BASI™

Basic Achievement Skills Inventory

Achilles N. Bardos, PhD

Manual for the BASI Comprehensive Test

PEARSON Assessments

Product Number
22323

Manual for the BASI™
(Basic Achievement Skills Inventory)
Comprehensive Test

Achilles N. Bardos, PhD

Dedication

I dedicate this test to my children, Katerina and Nicolette Bardos, for their love, support, and tolerance of the time spent working on this project. The two of you give purpose and meaning to my life. Last but not least, I would also like to thank Theresa S. Bardos for all her help and support during this entire project.

Manual for the BASI (Basic Achievement Skills Inventory) Comprehensive Test
Copyright © 2020 EduMetrisis, LLC. All rights reserved.

WARNING: No part of this manual, or the inventory, answer and recording forms, norms, and scoring keys associated with it may be reproduced in any form of printing or by any other means, electronic or mechanical, including, but not limited to, photocopying, audiovisual recording and transmission, and portrayal or duplication in any information storage and retrieval system, without permission in writing from EduMetrisis, LLC., PO Box 336404, Greeley CO 80634 970-301-5166 www.edumetrisis.com

Printed in the United States of America.

"BASI" is a trademark of EduMetrisis, LLC. "MCAD" is a registered trademark of NCS Pearson, Inc. "TABE" is a registered trademark of CTB/McGraw-Hill. "GED" is a registered trademark of the American Council on Education. "WIAT" and "Wechsler Individual Achievement Test" are registered trademarks of Harcourt Assessment, Inc. "ITBS," "Iowa Tests of Basic Skills," "ITED," "Iowa Tests of Educational Development," "WJ III," and "Woodcock-Johnson" are registered trademarks of Riverside Publishing Company (a division of Houghton Mifflin Company).

Table of Contents

About the Author xxi

Acknowledgments xxii

BASI Project Participants xxiv

Chapter 1. Introduction 1

Structure of the BASI Comprehensive Test 1
Overview of Key Characteristics 2
Distinguishing Features 3
Uses 3
Choosing the BASI Comprehensive or Survey Version 4
Limitations 4
User Qualifications 4

Chapter 2. Administration and Scoring 5

Test Materials 5
- Paper-and-Pencil Administration With Computer Scoring 5
- Paper-and-Pencil Administration With Hand Scoring 5
- Computer Administration and Scoring 6

Factors to Consider Prior to Testing 6
- Choosing the Level, Form, and Norms for Student Examinees 6
- Choosing the Level, Form, and Norms for Adult Examinees 7
- Timed or Untimed Administration 7
- Need for Accommodations 7
- Order of Subtest Administration 8

Test Administration 8
- Importance of Standardized Administration 8
- Rapport 8
- Testing Environment 8
- Using the Answer Sheet Correctly 8
- Test Directions 8
- Group Administration 8
- Individual Administration 8
- Answering Questions 8

Scoring 9
- Computer Scoring 9
- Hand Scoring 9

Chapter 3. Interpreting BASI Scores and Results 11

Interpreting BASI Scores 11
Raw Scores (Hand Scoring) 12
Standard Scores (Hand Scoring and Computer-Generated Student Summary Report) 12
Confidence Intervals (Hand Scoring and Computer-Generated Student Summary Report) 12
Percentile Ranks (Hand Scoring and Computer-Generated Student Summary Report) 12
Grade-Equivalent Scores (Hand Scoring and Computer-Generated Student Summary Report and Adult Summary Report) 13
Age-Equivalent Scores (Hand Scoring and Computer-Generated Student Summary Report) 13
Achievement Area Scores, Percentage Correct, and Performance Descriptors (Computer-Generated Student Summary Report and Adult Summary Report) 13
Interpreting Results of an Untimed Administration 14
Comparisons Involving BASI Scores 14
Comparing Subtest Scores 14
Comparing BASI Scores to Other Test Scores 14
Comparing Scores From Repeat Administrations of the Same BASI Form 15
Comparing Form A and Form B Results to Measure Academic Progress 15

Chapter 4. Test Development and Standardization 17

Test Development and Item Selection 17
National Standardization 17
Site Solicitation 17
Test Administration 18
Quality Control 18
Demographics of the Standardization Samples 18
Derivation of Standardized Scores 25

Chapter 5. Psychometric Properties: Reliability and Validity 27

Reliability 27
Internal Consistency 27
Standard Error of Measurement 28
Test-Retest Reliability 29
Alternate-Forms Reliability 31
Validity 32
Content Validity 32
Test Content Specification 32
Item Development 34
Pilot Study and Item Selection 35

Construct Validity 36
Intercorrelations of BASI Scores 36
Relationships With Group-Administered Achievement Tests 37
The BASI and the Iowa Achievement Tests (ITBS and ITED) 37
BASI Level 4 (Form A) and the Tests of Adult Basic Education (TABE) 41
BASI Level 4 (Form B) and the TABE 42
Relationships Between the BASI Comprehensive and Survey Versions 43
Relationships With Individually Administered Achievement Tests 45
The BASI and the Wechsler Individual Achievement Test–Second Edition (WIAT-II) 45
BASI Form A and the Woodcock-Johnson Psychoeducational Battery–III (WJ III) 47
Performance of Special Education Groups 49
Performance of Bilingual Students 50
Summary of BASI Psychometric Properties 51

References 53

Tables

1.1 Subtests, Grade Levels, and Testing Times for the BASI Comprehensive Test 2
4.1 Number of Examinees per Grade Level in the Standardization Samples for Forms A and B . . . 18
4.2 Demographic Characteristics of the Form A and Form B Standardization Samples 19
4.3 Demographics and Subject Weights for the Level 1 (Form A) Standardization Sample 21
4.4 Demographics and Subject Weights for the Level 2 (Form A) Standardization Sample 21
4.5 Demographics and Subject Weights for the Level 3 (Form A) Standardization Sample 22
4.6 Demographics and Subject Weights for the Level 4 (Form A) Standardization Sample 22
4.7 Demographics and Subject Weights for the Level 1 (Form B) Standardization Sample 23
4.8 Demographics and Subject Weights for the Level 2 (Form B) Standardization Sample 23
4.9 Demographics and Subject Weights for the Level 3 (Form B) Standardization Sample 24
4.10 Demographics and Subject Weights for the Level 4 (Form B) Standardization Sample 24
5.1 Cronbach's Alpha Internal Consistency Reliability Coefficients for BASI Form A 27
5.2 Cronbach's Alpha Internal Consistency Reliability Coefficients for BASI Form B 28
5.3 Standard Errors of Measurement for BASI Form A Standard Scores 28
5.4 Standard Errors of Measurement for BASI Form B Standard Scores 29
5.5 Demographics for Test-Retest Reliability Study Samples 29
5.6 Test-Retest Data for BASI Level 1 (Form A) 30
5.7 Test-Retest Data for BASI Level 2 (Form A) 30
5.8 Test-Retest Data for BASI Level 3 (Form A) 31
5.9 Alternate-Forms Reliability Coefficients for BASI Levels 1, 2, and 3 31
5.10 Test Specification Matrix for the Vocabulary Subtest 32
5.11 Test Specification Matrix for the Spelling Subtest 32

5.12 Test Specification Matrix for the Language Mechanics Subtest 33
5.13 Test Specification Matrix for the Reading Comprehension Subtest 33
5.14 Test Specification Matrix for the Math Computation Subtest 33
5.15 Test Specification Matrix for the Math Application Subtest 34
5.16 Number of Items on Pilot Forms of the BASI Subtests 34
5.17 Number of Items on the Final BASI Subtests 35
5.18 Intercorrelations Among BASI Subtests and Total Scores for Level 1 36
5.19 Intercorrelations Among BASI Subtests and Total Scores for Level 2 36
5.20 Intercorrelations Among BASI Subtests and Total Scores for Level 3 37
5.21 Intercorrelations Among BASI Subtests and Total Scores for Level 4 37
5.22 Student Samples' Demographics for a Study Relating BASI Levels 1–3 to the ITBS 38
5.23 Student Samples' Performance on BASI Levels 1–3 and the ITBS 38
5.24 Student Sample's Performance on BASI Level 4 and the ITED 39
5.25 Correlations Between BASI Level 1 (Form A) and the ITBS 39
5.26 Correlations Between BASI Level 2 (Form A) and the ITBS 40
5.27 Correlations Between BASI Level 3 (Form A) and the ITBS 40
5.28 Correlations Between BASI Level 4 (Form A) and the ITED 40
5.29 Student Sample's Performance on BASI Level 4 (Form A) and the TABE 41
5.30 Correlations Between BASI Level 4 (Form A) and the TABE 41
5.31 Student Sample's Performance on BASI Level 4 (Form B) and the TABE 42
5.32 Correlations Between BASI Level 4 (Form B) and the TABE 42
5.33 Demographic Characteristics of Students Who Completed BASI Comprehensive Form A and the BASI Survey 43
5.34 Demographic Characteristics of Students Who Completed BASI Comprehensive Form B and the BASI Survey 44
5.35 Student Samples' Performance on BASI Comprehensive Form A and the BASI Survey 44
5.36 Student Samples' Performance on BASI Comprehensive Form B and the BASI Survey 45
5.37 Correlations Between BASI Comprehensive and Survey Scores in the Same Skill Areas 45
5.38 Student Samples' Demographics for a Study Relating the BASI Test to the WIAT-II 46
5.39 Student Samples' Performance on BASI Forms A and B and the WIAT-II 46
5.40 Correlations Between BASI Form A and the WIAT-II 47
5.41 Correlations Between BASI Form B and the WIAT-II 47
5.42 Student Sample's Performance on BASI Form A and the WJ III 48
5.43 Correlations Between BASI Form A and the WJ III 48
5.44 Description of Students Receiving Special Education Services 49
5.45 BASI Form A Means and Standard Deviations of Special Education Groups 50
5.46 BASI Form A Means and Standard Deviations of Bilingual Students 50

Figures

3.1 BASI Student Summary Report 11
3.2 Excerpt From Appendix Table K.1 15
4.1 Locations of Schools That Participated in the National Standardization of BASI Forms A and B 20

About the Author

Achilles N. Bardos, PhD, is Professor of School Psychology at the University of Northern Colorado. He earned his elementary school teaching certificate in Greece. Following his studies at Wright State University (BS, Psychology), Ball State University (MA, Educational Psychology), and The Ohio State University (PhD, School Psychology, Research Methods), he held a two-year appointment (1988–1990) in the school psychology program at Alfred University in New York. Since 1990, he has been a faculty member in the Division of Professional Psychology at the University of Northern Colorado. His teaching and research interests include intelligence, psychological and educational assessment, measurement, computer applications in psychology, program evaluation, and evaluation of psychological services. He has published many journal articles and book chapters and has presented more than 100 papers and workshops at national and international conferences. He co-authored the Draw A Person: Screening Procedure for Emotional Disturbance (Naglieri, McNeish, and Bardos, published in 1991) and the General Ability Measure for Adults (GAMA; Naglieri, Bardos, published in 1997). He has consulted in the development of other intelligence and personality tests.

Acknowledgments

The development and standardization of the Basic Achievement Skills Inventory (BASI™) spanned over four years and was accomplished through the efforts of many individuals with diverse backgrounds and expertise.

The idea for a test like the BASI began in the late 90s at workshops with psychologists and educators who expressed interest in having a way to evaluate academic skills using an efficient yet comprehensive tool. This would have remained just a wish and an idea if it weren't for the vision and support of Julie Ethier, product manager at Pearson Assessments. Julie was the driving force behind and a source of energy for the development team. She was involved with the initial conceptualization and the operationalization of the BASI test. Her leadership skills helped the development team overcome hurdles typical of a project of this nature. Her contributions to all aspects of the BASI development project are difficult to describe. She reviewed all test items, helped with item selection, and assisted with the computerized reports across all levels and forms. The quality of the BASI test is to a great extent a result of her insightful input.

Dr. Julie Lackaff (project manager of the BASI development team) accomplished the impossible tasks involved in the development of a multi-year multi-level test. She participated in the initial design of the test and in item selection, recruited test sites for the pilot and standardization projects, managed the databases, collected validity and reliability data, wrote and reviewed sections of the manual, and was able to juggle with great success the hundreds of tasks that are part of such an enormous project. She ensured that the highest standards of quality were applied to every aspect of the project. This test would not be what it is if it were not for Julie and her dedication.

Dr. John Kamp (senior psychologist) consulted on this project from the initial steps of item selection and provided insightful feedback on the data analysis process and the writing of the manual. He assisted with data collection in the corrections and employment settings. Dr. Kamp also ensured that all BASI manuals were clear, easy to understand, and comprehensive.

Dr. Michael Cunningham (University of Louisville) also consulted on the BASI project. He assisted during the item selection process by analyzing the pilot data and later assisted with the calculation of the grade- and age-equivalent scores. Thank you, Mike, for all your efforts and timely responses to all of our data analysis requests.

