more difficult, while dyslexic group did not.
Swanson & Hsieh, 2009	n: 3686 (52 studies) rl: all age: 18-44 lang: English	ABE ASE	Assessment-I Meta-Analysis with Effect Sizes	Meta-analysis of 52 studies of adults with and without a learning disability in reading	Various measure of reading achievement and cognition including classification measures (comprehension, word recognition, and verbal IQ) and comparative measures (naming speed, phonological processing, verbal memory, word attack, vocabulary, and spelling	LD adults significantly different from non-LD adults on reading related classification measures (comprehension and word recognition) and reading related processing measures (word attack, vocabulary, and spelling). Differences do not change with age in adults. As with children, phonological processing, naming speed, and verbal memory characterize adults with LD, although problems extend beyond a phonological core for adults.

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Thompkins & Binder, 2003	n: 60 adults, 99 children rl: 2.6 & 5.0 (skilled and less-skilled) age: 17-55 (children: 5-8) lang: English and other (but all fluent in English)	ABE	Assessment-I MS	Adults from local literacy program and children from grades K-2 were divided into groups of more-skilled (GE 4-7) and less-skilled readers (GE 0-3) based on the TABE for adults (reading, language, and spelling measures combined) and the WRAT for children (reading and spelling measures) and given assessments of word analysis.	Phonological (letter-sound) task: Phonological spelling (words and nonwords, scored on basis of phonological correctness). Orthographic (rule-based or recognition) tasks: (a) orthographic knowledge (*Which could be a word, jull or jjull?*); (b) orthographic spelling (spell words and nonwords that conform to spelling rule).	Spelling develops as reading develops -- more-skilled readers (adults and children) better than less-skilled overall on all spelling tasks except orthographic knowledge. More-skilled readers (adults and children) use their knowledge or exposure to print-they perform better than less-skilled on phonological and orthographic spelling of real words (no difference on nonwords). Adult experience helpful on several tasks: (1) better than children on orthographic knowledge task, (2) better on phonological spelling of real words.
Thompkins & Binder, 2003	n: 60 adults, 99 children rl: 2.6 & 5.0 (skilled and less-skilled) age: 17-55 (children: 5-8) lang: English and other (but all fluent in English)	ABE	Assessment-I MS	Adults from local literacy program and children from grades K-2 were divided into groups of more-skilled (GE 4-7) and less-skilled readers (GE 0-3) based on the TABE for adults (reading, language, and spelling measures combined) and the WRAT for children (reading and spelling measures) and given assessments of word analysis.	Phonological (letter-sound) tasks: Phonological spelling (words and nonwords, scored on basis of phonological correctness). Orthographic (rule-based or recognition) tasks: (a) orthographic knowledge (*Which could be a word, jull or jjull?*); (b) orthographic spelling (spell words and nonwords that conform to spelling rule). Word recognition tasks: Match picture with word for common words (a) seen on product labels (e.g., milk) and (b) not generally seen on labels (e.g., tree)	WA skills develop as reading develops -- more-skilled adults (like more-skilled children) better than less-skilled overall on all tasks except orthographic knowledge. More-skilled adult readers (like more-skilled children) use their knowledge or exposure to print more than less-skilled readers: (a) more-skilled perform better on phonological and orthographic spelling of real words (as opposed to nonwords, where there was no difference); and (b) more-skilled perform better on words that commonly appear on product labels (as opposed to those that do not). Adult experience helpful on several tasks: (1) better than children on orthographic knowledge task, (2) better on phonological spelling of real words; and (3) less-skilled adults faster than less-skilled children on word recognition tasks.

Alphabetics Instruction-Phonemic Awareness

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Bertelson, Gelder, Tfouni, & Morais, 1989	n: 25 rl: nonreaders to beginning readers age: 30 (mean) lang: Spanish (all testing in Spanish)	ABE	Descriptive MS	Simple instruction in phonemic awareness (give examples of PA task; give up to about 20 items or until 6 consecutive correct; provide correct response if necessary)	Phonemic awareness: rhyme detection, vowel deletion, consonant deletion	With simple instruction, nonreader and reader groups not significantly different on rhyme detection and vowel deletion, but readers significantly better on consonant deletion
Durgunoglu & Oney, 2002	n: 59 women rl: very low (no formal schooling; unable to recognize most letters in alphabet) age: 39 (mean) lang: Turkish	ABE	Descriptive PPNC	Functional literacy program with highly trained volunteers using spelling, explicit instruction in letter-sound correspondence, syllabication, blending, word recognition, and comprehension activities to teach reading. 90 hour program also emphasized functional reading (newspapers, bills, product labels), active and cooperative learning, and critical thinking.	Letter recognition, phonemic awareness, spelling, word recognition, and comprehension (listening comprehension for pretest and reading comprehension for posttest)	Improvement in all areas and significant improvement on letter recognition and phonemic awareness (the only tests that all students were able to complete and that were repeated pre and post)

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Eden, Jones, et al., 2004	n: 19 rl: age: 44 lang: English	ABE	Experimental TERPP TERP	For 3 hours/day over 8 weeks, dyslexic adults given multisensory, structured, and intense phonologically based instruction in phonemic awareness and word analysis (Lindamood-Bell) versus dyslexic controls (no intervention) 3 hr/day for 8 wks.	Skills targeted: Auditory and visual phonemic awareness, nonword and real word recognition (Rosner, Symbol Imagery, Woodcock Word Attack, Decoding Skills Test Phonemic Transfer Index, WRAT). Skills not targeted: oral reading rate, accuracy, and comprehension (Gray Oral Reading Test). Physiological measures: fMRI during simple phonemic awareness task	Significant gains for experimental group on targeted skills and oral reading accuracy, but not on oral reading rate and comprehension Physiological changes: After instruction, patterns of brain activity during phonemic awareness activity more closely resembles that of non-dyslexic adult readers (increased activity in the left hemisphere areas associated with phonemic awareness) but with compensatory activity in the right hemisphere
Evans, Falconer, Goves, Rubin, & Mather, 1992	n: 27 rl: GE 1-7 age: 16-60 lang: English	ABE	Descriptive PPNC	PALS, a computer-based multimedia reading program focusing on phonemic awareness, word analysis, and writing, administered to adults at three reading levels (GE1-2, 3-5, and 5-7) for 100 hours over 20 weeks	Woodcock Reading Mastery Test, Word Attack (letters and nonsense words)	Significant increases for all three groups, with much greater increases for students with better beginning reading scores (i.e., improvement not restricted to beginning readers).
Gombert, 1994	n: 21 rl: nonreaders, beginning readers, readers age: 30 lang: French and other	ABE ESOL	Descriptive PPNC	For one session, phonemic awareness task (initial consonant deletion) taught to second language learners using corrective feedback until six consecutive correct responses or 18 trials. Three groups: nonreaders and beginning readers with no schooling, and readers.	Consonant deletion	Readers better than beginning readers and beginning readers better than nonreaders on PA task. All groups improved significantly following brief, simple instruction in PA.
Greenberg, 1998	n: 1 rl: nonreader age: 53 lang: English	ABE	Descriptive CASE	Nonreader tutored during 2 one-hour sessions each week for 4.5 months using both phonics-based (rhyme awareness, word families, letter-sound correspondences) and whole language (student-selected and high-interest reading; language experience) approaches	Lewkowicz PA tasks and many informal measures of letter knowledge, sight word recognition, spelling, knowledge of print	Significant improvement in phonemic awareness and knowledge of print (letter knowledge, sight word knowledge, spelling)
Morais, Cary, Alegria, & Bertelson, 1979	n: 30 rl: beginning readers age: 26-60 lang: Portuguese	ABE	Experimental MS	Phoneme awareness ability of beginning readers completing adult ed program versus those not completing program Phoneme awareness ability of beginning readers who learned to read before age 25 versus those who learned to read after age 25	Phoneme addition/deletion, initial consonant, nonsense words	Phonemic awareness of adults completing adult ed program significantly better Phonemic awareness of adults learning to read before and after age 25 not significantly different
Morais, Content, Bertelson, Cary, & Kolinsky, 1988	n: 12 rl: nonreaders age: 54 (mean) lang: Portuguese	ABE	Descriptive PPNC	Explicit instruction with analytic corrective feedback for vowel deletion (7 examples and 22 trials) and consonant deletion (8 examples followed by 5 blocks of 8 trials)	Initial consonant and vowel deletion, nonsense words	Almost all adult nonreaders taught PA, with significant gains after each block of trials (3 adults could not learn PA)
Purcell-Gates, 1993	n: 1 rl: GE 4 (academic) age: 33 lang: English	ABE	Descriptive CASE	2 years of tutoring in academic setting consisting of language experience reading and writing, journal writing, and other work	Phonemic awareness as shown in spelling (and misspellings); reading comprehension (observations of functional and academic reading)	Good improvement in phonemic awareness and improvement in functional reading comprehension
Truch, 1994	n: 281 including 24 adults rl: 3 age: 5-55 lang: English	ABE	Descriptive PPNC (ANCOVA with age and vocabulary level used as covariates)	Lindamood-Bell Auditory Discrimination in Depth (phonemic awareness, spelling-sound correspondence in writing, word recognition, reading of connected text at appropriate level)	Lindamood Auditory Conceptualization Test; informal Lindamood sound-to-symbol test; Woodcock Word Attack (nonsense patterns); WRAT word recognition and spelling; GORT fluency	Significant increases on all measures

Alphabetics Instruction-Word Analysis

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Burns & Kimosh, 2005	n: 2 rl: < 6th %ile age: 21, 19 lang: English Moderate MR (IQ 48 to 55)	ABE	Descriptive MB	Adults with Down Syndrome taught basic, functional sight words using incremental rehearsal (ten words at a time were practiced with flashcards while maintaining a constant ratio of nine known words and one unknown word)	Words correct per minute	One student increased from a mean of 14 wcpm during baseline to 27 wcpm during intervention (with 30 out of 30 wcpm during last few intervention sessions and during follow-up 3 wks. later); Second student increased from a mean of 1 wcpm to 10 wcmp (16 during last session and 15 during follow-up)

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Cheek & Lindsey, 1994	n: 71 rl: GE 6.0 age: 27 (mean) lang: English and perhaps other	ABE	Experimental TERPP	In votech classes lasting 1 hour/ day for 2 months, diagnostic-prescriptive approach (assess to plan and adjust instruction; use language experience, literature-based, real-life materials) vs. programmed approach (assess to find beginning level for computer and print-based programs; self-paced; feedback and repetition)	Stanford Diag. Rdg. Test: phonetic analysis and structural analysis	No difference between approaches
Christenberry, Burns, & Dickinson, 1994	n: 193 rl: GE 6 age: 43%<21; 8%>30 lang: English	ASE	Descriptive PPNC	1-2 hours/day in educational portion of boot camp approach in correctional facility (educational program not described)	WRAT word recognition and spelling	Significant increase in WRAT reading GE (average increase of 1.4) and spelling GE (average increase of 0.9)
Curtis & Chmelka, 1994	n: 4 rl: GE 3-5 age: 15-16 lang: English	ABE	Descriptive PPNC	Students with LD taught basic word analysis each day for 30 minutes over 10 weeks using Laubach Way to Reading, collaborative oral reading, and word games versus the same group over 15 weeks using oral reading and a modified Laubach approach that included practice with more challenging words incorporating the letter-sound correspondences being taught.	Word analysis (Woodcock Johnson Basic Reading subtest, word recognition, regular and irregular words) Comprehension (subtest of California Achievement Test)	Modified program led to faster rate of growth in word analysis and comprehension
Delen & McLaughlin, 1984	n: 2 rl: GE 2.1 age: 54, 23 lang: English	ABE	Descriptive MB	In 20 to 40 minute individual sessions over 12 to 15 weeks, and in classes 2 times per week for 100 minutes, adults were taught functional, real-life and work-related words and short sentences. Instruction included trips to places where words could be found (e.g., on signs), hearing the meaning of the word explained, using the word in sentences, and receiving PA and WA instruction related to the word.	Number words and sentences read orally	Both could read more words and sentences after treatment than during baseline, going from an average of 8 words and 5 sentences to 19 words and 10 sentences, with no decrease at 3-week follow-up
Eden, Jones, et al., 2004	n: 19 rl: age: 44 lang: English	ABE	Experimental TERPP TERP	For 3 hours/day over 8 weeks, dyslexic adults given multisensory, structured, and intense phonologically based instruction in phonemic awareness and word analysis (Lindamood-Bell) versus dyslexic controls (no intervention)	Skills targeted: Auditory and visual phonemic awareness, nonword and real word recognition (Rosner, Symbol Imagery, Woodcock Word Attack, Decoding Skills Test Phonemic Transfer Index, WRAT). Skills not targeted: oral reading rate, accuracy, and comprehension (Gray Oral Reading Test). Physiological measures: fMRI during simple phonemic awareness task	Significant gains for experimental group on targeted skills and oral reading accuracy, but not on oral reading rate and comprehension Physiological changes: After instruction, patterns of brain activity during phonemic awareness activity more closely resembles that of non-dyslexic adult readers (increased activity in the left hemisphere areas associated with phonemic awareness) but with compensatory activity in the right hemisphere
Gallaher, van Kraayenoord, Jobling, & Moni, 2002	n: 1 rl: Emergent age: 19 lang: English	ABE	Descriptive CASE	12 tutoring sessions for student with Down syndrome including instruction in concepts of print, phoneme awareness, word analysis, repeated reading using predictable text, and writing	Tests, observations, interviews, and portfolio	Like nondisabled beginning readers, able to develop letter-sound and sight word knowledge, although seemed to make more semantic errors than non-disabled beginning readers
Gold & Horn, 1982 (and Gold & Johnson, 1982)	n: 76 rl: between GE 2-3 age: 30 (mean) lang: English	ABE	Experimental TERPP	For 34 hours over 12-15 weeks, no instruction versus combination of Directed Listening Technique (discussion of interesting topics, focusing on understanding), Lang. Experience Approach, multisensory approach, whole-word phonics (phonics by analogy), comprehension strategies, and recreational reading	Word attack (Woodcock), word recognition (WRAT, Woodcock)	Treatment better than control on measures of word attack, word recognition, reading vocabulary, and reading comprehension but not on oral vocabulary and listening comprehension
Greenberg, 1998	n: 1 rl: nonreader age: 53 lang: English	ABE	Descriptive CASE	Nonreader tutored during 2 one-hour sessions each week for 4.5 months using both phonics-based (rhyme awareness, word families, letter-sound correspondences) and whole language (student-selected and high-interest reading; language experience) approaches	Lewkowicz PA tasks and many informal measures of letter knowledge, sight word recognition, spelling, knowledge of print	Significant improvement in phonemic awareness and knowledge of print (letter knowledge, sight word knowledge, spelling)