Dr. Jack A. Naglieri (George Mason University) spent countless hours on the phone and in person consulting on data analysis and norms generation and providing overall guidance of the BASI development project. Jack, I learned everything I know about assessment from you. You have been the kind of mentor one can only dream of. I know how lucky I was when I walked into your office at Ohio State University as a first-year graduate student in school psychology. When you review this entire project, I hope you feel that you taught me well.

I would also like to thank all the individuals at Pearson Assessments who worked on various aspects of the test. In addition, I am most grateful to a number of colleagues around the country who assisted with the data collection and the validity studies. These were Drs. Kerry Lassitter (The Citadel), Steven Truscott (University of Buffalo), James McDougal (State University of New York, Oswego), Natalie Politikos (University of Connecticut), Diane Cooke (Worcester State College), and Judy Johnson (University of Houston).

I am also very grateful to my graduate students who helped me with all aspects of the project. Greg Wochos collected a significant portion of the data for the validity studies, and Christa Hutaff assisted with the data analysis. Kathleen Woodward reviewed all test booklets, answer sheets, and manuals and collected and analyzed data and presented the results at conferences. Kathleen, thank you for your collegial support and friendship.

Finally, I would also like to thank the test administrators and the thousands of parents, children, and adults who participated in the standardization of the various forms of the BASI test.

Achilles N. Bardos
April, 2004

BASI
Project Participants

Pilot Study 1 – All Test Items for Forms A and B and the Survey Tests (Fall, 2001)

Alvin High School – Alvin, TX
G. W. Carver Elementary School – Marshall, TX
Forrest Hills Elementary School – Forrest City, AR
Garden Park High School – Cannon City, CO
Jay High School – Jay, FL
Liberty Hills School – Liberty Hills, TX
Morris Adler Elementary School – Southfield, MI
Our Lady of Providence School – Central Islip, NY
Pasco High School – Pasco, WA
Pershing Magnet School – Chicago, IL
Pine Grove Elementary School – Brooksville, FL
Roulhac Middle School – Chipley, FL
St. Isidore Catholic School – Bloomingdale, IL
Scavo High School – Des Moines, IA
University Laboratory School – Greeley, CO

Pilot Study 2 – Reading Comprehension Level 4 Test Items Only (Spring, 2002)

Cary High School – Cary, NC
Central High School – Cheyenne, WY
Triumph High School – Cheyenne, WY

Pilot Study 3 – Survey Test Items for Adults Only (Summer, 2002)

Jennifer Brug – Windsor, CO
Hui-Shiang Chao – Greeley, CO
Dr. Andrew Davis – Malvern, PA
Julie Fisher – Elizabeth, CO
Susan Harnden – Cleveland, OH
Laura Millsap – Greeley, CO
Joe Murphy – Cleveland, OH
Louis Santoni – NTMA Training Centers of Southern California, Norwalk, CA
Karen Sickles – The Dalles, OR
Dwayne Wilson – Cleveland, OH
Kathleen Woodward – Island Grove Regional Treatment Center, Greeley, CO
Jill Wyatt – Galeton, CO

Standardization School Norms – Form A (Fall, 2002) and Survey Tests

ACES High School – Everett, WA
Berryhill Elementary School – Milton, FL
Bethlehem Lutheran School – Lakewood, CO
Blalack Middle School – Carrollton, TX
Blessed Sacrament School – Charleston, SC
Blossom Wood Day School – Hazelwood, MO
Cedarcrest Academy – Maple Grove, MN
Chandler Elementary School – Chandler, TX
Douglas Middle and High Schools – Douglas, MA
Elwood Public School – Elwood, NE
Holy Ghost Catholic School – Albuquerque, NM
Immaculate Heart of Mary School – Still River, MA
Friedrich Jahn School – Chicago, IL
Leo U. Leo Elementary School – Mission, TX
Maxey Training School – Whitmore Lake, MI
(Survey test only)
Muscatine School District – Muscatine, IA
Pasco High School – Pasco, WA
Scotland Elementary School – Scotland, CT
Sealy Junior High School – Sealy, TX
Southeast School – Yoder, WY
Stockton Elementary School – Chicago, IL
Triumph High School – Cheyenne, WY
University Heights Academy – Hopkinsville, KY
University Schools – Greeley, CO

Standardization School Norms – Form B (Spring, 2003)

ACES High School – Everett, WA
Armour School – Chicago, IL
Berryhill Elementary School – Milton, FL
Blalack Middle School – Carrollton, TX
Blessed Sacrament School – Charleston, SC
Blossom Wood Day School – Hazelwood, MO
Cedarcrest Academy – Maple Grove, MN
The Clear Spring School – Eureka Springs, AR
Elkhart High School – Elkhart, TX
Elwood Public Schools – Elwood, NE
Holy Ghost Catholic School – Albuquerque, NM
Friedrich Jahn School – Chicago, IL
Leo U. Leo Elementary School – Mission, TX
Jackson Mann Elementary School – Allston, MA
Maxey Training School – Whitmore Lake, MI
Muscatine School District – Muscatine, IA
Our Lady of Providence School – Central Islip, NY
Pasco High School – Pasco, WA
Scotland Elementary School – Scotland, CT
Southeast School – Yoder, WY
Stockton Elementary School – Chicago, IL
Triumph High School – Cheyenne, WY
University Heights Academy – Hopkinsville, KY
University Schools – Greeley, CO

Psychologists, Proctors, and Sites for Validity Studies (Fall 2002 to Summer 2003)

Nikki Bishop Kallmeyer – Chicago, IL
Carol Brucker – Pasco High School, Pasco, WA
Jennifer Brug – Windsor, CO
Anne Cabanilla – Greeley, CO
Jim Collins – Greeley, CO
Shelley Cordova – Armour School, Chicago, IL
Jennifer Dicky – Charleston, SC
Camela Ehmke – Greeley, CO
Jeremy Ehmke – Greeley, CO
Becky Fenske – Greeley, CO
Gary Hauswirth –Triumph High School, Cheyenne, WY
David Hulac – Excelsior Youth Center, Aurora, CO
Jennifer Joy – Longmont, CO
Chris Kohler – Colorado Springs, CO
Dr. Kerry Lassiter – Charleston, SC
Sister Linda Marie – Blessed Sacrament School, Charleston, SC
Jana McElveen – Charleston, SC
Sherry Nelson – Cheyenne Wells, CO
Elizabeth Palmer – Englewood, CO
Kim Root – Greeley, CO
Shannon Welch-Groves – Eaton, CO
Catherine Wilkinson – Mount Pleasant, SC
Greg Wochos – Greeley, CO
Mara Woods – Colorado Springs, CO
Kathleen Woodward – Greeley, CO

Proctors and Sites for Adult Survey Norms (Summer 2002 to Summer 2003)

Kelly Adamchick – Orchard Park, NY
Geoff Alkire – Golden, CO
Norma Alkire – Greeley, CO

Theresa Bardos – Greeley, CO
Blalack Middle School – Carrollton, TX
Joan Brubaker – Watkins Glen, NY
Jennifer Brug – Windsor, CO
Roberta Bryers – Neenah, WI
Ann Cabanilla – Honolulu, HI
Angela Catanese – Sanborn, NY
Hui-Shiang Chao – Greeley, CO
Jaime Chmielewski – Greeley, CO
Sabrina Chow – East Amherst, NY
Sue Claxton – Cortez, CO
Dr. Diane Cooke – Worcester, MA
Noreen Copeland – Holy Ghost Catholic School, Albuquerque, NM
Aaron Crowley – Greeley, CO
Bradford Daly – Rochester, NY
Dr. Andrew Davis – Ball State University, Muncie, IN
Brian Dreschler – Hainesville, IL
Jeremy Ehmke – Greeley, CO
Karen Everett – Greeley, CO
Becky Fenske – Greeley, CO
Julie Fisher – Elizabeth, CO
Catherine Frazer – Baylor Women's Correctional Center, New Castle, DE
Chris Freeborn – Greenville, NC
Lorraine Freedle – Fort Sumner, NM
Rebecca Gellman – Williamsville, NY
Craig Goodell – Salina Career Development Center, Salina, KS
Dr. Mark Hald – Scottsbluff High School, Scottsbluff, NE
Susan Harnden – Cuyahoga Employment and Family Services, Cleveland, OH
Gary Hauswirth – Triumph High School, Cheyenne, WY
Dr. Judy Johnson – The Woodlands, TX
Dr. Laurice Joseph – Columbus, OH
Jennifer Joy – Longmont, CO
Peggy Knitter – Escondido, CA
Jacquie Lackaff – Downers Grove, IL
Jeff Lackaff – Downers Grove, IL
Mark Lackaff – Downers Grove, IL
Natalie Lamarque – Buffalo, NY
Jennifer Latino – Johnston Community College, Smithfield, NC
Linda Ledford – University Heights Academy, Hopkinsville, KY
Melissa Lelm – Greeley, CO
Michael Lewis – Buffalo, NY
Valerie Lubkowski – Kenmore, NY
Michelle McClellan – Buffalo, NY
Jana McElveen – Charleston, SC
Laura Millsap – Greeley, CO
Joe Murphy – Cleveland, OH
Jamie Murray – Canon City, CO
Andrea Naglieri – Greenville, NC
Angela Nathaniel – Florida Department of Corrections, Tallahassee, FL
Terry Neustaedter – Berryhill Elementary School, Milton, FL
Vicki Parsnow – State University of New York, Oswego, NY
Pearson Assessments employees – Bloomington, MN
Pearson Digital Learning employees – Phoenix, AZ
Pearson employees – Lawrence, KS, Iowa City, IA, Eagan, MN, and Owatonna, MN
Pearson Reid London House employees – Chicago, IL
Bernadette Peters – Williamsville, NY
Dr. Natalie Politikos – University of Hartford, CT
Erin Rafter – North Olmsted, OH
Susan Santarpia – Buffalo, NY
Louis Santoni – NTMA Training Centers of Southern California, Norwalk, CA
Julie Schumpelt – Cortez, CO
Melinda Scime – Tonawanda, NY
Karen Sickels – The Dalles, OR
Dr. Lia Softas – Greeley, CO
Kristin Spadafora – Farmington, NY
Sister Stephen Mary – Our Lady of Providence School, Central Islip, NY
Katherine Stukenborg – Dayton, OH
Janet Tauer – Minneapolis EOC and Community College, Minneapolis, MN
Dr. Kandi Tayebi – Huntsville, TX
Dr. Mike Tincup – Aliso Viejo, CA
Richelle Tordoff – Buffalo, NY
Matthew Traughber – Greeley, CO
Howard Wakkinen – Greeley, CO
Angela Weinert – Buffalo, NY
Dwayne Wilson – Mt. Pleasant, OH
Greg Wochos – Greeley, CO
Kathleen Woodward – Island Grove Regional Treatment Center, Greeley, CO
Mary Worthington – Hannibal Career and Technical College, Hannibal, MO
Jill Wyatt – Galeton, CO

Curriculum Experts – Test Item Developers – NCS Pearson California

P. Barrett
Roseann Freet
Kim Hawk
Paz Jensen
Keith Milne, PhD
Nance Morrissey, PhD

Rosella Ogrodski
Lisa Peterson
Les Sewall
Bill Weston
Diane Wolfe

Curriculum Experts – Test Item Reviewers

John Bardos – Science Teacher – DOMI College Preparatory School, Greece
Dorothy Blyth, MS – Curriculum Coordinator – Chicago Public Schools
Dr. Linda Button – University of Northern Colorado, Greeley, CO
Debra Fritz-Fanning, MA – Reading Specialist – Pershing Magnet School, Chicago, IL
Amanda Hass – 5th–8th Grade Teacher – University Schools, Greeley, CO
Patricia Heino – 3rd and 4th Grade Teacher – University Schools, Greeley, CO
Donald Hurt – 5th Grade Teacher – University Schools, Greeley, CO
Cordelia Parker, MEd – Special Education Teacher – Pershing Magnet School, Chicago, IL
David Sarocka, PhD – Math Professor – Madison Area Technical College, Wisconsin
Deb Schauermann – 5th Grade Teacher – University Schools, Greeley, CO
Daniel Wagner – High School Math Teacher – University Schools, Greeley, CO

Project Team

Brian Aagaard – Psychology Intern
Rob Altmann, MA – Project Manager
Pat Anderson – Senior Technical Document Coordinator
Dave Arnold, PhD, JD – Legal Consultant
Achilles Bardos, PhD – Author/School Psychologist
Crystal Bartosh – Printing
Mike Cunningham, PhD – Psychologist
Brian Dreschler – Research and Development
Rob Duff – Software Consultant
Colleen Dwyer-Tyson – Graphic Designer, Senior Specialist
Julie Ethier – Product Manager – BASI
Jim Fisher – Software Consultant
Katy Fisk – Technical Production Coordinator
Mike Fogelberg – Software Development Manager
Lavinia Gangl – Database Marketing Analyst
Sonja Gupta – Psychology Intern
Bridget Herd – Director of Product Management
Julie Hoban – Project Manager, PDL software
John Kamp, PhD – Senior Psychologist
Julie Lackaff, PhD – Senior Project Manager/School Psychologist
Sandra Lassiter – Product Manager – NovaNET
Jon Mahoney – Production Manager
Lisa McChesney – Materials Development
Rebekah Muros – Technical Production Coordinator
Jack Naglieri, PhD – Psychologist
Andrew Olson – Packaging and Shipping
Erika Olson – Technical Production Coordinator
William Paddock – Research and Development
Sarah Perdue – Editor
Karen Perkins – Technical Production Coordinator
Steve Prestwood – Director of Test Production
Jim Sarne – Software Consultant
Paul Schmidtlein – Packaging and Shipping
Tracey Sheehan, JD – Legal Consultant
Robin Thomsen – Technical Production Coordinator
Sandra L. Whelan – Senior Editor
Lisa Yang – Materials Production Coordinator
Matt Zagorski – Production Specialist
Yan Zheng – Programmer

This page has been intentionally left blank.

Chapter 1. Introduction

The Basic Achievement Skills Inventory (BASI™) test is a series of multilevel, group or individually administered, norm-referenced achievement tests that measure reading, written language, and math skills among children and adults. The BASI test is designed to be convenient to use, broad in coverage, and well suited to a wide variety of applications.

There are two versions of the BASI test: Comprehensive and Survey. The Comprehensive version consists of subtests at four grade-specific levels. Level 1 is for grades 3 and 4, Level 2 for grades 5 and 6, Level 3 for grades 7 and 8, and Level 4 for grades 9 through 12. For each of the four test levels there are six subtests: Vocabulary, Spelling, Language Mechanics, Reading Comprehension, Math Computation, and Math Application. These six subtests are further organized into three composite areas that yield total scores: Reading, Written Language, and Math.

The BASI Survey is a briefer instrument with similar content but a different structure. It consists of two tests: Verbal Skills and Math Skills. Verbal skills are assessed using vocabulary, language mechanics, and reading comprehension questions, and math skills are assessed using math computation and math application questions. The two BASI Survey tests can be administered together or independently; each has a 25-minute time limit. Two manuals, one for educational and clinical applications and one for workforce applications, provide guidelines for using the BASI Survey. (See the Pearson Assessments catalog for more information about the Survey version of the BASI test.)

This manual is devoted to the more in-depth BASI Comprehensive test. It describes the development and statistical properties of the test as well as how to interpret and use the information it generates.

Structure of the BASI Comprehensive Test

The content of each subtest of the BASI Comprehensive test is briefly described below. A more detailed description of the specific content areas assessed by each subtest is presented in Chapter 5.

Vocabulary. Measures the test taker's skills in identifying the meaning of words within the context of a sentence, recognizing synonyms and antonyms, analyzing verbal analogies, and recognizing the meaning of words presented in isolation.

Spelling. Assesses the test taker's ability to identify correctly spelled and misspelled words. At each level, the Spelling subtest includes sight words, commonly misspelled words, and words with affixes.

Language Mechanics. Measures the examinee's knowledge of various grammar and syntax rules, including capitalization, punctuation, verb forms, and tense agreement.

Reading Comprehension. Consists of passages that the examinee must read and understand in order to answer questions about the main idea, sequence of events, and setting. These literal comprehension questions are complemented by questions that assess inferential comprehension skills such as identifying cause and effect relationships, predicting outcomes, and drawing conclusions.

Math Computation. Assesses the test taker's ability to apply the four basic arithmetic operations to whole numbers, fractions, and decimals and to simplify numerical expressions and algebraic equations.

Math Application. Measures the test taker's ability to solve mathematical word problems using all the basic arithmetic operations, to read and interpret data presented in graphs or tables, to solve problems involving the measurement of shapes and volumes, and to demonstrate knowledge of measurement principles as they relate to length, weight, volume, perimeter, and money.

The six subtests are further organized into three composite areas—Reading, Written Language, and Math—for which total scores can be calculated. The Reading Total score is based on the Vocabulary and Reading Comprehension subtests, the Written Language Total score is based on the Spelling and Language Mechanics subtests, and the Math Total score is based on the Math Computation and Math Application subtests.

Overview of Key Characteristics

The BASI test uses a multiple-choice item format and is designed for ease of group administration. It can also be administered to individual examinees with relatively little supervision.

The standard time limits for the six BASI Comprehensive subtests are shown in Table 1.1. The subtests can be administered individually or in any combination. The total testing time for all six subtests is just under two hours. The BASI subtests can also be administered untimed to yield criterion-referenced performance information.

TABLE 1.1 Subtests, Grade Levels, and Testing Times for the BASI Comprehensive Test

Subtest	Level 1 Grades 3–4	Level 2 Grades 5–6	Level 3 Grades 7–8	Level 4 Grades 9–12
Vocabulary	10 min.	10 min.	10 min.	10 min.
Spelling	10 min.	10 min.	10 min.	10 min.
Language Mechanics	10 min.	10 min.	10 min.	10 min.
Reading Comprehension	30 min.	30 min.	30 min.	30 min.
Math Computation	20 min.	20 min.	20 min.	20 min.
Math Application	35 min.	35 min.	35 min.	35 min.
All six subtests	115 min.	115 min.	115 min.	115 min.

At each level there are two forms of each BASI subtest. Form A was normed in the fall (August–December), and Form B was normed in the spring (January–July). This allows the BASI test to be used to measure progress within a school year.

BASI norms are based on data collected during the 2002–2003 school year using a nationwide sample of over 4,000 students matched to the 2000 U.S. Census (see Chapter 4). These norms are used to generate a wide variety of scores: standard scores (mean = 100, standard deviation = 15), confidence intervals, percentile ranks, grade-equivalent scores, and age-equivalent scores. Also available for each subtest are the percentage correct for the subtest and for individual achievement areas. The various BASI scores are described in detail in Chapter 3.

The content of each BASI subtest was determined using a set of curriculum standards referred to as the MCAD® (Model Curriculum and Assessment

Database) standards. These standards are an amalgamation of the "best-of-the-best" local, state, and national U.S. educational standards. The MCAD standards and their use in BASI test development are described in Chapter 5.

The BASI subtests have strong reliability. They show significant correlations with commonly used group-administered and individually administered achievement tests. These and other psychometric data for the BASI test are presented in Chapter 5.

Finally, efforts were made in the development of the BASI test to minimize possible cultural bias. The curriculum experts and content specialists who wrote the test items were careful to use unbiased ethnic, racial, and cultural references, to avoid sexist language and stereotypes, and to avoid geographic and socioeconomic bias. The success of these efforts was confirmed by an independent review of BASI item content conducted by a panel consisting of teachers, learning disability specialists, reading specialists, and college professors.

Distinguishing Features

The BASI test series was designed for *convenience of use*. Test users can choose between the shorter Survey version and the more in-depth Comprehensive version. The Comprehensive test's modular design allows individual subtests or subtest combinations to be used for targeted assessment of specific skills, or all six subtests can be used for a complete evaluation of academic achievement. Testing time for each subtest is relatively brief, and the approximate two-hour administration time for all six subtests compares favorably to those for many comprehensive achievement tests. The multiple-choice item format allows group administration (e.g., to an entire classroom) or administration to individual examinees with minimal supervision. Finally, Pearson Assessments offers a variety of convenient administration and scoring options for the BASI test, as described in Chapter 2.

The BASI Comprehensive test has also been *carefully normed*. The test's standardization sample of over 4,000 students tested in 2002–2003 was constructed to match the 2000 U.S. Census on the following demographic variables: gender, race and ethnicity, geographic region, and socioeconomic status (measured by the parents' level of education). In addition, the sample was drawn from a representative mix of public and private schools and from urban, suburban, and rural schools.

The BASI test allows assessment of achievement across a very *wide range*. Nearly all individuals, even if academically deficient, should be able to correctly answer some test items at their grade level, allowing for differentiation of performance at low levels of achievement. Conversely, because perfect or nearly perfect scores on any subtest are rare, the BASI test can differentiate levels of academic giftedness. In other words, the test has both a low floor and a high ceiling.

Increasingly, local, state, and federal agencies are requiring schools to demonstrate academic progress for their students. Because the BASI test has two forms, one (Form A) standardized during the fall of the school year and one (Form B) standardized during the spring, it *can be used to measure and document student progress*.

Uses

The BASI Comprehensive test was designed to be useful for a wide variety of applications. Many of these applications can be grouped into three broad categories, as follows.

Help identify appropriate educational programming and thereby improve learning:

- Diagnose learning disabilities in reading, written expression, and math
- Design appropriate instructional plans and learning interventions
- Evaluate students for gifted programs
- Place college students
- Make literacy, ESL, GED®, and other placement decisions for adult learners
- Evaluate offenders for program placement

Help ensure success in government-mandated testing programs:

- Evaluate student progress during a school year or over several years
- Practice for or predict performance on a high-stakes test

- Efficiently complete triennial evaluations for students with an IEP or 504 plan

Realize the general benefits of an accurate assessment of educational achievement:

- Identify a child's or adult's academic strengths and weaknesses
- Compare performance to the national average
- Aid in career counseling

Because of its strong psychometric properties, the BASI Comprehensive test is also a good choice for use in research and program evaluation.

Choosing the BASI Comprehensive or Survey Version

In general, the user should select the BASI Comprehensive version when an in-depth assessment of academic achievement is needed, pinpointing specific content areas through the use of individual subtests or across a broad spectrum through administration of all six subtests. Approximately two hours of testing time is needed to administer all six subtests. The BASI Survey is preferable when a less in-depth assessment of verbal skills, math skills, or both is required and the 25-minute testing time for each test provides a better fit.

Users in elementary school, middle school, and high school settings will usually find the Comprehensive version better suited to their needs. Particularly valuable is the availability of one form normed during the fall and one normed during the spring at each grade level, which allows the BASI Comprehensive test to be used to assess student progress over the course of a school year. However, the Survey does have norms for students in grades 3 through 12 and can be useful as a screening measure.

Conversely, BASI users who work with adults may prefer the Survey version for most applications. The Survey has adult norms, whereas the Comprehensive version does not. The shorter testing time for the Survey may be more practical for many settings in which the academic skills of adults are assessed. The Survey can also be used to help determine which level of the BASI Comprehensive test to administer to a child or adult.

Limitations

The norms for the BASI Comprehensive test are based on the performance of U.S. students in grades 3 through 12. The test can be usefully administered to individuals younger or older than these ages because grade-equivalent scores are provided. Examples might include assessing a first or second grader for giftedness or an adult for placement in an educational program. However, for a test taker outside the grade 3 to 12 range, standardized scores that directly compare the individual to others his or her own age are not currently available.

Any test can be misused. It is imperative that users of the BASI tests follow commonly accepted professional guidelines for test use and interpretation, such as those found in the *Standards for Educational and Psychological Testing* (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999). Professional ethical standards and the standards of state credentialing agencies should also be adhered to. Moreover, as with any test, the BASI test should not be used in isolation but rather in conjunction with other pertinent information when making decisions about individual examinees.

User Qualifications

All materials and reports offered by Pearson Assessments are assigned a qualification level based on the credentials required to purchase them. The BASI test is a Level C product. Level C purchasers must provide credentials indicating that they have a bachelor's degree in psychology, education, human resources, or a closely related field. Specific course work or workshops are not required.

Chapter 2. Administration and Scoring

This chapter describes how to administer and score the BASI Comprehensive test. Topics covered include test materials, factors to consider prior to test administration, how to administer the BASI test, and the two scoring options.

Test Materials

The BASI Comprehensive test materials include this test manual, test booklets, answer sheets, and computer software for test administration and scoring. These materials are listed in the current Pearson Assessments catalog. The test materials needed will vary somewhat depending on how the user chooses to administer and score the BASI test.

Paper-and-Pencil Administration With Computer Scoring

Eight different test booklets are available for the BASI Comprehensive test:

Level 1 Form A and Form B (for grades 3–4)
Level 2 Form A and Form B (for grades 5–6)
Level 3 Form A and Form B (for grades 7–8)
Level 4 Form A and Form B (for grades 9–12)

Each booklet contains all six subtests. (Some or all of the subtests can be administered. It is not necessary to administer the subtests in the order in which they appear in the booklet.) The test booklets include test directions, sample items, and test items.

A scannable answer sheet is required to score a paper-and-pencil BASI test using Pearson Assessments software. There are different scannable answer sheets for Levels 1, 2, 3, and 4, each of which can be used to score either Form A or Form B. The scannable answer sheet allows computer scoring of the BASI test at the user's site through scanning or key entry of the test taker's responses, or the answer sheet can be mailed to Pearson Assessments for computer scoring. More details about computer scoring are provided later in this chapter.