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Greenberg, Frederick, Hughes, & Bunting, 2002	n: 7 rl: 2.5 age: 41 (21-71) lang: English	ABE	Descriptive PPNC	80 hours (45 mins./day each day) of Direct Instruction Corrective Reading (SRA/McGraw-Hill)-systematic and explicit instruction in phoneme awareness, word analysis, fluency, vocabulary, and comprehension	Woodcock word identification and word attack	No gain on either measure
Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006	n: 27 rl: 3-5 age: 39 lang: mostly English	ABE	Descriptive PPNC	71 hours (2 hrs./day, 4 days/wk, over 13 wks.) of classroom instruction using extensive reading approach (students learn how to select authentic literature written at their reading grade level; teacher models, and students engage in, sustained silent reading, teacher read-alouds, and group discussion about content of material read)	Reading survey; Woodcock-Johnson (word-letter identification, passage comprehension, word attack, and reading fluency); Boston Naming Test (expressive vocabulary); Peabody Picture Vocabulary (receptive)	Changes from pretest to posttest: students reported reading more, understanding more, and reading less slowly (survey results); students did not significantly increase receptive vocabulary, word attack, or comprehension scores; students did significantly increase fluency and expressive vocabulary scores
Hanlon & Cantrell, 1999	n: 1 rl: GE 2 age: 31 lang: English	ABE	Descriptive CASE	Over 9 months of tutoring, spelling-based word study (word sorting by vowel pattern; spelling words with learned patterns; homophone matching game)	Woods and Moe Analytic Reading Inventory (word recognition, fluency [accuracy and rate], and comprehension)	Increase in word recognition from about GE 1 to GE 4; increase in fluency from about GE 1 to 4; increase in comprehension from about GE 4 to 8
Idol-Maestas, 1981	n: 1 rl: GE 2 age: 21 lang: English	ABE	Descriptive CASE MB	Diagnostic word analysis testing followed by direct instruction in unknown letter-sound correspondences	Oral reading (SARPI formal reading inventory); % correct from word lists using relevant letter-sound combinations (multiple baseline data)	Increased from GE 2 to GE 5 (on SARPI). From baseline through intervention, increase in each letter-sound combination taught.
Lavery, Townsend, & Wilton, 1998	n: 12 rl: basic age: 33 lang: English	ABE	Experimental QNPP	18 one-hour sessions using computer-based instruction (Computer Curriculum Corporation Integrated Learning System focusing on literacy and interpretive comprehension, word meaning, word analysis, and reference skills, along with math) versus traditional instruction (using textbook and lecture to teach comparable skills)	Word recognition (Burt Word Reading Test), fluency (reading accuracy; Neale Analysis of Reading Ability), and comprehension (Neale).	Controlling for initial differences, computer-based instruction led to greater gains for word recognition and comprehension, but not fluency (accuracy)
Maclay & Askov, 1988	n: 76 rl: GE 3 age: 35 lang: English and other	ABE ESOL	Experimental QNPP	During 20 hrs of instruction over about 3 months, computer-based word recognition training on 1000 high frequency and functional sight words (including some words with common phonograms) vs. group with no instruction	Word recognition (Slosson Oral Reading Test)	Experimental group improved significantly and out-performed control
Massengill, 2003	n: 4 rl: GE 1-6 age: 41.5 lang: English	ABE	Descriptive MB PPNC	32 one-our sessions of Guided Reading (re-reading familiar texts to work on word recognition and fluency; direct instruction in word analysis; sight word practice; oral reading with teacher support to practice and apply new skills; daily assessments) followed by 4 wks independent reading	Word recognition (Slosson Oral Reading Test), and oral reading and comprehension (Analytical Reading Inventory) given pre-post. Nonsense word and sight word assessments given daily.	On pre-post tests, all four students increased reading GE on word recognition, oral reading, and comprehension. On multiple baseline measures, increased word analysis (sight word recognition and decoding) from baseline to intervention and maintained gains at follow-up (2 and 4 weeks into independent reading).
McCarty, 2002	n: 9 rl: GE 2.5 age: 26-66 lang: English	ABE	Descriptive PPNC	Tutoring twice a week for 15 weeks with added small group instruction for 11 weeks using Phono-Graphix (systematic and direct instruction in letter-sound correspondence and blending and segmenting words).	Word recognition (Woodcock Word Identification), word analysis (Woodcock Word Attack); and blending, segmenting, and code knowledge (Phono-Graphix)	On Woodcock, increase of 12 standard score points on word ID (increase from GE 2.5 to GE 3.9) and 26 points on word attack. Gains on all Phono-Graphix measures: blending, segmenting, and code knowledge.
McKane & Greene, 1996	n: 94 rl: GE 0-9 age: adult lang:	ABE ASE	Experimental TERPP	40 hours of instruction with either traditional approach (mix of Laubach, Steck-Vaughn material, peer tutoring, classroom instruction) or traditional plus computer-based alphabetics and fluency instruction (placement and then instruction to increase accuracy and rate of letter, syllable and nonsense syllable, and word and nonsense word recognition (audio and visual recognition) and oral reading of 2- and 3-word phrases, sentences and paragraphs	TABE (combined comprehension and vocabulary)	Comprehension gains for lower level readers (GE 0-3.0) but not for those reading at higher levels (GE 3.1-6.0 and 6.1-9.0).
Pershey & Gilbert, 2002	n: 1 rl: 0 (nonreader w/ IQ=40) age: 35 lang: English	ABE	Descriptive CASE	Over 7 years, echo reading of brief, authentic passages (sentences and stories), eventually exploring letter-sound correspondences and writing	Slosson Reading Test; work products	Increase on Slosson to GE 1.5; able to write letters of the alphabet and understands some print concepts; low # correct on comprehension questions; unable to produce story from picture

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Scully & Johnston, 1991	n: 1 rl: 3 age: 49 lang: English	ABE	Descriptive CASE	Reading instruction (word sorts, word families, word lists, picture/vowel associations, and oral reading in context) combined with educational therapy to reduce anxiety and fear related to inability to read	Transcripts of sessions, researcher notes, process recordings, interviews, questionnaire. Tests of letter-sound knowledge, word attack, sight word recognition.	Instruction and therapy led to increased reading achievement
Truch, 1994	n: 281 including 24 adults rl: 3 age: 5-55 lang: English	ABE	Descriptive PPNC (ANCOVA with age and vocabulary level used as covariates)	Lindamood-Bell Auditory Discrimination in Depth (phonemic awareness, spelling-sound correspondence in writing, word recognition, reading of connected text at appropriate level)	Lindamood Auditory Conceptualization Test; informal Lindamood sound-to-symbol test; Woodcock Word Attack (nonsense patterns); WRAT word recognition and spelling; GORT fluency	Significant increases on all measures
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Descriptive PPNC	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for reading instruction, along with some writing instruction, over 18-20 weeks (120-360 hours).	Decoding (pseudowords)	No significant difference between groups' pre and posttest scores
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Experimental QNPP	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for reading instruction, along with some writing instruction, over 18-20 weeks for 120 hours versus 360 hours.	Decoding (pseudowords)	No significant difference between groups with 120 or 360 hours of instruction (neither group gained).
Wood & McElhinney, 1990	n: 99 rl: GE 3.9 (0-9) age: 32.4 lang: English	ABE	Descriptive PPNC	Use of PALS (Principles of Alphabetic Literacy) computer application over 18 months for an average of 84 total hours to teach beginning reading	ABLE	Average reading gain of a little over 1GE

A3. Adult Studies: Fluency

Fluency Assessment

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Baer, Kutner, & Sabatini, 2009	n: 19,000 rl: all age: 16+ lang: English and other	ABE ASE ESOL	Assessment-I MS	Fluency Addition to the NAAL (FAN) given to all adults, including those unable to take the National Assessment of Adult Literacy (6% of all adults).	Fluency: number of items or words correct per minute (wcpm) for digits, letters, words, pseudowords, and passages. Basic Reading Skill (BRS): Simple average of wcpm scores from word, pseudoword, and passage reading.	Adults who qualify for AE (primarily Below Basic and Basic Readers on NAAL comprehension task) have lower fluency on all measures than more skilled readers (Intermediate and Proficient). Passage fluency for Below Basic (with range from 0-113 wcpm) and Basic (avg. of 143) lower than Intermediate (166) and proficient (178). Those who qualify for AE are more fluent reading digits and letters than words in context (passages) while Int. and Prof. are more fluent reading passages. ELLs have lower fluency (BRS scores) than non-ELLs, except for those ELLs learning English before age 10.
Eden, Jones, et al., 2004	n: 28 rl: age: 43 lang: English	ABE	Assessment-I MS	Assessments across components of reading given to (a) dyslexic adults who had attended reading clinics and continued to have poor phonemic awareness and (b) non-dyslexic adults (typical readers). Brain images (fMRI data) collected while adults in both groups completed a very simple phonemic awareness task (initial consonant deletion).	Word analysis (Woodcock Johnson Word Attack); word recognition (WRAT); fluency (Gray Oral Reading Test , Accuracy and Rate), and comprehension (GORT)	Dyslexic group significantly lower on measures of all components. While both groups performed adequately on the simple phonemic awareness task, the patterns of brain activity during the task were different. The dyslexic group exhibited less activity in some areas of the brain associated PA activity in typical readers.
Gallo, 1972	n: 1239 rl: 25th, 50th, and 75th percentile age: 26-35 lang: English	ABE ASE	Assessment-I MNS	Assessment of reading rate.	Rate (words per minute) reading 10th grade and college level passages	Average reading rate in words per minute for adults at 25th percentile -- 145 wpm; for those at 50th percentile-187 wpm; for those at 75th percentile-234 wpm