Paper-and-Pencil Administration With Hand Scoring

The same test booklet is used to administer the BASI test regardless of whether the test will be computer scored or hand scored. However, there are different answer sheets for computer scoring and hand scoring. As with the scannable answer sheet, there are different hand-scoring answer sheets for Levels 1, 2, 3, and 4, each of which can be used to score either Form A or Form B. The hand-scoring answer sheet includes scoring directions. No separate answer keys or overlays are required, but you must have a copy of the BASI manual, which contains scoring tables. Hand scoring is discussed in more detail later in this chapter.

Computer Administration and Scoring

With Pearson Assessments software, users can administer the BASI test by computer. The software then scores the test and generates a score report. No test booklets or answer sheets are needed when computer administration and scoring are used. The software must be installed on each individual computer that will be used to administer the test.

Factors to Consider Prior to Testing

This section addresses the key decisions that must be made prior to administering the BASI Comprehensive test. These decisions include the appropriate level, form, and norms to use, timed vs. untimed administration, possible need for accommodations, and order of subtest administration. Some of the discussion in this section refers to the various scores that can be produced for the BASI test. All of the BASI scores are described in detail in Chapter 3.

Choosing the Level, Form, and Norms for Student Examinees

Normally, decisions concerning the appropriate BASI test level, form, and norms to use for student examinees are straightforward. Students in third grade should be given Level 1 and compared to third grade norms. Students in fourth grade should be given Level 1 and compared to fourth grade norms. Similarly, Level 2 is appropriate for fifth and sixth graders, Level 3 for seventh and eighth graders, and Level 4 for ninth, tenth, eleventh, and twelfth graders. The BASI test has separate norms for each grade level (3 through 12).

For all BASI test levels, Form A was standardized in the fall and should be used when testing students in August through December. Form B was standardized in the spring and should be used when testing students in January through July. If a repeat testing with the same form is desired (e.g., to measure change within the fall or spring term), the test-retest interval should be longer than six weeks to minimize practice effects. (Chapter 3 includes a section on comparing scores from a repeat administration of the same BASI form.)

Because the BASI test was designed to assess academic achievement across a very wide range at each grade level, it is rarely appropriate to administer a BASI test at a level that differs from the student's actual grade level. Even highly gifted students will be challenged by the test for their grade level. Further, the item content for each level is designed to reflect the learning objectives that are taught and measured at those grades. For these reasons, administering a test at a level higher than the student's grade level is usually not recommended.

Occasionally, however, it may be desirable to administer a higher- or lower-level BASI test than would normally be appropriate given the examinee's age and/or grade level. For example, a teacher may choose to administer Level 3 or 4 to a highly gifted fifth grader to determine what academic skills beyond his or her grade level the student has mastered. However, it is more likely that an administrator will choose a test that is *lower* than the student's age or grade level. This will almost always involve an individualized assessment in a non-school setting in which the Level 1 or Level 2 test is given to a teenager who has been out of school and/or is clearly achieving at a level far below that of others of his or her age.

When testing a teenager with the Level 1 or Level 2 test, the examiner must decide whether he or she is more interested in establishing the grade level at which the examinee is achieving or in determining what specific content he or she has and has not mastered. In the former case, the examiner should administer the BASI test using the standard time limits and focus on the grade-equivalent scores (and perhaps age-equivalent scores), which are only interpretable for timed administrations. Standard scores, confidence intervals, and percentile ranks should not be interpreted because these scores depend on comparisons with the norm group at the examinee's grade level.

To determine what specific content a teenager achieving far below age level has and has not mastered, the BASI test at the chosen level should be administered without time limits. Untimed administration of the BASI test is discussed in more detail later in this chapter.

Choosing the Level, Form, and Norms for Adult Examinees

As discussed in Chapter 1, the Survey version of the BASI test is preferable for most applications with adult examinees. When using the Comprehensive version with adults, the decision concerning which of the four BASI level tests to administer must be based on information other than current grade level, which is the usual criterion for third to twelfth graders. For most adults who have finished high school or earned a GED, Level 4 will be appropriate. However, if there is reason to believe that the adult's skills fall below the ninth grade level, a lower level test may be more informative. Which level to administer might be determined based on background information such as highest grade level achieved or on the results of a broad-range adult achievement test that yields grade-equivalent scores (such as the BASI Survey).

Form A should be used for testing adult examinees in August through December. Form B should be used January through July. If repeat testing with the same form is desired (e.g., to measure change within the fall or spring season), the test-retest interval should be longer than six weeks to minimize practice effects. (Chapter 3 includes information about comparing scores from a repeat administration of the same BASI form.)

Because there is no adult normative sample against which the performance of an adult examinee can be compared, no meaningful standard scores, percentile ranks, confidence intervals, or age-equivalent scores can be determined for an adult examinee. When hand scoring a BASI Comprehensive test for an examinee who is over 18 and no longer in high school, only raw scores and grade-equivalent scores at the subtest level should be recorded and interpreted. Appendixes C and G provide conversions from subtest raw scores to grade-equivalent scores for each of the two forms at each of the four test levels.

When an adult's BASI Comprehensive test is computer scored, the Adult Summary Report provides percentage correct scores for subtests, total scores, and achievement areas. Grade-equivalent scores for subtests are also reported. To generate this report, the user must specify one of the grade-level norm groups that matches the test level (e.g., 9th-, 10th-, 11th-, or 12th-grade norms for Level 4). However, the norm group selected has no impact on the grade-equivalent scores reported because these scores are determined by test level, not by grade level. The choice of norm group also does not affect percentage correct scores because these are simply the number correct divided by the total number of items.

Timed or Untimed Administration

The vast majority of uses of the BASI test require administration of subtests using the standard time limits given in Chapter 1. Because the test was standardized using these time limits, all scores that depend on comparisons to the BASI standardization sample—standard scores, confidence intervals, percentile ranks, grade-equivalent scores, and age-equivalent scores—are interpretable *only for timed administrations*.

If the examiner is interested solely in what specific content the examinee has and has not mastered and not in norm-referenced performance information, the test should be administered untimed. In this case, only the percentage correct scores for subtests and for specific achievement areas should be interpreted (note that percentage correct scores for achievement areas are not available for hand scoring). See Chapter 3 for more information about percentage correct scores and interpreting results of an untimed administration.

Need for Accommodations

Some individuals with disabilities may need to be administered the BASI test with accommodations so their test scores will accurately reflect their level of achievement. A thorough discussion of the various possible test-taking accommodations is beyond the scope of this manual. The examiner should follow the testing accommodation policies established by his or her organization and/or professional practice guidelines to determine appropriate accommodations for BASI test administration.

Every effort should be made to administer the BASI test using the standard time limits for each subtest. As noted above, if untimed administration of the BASI test is deemed necessary as an accommodation, none of the norm-referenced scores will be meaningful.

Order of Subtest Administration

In the standardization of the BASI Comprehensive test, the six subtests were administered in the same order as they appear in the test booklets: Vocabulary, Spelling, Language Mechanics, Reading Comprehension, Math Computation, Math Application. However, it is not necessary to follow this order. The subtests can be administered in any order in one or more sessions. Each subtest that is begun during a testing session should be completed during that session.

Test Administration

Except for the reading of instructions and timing of the subtests by an administrator, the BASI test is largely self-administering. In most circumstances it can easily be administered to groups (e.g., an entire class) by one or two proctors or to individual examinees with minimal supervision. The requirements of an effective test administration are discussed below.

Importance of Standardized Administration

Administration of the BASI test must be carefully conducted following the methods described in this manual. Alteration of the instructions, materials, or time limits may affect the test taker's performance and may compromise the validity of the test scores.

Rapport

Examiners should recognize the need to create an appropriate environment for testing. This includes developing and maintaining rapport with examinees. Several sources provide a description of good testing practices (Aiken, 1987; Hood & Johnson, 1991; Salvia & Ysseldyke, 1981; Sattler, 1992).

Testing Environment

The BASI test should be administered in a room that is free of distractions. The administrator should ensure that examinees can work comfortably. For paper-and-pencil administration, each examinee must have a good writing surface, adequate lighting, two No. 2 pencils with erasers, and a test booklet and answer sheet. Scratch paper is allowed, but calculators are not.

Using the Answer Sheet Correctly

When the BASI test is administered using a test booklet and answer sheet, it is critical that examinees mark their answer for each item in the correct place on the answer sheet. The administrator should instruct examinees to periodically check that their current test item number matches their current place on the answer sheet. If possible, the proctor should check during testing to make sure examinees are using the answer sheet correctly.

Test Directions

Before examinees begin each subtest, the administrator should *read aloud* the directions for that subtest. These directions should be read *word for word* from the test booklet while examinees follow along. For those subtests that include sample items as part of the directions (Vocabulary, Spelling, Math Computation, Math Application), the administrator should read the sample items aloud and watch to make sure that examinees mark their answers to the sample items on their answer sheet. Timing for each subtest begins when the administrator instructs examinees to turn to the first page of the subtest.

Group Administration

The BASI test is designed for ease of group administration. Group administration simply requires one or more proctors to distribute the test materials, read the instructions aloud, time the subtests, and collect the completed tests. Proctors should remain available at all times to monitor examinees and answer questions. (See "Answering Questions" below.)

Individual Administration

As with group administration, individual administration of the BASI test requires a test administrator to give out test materials, read the instructions aloud, time the subtests, and collect the completed test. It is usually not necessary for the administrator to closely monitor the examinee while he or she is working on the test. However, the administrator should remain readily available in case the examinee needs assistance. In some special circumstances, continuous monitoring may be required.

Answering Questions

Administrators should not volunteer information about guessing. If examinees ask whether or not they should guess on items they don't know or don't have time to get to, the administrator should simply reiter-

ate the importance of working quickly but carefully and trying to answer as many items as possible. If asked directly whether incorrect responses are penalized, the administrator may respond that they are not. If asked a question about a particular test item, the administrator may suggest that the examinee review the sample items, but he or she should not provide any additional information.

Scoring

This section addresses computer scoring and hand scoring of the BASI Comprehensive test.

Computer Scoring

When the BASI test is administered using a test booklet and scannable answer sheet, the user can score it either by scanning the answer sheet or by keying in the test responses. Alternatively, the scannable answer sheet can be mailed to Pearson Assessments for scoring.

Before the test can be computer scored, the identifying information on the scannable answer sheet must be completed. Normally this is done at the beginning of the testing session. When the test is administered to a group, the administrator may find it convenient to have the test takers complete the information. When the test is administered to an individual examinee, the administrator may complete the information or have the examinee complete it.

The Test Form, Grade Level, and Timed Test entries on the answer sheet, as well as the examinee's identification number, birth date, and test date, must *all* be completed for computer scoring. The examinee's name, ethnic group/race, highest grade achieved, and gender are optional. In addition, the answer sheet that is used for on-site scoring or for mail-in scoring with the Student Summary Report includes a number of boxes that can be used for recording optional information that may be useful for managing, analyzing, and reporting group performance data (e.g., for a class or an entire school grade). The software allows the data records for BASI test takers to be easily exported to other software programs for these purposes.

When the BASI test is administered by computer, scoring directions are fully contained within the software. The same information needed to computer score a scannable answer sheet (test form, grade level, timed vs. untimed, identification number, birth date, and test date) is needed to score a computer-administered test.

Two score reports are available through computer scoring. The Student Summary Report, for students in grades 3 through 12, provides standard scores, confidence intervals, percentile ranks, grade-equivalent scores, and age-equivalent scores for subtests. Percentage correct scores and performance descriptors are provided for achievement areas. All of these scores are described in detail in the next chapter. (The Student Summary Report also includes an optional Parent's Summary Report, which lists percentile ranks and performance descriptors. There is also space allotted on this report for teacher's comments.) The Adult Summary Report provides grade-equivalent scores, percentage correct scores, and performance descriptors. Sample reports can be found in Appendix L.

Hand Scoring

The hand-scoring answer sheet must be opened for scoring. To open the form, tear off the perforated strip at the bottom. The form provides sections for recording subtest results and for computing and recording total scores. Scoring directions are provided on the form and are not repeated here. After scoring, retain the examinee's results for your records. Because the rest of the form includes the answer key, shred or discard it as you would other confidential documents or keep it in a *secure* location.

All of the scores that can be recorded on the hand-scoring form are meaningful for student examinees in grades 3 through 12. For examinees who are over 18 and no longer in high school, however, only the subtest raw scores and grade-equivalent scores are meaningful because there is no adult normative sample. For adults, standard scores, percentile ranks, confidence intervals, and age-equivalent scores for the subtests should not be recorded or interpreted, nor should any of the total scores (Reading Total, Written Language Total, Math Total).

This page has been intentionally left blank.

Chapter 3.