Study	Participants	Prog Type	Design	Treatment	Measures	Results
MacArthur, Konold, Glutting & Alamprese, 2010	n: 486 rl: GE 4-7 age: 35 (16-71) lang: English and other	ABE	Assessment-I CORR (Factor Analysis)	Given assessments across components of reading to determine, through factor analysis, the best model for the component skills of reading (and the best set of measures for complete reading assessment profiles)	11 measures of five components, including the following fluency measures: TOWRE-Sight Word Efficiency (SWE) and Passage Reading Test (PRT; correct words per minute on 4th grade level text)	Adult low-intermediate readers read an average of 111 correct words per minute on PRT and their average SWE score converts to GE 4.0. ESOL: ELLs significantly lower on fluency component measure (factor including PRT and SWE). LD: Those with LD significantly lower on all components, including fluency.
Mellard, Fall, & Mark, 2008	n: 295 rl: 0-12 age: 24 (16-73) lang: English and other, but non-ELL	ABE ASE	Assessment-I CORR (Cluster Analysis with ANOVAs to test for significant diffs. among clusters)	Stratified sample (random at some strata and convenience at others) of AE learners across all NRS reading levels given assessments across components of reading to determine, through cluster analysis, instructionally relevant profiles	Fluency (QRI words correct per min. in 6th grade passage) along with measures for other components of reading	Identified 7 reading ability subtypes (profiles) that do not all correspond to typical AE groupings based on a single measure of reading comprehension. Fluency increases steadily across groups from lower-literate (Group 1: 21 wcpm) to higher-literate adults (Group 7: 186 wcpm) with overall average of 106 wcpm.
Nanda, Greenberg, & Morris, 2010	n: 371 rl: GE 3-5 age: 16+ lang: English and other	ABE ESOL	Assessment-I CORR (factor analysis)	Given assessments across components of reading to determine, through factor analysis, which child-based component model of reading fits AE readers: an achievement model of reading skills, a core deficit model of reading subskills, or an integrated model	Numerous measures across components of reading: phonological awareness, word reading, nonword reading, fluency, vocabulary, and reading comprehension. Fluency measures included: word reading fluency (TOWRE Sight Word); Nonword reading fluency (TOWRE Phonemic Decoding); Reading fluency (WJIII Reading Fluency; GORT-4); RAN (CTOPP Rapid Letter, and Color, Naming).	While there was difficulty obtaining models with good fit using child-based component models, differences between native speakers of English and English Speakers of Other Languages (ESOL) Based on Effect Sizes > .20, native speakers performed better on oral vocabulary, reading comprehension, and sight word recognition, and ESOL performed better on nonword reading fluency (but not on an untimed measure of nonword reading).
Mudd, 1987	n: 168 rl: GE 1 age: 19 to 44-year-old adults; 7-year-old children lang: English	ABE	Assessment-I MS	Adults and reading-matched children given assessments of reading fluency (with children split into able and less-able group for analyses)	Oral reading miscues (accuracy): substitutions, insertions, and omissions Strategies: phonological vs. graphic; semantic vs. syntactic Rate: reading time, hesitations, corrections, and omissions	Overall: Rate and accuracy similar across adults and children who are beginning readers. Use of strategies similar across adults and children (rely more on phonological-graphic cues than semantic-graphic cues). Interactions: Adults and less-able children rely more on semantic cues and have more hesitations than able children. [not used in original Principles.]
Sabatini, 2002	n: 95 rl: GE3-college age: 27 lang: English	ABE ASE	Assessment-I MS	Adults in adult education and college given assessments across components of reading. For analysis, divided into high, average, and low ability groups based on WRAT word recognition scores.	WIAT Reading Comprehension Subtest; accuracy and speed on sentence comprehension, word naming, pseudoword naming, single word decoding and paired-word decoding; speed on non-readng tasks (digit and picture naming, perceptual-motor reaction time, rapid number naming)	Significant group differences were found for all speed tasks. High-ability group had rapid and efficient (fluent) word-analysis and comprehension skills; average-ability group had accurate but not as automatic processing skills; low-ability group struggled with both accuracy and efficiency in word-analysis and comprehension.
Sabatini, Sawaki, Shore, & Scarborough, 2010	n: 476 rl: GE 7 or lower age: 37 (16-76) lang: English and other (but intermediate or better English language skills)	ABE	Assessment-I CORR (Factor Analysis)	ABE learners given 13 assessments across components of reading to determine, through factor analysis, the best model for the component skills of reading	In addition to tests of word analysis, vocabulary, comprehension, and language, also given tests of fluency/speed: TOWRE Sight Word Efficiency; TOWRE Phonemic Decoding; WJ Reading Fluency; NAAL Oral Reading)	Average scores presented as GEs and words correct per minute: TOWRE Sight Word Reading Efficiency: 3.8 TOWRE Phonemic Decoding: 1.8 WJ Reading Fluency: 2.5 Passage reading fluency: 95 wcpm

Fluency Instruction

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Brock, 1998	n: 1 rl: age: adult lang: English	ABE	Descriptive Case	During 8-10 sessions lasting 1-2 hours, adult dictated story from picture book, discussed story, practiced book's words on flashcards, and engaged in repeated reading of dictated story	Oral reading accuracy	Observed increase in oral reading accuracy

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Eden, Jones, et al., 2004	n: 19 rl: age: 44 lang: English	ABE	Experimental TERPP TERP	For 3 hours/day over 8 weeks, dyslexic adults given multisensory, structured, and intense phonologically based instruction in phonemic awareness and word analysis (Lindamood-Bell) versus dyslexic controls (no intervention)	Skills targeted: Auditory and visual phonemic awareness, nonword and real word recognition (Rosner, Symbol Imagery, Woodcock Word Attack, Decoding Skills Test Phonemic Transfer Index, WRAT). Skills not targeted: oral reading rate, accuracy, and comprehension (Gray Oral Reading Test). Physiological measures: fMRI during simple phonemic awareness task	Significant gains for experimental group on targeted skills and oral reading accuracy, but not on oral reading rate and comprehension
Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006	n: 27 rl: 3-5 age: 39 lang: mostly English	ABE	Descriptive PPNC	71 hours (2 hrs./day, 4 days/wk, over 13 wks.) of classroom instruction using extensive reading approach (students learn how to select authentic literature written at their reading grade level; teacher models, and students engage in, sustained silent reading, teacher read-alouds, and group discussion about content of material read)	Reading survey; Woodcock-Johnson (word-letter identification, passage comprehension, word attack, and reading fluency); Boston Naming Test (expressive vocabulary); Peabody Picture Vocabulary (receptive)	Changes from pretest to posttest: students reported reading more, understanding more, and reading less slowly (survey results); students did not significantly increase receptive vocabulary, word attack, or comprehension scores; students did significantly increase fluency and expressive vocabulary scores
Hanlon & Cantrell, 1999	n: 1 rl: GE 2 age: 31 lang: English	ABE	Descriptive CASE	Over 9 months of tutoring, spelling-based word study (word sorting by vowel pattern; spelling words with learned patterns; homophone matching game)	Woods and Moe Analytic Reading Inventory (word recognition, fluency [accuracy and rate], and comprehension)	Increase in word recognition from about GE 1 to GE 4; increase in fluency from about GE 1 to 4; increase in comprehension from about GE 4 to 8
Idol-Maestas, 1981	n: 1 rl: GE 2 age: 21 lang: English	ABE	Descriptive CASE MB	Diagnostic word analysis testing followed by direct instruction in unknown letter-sound correspondences	SARPI formal reading inventory, oral reading; multiple baseline data -- % correct from word lists using relevant letter-sound combinations	Increased from GE 2 to GE 5 (on SARPI). From baseline through intervention, increase in each letter-sound combination taught.
Lavery, Townsend, & Wilton, 1998	n: 12 rl: basic age: 33 lang: English	ABE	Experimental QNPP	18 one-hour sessions using computer-based instruction (*Successmaker* Integrated Learning System) focusing on literacy and interpretive comprehension, word meaning, word analysis, and reference skills, along with math, versus traditional instruction (using textbook and lecture to teach comparable skills)	Word recognition (Burt Word Reading Test), fluency (oral reading accuracy; Neale Analysis of Reading Ability), and comprehension (Neale).	Controlling for initial differences, computer-based instruction led to greater gains for word recognition and comprehension, but not fluency (accuracy)
McKane & Greene, 1996	n: 94 rl: GE 0-9 age: adult lang:	ABE ASE	Experimental TERPP	40 hours of instruction with either traditional approach (mix of Laubach, Steck-Vaughn material, peer tutoring, classroom instruction) or traditional plus *Autoskill*, an application for alphabetics and fluency instruction (placement and then instruction to increase accuracy and rate of letter, syllable and nonsense syllable, and word and nonsense word recognition [audio and visual recognition] and oral reading of 2- and 3-word phrases, sentences and paragraphs)	TABE (combined comprehension and vocabulary)	Comprehension gains for lower level readers (GE 0-3.0) but not for those reading at higher levels (GE 3.1-6.0 and 6.1-9.0).
Meyer, 1982	n: 20 rl: GE 5-6 (mean) age: 17-74 lang: English	ABE	Experimental QNPP	7 hours of fluency instruction (repeated oral reading of increasingly more difficult texts while listening to them on tape) versus regular reading instruction (remedial instruction, independent reading, writing, word and sentence games)	TABE vocabulary, comprehension, and total reading	Significant increase on vocabulary and total reading but not comprehension
Moni & Jobling, 2001	n: 17 rl: Reading Age scores from below 6 to 12 (about GE 0-6) age: 18.5 (mean) lang: English	ABE	Descriptive PPNC	Over one year (2 full days/week for 32 weeks) developing confidence and ability to read, write and talk about familiar contexts; building vocabulary around everyday experiences; and use of email and internet. Direct teaching, demonstration, modeling, and scaffolding.	Fluency (rate and accuracy) and comprehension (Neale Analysis of Reading Ability); Concepts About Print (for those unable to complete 1st passage on Neale)	7 students took *Concepts About Print* pretest, demonstrated some emergent reader skills, but unable to apply them. 5 were unable to complete the 1st comprehension passage on the pretest but all could on the posttest. Of those who took the pretest and posttest, average gain on reading rate was 3 years, 3 mos. (3.3); 1.2 on accuracy; and .9 on comprehension.

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Tan, Moore, Dixon, & Nicholson, 1994	n: 3 rl: 1-2 age: 26-35 lang: non-English	ESOL	Descriptive QMB	Practice in word recognition fluency (speed and accuracy) with 25 difficult words taken from passages of 330-500 words	Word Recognition fluency (rate and accuracy); oral reading rate fluency (rate and accuracy); comprehension questions	Significant increase on all measures from baseline to intervention. Increase in oral reading fluency maintained (during reversal phase in multiple baseline design), but not word recognition fluency and comprehension.
Truch, 1994	n: 281 including 24 adults rl: 3 age: 5-55 lang: English	ABE	Descriptive PPNC (ANCOVA with age and vocabulary level used as covariates)	Lindamood-Bell Auditory Discrimination in Depth (phonemic awareness, spelling-sound correspondence in writing, word recognition, reading of connected text at appropriate level)	Lindamood Auditory Conceptualization Test; informal Lindamood sound-to-symbol test; Woodcock Word Attack (nonsense patterns); WRAT word recognition and spelling; GORT fluency	Significant increases on all measures
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Descriptive PPNC	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for reading instruction, along with some writing instruction, over 18-20 weeks (120-360 hours).	Oral reading rate on typical adult education texts	Significant increase in reading rate from pre to posttest
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Experimental QNPP	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for reading instruction, along with some writing instruction, over 18-20 weeks for 120 hours versus 360 hours.	Oral reading rate on typical adult education texts	No significant difference between groups with 120 or 360 hours of instruction.
Winn, Skinner, Oliver, Hale, & Ziegler, 2006	n: 12 rl: GE4 -5 age: adult lang: English	ABE	Experimental TRM	During a 20 minute session, adults read 3 randomly assigned, 100 word passages in each of 3 randomly assigned conditions: (1) following along silently while a passage is read, then reading the passage aloud; (2) reading silently followed by oral reading; and (3) orally reading each passage once (control)	Words correct per minute (WPM); errors per minute (EPM)	Both repeated reading conditions (Listening While Reading and Repeated Reading), successfully used with children in the past, led to significantly faster reading (WPM) than control condition but were not different from each other. No significant differences on EPM measure.

A4. Adult Studies: Vocabulary

Vocabulary Assessment

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Greenberg, Ehri, & Perin, 1997	n: 144 rl: GE 3-5 age: 33 and 10 lang: English	ABE	Assessment-I MS	Assessment of adults and children reading at GE 3, 4, and 5 on word recognition	Phoneme deletion, real words; phoneme segmentation, real words; non-word decoding (Woodcock Word Attack); sight word recognition, irregularly spelled words; wordlikeness choice task; spelling; rhyme word reading; oral vocabulary (PPVT)	V: Adults' vocabulary better than children's at GE 3 and 4, but not at GE 5. (Life experience may help until reading provides greater exposure to written language.)
Nanda, Greenberg, & Morris, 2010	n: 371 rl: GE 3-5 age: 16+ lang: English and other	ABE ESOL	Assessment-I CORR (factor analysis)	Given assessments across components of reading to determine, through factor analysis, which child-based component model of reading fits AE readers: an achievement model of reading skills, a core deficit model of reading subskills, or an integrated model	Word reading (WJIII Letter-Word ID; Sight Word Reading Test); Word reading fluency (TOWRE Sight Word); Nonword reading (WJIII Word Attack); Nonword reading fluency (TOWRE Phonemic Decoding); Reading fluency (WJIII Reading Fluency; GORT-4); Reading Comprehension (WJIII Passage Comp; GORT-4); Phonological Awareness (CTOPP Elison and Blending); RAN (CTOPP Rapid Letter, and Color, Naming); Oral Vocab (PPVT; Boston Naming)	OVERALL: Difficulty obtaining models with good fit using child-based component models. ESOL: Non-ESOL performed better on oral vocabulary, reading comp, and sight word recognition. ESOL performed better on nonword reading [no diff on fluency] [Consistent with Strucker]
Swanson & Hsieh, 2009	n: 3686 (52 studies) rl: all age: 18-44 lang: English	ABE ASE	Assessment-I Meta-Analysis with Effect Sizes	Meta-analysis of 52 studies of adults with and without a learning disability in reading	Various measure of reading achievement and cognition including classification measures (comprehension, word recognition, and verbal IQ) and comparative measures (naming speed, phonological processing, verbal memory, word attack, vocabulary, and spelling	LD adults significantly different from non-LD adults on reading related classification measures (comprehension and word recognition) and reading related processing measures (word attack, vocabulary, and spelling). Differences do not change with age in adults. As with children, phonological processing, naming speed, and verbal memory characterize adults with LD, although problems extend beyond a phonological core for adults.

Vocabulary Instruction

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Byrne, Crowe, & Hale, Meeks, & Epps, 1996	n: 22 rl: GE 3.0 (mean) age: 31 (mean) lang:	ABE ESOL	Descriptive PPNC	Project LEAP: literacy instruction and guidance in workplace communication for low-income adults delivered via on-site teacher and satellite (20 hours per week for 6-8 months)	Test of Word Knowledge subtests: recognizing synonyms, defining words, understanding figurative language, using words in multiple contexts	Significant increase on only one of four subtests: synonyms
Diem & Fairweather, 1980	n: 30 rl: age: adult lang: English	ABE	Experimental QNPP	Over 8 weeks in a correctional facility, individualized, computer-assisted instruction in reading and vocabulary using PLATO versus a control group (covering same content using lecture format)	ABLE Level II Reading Comprehension and Vocabulary	No difference between PLATO group and control
Gold & Horn, 1982 (and Gold & Johnson, 1982)	n: 76 rl: between GE 2-3 age: 30 (mean) lang: English	ABE	Experimental TERPP	34 hours (1.5 hours/week over 12-15 weeks) of engaging, structured volunteer tutoring vs. no instruction. 12 hours of tutor training on use of Directed Listening-Language Experience approach (discussion of interesting topics and vocabulary, focusing on understanding, and use of student-generated texts); word recognition using multisensory approach (VAKT); whole-word phonics (phonics by analogy); comprehension strategies; and recreational reading.	Oral vocabulary-verbal opposites (Detroit); Reading vocabulary-analogies (Woodcock)	Treatment better than control on measures of word attack, word recognition, reading vocabulary, and reading comprehension but no difference on oral vocabulary and listening comprehension
Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006	n: 27 rl: 3-5 age: 39 lang: mostly English	ABE	Descriptive PPNC	71 hours (2 hrs./day, 4 days/wk, over 13 wks.) of classroom instruction using extensive reading approach (students learn how to select authentic literature written at their reading grade level; teacher models, and students engage in, sustained silent reading, teacher read-alouds, and group discussion about content of material read)	Reading survey; Woodcock-Johnson (word-letter identification, passage comprehension, word attack, and reading fluency); Boston Naming Test (expressive vocabulary); Peabody Picture Vocabulary (receptive)	Changes from pretest to posttest: students reported reading more, understanding more, and reading less slowly (survey results); students did not significantly increase receptive vocabulary, word attack, or comprehension scores; students did significantly increase fluency and expressive vocabulary scores
Joe, 1998	n: 48 rl: age: 19-46 lang: Asian, Somoan	ESOL	Experimental TERPP	No instruction vs. one instructional session and one practice session for two additional groups: (1) a group receiving instruction in read-retell procedure alone (read questions to activate background knowledge and guide passage reading; retell key concepts from the passage and use think-aloud phrases to discuss unfamiliar concepts), or (2) a group receiving instruction in read-retell plus instruction in generative strategies for learning concepts	Depth of vocabulary knowledge scale; Generativeness scale (degree to which student relates concepts in text to each other and to prior knowledge); Multiple choice vocabulary tests; background knowledge (composite of vocab. know., lang. ability, and use of generative processing)	No difference between the two read-retell instruction groups but both read-retell groups better than no instruction group on depth of vocabulary knowledge and multiple choice measures. Those with more background knowledge benefit the most (regardless of instruction). While those in generative strategy group were not better on vocabulary measures, overall those who used generative strategies most did do better.
Lazar, Bean, & Horn, 1998	n: 47 rl: < GE 8 age: 43 lang: English	ABE	Descriptive PPNC	Instruction in work-related vocabulary using demos, discussion, and simulations during 54 hours of instruction over a 12 week period that also included reading, writing, and discussion about work-related documents, tasks, problem-solving, and attitude	TABE vocabulary; job-related medical vocabulary	Significant increase on comprehension and vocabulary tests
Messemer & Valentine, 2004	n: 124 rl: <11.0 age: 20.4 lang: English	ABE GED	Descriptive PPNC	Inmates participated for varying lengths of time in prison literacy programs including independent study, small-groups, and large-group lectures. Content consisted of videos and CAI, with some delivered via distance learning.	TABE 5/6 total reading (comprehension and vocabulary)	Significant increase from pre to post on reading. 46% gained between GE .5 to 1.5; 24% gained between GE 1.6 to 2.5; 7% gained more than GE 2.5. 24% made no gain. A gain of GE 1 took an average of 118 hours of instruction. No significant correlation between hours of instruction and reading gains.
Nickse, 1988	n: 30 rl: age: adult lang: Enlglish and other	ABE ASE ESOL	Descriptive PPNC	Parents in family literacy program receive 25-50 hours of decoding, vocabulary, reading/listening comprehension, study skills, and writing instruction from highly trained tutors in weekly sessions over 2 semesters.	TABE vocabulary	Adults receiving 41-50 hours gained most on vocabulary measure, those receiving 31-40 hours gained less, and those receiving 25-30 hours showed no gain.
Philliber, Spillman, & King, 1996	n: >1750 rl: low HS on CASAS, GE 8 on TABE age: >21 lang: English	ABE ASE	Experimental QPHPP	One academic year in family literacy programs (various programs, but all included early childhood education, parent literacy training, parent support groups, and parent-child interaction) versus non-family literacy programs	TABE for one exp/control pair [combined vocabulary and comprehension score] and CASAS for the other exp/control pair	Greater gains for family literacy programs

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Phillibber, Spillman, & King, 1996	n: 222 rl: low HS on CASAS, GE 8 on TABE age: >21 lang: English	ABE ASE	Experimental QPHPP	Less than 50 hours, 51-150 hours, or more than 150 hours of participation in family literacy programs (various programs, but all included early childhood education, parent literacy training, parent support groups, and parent-child interaction) versus non-family literacy programs	TABE for one exp/control pair [combined vocabulary and comprehension score] and CASAS for the other exp/control pair	Longer participation resulted in significantly greater gains than shorter stays on each measure
Roberts, Cheek, & Mumm 1994	n: 150 rl: GE 6.1 age: 29.9 lang: English	ABE	Experimental TERPP (random assignment of treatment to 1 of 3 dormitories)	7 weeks of instruction using SRA material in cooperative setting (teacher instruction, team practice, individual assessments, group recognition) vs. same intervention plus intensive community-building workshop and follow-up vs. no instruction	Gates-MacGinitie vocabulary, comprehension, and total reading	Significantly greater gains for community building group on comprehension and total reading but no difference on vocabulary
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Descriptive PPNC	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for reading instruction, along with some writing instruction, over 18-20 weeks (120-360 hours).	TABE vocabulary	No significant increase in vocabulary from pre to posttest
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Experimental QNPP	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for reading instruction, along with some writing instruction, over 18-20 weeks for 120 hours versus 360 hours.	TABE vocabulary	No significant difference between groups with 120 or 360 hours of instruction (neither group gained).

A5. Adult Studies: Comprehension

Comprehension Assessment

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Chiappe, Stringer, Siegel, & Stanovich, 2002	n: 93 rl: below 25th %ile on WRAT (controls: all levels for adults; above 25th %ile for children) age: 25 (controls: 25; 10) lang: English	ABE	Assessment-I	Phonemic awareness, word analysis, and comprehension tests given to reading disabled adults and two control groups (an age-matched group of non-disabled adults and a reading-matched group of non-disabled children)	WRAT3 word recognition (used for matching); Rosner: phoneme and syllable deletion; Woodcock: word recognition and psuedoword reading; WRAT3: spelling; WIAT listening comp.; Nelson Deny reading comp. (adults only)	Reading disabled adults significantly lower than non-disabled adults on phonemic awareness, pseudoword reading, word recognition, and reading comprehension but lower than reading-matched children on only phonemic awareness and pseudoword reading
Fang, 1994	n: 30 rl: not given; 10 low-, medium-, and high-abililty ELLs age: 20-46 lang: Chinese	ESOL	Assessment-I CORR (multiple regression)	Students with Level 1, Level 2, or Level 3 on TOEFL given familiar and unfamiliar paragraphs to read (topics had either been studied in class or not)	Read 500 word passage and answer reading comprehension questions	Both language proficiency, background knowledge (text familiarity), and the interaction between the two contribute to reading comprehension: language ability affects comprehension more when background knowledge is lower
Gambrel & Heathington, 1981	n: 28 rl: less than GE 6 age: adult lang: English	ABE	Assessment-I MS	Assessment of adult literacy and college students' metacomprehension	Knowledge of the role that motivation, prior knowledge, and text structure play in reading tasks. Knowledge of reading strategies (reading for meaning vs. reading word-by-word; oral vs. silent reading; what good readers do; handling comprehension failures)	Good readers aware of task and strategy dimensions while poor readers lack awareness, especially of reading strategies. Both groups aware of effects of motivation and prior knowledge, but ABE learners not as aware of text structure and focus more on decoding than on comprehension strategies.
Greenberg, Pae, Morris, Calhoon, & Nanda, 2009	n: 193 rl: 3-5 age: 31 (mean) lang: English and other	ABE	Assessment-I MNS	Assessment of reading using GORT-4, a reading test normed on children that consists of graded passages that increase in difficulty from level 1 to 13.	Woodcock Letter-Word ID; GORT-4	GORT-4 comprehension results may not be valid for adults with low word identification scores (GE 3-5). Adults performed more poorly on easier passages (Levels 1-2) than on harder passages (Level 3)
Gold, R., 1983	n: 18 rl: GE 5.1 age: adult lang: English	ABE	Assessment-I MS	Assessment of story recall after hearing story, reading silently, or reading orally. Story written below reading GE	Story recall (idea units) Reading time	Adults reading at GE 5 understand stories written below their reading GE (same recall and rate whether listening, hearing, or reading story)