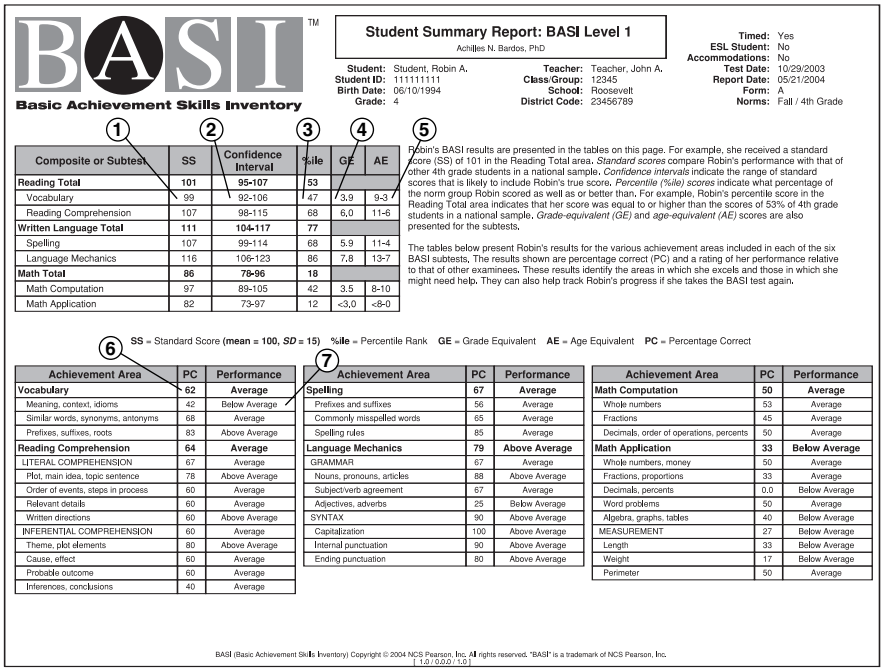
Interpreting BASI Scores and Results

The purpose of this chapter is to describe how to interpret the various scores that can be obtained from the BASI Comprehensive test. The recommended procedures are intended to serve as guidelines that should be applied flexibly and within the context of other available information about the individual being assessed. The discussion assumes a typical timed administration of the BASI test following the administration guidelines described in Chapter 2.

Interpreting BASI Scores

There are a number of scores that can be used to interpret an individual's performance on the BASI test. Most of these scores can be obtained using hand scoring or computer scoring. The scores used to interpret the BASI test include raw scores, standard scores, confidence intervals of standard scores, percentile ranks, grade-equivalent scores, age-equivalent scores, and achievement area scores. A sample computer-generated Student Summary Report is shown in Figure 3.1 to illustrate these different scores and their interpretation. As described in Chapter 2, the computer-generated Adult Summary Report provides a subset of the scores that are included in the Student Summary Report.

FIGURE 3.1 BASI Student Summary Report



BASI™

Basic Achievement Skills Inventory

Student Summary Report: BASI Level 1

Achilles N. Bardos, PhD

Student: Student, Robin A.
Student ID: 111111111
Birth Date: 06/10/1994
Grade: 4

Teacher: Teacher, John A.
Class/Group: 12345
School: Roosevelt
District Code: 23456789

Timed: Yes
ESL Student: No
Accommodations: No
Test Date: 10/29/2003
Report Date: 05/21/2004
Form: A
Norms: Fall / 4th Grade

Composite or Subtest	SS	Confidence Interval	%ile	GE	AE
Reading Total	**101**	**95-107**	**53**		
Vocabulary	99	92-106	47	3.9	9-3
Reading Comprehension	107	98-115	68	6.0	11-6
Written Language Total	**111**	**104-117**	**77**		
Spelling	107	99-114	68	5.9	11-4
Language Mechanics	116	106-123	86	7.8	13-7
Math Total	**86**	**78-96**	**18**		
Math Computation	97	89-105	42	3.5	8-10
Math Application	82	73-97	12	<3.0	<8-0

Robin's BASI results are presented in the tables on this page. For example, she received a standard score (SS) of 101 in the Reading Total area. *Standard scores* compare Robin's performance with that of other 4th grade students in a national sample. *Confidence intervals* indicate the range of standard scores that is likely to include Robin's true score. *Percentile (%ile) scores* indicate what percentage of the norm group Robin scored as well as or better than. For example, Robin's percentile score in the Reading Total area indicates that her score was equal to or higher than the scores of 53% of 4th grade students in a national sample. *Grade-equivalent (GE)* and *age-equivalent (AE)* scores are also presented for the subtests.

The tables below present Robin's results for the various achievement areas included in each of the six BASI subtests. The results shown are percentage correct (PC) and a rating of her performance relative to that of other examinees. These results identify the areas in which she excels and those in which she might need help. They can also help track Robin's progress if she takes the BASI test again.

SS = Standard Score (**mean = 100, *SD* = 15**) **%ile** = Percentile Rank **GE** = Grade Equivalent **AE** = Age Equivalent **PC** = Percentage Correct

Achievement Area	PC	Performance
Vocabulary	**62**	**Average**
Meaning, context, idioms	42	Below Average
Similar words, synonyms, antonyms	68	Average
Prefixes, suffixes, roots	83	Above Average
Reading Comprehension	**64**	**Average**
LITERAL COMPREHENSION	67	Average
Plot, main idea, topic sentence	78	Above Average
Order of events, steps in process	60	Average
Relevant details	60	Average
Written directions	60	Above Average
INFERENTIAL COMPREHENSION	60	Average
Theme, plot elements	80	Above Average
Cause, effect	60	Average
Probable outcome	60	Average
Inferences, conclusions	40	Average

Achievement Area	PC	Performance
Spelling	**67**	**Average**
Prefixes and suffixes	56	Average
Commonly misspelled words	65	Average
Spelling rules	85	Average
Language Mechanics	**79**	**Above Average**
GRAMMAR	67	Average
Nouns, pronouns, articles	88	Above Average
Subject/verb agreement	67	Average
Adjectives, adverbs	25	Below Average
SYNTAX	90	Above Average
Capitalization	100	Above Average
Internal punctuation	90	Above Average
Ending punctuation	80	Above Average

Achievement Area	PC	Performance
Math Computation	**50**	**Average**
Whole numbers	53	Average
Fractions	45	Average
Decimals, order of operations, percents	50	Average
Math Application	**33**	**Below Average**
Whole numbers, money	50	Average
Fractions, proportions	33	Average
Decimals, percents	0.0	Below Average
Word problems	50	Average
Algebra, graphs, tables	40	Below Average
MEASUREMENT	27	Below Average
Length	33	Below Average
Weight	17	Below Average
Perimeter	50	Average

BASI (Basic Achievement Skills Inventory) Copyright © 2004 NCS Pearson, Inc. All rights reserved. "BASI" is a trademark of NCS Pearson, Inc.
[1.0 / 0.0.0 / 1.0]

Raw Scores (Hand Scoring)

For each subtest, the raw score is simply the number of test items answered correctly. BASI raw scores are not corrected for guessing. Note that raw scores are not included in either the Student Summary Report or the Adult Summary Report generated via computer scoring.

Standard Scores (Hand Scoring and Computer-Generated Student Summary Report)

An examinee's raw score is transformed into a standard score with a mean of 100 and a standard deviation of 15 (see point 1 in Figure 3.1). Standard scores with a mean of 100 and a standard deviation of 15 are a common metric for many individually administered achievement and intelligence tests. A standard score indicates the position of an individual's score or test performance relative to the scores of others in the test's normative sample, which in the case of the BASI test is designed to represent the general population of U.S. students at the same grade level as the examinee. For example, a Vocabulary subtest standard score of 115 indicates that the examinee performed one standard deviation above the mean in comparison to others at the same grade level in the general population. Usually, about 99% of individuals who take a test that is standardized with this metric score between 55 (three standard deviations below the mean) and 145 (three standard deviations above the mean). For hand-scored tests, tables for converting raw scores to standard scores can be found in Appendixes A and B for Form A and Appendixes E and F for Form B.

Confidence Intervals (Hand Scoring and Computer-Generated Student Summary Report)

Interpretation of BASI standard scores is further enhanced by the use of confidence intervals. An individual's score on a norm-referenced test represents an estimate of his or her true standing on the construct measured. In measurement theory, the test taker's "true score" can be estimated but not directly obtained. The difference between an individual's observed score and his or her true score is referred to as measurement error. All achievement tests, including the BASI test, have some measurement error.

Confidence intervals (see point 2 in Figure 3.1) account for the amount of measurement error associated with a test score and should be reported and used when interpreting an examinee's performance on any test of ability or achievement. Confidence intervals demonstrate the range of scores in which an individual's true score is likely to fall. In Figure 3.1, for example, the 95% confidence interval values associated with the standard score value of 99 range from 92 to 106. This suggests that it is likely (i.e., there is a 95% probability) that the individual's true score falls within the range of 92 to 106.

For each BASI subtest and total score, the estimated true score is calculated according to a method proposed by Dudek (1979) and Glutting, McDermott, and Stanley (1987). The estimated true score is obtained by the formula:

$$\text{Estimated True Score} = 100 + r_{xx}\,(x - 100)$$

where x is the standard score obtained and r_{xx} is the internal consistency reliability coefficient of that subtest or total score at the examinee's grade level (these reliability coefficients are shown in Tables 5.1 and 5.2). The 95% confidence interval for each standard score is calculated around the estimated true score using the standard error of estimate (se_e) according to the formula proposed by Stanley (1971):

$$se_e = 15\sqrt{1 - r_{xx}\,(r_{xx})}$$

This procedure for calculating 95% confidence intervals results in intervals that are asymmetric around the observed standard score because of a correction for true score regression toward the mean. The confidence interval scores should always be reported along with the obtained subtest or total composite standard score. Appendixes A and B (for Form A) and E and F (for Form B) contain tables showing the 95% confidence intervals for use with hand-scored BASI tests.

Percentile Ranks (Hand Scoring and Computer-Generated Student Summary Report)

Further information about BASI test performance is provided through the use of percentile ranks (see point 3 in Figure 3.1). For example, a percentile rank of 47 on a BASI subtest or total score indicates that

the individual's performance equaled or exceeded that of 47% of the standardization sample subjects in the same grade. Percentile ranks have the advantage of being relatively easy to understand and explain; however, they are best considered an ordinal level measure. For that reason, comparisons of different scores within the BASI test and between the BASI test and other tests should be made using standard scores, which are interval level measures. Such comparisons are discussed in more detail later in this chapter. Percentile ranks for hand scoring are shown in Appendixes A, B, E, and F.

Grade-Equivalent Scores (Hand Scoring and Computer-Generated Student Summary Report and Adult Summary Report)

A grade-equivalent score (point 4 in Figure 3.1) is intended to represent an examinee's test performance in terms of the grade level at which the "average" student's performance matches that of the examinee. For example, a grade-equivalent score of 3.9 indicates that a person's performance is similar to the average (median) performance of 3rd-grade students in the month of May (August is month 0, September is month 1, etc.). The computer-generated BASI score reports for students and for adults provide grade-equivalent scores for subtests; for hand-scored tests, these scores can be looked up in Appendix C (for Form A) and Appendix G (for Form B). Because it was felt that grade-equivalent scores would only be useful at the subtest level, they are not provided for total scores. (An explanation of the procedures used to calculate BASI grade-equivalent scores can be found in Appendix C.)

Although grade-equivalent scores are frequently used and reported in schools, they do have limitations. Like percentile scores, grade-equivalent scores represent ordinal, not interval, level measures; thus, they are not as well suited as are standard scores for comparing different BASI scores and for comparing BASI scores with scores from other tests. For the BASI user who wishes to learn more about grade-equivalent scores and their limitations, Nitko (2001) offers a recent comprehensive review.

Age-Equivalent Scores (Hand Scoring and Computer-Generated Student Summary Report)

Age-equivalent scores (point 5 in Figure 3.1) parallel grade-equivalent scores; they are intended to represent an examinee's test performance in terms of the age at which the "average" student's performance matches that of the examinee. For example, an age-equivalent score of 9-3 indicates that a person's performance is similar to the average (median) performance of children 9 years and 3 months old. Age-equivalent scores share the same psychometric limitations as grade-equivalent scores. For hand scoring, age-equivalent scores are given in Appendix D for Form A and Appendix H for Form B. (See Appendix C for an explanation of the procedures used to calculate age-equivalent scores.) As with grade-equivalent scores, age-equivalent scores are provided only at the subtest level.

Achievement Area Scores, Percentage Correct, and Performance Descriptors (Computer-Generated Student Summary Report and Adult Summary Report)

The six subtest scores and the three total scores represent the most reliable means of describing an examinee's overall performance on the BASI test. However, as discussed in detail in Chapter 5, each subtest includes a number of specific content areas referred to as *achievement areas*. The computer-generated BASI Student Summary Report and Adult Summary Report include scores at the level of individual achievement areas. The purpose of these scores is to recognize the importance of each test item and the curriculum/content area it represents in the assessment process.

Achievement area scores are reported as a percentage correct (see point 6 in Figure 3.1), which is simply the number of items answered correctly divided by the total number of items that measure a given achievement area. Percentage correct scores are also reported at the overall subtest level in the Student Summary Report and the Adult Summary Report. Finally, percentage correct scores are also reported at the total composite score level in the Adult Summary Report.