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Kirsch, Jungeblut, Jenkins, & Kolstad, 1993	n: 26,000 rl: all age: 16+ lang: English and other	ABE ASE ESOL	Assessment-I MS, MNS	Representative sample of U.S. adults given reading reading comprehension assessment	National Adult Literacy Survey (NALS); measures of prose, document, and quantitative literacy	Adults who qualify for AE have poor comprehension; unable to integrate information in a text or combine information across texts. ELL and LD adults are over-represented in the AE target population (on average, have lower NALS scores).
Kutner, Greenberg, Jin, Boyle, Hsu, & Dunleavy, 2007	n: 21,000 rl: all age: 16+ lang: English and other	ABE ASE ESOL	Assessment-I MS, MNS	Representative sample of U.S. adults given reading reading comprehension assessment	National Assessment of Adult Literacy (NAAL); measures of prose, document, and quantitative literacy	Adults who qualify for AE have difficulty understanding moderately dense, less common texts and summarizing, making inferences, determining cause and effect, and recognizing an author's purpose. ELL and LD adults are over-represented in the AE target population (on average, have lower NALS scores). Adults' prose literacy improves through age 50 and declines after age 65.
Kutner, Greenberg, Jin, & Paulsen, 2006	n: 21,000 rl: all age: 16+ lang: English and other	ABE ASE ESOL	Assessment-I MS, MNS	Representative sample of U.S. adults given reading reading comprehension assessment	National Assessment of Adult Literacy (NAAL); measures of prose, document, and quantitative health literacy	Adults who qualify for AE have difficulty understanding moderately dense, less common health. ELL adults are over-represented in the AE target population (on average, have lower NAAL health literacy scores). Adults with poor health are over-represented in the AE target population.
MacArthur, Konold, Glutting & Alamprese, 2010	n: 486 rl: GE 4-7 age: 35 (16-71) lang: English and other	ABE	Assessment-I CORR (Factor Analysis)	Given assessments across components of reading to determine, through factor analysis, the best model for the component skills of reading (and the best set of measures for complete reading assessment profiles)	11 measures of five components, including the following reading comprehension measures: Nelson Word Meaning and Comprehension	ESOL: ELLs higher on decoding than native speakers, but lower on comprehension. LD: Those with LD significantly lower on all components, including reading comprehension.
Mellard, Fall, & Mark, 2008	n: 295 rl: 0-12 age: 24 (16-73) lang: English and other, but non-ELL	ABE ASE	Assessment-I CORR (Cluster Analysis with ANOVAs to test for significant diffs. among clusters)	Stratified random (and, when necessary, convenience) sample of AE learners across all NRS reading levels were given assessments of components of reading (word analysis, fluency, and comprehension) to determine, through cluster analysis, instructionally relevant profiles	Multiple measures of components of reading including reading comprehension (Woodcock Passage Comprehension)	Identified 7 reading ability subtypes (profiles) from lower-literate to higher literate. Reading comprehension improves across levels. Lowest four groups scored below the 10th percentile on comprehension. Only the highest group scored above the 50th percentile.
Mellard, & Patterson, 2008	n: 311 rl: 0-12 age: 31 (mean) lang: English and other	ABE ASE	Assessment-I MS, CORR (regression)	AE learners with self-reported LD and non-LD given assessments in academic and functional reading comprehension	Reading comprehension (Woodcock Passage Comp.), functional reading (CASAS), IQ (WAIS Block Design, Information, Vocabulary)	Adults with LD scored significantly lower than non-LD adults on academic reading comprehension (10-25% lower, or GE 3 vs. 5) and functional reading comprehension (15-30% lower). Results held when controlling for IQ and age. Also, adults with LD entered AE with lower NRS levels (Level 3 vs. Level 4 or roughly GE 6 vs. GE 8).
Nanda, Greenberg, & Morris, 2010	n: 371 rl: GE 3-5 age: 16+ lang: English and other	ABE ESOL	Assessment-I CORR (factor analysis)	Given assessments across components of reading to determine, through factor analysis, which child-based component model of reading fits AE readers: an achievement model of reading skills, a core deficit model of reading subskills, or an integrated model	Multiple measures across components of reading including comprehension (WJIII Passage Comprehension and GORT-4)	Overall: difficulty obtaining models with good fit using child-based component models. ESOL vs. Non-ESOL: Non-ESOL performed better on oral vocabulary, reading comp, and sight word recognition. ESOL performed better on non-word reading. No difference on fluency.
Perin & Greenberg, 1993	n: 99 rl: age: 22-58 lang: English and other	ABE ASE	Assessment-I	Six hours of instruction per week in work setting for learners staying in program for 7, 14, 21, or 28 weeks. Basic skills instruction focusing on career development with goal of preparing for college level courses. Literacy instruction using health-related content and both collaborative and traditional methods.	Passage comprehension at 7, 14, 21, or 28 weeks. Teacher ratings of reading comprehension at 10, 20, and 30 weeks.	At 20 to 21 weeks, there was a significant relationship between length of stay and reading level on both measures; those who were to complete the program had significantly higher scores than those who would not. Those completing program had significant gain on one of two measures.
Sabatini, 2002	n: 95 rl: GE3-college age: 27 lang: English	ABE ASE	Assessment-I MS	Adults in adult education and college given assessments across components of reading. For analysis, divided into high, average, and low ability groups based on WRAT word recognition scores.	WIAT Reading Comprehension Subtest; accuracy and speed on sentence comprehension, word naming, pseudoword naming, single word decoding and paired-word decoding; speed on non-readng tasks (digit and picture naming, perceptual-motor reaction time, rapid number naming)	Significant group differences were found for all speed tasks. High-ability group had rapid and efficient (fluent) word-analysis and comprehension skills; average-ability group had accurate but not as automatic processing skills; low-ability group struggled with both accuracy and efficiency in word-analysis and comprehension.

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Swanson & Hsieh, 2009	n: 3686 (52 studies) rl: all age: 18-44 lang: English	ABE ASE	Assessment-I Meta-Analysis with Effect Sizes	Meta-analysis of 52 studies of adults with and without a learning disability in reading	Various measure of reading achievement and cognition including classification measures (comprehension, word recognition, and verbal IQ) and comparative measures (naming speed, phonological processing, verbal memory, word attack, vocabulary, and spelling	LD adults significantly different from non-LD adults on reading related classification measures (comprehension and word recognition) and reading related processing measures (word attack, vocabulary, and spelling). Differences do not change with age in adults. As with children, phonological processing, naming speed, and verbal memory characterize adults with LD, although problems extend beyond a phonological core for adults.
Tamassia, Lennon, Yamamoto, & Kirsch, 2007	n: 6,100 rl: all age: 16+ lang: English and other	ABE ASE ESOL	Assessment-I MS	Nationally representative sample of U.S. adults in federally funded adult education programs given reading comprehension assessment	Adult Education Program Study (AEPS) and Adult Literacy and Life Skills Survey (ALL); measures of prose, document, and quantitative literacy (reading comprehension) Health (self-report) LD (self-report)	AE learners have poor comprehension, falling on average into high Level 1 of 5 levels on prose and document literacy, significantly lower than the general population. At this level, can locate single piece of information in a short text. On average, unable to perform Level 2 prose tasks: locate information in texts when distractors present or low-level inferences required. ELL group average is in Level 1, significantly below ABE group (mid-Level 2). ASE adults' average is also in mid-Level 2 range, but significantly higher than ABE. Hispanic ELLs score at same level as AE learners when tested in Spanish. Older (>60) ELLs and ABE adults have lower scores, as do very young ELLs (16-18). 31% in Levels 1 & 2 report having LD; only 15% in Levels 3-5. No strong relationship between level of health and reading in AE adults.
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Descriptive	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for reading instruction, along with some writing instruction, over 18-20 weeks (120-360 hours).	TALS document and quantitative comprehension, and TABE comprehension	Results very variable: learners showed gain on all three measures from time one to time two, but on only one from time two to time three.

Comprehension Instruction

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Aderman, Nitzke, Pingree, & Voichick, 1987	n: 4 rl: GE 3-5 age: adult lang: English	ABE	Descriptive PPNC	Participants read two versions of a nutrition pamphlet, the first one written for low-literate adults by a nutritionist and the other rewritten based on statements made by adults who had read, discussed, and restated information in the pamphlet in their own words (readability on both was comparable at GE5 or below)	Comprehension (free recall, main idea recall, multiple choice, number of elaborations)	Comprehension better for rewritten version on all measures except multiple choice
Alessi, Siegel, Silver, & Barnes, 1982-83	n: 36 rl: GE 4-6 age: adult lang: English	ABE	Experimental TERPP	40 sessions over 2 months for a total of 20 hours of self-paced computer-based comprehension strategy instruction (early PLATO) vs. computer-based math (PLATO)	Finding information; paraphrasing; main idea questions	Self-paced computer-based comprehension strategy instruction better for finding information and paraphrasing (but not for answering main idea questions) at end of treatment and at one month follow-up
Askov & Brown, 1992	n: 36 rl: GE 3 (1-6) age: 41 (mean) lang: English	ABE	Experimental TERPP	Control (no treatment) vs. 100 hour CAI workplace reading program using worker training manual as basis for comprehension instruction on computer (vocabulary, main ideas, details, paraphrasing, following directions) and in classroom (reading, writing, and interaction)	Criterion Referenced Test (measuring vocabulary, main ideas, details, paraphrasing, following directions using manual content); and Quick Assessment Test (measuring knowledge of manual content)	Workplace reading program participants had significant increase on Quick Assessment Test but not on the Criterion Referenced Test

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Batchelder & Rachal, 2000	n: 71 rl: all age: 31 (mean) lang: English	ABE ASE	Experimental TERPP	Traditional instruction (4 one-hour ABE or GED classes a day over 20 days in English, math, history, and science) versus same approach with computer-assisted instruction substituted on a rotating basis for one class (diagnostic/ prescriptive, self-paced, drill and practice tutorial in editing skills—recognizing and correcting writing errors)	CASAS reading	No difference between traditional instruction alone and traditional instruction plus CAI editing instruction (neither group had significant increases from pre to post)
Boudett & Friedlander, 1997; Friedlander & Martinson, 1996	n: 1081 rl: TALS, Level 2 age: 35 (mean) lang: English, Spanish (30%)	ABE ASE ESOL	Experimental TERP	Adults required to attend basic education classes (ABE, GED, and ESOL) in large five-county program in order to receive welfare benefits over 2-3 years (vs. those not required to attend)	TALS Document and Quantitative literacy scores	Motivation: Requiring adults to attend a literacy program in order to receive welfare benefits does not increase reading comprehension achievement. Duration: Reading achievement significantly higher for those with over 60 hours of instruction. Reading Level: Reading outcomes were not dependent on participant reading level.
Brooks, Ducke, Hutchinson, Kendall & Wilkin, 2001	n: 1124 rl: GE 3 age: 25 (mean) lang: English (87%) and other	ABE	Descriptive PPNC	Basic reading and writing instruction in 71 ABE programs in Britain, with analysis for students attending for various lengths of time	Functional reading comprehension test with items derived from previous national studies (e.g., IALS)	Overall, significant increase in reading comprehension achievement, with greater increase for those attending regularly (over 50 hours of instruction)
Brooks, Ducke, Hutchinson, Kendall & Wilkin, 2001	n: 1124 rl: GE 3 age: 25 (mean) lang: English (87%) and other	ABE	Experimental QPHPP	Basic reading and writing instruction in 71 ABE programs in Britain (a) with vs. without teacher assistance in classroom (volunteer or paid); and (b) some with more qualified vs. some with less qualified teachers	Functional reading comprehension test with items derived from previous national studies (e.g., IALS)	Students made greater gains in programs where (a) teachers had assistants in the classroom and (b) all teachers were "qualified" (certified or bachelor's degree in education).
Carrell, 1985	n: 25 rl: age: lang: various, non-English	ESOL	Experimental TERPP	In five one-hour daily sessions, training in top-level organization of expository texts (comparison, causation, problem/solution, and descriptive texts) vs. Control (using same texts for other reading and writing tasks)	Percent high-, mid-, and low-level idea units recalled during written free recall; percent subjects using text organization during recall, percent subjects correctly identifying text structures	Trained group recalled significantly more high-, mid-, and low-level idea units. Significant increase in the percent of trained group who recognized and used text organization, but not for control. Results same at 3-week follow-up.
Cheek & Lindsey, 1994	n: 71 rl: GE 6.0 age: 27 (mean) lang: English and perhaps other	ABE	Experimental TERPP	In votech classes lasting 1 hour/day for 2 months, diagnostic-prescriptive approach (assess to plan and adjust instruction; use language experience, literature-based, real-life materials) vs. programmed approach (assess to find beginning level for computer and print-based programs; self-paced; feedback and repetition)	Stanford Diag. Rdg. Test: literal comprehension, inferential comprehension, total comprehension	Greater increases on inferential and total comprehension for diagnostic-prescriptive approach. No difference on literal comprehension.
Conti, 1985	n: 837 students (29 teachers) rl: age: 30 (mean) lang: English	ABE ASE ESOL	Experimental QNPP	Over academic year, including collaborative, learner-centered approaches in classrooms that are primarily teacher-centered	Teacher judgment of student reading and math achievement	GED students performed better with teachers incorporating relatively more student-teacher collaboration while ABE and ESOL students performed better with teachers incorporating relatively less collaboration
Curtis & Chmelka, 1994	n: 5 rl: GE 3-5 age: 15-16 lang: English	ABE	Descriptive PPNC	Students with LD taught basic word analysis each day for 30 minutes over 10 weeks using Laubach Way to Reading, collaborative oral reading, and word games versus the same group over 15 weeks using oral reading and a modified Laubach approach (included practice with more challenging words incorporating the letter-sound correspondences being taught).	Comprehension subtest of California Achievement Test	Modified program led to faster rate of growth in comprehension
Darkenwald & Valentine, 1985	n: 294 rl: GE 0-12 age: 50% < 30 lang: English (and perhaps other-20% Hispanic)	ABE ASE	Descriptive PO	Participation for 7 months in one state's basic skills classes (literacy instruction through high school level)	Self-report of reading improvement via phone survey	80% reported gains in reading ability

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Diem & Fairweather, 1980	n: 30 rl: age: adult lang: English	ABE	Experimental QNPP	Over 8 weeks in a correctional facility, individualized, computer-assisted instruction in reading and vocabulary using PLATO versus a control group (covering same content using lecture format)	ABLE Level II Reading Comprehension and Vocabulary	No difference between PLATO group and control
Dirkx & Crawford, 1993	n: 18 rl: GE 2 age: adult lang: English	ABE	Descriptive E-Stats	Over 8 months with 10 hours of instruction per week, control group in regular ABE program vs. group experiencing a contextual approach to reading (using highly engaging content related to science and the natural world)	T-NAT (Test that is Not A Test)	Those in contextual group increased .4 GE and controls increased .2 GE (no test for significance)
Fitzgerald & Young, 1997	n: 614 rl: GE 6-9 age: 30 (mean) lang: English and other	ABE ASE ESOL	Descriptive PPNC (for general increase in comp. achievement for each group) CORR (for all other results)	Adult education curricula in 44 programs across 20 states and 3 program types (ABE, ASE, ESOL). An average of 60-120 hours of instruction, 5-9 hours per week for 10-15 weeks.	CASAS reading test (for ESOL) TABE reading comprehension (for ABE, ASE) Background variables: Student background (race-ethnicity, years of school, voluntary-involuntary participation) Instruction (individualized-fixed, fulltime/part-time staff, teacher experience, cost, class size) Persistence (total hours instruction, hours per week)	Increase in reading comprehension achievement for all three program types. Strategy: Highly individualized instruction is related to achievement for learners in ABE. Intensity: Hours of instruction related to increased achievement only for ESOL (and effect is small). Hours/week negatively related to achievement (which declines above 9 hours/wk.). Teacher Prep: Use of experienced, full-time staff important factors for all groups. Reading level: Initial reading level is the most important factor related to achievement for all three groups. More Results for factors affecting comp. achievement: ESOL -- investment in structured curricula, full-time and experienced staff, and support services. ABE -- Use of individualized curricula and full-time staff. ASE -- Cost of instruction (influenced by full-time staff).
Gerber & Finn, 1998	n: 21522 rl: all age: adult lang: English and other	ABE ASE	Descriptive CORR	Degree to which adults engaged in specific reading practices at work (NALS data)	NALS document literacy	For all groups, there is a significant positive relationship between amount of literacy practices and NALS document literacy scores
Gold & Horn, 1982 (and Gold & Johnson, 1982)	n: 76 rl: between GE 2-3 age: 30 (mean) lang: English	ABE	Experimental TERPP	34 hours (1.5 hours/week over 12-15 weeks) of engaging, structured volunteer tutoring vs. no instruction. 12 hours of tutor training on use of Directed Listening-Language Experience approach (discussion of interesting topics and vocabulary, focusing on understanding, and use of student-generated texts); word recognition using multisensory approach (VAKT); whole-word phonics (phonics by analogy); comprehension strategies; and recreational reading.	Listening comprehension (Spache) and Reading comprehension (Woodcock)	Treatment better than control on measure of reading comprehension but no difference on listening comprehension
Gorman, 1981	n: 541 rl: all levels age: all ages lang: English	ABE ASE	Descriptive PPNC	Reading instruction in adult education program in United Kingdom	Combined measure of decoding and comprehension	Pre-post gains in reading
Greenberg, Rodrigo, Berry, Brinck, & Joseph, 2006	n: 27 rl: 3-5 age: 39 lang: mostly English	ABE	Descriptive PPNC	71 hours (2 hrs./day, 4 days/wk, over 13 wks.) of classroom instruction using extensive reading approach (students learn how to select authentic literature written at their reading grade level; teacher models, and students engage in, sustained silent reading, teacher read-alouds, and group discussion about content of material read)	Comprehension self-report (survey) and passage comprehension (Woodcock). Other measures included Woodcock letter-word identification, word attack, and reading fluency; Boston Naming Test (expressive vocabulary); and Peabody Picture Vocabulary (receptive)	Changes from pretest to posttest: students reported reading more, understanding more, and reading less slowly (survey results); students did not significantly increase receptive vocabulary, word attack, or comprehension scores; students did significantly increase fluency and expressive vocabulary scores

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Gretes & Green, 1994	n: 487 rl: age: adult lang: English	ASE	Experimental QNPP Experimental group divided into (a) low (below GE 6) and high (above GE 6) reading groups; (b) those completing 1, 1-3, or 4-6 curriculum units.	Over 11 weeks and 44-66 hours of instruction, conventional classroom reading instruction versus self-paced, computer-based reading, vocabulary, and comprehension strategy instruction (real life passages read with digital audio for help with reading and definitions; exercises in scanning, making inferences, organizing information, summarizing information, and question answering)	TABE Total Reading (vocabulary and comprehension combined)	Computer-based group made greater gains. Reading level: No difference between low and high reading groups. Duration: Those completing more than one unit made greater gains.
Hanlon & Cantrell, 1999	n: 1 rl: GE 2 age: 31 lang: English	ABE	Descriptive CASE	Over 9 months of tutoring, spelling-based word study (word sorting by vowel pattern; spelling words with learned patterns; homophone matching game)	Woods and Moe Analytic Reading Inventory: word recognition, fluency (accuracy and rate), and comprehension	Increase in word recognition from about GE 1 to GE 4; increase in fluency from about GE 1 to 4; increase in comprehension from about GE 4 to 8
Kasper, 1995	n: 32 rl: advanced ESOL reading age: lang: Russian, Haitian, Hispanic, Asian	ESOL	Experimental QNPP	Literature-based ESOL reading course (control) versus two types of content oriented ESOL reading courses: (1) single content (focusing on psychology as topic) and (2) paired content (same plus mainstream psychology course)	Final exam in reading at community college	Significantly higher pass rates for students in content oriented ESOL reading courses, although no significant difference between single and paired content students (72% and 81% for single and paired, and 45% for literature-based)
Lazar, Bean, & Van Horn, 1998	n: 47 rl: < GE 8 age: 43 lang: English	ABE	Descriptive PPNC	54 hours of instruction over a 12 week period including reading, writing, and discussion about work-related documents, tasks, problem-solving, and attitude	Comprehension: Researcher reading comprehension test; TABE comprehension; cloze; retell (job-related document)	Significant increase on all comprehension tests
Massengill, 2003	n: 4 rl: GE 1-6 age: 41.5 lang: English	ABE	Descriptive MB PPNC	32 one-our sessions of Guided Reading (re-reading familiar texts to work on word recognition and fluency; direct instruction in word analysis; sight word practice; oral reading with teacher support to practice and apply new skills; daily assessments) followed by 4 wks independent reading	Word recognition (Slosson Oral Reading Test), and oral reading and comprehension (Analytical Reading Inventory) given pre-post. Nonsense word and sight word assessments given daily.	On pre-post tests, all four students increased reading GE on word recognition, oral reading, and comprehension.
McKane & Greene, 1996	n: 94 rl: GE 0-9 age: adult lang:	ABE ASE	Experimental TERPP	40 hours of instruction with either traditional approach (some mix of Laubach phonics, Steck-Vaughn literacy tutoring, peer tutoring, or classroom instruction) or traditional plus *Autoskill*, an application for alphabetics and fluency instruction (placement and then instruction to increase accuracy and rate of letter, syllable and nonsense syllable, and word and nonsense word recognition [audio and visual recognition] and oral reading of 2- and 3-word phrases, sentences and paragraphs)	TABE (combined comprehension and vocabulary)	Significantly higher gain scores on comprehension for lower level readers (GE 0-3.0) but not for those reading at higher levels (GE 3.1-6.0 and 6.1-9.0).
Messemer & Valentine, 2004	n: 124 rl: < 11.0 age: 20.4 lang: English	ABE ASE	Descriptive PPNC	Inmates participated for varying lengths of time in prison literacy programs including independent study, small-groups, and large-group lectures. Content consisted of videos and CAI, with some delivered via distance learning.	TABE 5/6 total reading (comprehension and vocabulary)	Significant gains from pre to post on reading. 46% gained between GE .5 to 1.5; 24% gained between GE 1.6 to 2.5; 7% gained more than GE 2.5. 24% made no gain. A gain of GE 1 took an average of 118 hours of instruction. No significant correlation between hours of instruction and reading gains.
Mikulecky & Lloyd, 1997	n: 180 rl: GE 5-6 to 12-13 age: 20-60 lang: English and other	ASE ESOL	Experimental QPHPP Descriptive PPNC	Various approaches to workplace literacy (reading and writing) instruction) lasting anywhere from approximately 20 to 200 hours, in 10 programs at 6 workplace sites (including one ESOL program). Intensity: Intense vs. less intense literacy instruction. Strategy and Motivation: Deliberate vs. incidental discussion of reading strategies and literacy beliefs/plans. Material: High vs. low use of work-related classroom materials.	Comprehension (questions about site-specific workplace material including prose, chart, and graph documents). Metacomprehension (knowledge of reading processes and strategies).	Greater increases in metacomprehension in high-intensity programs where >70% of instructional time is spent on reading and writing activities. Greater increases in comprehension in programs where (a) use of reading strategies (metacomprehension) is discussed deliberately as opposed to incidentally; (b) workplace oriented material is used more (at least 20-30% of time); or (c) motivation or self-efficacy (beliefs and plans related to literacy) are discussed deliberately as opposed to incidentally. Descriptive result: Significant increase in comprehension and metacomprehension in all programs

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Moni & Jobling, 2001	n: 17 rl: Reading Age scores from below 6 to 12 (about GE 0-6) age: 18.5 (mean) lang: English	ABE	Descriptive PPNC	Over one year (2 full days/week for 32 weeks) developing confidence and ability to read, write and talk about familiar contexts; building vocabulary around everyday experiences; and use of email and internet. Direct teaching, demonstration, modeling, and scaffolding.	Fluency (rate and accuracy) and comprehension (Neale Analysis of Reading Ability); Concepts About Print (for those unable to complete 1st passage on Neale)	7 students took Concepts About Print on pretest and showed some skills of emergent readers, but unable to apply them. 5 were unable to complete the 1st comprehension passage on the pretest but all could on the posttest. Of those who took the pretest and posttest, average gain on reading rate was 3 years, 3 mos. (3.3); 1.2 on accuracy; and .9 on comprehension.
Nickse, 1988	n: 30 rl: age: adult lang: Enlglish and other	ABE ASE ESOL	Descriptive PPNC	Parents in family literacy program receive 25-50 hours of decoding, vocabulary, reading/listening comprehension, study skills, and writing instruction from highly trained tutors in weekly sessions over 2 semesters.	TABE comprehension	Adults receiving 41-50 hours gained most on comprehension measure, those receiving 31-40 hours gained less, and those receiving 25-30 hours gained least.
Perin & Greenberg, 1993	n: 99 rl: age: 22-58 lang: English and other	ABE ASE	Descriptive PPNC	Six hours of instruction per week in work setting for learners staying in program for 7, 14, 21, or 28 weeks. Basic skills instruction focusing on career development with goal of preparing for college level courses. Literacy instruction using health-related content and both collaborative and traditional methods.	Passage comprehension at 7, 14, 21, or 28 weeks. Teacher ratings of reading comprehension at 10, 20, and 30 weeks.	Those completing program had significant gain on teacher ratings but not on passage comprehension.
Perin & Greenberg, 1993	n: 99 rl: age: 22-58 lang: English and other	ABE ASE	Experimental QRM	Six hours of instruction per week in work setting for learners staying in program for 7, 14, 21, or 28 weeks. Basic skills instruction focusing on career development with goal of preparing for college level courses. Literacy instruction using health-related content and both collaborative and traditional methods.	Passage comprehension at 7, 14, 21, or 28 weeks. Teacher ratings of reading comprehension at 10, 20, and 30 weeks.	At 20 to 21 weeks, there was a significant relationship between length of stay and reading level on both measures; those who were to complete the program had significantly higher gain scores than those who would not. (Those doing better stayed longer.)
Philliber, Spillman, & King, 1996	n: >1750 n: 222 rl: low HS on CASAS, GE 8 on TABE age: >21 lang: English	ABE ASE	Experimental QPHPP	One academic year in family literacy programs (various programs, but all included early childhood education, parent literacy training, parent support groups, and parent-child interaction) versus non-family literacy programs	TABE for one exp/control pair (combined vocabulary and comprehension score) and CASAS for the other exp/control pair	For n >1750 group: Greater gains for family literacy programs For n=222 group: Among family literacy programs, longer participation resulted in significantly greater gains than shorter stays
Purcell-Gates, 1993	n: 1 rl: 4 with academic material; 0 with functional material age: 30+ lang: English	ABE	Descriptive CASE	1:1 tutoring for 2 hrs. twice a week plus work with author using language experience approach	Teacher observations of reading	Before intervention, could read about GE 4 in academic material but unable to read functional material. After intervention, able to read functional material (and also improved spelling, journal writing, and compositions)
Rich & Shepherd, 1993	n: 90 rl: GE 5.1 (3.7-7.1) age: 26.3 lang: English	ABE	Experimental TERPP	Comprehension strategy instruction: During six 45 minute reciprocal teaching sessions over 18 days, summarizing and question-asking instruction vs. summarizing only vs. question-asking only vs. reading materials only control vs. no instruction control	Multiple choice questions and free recall	Strategy instruction in questioning and summarizing better than control conditions on both measures. Strategy instruction in questioning alone better than controls on the question task. Summarizing alone better than controls on free recall task.
Roberts, Cheek, & Mumm 1994	n: 150 rl: GE 6.1 age: 29.9 lang: English	ABE	Experimental TERPP (random assignment of treatment to 1 of 3 dormitories)	7 weeks of instruction using SRA material in cooperative setting (teacher instruction, team practice, individual assessments, group recognition) vs. same intervention plus intensive community-building workshop and follow-up vs. no instruction	Gates-MacGinitie vocabulary, comprehension, and total reading	Significantly greater gains for community building group on comprehension and total reading but no difference on vocabulary
Scully and Johnson, 1991	n: 1 rl: 3 age: 49 lang: English	ABE	Descriptive CASE	Reading instruction (word sorts, word families, word lists, picture/vowel associations, and oral reading in context) combined with educational therapy to reduce anxiety and fear related to inability to read	Transcripts of sessions, researcher notes, process recordings, interviews, questionnaire. Tests of letter-sound knowledge, word attack, sight word recognition.	Instruction and therapy led to increased reading achievement