Accompanying the percentage correct score for each achievement area or subtest is a three-level performance descriptor: above average, average, or below average (point 7 in Figure 3.1). For the subtest scores in the Student Summary Report, standard scores above 110 receive an "above average" descriptor, standard scores of 90 to 110 receive an "average" descriptor, and standard scores below 90

receive a "below average" descriptor. For the subtest and total scores in the Adult Summary Report, the descriptors are based on comparing the examinee's performance to that of the norm group selected by the user.

The performance descriptors for the individual achievement areas are based on the percentage correct scores. For each achievement area, the examinee's percentage correct is compared to the mean and standard deviation derived from the pooled standardization samples for Forms A and B at the grade level that the user specifies when selecting norms. Scores within plus or minus one-third of a standard deviation of the pooled standardization sample mean receive the "average" descriptor. Scores that exceed the standardization mean by more than one-third of a standard deviation are labeled "above average," and those falling more than one-third of a standard deviation below the mean are labeled "below average."

Interpreting Results of an Untimed Administration

When a BASI subtest is administered using the standard time limits shown in Chapter 1, many examinees will run out of time before attempting all of the items. If an examiner wishes to determine what specific content an individual has and has not mastered without regard to the time limits used in the standardization of the BASI test, the subtest should be administered with no time limits. When administered untimed, a BASI subtest can be considered a "pure power test" that yields criterion-referenced performance information. In this case, only the percentage correct scores for the subtests and achievement areas should be used. (Note that results for achievement areas are available only for computer-scored tests.) Because the BASI subtests were standardized using timed administration, none of the scores that depend on comparisons to the BASI standardization sample—standard scores, confidence intervals, percentile ranks, grade-equivalent scores, and age-equivalent scores—should be interpreted for an untimed administration. The above average/average/below average performance descriptors should also not be interpreted.

Comparisons Involving BASI Scores

The final sections of this chapter discuss how best to perform comparisons involving BASI test scores. Such comparisons include:

- comparing subtest scores for a single BASI testing,
- comparing BASI scores to scores from other tests,
- comparing scores from repeat administrations of the same BASI form, and, finally
- comparing Form A and Form B results to measure academic progress.

Comparing Subtest Scores

Sometimes comparing results between certain BASI subtests can further enhance the interpretation and utility of the test. For example, a user may wish to compare an individual's performance on the Vocabulary and Reading Comprehension subtests. It is commonly accepted that a well-developed vocabulary is essential for successful reading comprehension. Poor performance on the Vocabulary subtest might explain poor performance on the Reading Comprehension subtest. Such information might have both diagnostic and instructional implications.

When a statistically significant difference exists between scores on two subtests (e.g., Math Computation and Math Application) that contribute to a total score (e.g., Math Total), the total score should be interpreted with caution because it masks the underlying discrepancy. The tables in Appendix I list the minimum statistically significant differences between subtest/subtest and subtest/total standard scores.

Comparing BASI Scores to Other Test Scores

In most school settings, there is a plethora of data regarding students' academic achievement. Some of the data are derived from nationally standardized tests, some from tests with local norms, and yet others from state-administered tests. Unfortunately, the lack of a common metric among tests can make these data difficult if not impossible to interpret and use appropriately.

The tables in Appendix J show the amount of difference in scores required for statistical significance when comparing BASI standard scores with those from two tests with a mean of 100 and a standard deviation of 15: the Wechsler Individual Achievement Test®–Second Edition (WIAT®-II; Wechsler,

2001) and the Kaufman Test of Educational Achievement (K-TEA; Kaufman & Kaufman, 1998). (As available, additional information can be found on the Pearson Assessments website.)

Comparisons between BASI standard scores and scores from other achievement tests that do not use a mean of 100 and a standard deviation of 15 can be made, but they require a few additional steps. For example, the user can identify a test score's equivalent percentile score and convert it to a standard score with a mean of 100 and a standard deviation of 15 to facilitate a direct comparison. Tables for such transformations are available in Sattler (1992).

Comparing Scores From Repeat Administrations of the Same BASI Form

Sometimes a BASI user may wish to administer the same form (A or B) to one or more examinees before and after a training or instructional intervention in order to assess the effectiveness of the intervention. In this case, the statistical significance of the difference between two test scores can be determined using a method described by Atkinson (1991). This method, described more fully below, should be applied only when minimal practice effects are expected (the test-retest interval should be longer than six weeks).

The determination of whether a BASI subtest or total score has increased (or decreased) by a statistically significant amount from a first to second administration of the same form is accomplished in two steps. First, the initial subtest or total composite standard score is identified. Next, the standard score from the second administration is compared to the appropriate range of values found in Appendix K. These score ranges reflect the variability expected due to test-retest unreliability and regression to the mean. If the second BASI score falls outside of the range of scores given in Appendix K, the difference between the two standard scores is considered statistically significant. For example (see Figure 3.2), an examinee who received an initial BASI Vocabulary score of 90 would have to obtain a second BASI Vocabulary score of at least 104 to show significant improvement.

FIGURE 3.2 Excerpt From Appendix Table K.1

Expected Variability in Scores From Repeat Administrations of the Same BASI Form — Form A, Grade 3 Norms

Standard Score (First Admin.)	Expected Retest Score Ranges					
	Vocabulary	Spelling	Language Mechanics	Reading Comprehension	Math Computation	Math Application
98	88 - 108	87 - 109	86 - 110	87 - 110	87 - 110	82 - 115
97	87 - 107	86 - 108	85 - 109	86 - 109	86 - 109	81 - 114
96	86 - 106	85 - 107	84 - 109	85 - 108	85 - 108	80 - 113
95	85 - 105	85 - 106	83 - 108	84 - 107	84 - 107	79 - 112
94	84 - 104	84 - 105	82 - 107	83 - 106	83 - 106	79 - 111
93	83 - 103	83 - 104	81 - 106	82 - 105	82 - 105	78 - 111
92	82 - 103	82 - 103	81 - 105	81 - 104	81 - 104	77 - 110
91	82 - 102	81 - 102	80 - 104	80 - 103	80 - 103	76 - 109
90	81 - 101	80 - 102	79 - 103	79 - 102	79 - 102	75 - 108
89	80 - 100	79 - 101	78 - 102	78 - 101	78 - 101	74 - 107
88	79 - 99	78 - 100	77 - 101	77 - 100	77 - 100	74 - 106
87	78 - 98	77 - 99	76 - 100	77 - 100	77 - 100	73 - 106
86	77 - 97	76 - 98	75 - 99	76 - 99	76 - 99	72 - 105
85	76 - 96	75 - 97	74 - 99	75 - 98	75 - 98	71 - 104

Comparing Form A and Form B Results to Measure Academic Progress

Two forms were developed for each BASI Comprehensive subtest to allow evaluation of progress over the course of a school year. Form A of each subtest was normed in the fall (August–December), and Form B was normed in the spring (January– July).

Comparisons between Form A and Form B results are best made using the standard scores for subtests and total composites because of the high reliability of those scores. A standard score that stays the same or changes little from Form A to Form B indicates "normal" growth in that the examinee has retained roughly the same relative position among all individuals in the BASI normative sample. Large standard score increases (15 or more points) reflect "above-normal" growth, and large standard score decreases (15 or more points) reflect "below-normal" growth.

Comparisons can also be made at the level of percentage correct scores for individual achievement areas. The strength of comparisons at this level is that they allow a more fine-grained analysis of progress in specific content areas. The limitation is that the achievement area scores are in some cases based on relatively few test items and thus are subject to higher levels of measurement error than are the subtest and total scores.

Of course, scores can be compared between Forms A and B for both individuals and groups (e.g., classrooms). BASI users who use computer scoring can export BASI data to other software programs to facilitate group-level analyses.

In summary, the BASI Comprehensive test offers a variety of scores to describe an individual test taker's performance. These scores can be cumulated for an entire classroom, school, or other group to describe the performance of that group. This information can be used to complement other data regarding academic skills and to reach better data-based decisions.

Chapter 4.

Test Development and Standardization

This chapter presents a general description of the methods used to develop the BASI Comprehensive test and describes its standardization in detail. Because the BASI test is norm-referenced, a sound standardization plan and sample are critical to establishing the basis for its psychometric properties. The chapter is organized in the following three sections: test development and item selection, national standardization, and derivation of standardized scores.

Test Development and Item Selection

Development of the BASI test began in the spring of 2001 with the initial creation of a test blueprint. This was followed by item writing and pilot testing of items with national samples in the fall of 2001 and the spring of 2002. Finally, the standardization of the BASI test took place in the fall of 2002 for Form A and in the spring of 2003 for Form B. Validity and reliability studies were also conducted during the period when the test was being standardized. A detailed description of the BASI test blueprint, item writing and item selection process, and validity and reliability results is presented in Chapter 5.

National Standardization

The BASI test was standardized using a stratified random sampling plan so that the sample would closely match the U.S. population according to the 2000 census (www.census.gov). The entire BASI Comprehensive series consists of eight sets of tests: two forms (Form A with fall norms, Form B with spring norms) at each of four levels defined by grade (3–4, 5–6, 7–8, 9–12). Each of the eight sets of tests was standardized using a grade-appropriate sample stratified according to four demographic variables: (1) gender, (2) race/ethnicity (White, African American, Hispanic/Latino, Asian American, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and Other), (3) parental education (less than 12th grade, high school graduate or GED, 1–3 years of college or technical school, and 4 or more years of college), and (4) geographic region (Northeast, South, Midwest, and West). Information about parental education was reported separately for the mother and father. If their levels of education were not the same, the higher level was used.

Site Solicitation

To obtain student samples, sites were selected from a national pool of schools identified by Pearson Assessments. (A list of all the sites that participated can be found in the BASI Project Participants section in the beginning of this manual.) Letters were sent to schools throughout the country inviting them to participate in the standardization of the BASI test. Educational consultants from Pearson Digital Learning also assisted with the recruitment of schools.

School principals across the various regions of the country were asked to describe the demographics of their student population and their community. Schools were invited to participate if they approximated the census-based criteria.

Test Administration

Before data collection began, written permission to solicit participants was obtained from each school. The principal from each participating school drafted a letter that was distributed to parents encouraging the participation of their children. Parents or guardians were given the opportunity to decide whether their children would participate. Demographic information was provided for each student, in some cases by the parent on a parental consent form and in other cases by the student him- or herself with assistance from the teacher.

Teachers at each participating school administered the test to their classrooms and returned completed test packets to Pearson Assessments according to written procedures. Teachers administered the tests in one or two sessions and completed all testing within two weeks of the first testing session. Teachers and/or principals reviewed the student packets for completeness and returned them to Pearson Assessments for processing.

Quality Control

Once the BASI forms were returned to Pearson Assessments, they were subjected to a thorough visual inspection by trained staff prior to data processing. Data analyses and norms development were subjected to a series of quality assurance procedures using members of the Pearson Assessments test development team and external consultants.

Demographics of the Standardization Samples

A total of 2,439 students in grades 3 through 12 participated in the standardization of Form A during the fall of 2002, and another 2,130 students participated in the standardization of Form B during the spring of 2003. Table 4.1 shows the breakdown of the Form A and Form B standardization samples by grade.

TABLE 4.1 Number of Examinees per Grade Level in the Standardization Samples for Forms A and B

Grade	Form A	Form B
3	319	273
4	301	289
5	227	234
6	224	261
7	227	210
8	253	212
9	217	154
10	225	135
11	227	204
12	219	158
Total	2,439	2,130

As mentioned earlier, the standardization samples were constructed to match the 2000 U.S. census as closely as possible on four demographic variables: gender, race/ethnicity, parental education, and geographic region. Table 4.2 shows the breakdowns of the total (grades 3 through 12) Form A and Form B standardization samples across these demographic variables and how those breakdowns compare to the census values. The data in Table 4.2 show that the goal of matching the 2000 U.S. population was largely achieved. Nearly all of the subgroup percentages for the two BASI standardization samples are within 5% of the population figures, and most are within 2%. The greatest deviation from the U.S. population subgroup percentages is for geographic region (the South was somewhat underrepresented relative to the U.S. population, and the West was somewhat overrepresented). However, there is little evidence that geographic region systematically affects performance on tests of academic achievement such as the BASI test.