Study	Participants	Prog Type	Design	Treatment	Measures	Results
Sheehan-Holt & Smith, 2000	n: 17213 rl: all age: adult lang: English and other	ABE ASE ESOL	Descriptive CORR Multiple regression	NALS assessment results for those who reported having participated in adult education programs versus those who did not. Among those who participated, those who participated in job-related programs versus those who participated in community-based tutoring programs.	NALS Prose Literacy	No significant difference in reading comprehension achievement between those who participated and those who did not. No difference between those in job-related and those in community-based programs.
Smith, 1996	n: 24842 rl: all age: adult lang: English	ABE ASE	Descriptive MS	NALS assessment results for those who did not graduate from high school (qualify for ABE and ASE), those who graduated, and those who went on to post-secondary studies, and those who received a college degree	NALS prose, document and quantitative literacy. Degree to which adults engaged in specific, everyday reading practices	For all groups, there is a significant positive relationship between amount of literacy practices and all NALS literacy scores. For those without a HS degree (qualify for AE), there is a much larger gap in reading scores between low and high activity readers.
Sticht, Armstrong, Hickey, & Caylor, 1987; Sticht, 1988-89; Sticht, 1997	n: 3-12,000 rl: 4-6 age: adult lang:	ABE	Descriptive PPNC	Military literacy programs in 6 states based on job content versus competency-based military literacy programs at 2 sites using programmed, general literacy material	Comprehension of job-related material; comprehension of general material (general literacy comprehension)	No difference in gain scores on general literacy, but greater gains for job content program on job-related measure of comprehension
Tammassia, Lennon, Yamamoto, & Kirsch, 2007	n: 1,200 AE programs rl: all age: 16+ lang: English and other	ABE ASE ESOL	Descriptive MNS	All adult education programs (nationally representative sample of federally funded adult education programs)	National Reporting System (NRS) Levels (1-6) Motivation/Engage-ment (amount of reading; self-report)	33% completed one NRS Level; 20% completed one Level and advanced one or more Levels; 23% stayed at same level; 27% left program before completing level. Engaged/Motivated AE learners had significantly higher reading scores.
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Descriptive PPNC (testing at three points in time)	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for reading instruction, along with some writing instruction, over 18-20 weeks (120-360 hours).	TALS document and quantitative comprehension, and TABE comprehension	Significant increase from pretest to posttest for TALS document compre-hension but not for TALS quantitative or TABE. Results very variable: learners showed gain on all three measures from time one to time two, but on only one from time two to time three.
Venezky, Bristow, & Sabatini, 1994	n: 92 rl: all age: 26-50 lang: English and other	ABE ASE	Experimental QNPP	Ability-grouped classes (ABE1, ABE2, ABE3, GED) using experienced teachers for rdg. instr., along with some writing instruction, over 18-20 weeks (120-360 hours).	TALS document and quantitative comprehension, and TABE comprehension	No significant difference on any measure between groups with 120 or 360 hours of instruction.
Wood & McElhinney, 1990	n: 99 rl: GE 3.9 (0-9) age: 32.4 lang: English	ABE	Descriptive PPNC	Use of PALS (Principles of Alphabetic Literacy) computer application over 18 months for an average of 84 hours to teach beginning reading	ABLE	Average reading gain of a little over 1GE

Appendix B: Adolescent Studies

B1. Adolescent Studies: Alphabetics

Experimental Alphabetics Studies

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Greene	1996	96 13 to 17-year-olds, reading at the 11th percentile	Existing groups assigned to conditions	Individualized instruction using LANGUAGE! (phonemic awareness, decoding, encoding, word structure components) vs. whole group instruction, with "eclectic approach"	GORT 3 rate, accuracy, comprehension, and total reading scores	After 22 weeks, treatment group made significantly greater gains from pre- to post- than did control (but control also started out significantly higher on all 4 measures)	
Simpson, Swanson, & Kunkel	1992	63 14 to 18-year-old males, reading at the 4th-5th grade level	Existing groups assigned to conditions	90 minutes daily of Orton Gillingham (highly structured phonics instruction) vs. 45 minutes daily reading in regular classroom	Woodcock Reading Mastery Test	After 50 hours instruction, treatment group made significantly greater gain than control	

Non-Experimental Alphabetics Studies

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Curtis & C hmelka	1994	4 15 to 16-year-olds, reading below the 20th percentile	One-group receiving multiple treatments	Students received 10 weeks of Laubach, followed by 15 more weeks supplemented by work with more challenging words incorporating the letter-sound correspondences being taught	Woodcock-Johnson (Basic Reading Skills cluster), California Achievement Test, Comprehension subtest	After first 10 weeks of instruction, no gain found; after next 15 weeks, average gain of 8 NCE on W-J; mean increase on CAT Comprehension was 17 NCE	
Lenz & Hughes	1990	12 7th to 9th graders with LD reading at the 16th percentile	Multiple-baseline	Students received 20-25 min. daily instruction in multi-step strategy for recognizing multi-syllabic words	Oral reading errors and multiple-choice comprehension questions on passages at reading level and grade level	After 6 weeks oral reading errors decreased for those participants making errors initially; comprehension improved for some but not all; performance maintained after 5 weeks	
Miller & Felton	2001	15-year-old male HS student with a history of deficits in phonemic awareness, rapid naming, & word finding	Case study	Beginning in 7th grade, twice weekly 45-60 minute sessions including LiPS, *Language!*, and The Sentence Master software program	CTOPP, WJ-R, Decoding Skills Test	After 170 lessons over 4 years, phonemic awareness improved to average range, WJ-R improved from 2.1 to 3.5, and all DST subtest scores improved (from 20-33% correct on pre- to 53-86% on post-)	
Scheffel, Shroyer, & Strongin	2003	552 students in grades 6, 7, 8, and 10; 10th graders reading at the 5th percentile	One-group receiving single treatment	Students received 90 minutes daily direct instruction in phonemic awareness, letter/sound correspondences, and morphology and syntax (using LANGUAGE!)	Woodcock-Johnson (word attack & letter-word id), WRAT Spelling and MAST (cloze comprehension)	After 270 hours, significant gains found for 10th graders on all measures except spelling	

B2: Adolescent Studies: Fluency

Experimental Fluency Studies

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Casteel	1988	30 10th & 11th graders with LD, reading at 7th to 8th grade levels	Random assignment to conditions	Chunked passage presentation vs. unchunked presentation	Multiple choice comprehension questions	After 7 months practice, chunked passage comprehension improved significantly	
Fuchs, Fuchs, & Kazdan	1999	102 HS students reading at the 2nd to 6th grade levels	Existing groups assigned to conditions	Peer assisted learning (PALS)-consisting of partner reading, summarizing, and prediction vs. no peer-mediated reading activities	Timed oral reading and short answer comprehension questions	After 16 weeks, no effect of PALS on reading rate	
Mastropieri, Scruggs, Spencer, & Fontana	2003	16 10th graders with LD; standard scores on W-J ranging from 63-100	Existing groups assigned to conditions	Students provided with peer tutoring vs. teacher directed guided notes	Words correct per minute and summary sentence generation	After 9 weeks, no significant rate gains	

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Skinner, Adamson, Woodward, Jackson, Atchison, & Mims	1993	12 students, ages 14 to 19, with LD, reading between the 4th to 11th grade levels	One group receiving multiple treatments	Students experienced 3 kinds of previewing: reading silently to themselves; listening at a rate slight better than their OR rate; listening at a rate much faster than their OR rate	Number of words read correctly per minute and number of errors per minute	After 3 sessions per treatment, none of the previewing conditions resulted in significant increases in oral reading rate	
Stevens	1981	85 10th graders at all levels of reading ability.	One group receiving multiple treatments	Chunked passage presentation vs unchunked presentation	Gates MacGinitie Reading Test	After 1 session, chunked passage comprehension significantly better than unchunked	
Thomas & Clapp	1989	18 9th graders reading at 4th grade level	Random assignment to conditions	30 minutes daily instruction in: CAI in recognizing isolated letters, syllables, and words vs. tutor assisted repeated reading vs. remedial reading control	Stanford Diagnostic Reading Test (Reading Rate) and Test of Reading Comprehension	After 3 months, CAI and repeated reading resulted in significant gains in rate and word recognition accuracy; gains in sentence comprehension were significant; gains in passage comprehension were not	✔

Non-Experimental Fluency Studies

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Beers	1986	14 9th graders, with Nelson-Denny total reading mean raw score of 43 and mean reading rate of 190 wpm	One group treatment	Students practiced and kept records of their successes in adjusting their reading rates according to purpose for 1 day per week	Nelson-Denny and words per minute	After 1 semester, N-D total reading raw score improved to 54 and reading rate to 352 wpm	
Carver & Hoffman	1981	6 HS students reading between the 4th to 6th grade reading level	Multiple baseline	Computerized repeated reading with modified cloze format	Paper and pencil measure of reading rate & modified cloze similar to one used during training; Gates-MacGinitie	After one semester, gains found in rate and comprehension with task similar to one used during training; no gain on Gates	✔
Freeland, Skinner, Jackson, McDaniel, & Smith	2000	1 16-year-old 11th grader with LD, reading at 55 wpm on 4th grade level passages	Multiple baseline	2 assisted repeated readings, followed by a silent reading 24 hours later vs. 1 silent reading	Silent reading rate and accuracy in answering comprehension questions	After 7 sessions, reading rate and factual comprehension accuracy improved with repeated readings; inferential did not	
Freeman & McLaughlin	1984	6 HS males with LD; reading levels unspecified	Multiple baseline	Students practiced reading word list along with taped presentations of the lists, recorded at 80 wpm	Words correct per minute	After 6-10 sessions, rate had increased for all 6 students (from 14 to 59 wpm at baseline to 62 to 97 wpm	
Harris, March-and-Martella, & Martella	2000	88 9th graders reading at the 4th grade level on the Gates	One group treatment	Tutoring by 11th & 12th graders using Corrective Reading, Decoding (word attack & story reading) and repeated reading	Gates-MacGinitie Reading Test and words per minute	After an average of 66 days, comprehension increased to 5.6 and wpm increased from 155 (38-247) to 254 (100-420)	
Howe	1982	31 HS students reading at 3.2 grade level on the Woodcock Reading Mastery Test	One group treatment	Intervention which included speeded practice reading 1600 sight words in isolation and in context	Woodcock Reading Mastery Test	After 1 year, reading grade level increased to 5.1	
Marchand-Martella, Martella, Orlob, & Ebey	2000	22 9th graders, reading at 3.6 grade level in comprehension on the Gates	One group treatment	Tutoring by 10th-12th graders using Corrective Reading, Decoding (word attack & story reading) and repeated reading	Gates-MacGinitie Reading Test and words per minute	After 80 days, comprehension improved to 5.1; reading rate improved from 121 wpm (56-180) to 131 wpm (56-225)	
Shapiro & McCurdy	1989	5 9th and 10th graders reading at or below 6th grade level	Multiple baseline	Repeated reading of words and passages using a taped presentation	Error rate and words per minute	After 9-20 school days, rate of reading words improved, but did not generalize to oral reading of passages containing those words	
Valleley & Shriver	2003	3 HS students with LD, WRMT-R standard scores below 85	Multiple baseline	Repeated reading of 4th grade level articles 3 times a week, for 20 minutes a session	WPM, cloze passages from a variety of sources, Woodcock Reading Mastery Test-Revised	After 10 weeks (10 hours), participants increased reading rate; no increase found in comprehension	