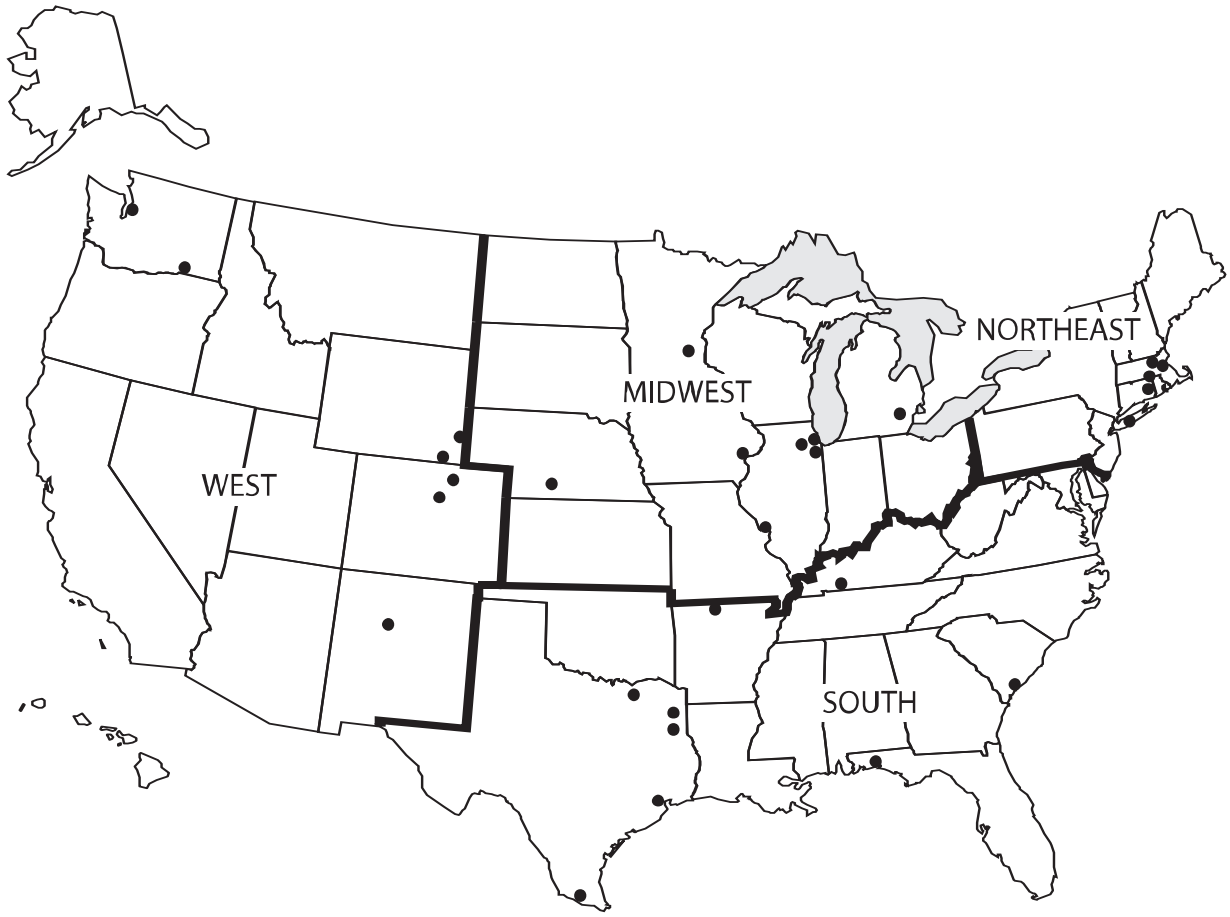
Figure 4.1 shows the locations of the sites that participated in the standardization of BASI Forms A and B.

Although the demographics of the overall standardization samples for Forms A and B approximate those of the U.S. population, individual subject weighting was applied in the final norming of the test to ensure that the norm group demographic makeup at each of the four grade-based test levels was exactly proportionate to the U.S. population. Each individual examinee was assigned a weight for each of the four stratification variables according to his or her subgroup membership on that variable. The weights were computed by dividing the percentage for the individual's subgroup in the U.S. population by the percentage for that subgroup in the BASI standardization sample. Each standardization sample member contributed to the final sample proportionally to the product of the weights for that individual across the four stratification variables.

TABLE 4.2 Demographic Characteristics of the Form A and Form B Standardization Samples

Demographic Variable	Subgroup	U.S. %	BASI Form A %	BASI Form B %
Gender	Male	48.4	49.1	49.9
	Female	51.6	50.9	50.1
Race/Ethnicity	White	69.1	66.1	66.4
	African American	12.1	10.7	10.3
	Hispanic/Latino	12.5	16.9	16.0
	Asian American	3.6	2.9	3.0
	American Indian	0.7	1.2	1.3
	Pacific Islander	0.1	0.2	0.3
	Other	1.8	2.0	2.7
Parental Education	Less than 12th grade	14.8	15.1	13.5
	High school grad/GED	32.5	30.8	33.0
	1–3 years college	28.3	28.2	28.5
	4+ years college	24.4	25.9	25.0
Region	Northeast	19.1	17.5	20.9
	South	35.7	30.5	22.3
	Midwest	22.9	23.9	27.6
	West	22.3	28.0	29.2

FIGURE 4.1 Locations of Schools That Participated in the National Standardization of BASI Forms A and B



Tables 4.3 to 4.10 present, for each of the eight BASI level-by-form combinations, the actual subject counts and percentages for each subgroup (gender, race/ethnicity, parental education, and geographic region), together with the subject weights used for each of those subgroups. The data shown in the first two rows of the "Parental Education" section of Table 4.3 are used here to illustrate the calculation of subject weights. In the Level 1 (Form A) standardization sample, 79 of the 620 subjects, or 12.7%, had a parental education level of "less than 12th grade." Because this would somewhat underrepresent the 14.8% of the U.S. population with this parental education level according to the 2000 census, the BASI scores for each of these subjects were weighted by a factor greater than 1.0 (14.8/12.7=1.16) in order to have their scores make up the exact census-matched proportion of this sample. Conversely, because subjects whose parental education level was "high school graduate/GED" were somewhat overrepresented (at 34.4% versus 32.5% in the U.S. population), scores for each of those subjects were weighted by a factor less than 1.0 (32.5/34.4 = 0.95).

TABLE 4.3 Demographics and Subject Weights for the Level 1 (Form A) Standardization Sample

Demographic Variable	Subgroup	Sample *n*	Sample % (x)	U.S. % (y)	Subject Weights[a] (y/x)
Gender	Male	301	48.5	48.4	1.00
	Female	319	51.5	51.6	1.00
Race/Ethnicity	White	411	66.3	69.1	1.04
	African American	65	10.5	12.1	1.15
	Hispanic/Latino	110	17.7	12.5	0.70
	Asian American	18	2.9	3.6	1.24
	American Indian	10	1.6	0.7	0.43
	Pacific Islander	1	0.2	0.1	0.62
	Other	5	0.8	1.8	2.23
Parental Education	Less than 12th grade	79	12.7	14.8	1.16
	High school grad/GED	213	34.4	32.5	0.95
	1–3 years college	176	28.4	28.3	1.00
	4+ years college	152	24.5	24.4	1.00
Region	Northeast	136	21.9	19.1	0.87
	South	216	34.8	35.7	1.02
	Midwest	144	23.2	22.9	0.99
	West	124	20.0	22.3	1.12

Note. $N = 620$.

[a] Subject weights may differ slightly from the ratio of column y to column x because the sample % was not rounded before being divided into the U.S. %.

TABLE 4.4 Demographics and Subject Weights for the Level 2 (Form A) Standardization Sample

Demographic Variable	Subgroup	Sample *n*	Sample % (x)	U.S. % (y)	Subject Weights[a] (y/x)
Gender	Male	224	49.7	48.4	0.97
	Female	227	50.3	51.6	1.03
Race/Ethnicity	White	303	67.2	69.1	1.03
	African American	49	10.9	12.1	1.11
	Hispanic/Latino	69	15.3	12.5	0.82
	Asian American	16	3.5	3.6	1.01
	American Indian	5	1.1	0.7	0.63
	Pacific Islander	0	—	0.1	—
	Other	9	2.0	1.8	0.90
Parental Education	Less than 12th grade	75	16.6	14.8	0.89
	High school grad/GED	132	29.3	32.5	1.11
	1–3 years college	126	27.9	28.3	1.01
	4+ years college	118	26.2	24.4	0.93
Region	Northeast	77	17.1	19.1	1.12
	South	155	34.4	35.7	1.04
	Midwest	107	23.7	22.9	0.97
	West	112	24.8	22.3	0.90

Note. $N = 451$.

[a] Subject weights may differ slightly from the ratio of column y to column x because the sample % was not rounded before being divided into the U.S. %.

TABLE 4.5 Demographics and Subject Weights for the Level 3 (Form A) Standardization Sample

Demographic Variable	Subgroup	Sample *n*	Sample % (x)	U.S. % (y)	Subject Weights[a] (y/x)
Gender	Male	235	49.0	48.4	0.99
	Female	245	51.0	51.6	1.01
Race/Ethnicity	White	315	65.6	69.1	1.05
	African American	40	8.3	12.1	1.45
	Hispanic/Latino	97	20.2	12.5	0.62
	Asian American	18	3.8	3.6	0.96
	American Indian	4	0.8	0.7	0.84
	Pacific Islander	0	—	0.1	—
	Other	6	1.3	1.8	1.44
Parental Education	Less than 12th grade	70	14.6	14.8	1.01
	High school grad/GED	143	29.8	32.5	1.09
	1–3 years college	142	29.6	28.3	0.96
	4+ years college	125	26.0	24.4	0.94
Region	Northeast	87	18.1	19.1	1.05
	South	180	37.5	35.7	0.95
	Midwest	114	23.8	22.9	0.96
	West	99	20.6	22.3	1.08

Note. $N = 480$.

[a] Subject weights may differ slightly from the ratio of column y to column x because the sample % was not rounded before being divided into the U.S. %.

TABLE 4.6 Demographics and Subject Weights for the Level 4 (Form A) Standardization Sample

Demographic Variable	Subgroup	Sample *n*	Sample % (x)	U.S. % (y)	Subject Weights[a] (y/x)
Gender	Male	437	49.2	48.4	0.98
	Female	451	50.8	51.6	1.02
Race/Ethnicity	White	584	65.8	69.1	1.05
	African American	107	12.0	12.1	1.00
	Hispanic/Latino	135	15.2	12.5	0.82
	Asian American	19	2.1	3.6	1.68
	American Indian	11	1.2	0.7	0.57
	Pacific Islander	4	0.5	0.1	0.22
	Other	28	3.2	1.8	0.57
Parental Education	Less than 12th grade	143	16.1	14.8	0.92
	High school grad/GED	263	29.6	32.5	1.10
	1–3 years college	245	27.6	28.3	1.03
	4+ years college	237	26.7	24.4	0.91
Region	Northeast	127	14.3	19.1	1.34
	South	196	22.1	35.7	1.62
	Midwest	219	24.7	22.9	0.93
	West	346	39.0	22.3	0.57

Note. $N = 888$.

[a] Subject weights may differ slightly from the ratio of column y to column x because the sample % was not rounded before being divided into the U.S. %.

TABLE 4.7 Demographics and Subject Weights for the Level 1 (Form B) Standardization Sample

Demographic Variable	Subgroup	Sample *n*	Sample % (x)	U.S. % (y)	Subject Weights[a] (y/x)
Gender	Male	276	49.1	48.4	0.99
	Female	286	50.9	51.6	1.01
Race/Ethnicity	White	378	67.3	69.1	1.03
	African American	67	11.9	12.1	1.01
	Hispanic/Latino	92	16.4	12.5	0.76
	Asian American	12	2.1	3.6	1.69
	American Indian	0	—	0.7	—
	Pacific Islander	2	0.4	0.1	0.28
	Other	11	2.0	1.8	0.92
Parental Education	Less than 12th grade	80	14.2	14.8	1.04
	High school grad/GED	162	28.8	32.5	1.13
	1–3 years college	172	30.6	28.3	0.92
	4+ years college	148	26.3	24.4	0.93
Region	Northeast	102	18.1	19.1	1.05
	South	193	34.3	35.7	1.04
	Midwest	139	24.7	22.9	0.93
	West	128	22.8	22.3	0.98

Note. $N = 562$.

[a] Subject weights may differ slightly from the ratio of column y to column x because the sample % was not rounded before being divided into the U.S. %.

TABLE 4.8 Demographics and Subject Weights for the Level 2 (Form B) Standardization Sample

Demographic Variable	Subgroup	Sample *n*	Sample % (x)	U.S. % (y)	Subject Weights[a] (y/x)
Gender	Male	242	48.9	48.4	0.99
	Female	253	51.1	51.6	1.01
Race/Ethnicity	White	332	67.1	69.1	1.03
	African American	63	12.7	12.1	0.95
	Hispanic/Latino	66	13.3	12.5	0.94
	Asian American	12	2.4	3.6	1.49
	American Indian	6	1.2	0.7	0.58
	Pacific Islander	3	0.6	0.1	0.17
	Other	13	2.6	1.8	0.69
Parental Education	Less than 12th grade	70	14.1	14.8	1.05
	High school grad/GED	144	29.1	32.5	1.12
	1–3 years college	145	29.3	28.3	0.97
	4+ years college	136	27.5	24.4	0.89
Region	Northeast	90	18.2	19.1	1.05
	South	145	29.3	35.7	1.22
	Midwest	148	29.9	22.9	0.77
	West	112	22.6	22.3	0.99

Note. $N = 495$.