Experimental Vocabulary Studies

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Bean, Inabinette, & Ryan	1983	58 10th to 12th graders; reading level not specified	Existing groups assigned to conditions	Participants taught to use List-Group-Label strategy to learn literary vocabulary vs. no strategy control	Multiple choice recognition of literary terms	After 12 weeks, treatment group had significantly higher score than control group	
Bos, Anders, Filip, & Jaffe	1989	50 HS students reading between 6th to 7th grade levels	Existing groups assigned to conditions	Concepts taught using semantic feature analysis vs. looking words up in dictionaries	Immediate and long-term (6 mo) multiple choice recognition of key vocabulary and concepts, with prior knowledge and interest as covariates	After 2 sessions, semantic feature analysis group's performance was significantly better than dictionary group; no main effect of time or interaction of time with condition	
Bulgren, Deshler, Schumaker, & Lenz	2000	83 HS students-at several ability levels	One group receiving multiple conditions	Difficult concepts taught using concept anchors (analogies that connect prior knowledge to new) vs. no concept anchors	Multiple choice recognition of facts and understanding related to concepts	After 1 session, concept anchors resulted in significantly better performance, although differences were not significant for all ability groups with every concept	
Dole, Sloan, & Trathen	1995	43 10th graders; reading level not specified	Existing groups assigned to conditions	Participants taught how to select key words and why those words are important vs. participants who selected words to learn on their own	Rating of knowledge of word meanings, multiple choice recognition of word meanings, and open-ended comprehension test	After 10 weeks, participants taught how to select words and why performed significantly better than group who selected words on their own on all 3 measures	✔
Hafner & Palmer	1980	80 9th graders at all levels of reading ability	Existing groups assigned to conditions	Identification of sentence kernels vs. text discussion vs. vocabulary exercises with randomly selected words vs. no treatment	Nelson-Denny vocabulary test and Davis Reading Test	After 51/2 weeks, sentence kernels & text discussion resulted in significant gains on both tests; vocabulary intervention improved vocabulary more than control, but not better than text discussion	
Holmes & Keffer	1995	115 HS students scoring an average of 385 (out of 800) on the verbal portion of a retired SAT	Random assignment to conditions	Computer program used to teach Latin & Greek roots vs. no treatment	Verbal portion of retired SAT	After 6 week intervention (about 8 hours total study time), treated group scored significantly higher than untreated group	
Horton, Lovitt, & Givens	1988	13 HS students reading between the 20th to 30th percentile	One group receiving multiple conditions	Vocabulary definitions taught via computer presentation vs. not taught at all	Percent correct recognition of definitions	After 3 30 minute sessions, significant gains on taught items; performance on untaught items did not improve	
Johnson, Gersten, & Carnine	1987	25 9th to 12th graders scoring at 8th percentile	Matched pairs randomly assigned to conditions	2 CAI programs presented the same 50 vocabulary words; programs differed in size of daily teaching set (large vs. small) and nature of daily & cumulative review	Multiple choice recognition of 50 words taught, 10 item oral recall of word meanings, & comprehension test	After about 2 weeks (20 min daily sessions), both groups learned about the same amount, but small set group learned it faster; no differences between groups on recall or comprehension	
Kolich	1991	138 11th graders at all reading levels	Random assignment to conditions	15 low frequency meanings taught using computer program that presented definitions vs. sentence completions vs. arcade game-type practice vs. combination of all 3	Immediate and delayed (2 weeks) multiple choice recognition and cloze tests	After one session, sentence completion and combination groups did significantly better on post-tests than definition or game conditions; no differences among conditions on delayed test	✔
Laflamme	1997	32 10th grade males reading above the 10th grade level	Existing groups assigned to conditions	Direct and explicit instruction connecting prior knowledge to new and providing repetition vs. instruction in using context clues and dictionary	PSAT verbal scores	After one year, direct and explicit instruction resulted in significantly higher scores than context clue and dictionary instruction	
Mastropieri, Scruggs, & Levin	1985	90 9th graders with LD; 45 at or above 40th percentile; 45 at or below 30th percentile	Stratified random assignment to conditions	Mnemonic strategy (keyword) vs. teacher-directed review vs. free study	Recall	After 20 minute intervention, mnemonic condition recalled significantly more than 2 other conditions in both ability groups	
Sjostrom & Hare	1984	19 9th and 10th graders scoring in 75th percentile	Random assignment to conditions	Workbook vocabulary instruction vs. main idea instruction	Davis Reading Test	After 5 hours, both groups improved, but not significantly; no significant difference found between groups	

Non-Experimental Vocabulary Studies

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Bloom & Shuell	1981	52 HS students learning French; reading level not specified	Stratified random assignment to conditions	20 words learned during 3 daily 10 minute study periods or 1 30 minute period	Immediate and delayed (4 days) written recall test of French word associated with its English equivalent	Groups did not differ on immediate test, but recall of distributed practice group significantly better on delayed test	
Dixon-Krauss	2001	43 9th graders; reading level not specified	One group receiving multiple treatments	Vocabulary discussed with students in the context of what has been read vs. words defined by teacher and students encouraged to use them	Vocabulary definition test (matching and cloze) and correct use of vocabulary words in journal writing	After 2 weeks in each condition, context discussion group had higher scores on vocabulary test than definition group; no difference in % of words used correctly, but context discussion group used more words in writing than did definition group	
Harris, March-and-Martella, & Martella	2000	88 9th graders with vocabulary scores 2 or more years below grade level	One group receiving single treatment	Tutoring by 11th & 12th graders using Corrective Reading (word attack & story reading) and repeated reading	Gates-MacGinitie Reading Test and words per minute	After an average of 66 days, Gates vocabulary increased from 4.7 (3.2-7.4) to 6.9 (2.5-9.1) & comprehension increased from 4.0 (1.7-12.3) to 5.6 (1.6-10.4); wpm increased from 155 (38-247) to 254 (100-420)	
Stump, Lovitt, Fister, Kemp, Moore, & Schroeder	1992	700 students, about 1/3 of whom were HS students, reading level not specified	Multiple baseline	Precision-teaching vocabulary technique, which teachers learned in a 1-day workshop and taught to students over a 2-week period	Accuracy and fluency in providing words that fit definitions	Significant improvement in accuracy and fluency	✔

B4: Adolescent Studies: Comprehension

Experimental Comprehension Studies

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Alfassi	1998	75 9th graders reading at 25thto 30th percentile	Existing groups assigned to conditions	Strategy instruction (Reciprocal teaching) vs. skill work (main idea, inferences, question answering)	Gates-MacGinitie & experimenter designed test with 9th grade expository texts requiring literal, short answer responses	After 35 days, treatment group did significantly better than control on experimenter measure; no difference on Gates	
Bean, Searles, Singer, & Cowen	1990	111 high school students at several levels of ability	Random assignment to conditions	Lecture+ analogicial guide+picture vs. Lecture+analogical guide vs. Analogical guide vs. Textbook	Matching test & short answer questions	After 1 class, picture+guide+lecture was most effective; textbook alone was significantly least effective	
Boyle & Weishaar	2001	26 10thto 12th graders with LD and MR; mean score of 71 on WRAT	Stratified random assignment to conditions	Participants taught to use cued note-taking form that helped in identifying link between known and new info vs. conventional note-taking procedures	Immediate free recall; 2 day delayed free recall; multiple choice comprehension test; number of words in notes	After 2 sessions of training, treatment group performed significantly better than control on all measures	
Dimino, Gersten, Carnine, & Blake	1990	32 9th graders with mean MAT comprehension scaled score of 742 (all were at least 1 grade level behind)	Random assignment of ability matched pairs to conditions	Direct instruction and interactive practice with components of story grammar vs. traditional instruction	Story grammar and basal-type comprehension questions; summary task	After 4 weeks, story grammar group performed significantly better than control on all measures; differences between groups maintained after 2 weeks	
Faber, Morris, & Lieberman	2000	9th graders, 60 of whom were reading at or above 80th percentile and 55 at or below 35th percentile	Existing groups assigned to conditions	Cornell method of note-taking, combined with pre-reading and self-questioning strategies vs. traditional instruction	Multiple choice performance on passages of high and low interest	After 9 weeks, note-taking group did better with low interest text than control; no interaction with ability	
Fuchs, Fuchs, & Kazdan	1999	102 high school students reading at the 2nd to 6th grade levels	Existing groups assigned to conditions	Peer-assisted learning (PALS)-consisting of partner reading, summarizing, and prediction vs. no peer-mediated learning activities	Short answer comprehension questions	After 16 weeks, PALS group did significantly better	
Gallini, Spires, Terry, & Gleaton	1993	66 high school readers at several levels of ability	Random assignment to conditions	Macro-level training (passage structure) vs. micro-level (sentence links) vs. traditional (main idea, details)	Multiple choice comprehension questions; immediate and delayed (3 weeks) recall	After 6 weeks, macro group performed significantly better on all measures	

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Hafner & Palmer	1980	80 9th graders at all levels of reading ability	Existing groups assigned to conditions	Identification of sentence kernels vs. text discussion vs. vocabulary exercises with randomly selected words vs. no treatment	Nelson-Denny vocabulary test and Davis Reading Test	After 5 1/2 weeks, sentence kernels & text discussion resulted in significantly better gains on both tests than the other 2 conditions; vocabulary intervention improved vocabulary more than control, but not comprehension	
Kletzien	1991	48 10th & 11th graders, 24 at 81st percentile and 24 at 42nd percentile	Two groups receiving multiple conditions	Groups presented with texts written at independent, instructional, and frustration levels	Number and kinds of strategies used while performing cloze task	On easy text, both groups used same # and kind of strategies; as difficulty increased, skilled readers used greater # and variety of strategies than less-skilled	
Lee	1995	77 12th graders at or below 50th percentile	Existing groups assigned to conditions	Literary interpretation taught using signifying (talk that may involve ritual insult, verbal dueling, and other forms of verbal play) vs. traditional instruction	Short answer questions Discourse analysis	After one instructional unit, signifying group improved significantly; change occurred in group's knowledge about how signifying applies to interpretation of literary text	
Mastropieri, Scruggs, Spencer, & Fontana	2003	16 10th graders with reading achievement standard scores on W-J ranging from 63-100	Existing groups assigned to conditions	Students provided with peer tutoring vs. teacher directed guided notes	Summary sentence generation	After 9 weeks, significant gains in summarizing for both groups, with tutoring group significantly better than guided notes	
Peverly & Wood	2001	50 9th to 11th graders reading 2-4 years below grade level	Existing groups assigned to conditions	Inserted questions (with and without feedback) vs. post-questions (with and without feedback) vs. no questions	Gates MacGinitie & experimenter designed short answer questions	After 6 weeks, gains for group receiving inserted questions significantly better on both measures; impact greater on higher level questions than factual; feedback more effective with inference and main idea questions	
Sjostrom & Hare	1984	19 9th and 10th graders scoring in 75th percentile	Random assignment to conditions	Main idea instruction vs. workbook vocabulary instruction	Davis Reading Test & experimenter designed main idea test	After 5 hours of instruction, main idea group did significantly better than control on experimenter measure; no significant difference on standardized test	✔
Wood, Winne, & Carney	1995	77 11th & 12th graders at all reading levels	Random assignment to conditions	Elaborated vs. condensed texts and summarization training vs, no training	Free recall, short-answer, multiple choice, and true-false	After one day, training students to summarize elaborated texts had the same effect on comprehension as giving condensed texts to untrained students	

Non-Experimental Comprehension Studies

Study	Date	Participants	Design	Treatment	Measures	Results	NRP
Greenleaf, Schoenbach, Cziko, & Mueller	2001	9th graders at 47th percentile	One group treatment	Collaborative inquiry into reading content area texts	Degrees of Reading Power	After 7 months, scores improved to 49th percentile	
Gurney, Gersten, Dimino, & Carnine	1990	7 high school students with median reading GE of 5.8	Multiple baseline	Phase 1: traditional basal literature instruction Phase 2: direct instruction & interactive practice in story grammar	Story grammar and basal type comprehension questions	After 9 weeks, improved performance on story grammar questions; no improvement on basal questions	
Harris, March-and-Martella, & Martella	2000	88 9th graders reading at the 4th grade level	One group treatment	Tutoring by 11th & 12th graders using Corrective Reading, Decoding (word attack & story reading) and repeated reading	Gates-MacGinitie Reading Test	After an average of 66 days, comprehension increased from 4.0 (1.7-12.3) to 5.6 (1.6-10.4)	
Horton, Boone, & Lovitt	1990	4 9th & 10th graders reading at 40th percentile	One group treatment	Computer-based social studies study guide using hypertext	Multiple choice comprehension questions	After 3 lessons, significant differences on taught info between pre-, post- & delayed tests; no significant differences on untaught information	
Kletzien	1992	24 10th & 11th graders, 12 reading at 81st percentile and 12 reading at 44th percentile	Two groups receiving single treatment	Groups presented with texts written at their instructional level	Number and kinds of strategies used while performing cloze task on passages with different structures (collection, causation, comparison)	Both skilled and less-skilled readers used the same total number and type of strategies	
Swanson, Kozleski, & Stegink	1987	2 15-year-olds reading below 10th percentile	Multiple baseline	Visual organizer used to assist in note-taking during listening	Prose recall; number of strategies used; multiple choice comprehension questions	After 14 sessions, recall and strategy use increased during training; reading comprehension did not improve	