[a] Subject weights may differ slightly from the ratio of column y to column x because the sample % was not rounded before being divided into the U.S. %.

TABLE 4.9 Demographics and Subject Weights for the Level 3 (Form B) Standardization Sample

Demographic Variable	Subgroup	Sample *n*	Sample % (x)	U.S. % (y)	Subject Weights[a] (y/x)
Gender	Male	216	51.2	48.4	0.95
	Female	206	48.8	51.6	1.06
Race/Ethnicity	White	256	60.7	69.1	1.14
	African American	39	9.2	12.1	1.31
	Hispanic/Latino	88	20.9	12.5	0.60
	Asian American	22	5.2	3.6	0.69
	American Indian	5	1.2	0.7	0.59
	Pacific Islander	0	—	0.1	—
	Other	12	2.8	1.8	0.63
Parental Education	Less than 12th grade	56	13.3	14.8	1.12
	High school grad/GED	149	35.3	32.5	0.92
	1–3 years college	123	29.1	28.3	0.97
	4+ years college	94	22.3	24.4	1.10
Region	Northeast	53	12.6	19.1	1.52
	South	137	32.5	35.7	1.10
	Midwest	152	36.0	22.9	0.64
	West	80	19.0	22.3	1.18

Note. $N = 422$.

[a] Subject weights may differ slightly from the ratio of column y to column x because the sample % was not rounded before being divided into the U.S. %.

TABLE 4.10 Demographics and Subject Weights for the Level 4 (Form B) Standardization Sample

Demographic Variable	Subgroup	Sample *n*	Sample % (x)	U.S. % (y)[a]	Subject Weights[b] (y/x)
Gender	Male	330	50.7	48.4	0.95
	Female	321	49.3	51.6	1.05
Race/Ethnicity	White	448	68.8	69.1	1.00
	African American	50	7.7	12.1	1.58
	Hispanic/Latino	95	14.6	12.5	0.86
	Asian American	17	2.6	3.6	1.38
	American Indian	17	2.6	0.7	0.27
	Pacific Islander	2	0.3	0.1	0.33
	Other	22	3.4	1.8	0.53
Parental Education	Less than 12th grade	81	12.4	14.8	1.19
	High school grad/GED	247	37.9	32.5	0.86
	1–3 years college	168	25.8	28.3	1.10
	4+ years college	155	23.8	24.4	1.02
Region	Northeast	0	—	—	—
	South	200	30.7	44.1	1.44
	Midwest	149	22.9	28.3	1.24
	West	302	46.4	27.6	0.59

Note. $N = 651$.

[a] Because no students from the Northeast geographic region were included in this standardization sample, the U.S. percentages for the other three regions were recalculated to total 100% for the purpose of calculating subject weights.

[b] Subject weights may differ slightly from the ratio of column y to column x because the sample % was not rounded before being divided into the U.S. %.

Derivation of Standardized Scores

Each BASI subtest is normed at the individual grade level. Thus, the Level 1 subtests have separate norms for grades 3 and 4, the Level 2 subtests have separate norms for grades 5 and 6, the Level 3 subtests have separate norms for grades 7 and 8, and the Level 4 subtests have separate norms for grades 9, 10, 11, and 12.

Following the construction of the census-matched sample for each form at each test level as described above, the raw score means, standard deviations, and frequency distribution statistics for each subtest were examined across all grades. The cumulative frequency distribution of each subtest was obtained and then normalized. Raw scores were converted to standard scores so that each grade-level norm group had a mean of 100 and a standard deviation of 15. The progression of standard scores within and between grades was examined and some smoothing was applied to correct for minor irregularities in the progression of scores. The tables for converting raw scores to standard scores for the six BASI subtests can be found in Appendix A for Form A and in Appendix E for Form B.

The six subtests are further organized into three broad composite areas—Reading Total (Vocabulary and Reading Comprehension), Written Language Total (Spelling and Language Mechanics), and Math Total (Math Computation and Math Application)—for which total scores are reported. Means, standard deviations, and frequency distributions were calculated for the sum of the two subtest standard scores contributing to each total score. Next, the sum of the subtest standard scores for each of the three composite areas was normalized and converted to a standard score with a mean of 100 and a standard deviation of 15 as described above for the subtest scores. Tables for determining total standard scores from the sum of subtest standard scores can be found in Appendix B for Form A and in Appendix F for Form B.

Other standardized scores—in addition to the standard scores with a mean of 100 and a standard deviation of 15—that can be determined include 95% confidence intervals for the standard scores, percentile ranks, grade-equivalent scores, and age-equivalent scores. The score transformations for the grade-equivalent and age-equivalent scores were determined using an "anchor test" design (Petersen, Kolen, & Hoover, 1989). The anchor test used was the BASI Survey. Groups of students at each grade level (3 through 12) completed the Comprehensive and the Survey versions of the BASI test; the determination of the grade-equivalent and age-equivalent scores was based on these data. (For more information about calculating grade- and age-equivalent scores, see Appendix C.) Guidelines for interpreting all of the various BASI test scores are presented in Chapter 3.

Chapter 5.

Psychometric Properties: Reliability and Validity

Reliability

The reliability of a test refers to the consistency or stability of scores across items within a test, across different forms of the test, or across repeat administrations of the test. The reliability of the BASI test was determined using a number of methods. Cronbach's alpha coefficients were calculated to estimate the test's internal consistency reliability and to determine standard errors of measurement. The stability of scores over time was examined with a test-retest study. Finally, a study was conducted to investigate the alternate-forms reliability of the BASI test.

Internal Consistency

Tables 5.1 and 5.2 present, for BASI Forms A and B respectively, the internal consistency reliability coefficients at each grade level for the six subtests and the three total scores. These Cronbach's alpha values were calculated using data from the Form A and Form B standardization samples described in Chapter 4. The coefficients are high (.80 or greater) for the majority of the subtests across the two forms of the test and very high (most at or above .90) for the three total scores. The subtest reliability coefficients are somewhat lower than those for the total scores because the subtests have fewer items. These internal consistency reliability coefficients were used for the calculation of confidence intervals for standard scores, as described in Chapter 3.

TABLE 5.1 Cronbach's Alpha Internal Consistency Reliability Coefficients for BASI Form A

	Level 1		Level 2		Level 3		Level 4			
BASI Subtest or Total Score	3rd grade *N* = 319	4th grade *N* = 301	5th grade *N* = 227	6th grade *N* = 224	7th grade *N* = 227	8th grade *N* = 253	9th grade *N* = 217	10th grade *N* = 225	11th grade *N* = 227	12th grade *N* = 219
Vocabulary	.93	.94	.77	.82	.80	.81	.83	.89	.90	.91
Spelling	.90	.93	.85	.88	.86	.89	.87	.87	.85	.88
Language Mechanics	.86	.91	.80	.87	.90	.88	.88	.90	.94	.93
Reading Comprehension	.87	.92	.87	.86	.89	.90	.86	.88	.91	.89
Math Computation	.82	.92	.69	.80	.81	.82	.84	.87	.90	.89
Math Application	.69	.83	.74	.80	.82	.82	.78	.71	.79	.78
Reading Total	.94	.96	.89	.90	.91	.91	.90	.93	.94	.94
Written Language Total	.92	.95	.89	.92	.93	.93	.92	.93	.94	.94
Math Total	.83	.92	.81	.87	.88	.89	.89	.87	.91	.90

TABLE 5.2 Cronbach's Alpha Internal Consistency Reliability Coefficients for BASI Form B

	Level 1		Level 2		Level 3		Level 4			
BASI Subtest or Total Score	3rd grade *N* = 273	4th grade *N* = 289	5th grade *N* = 234	6th grade *N* = 261	7th grade *N* = 210	8th grade *N* = 212	9th grade *N* = 154	10th grade *N* = 135	11th grade *N* = 204	12th grade *N* = 158
Vocabulary	.93	.93	.83	.88	.89	.81	.94	.94	.95	.96
Spelling	.92	.93	.85	.88	.85	.86	.92	.92	.93	.94
Language Mechanics	.89	.91	.84	.88	.90	.87	.95	.94	.95	.95
Reading Comprehension	.93	.94	.87	.90	.92	.85	.95	.94	.95	.96
Math Computation	.90	.93	.81	.83	.82	.84	.93	.90	.92	.92
Math Application	.85	.89	.84	.83	.81	.80	.85	.81	.85	.84
Reading Total	.96	.96	.91	.93	.94	.90	.97	.96	.97	.98
Written Language Total	.95	.95	.91	.92	.92	.92	.96	.96	.96	.97
Math Total	.93	.95	.89	.90	.89	.89	.93	.91	.93	.93

Standard Error of Measurement

The standard error of measurement (SEM) for each BASI subtest and total score at each grade level was obtained from the corresponding internal consistency reliability coefficient using the following formula:

$$SEM = SD_x \sqrt{1-r_{xx}}$$

where SD_x is the obtained standard deviation of the subtest or total composite standard score at that grade level and r_{xx} is the appropriate internal consistency reliability coefficient from Table 5.1 or Table 5.2. The resulting values are shown in Tables 5.3 and 5.4. The formula above produces SEM values for the subtests and total scores that are on the same scale as the standard scores, with a mean of 100 and a standard deviation of 15. The SEM values reported in Tables 5.3 and 5.4 vary according to the reliability coefficients on which they are based. Because reliability and standard error of measurement are inversely related (i.e., as reliability increases, SEM decreases), the SEM values for the total scores are somewhat lower than those for the subtest scores.

TABLE 5.3 Standard Errors of Measurement for BASI Form A Standard Scores

	Level 1		Level 2		Level 3		Level 4			
BASI Subtest or Total Score	3rd grade	4th grade	5th grade	6th grade	7th grade	8th grade	9th grade	10th grade	11th grade	12th grade
Vocabulary	3.90	3.60	7.72	6.27	6.86	6.44	6.55	6.24	5.75	5.64
Spelling	4.72	3.99	5.77	5.41	5.33	5.23	5.23	5.55	5.71	5.57
Language Mechanics	5.96	4.53	6.51	5.33	5.15	5.37	5.22	5.21	3.98	4.53
Reading Comprehension	5.29	4.14	5.80	5.56	5.15	4.96	5.70	5.75	5.74	5.57
Math Computation	6.06	3.83	6.83	6.13	6.30	6.24	6.18	6.11	5.84	6.32
Math Application	7.89	5.96	7.13	6.66	6.49	6.40	6.79	7.23	7.11	6.90
Reading Total	3.48	3.01	4.95	4.62	4.52	4.42	4.69	4.08	3.72	3.90
Written Language Total	4.25	3.45	4.89	4.31	3.96	3.86	4.26	4.02	3.71	3.91
Math Total	6.07	4.25	6.45	5.60	5.30	5.11	5.04	5.48	4.80	4.53

TABLE 5.4 Standard Errors of Measurement for BASI Form B Standard Scores

BASI Subtest or Total Score	Level 1		Level 2		Level 3		Level 4			
	3rd grade	4th grade	5th grade	6th grade	7th grade	8th grade	9th grade	10th grade	11th grade	12th grade
Vocabulary	4.57	4.50	5.71	4.91	5.28	5.87	3.89	4.61	4.06	3.76
Spelling	4.24	3.94	5.77	4.84	5.95	6.07	4.10	4.36	3.90	3.94
Language Mechanics	4.97	4.69	5.48	5.08	4.65	5.86	3.37	4.04	3.63	3.83
Reading Comprehension	4.02	3.54	5.65	4.61	4.64	6.04	3.41	4.07	4.28	3.36
Math Computation	4.71	4.80	6.66	6.70	6.96	6.85	4.09	5.36	5.23	5.39
Math Application	5.28	4.91	5.54	5.80	6.88	6.92	5.61	5.86	6.01	5.88
Reading Total	2.94	2.87	4.28	3.82	3.59	4.63	2.57	3.08	2.63	2.25
Written Language Total	3.14	3.22	4.36	4.33	4.22	4.24	3.01	3.04	3.03	2.76
Math Total	3.87	3.42	5.16	4.88	4.96	4.79	4.02	4.56	4.23	3.79

Test-Retest Reliability

Test-retest reliability coefficients indicate the stability of the scores obtained when the same people are tested twice over a period of time. Test-retest stability was examined using samples of students who were administered the BASI Form A subtests at Level 1 (N = 70), Level 2 (N = 74), and Level 3 (N = 53). In each case, the retest interval was two weeks. Demographics for these samples are shown in Table 5.5.[1]

TABLE 5.5 Demographics for Test-Retest Reliability Study Samples

		Level 1 Sample N = 70		Level 2 Sample N = 74		Level 3 Sample N = 53	
	Subgroup	***n***	**%**	***n***	**%**	***n***	**%**
Gender	Male	38	54.3	37	50.0	21	39.6
	Female	32	45.7	37	50.0	32	60.4
Grade	3	33	47.1				
	4	37	52.9				
	5			35	47.3		
	6			39	52.7		
	7					32	60.4
	8					21	39.6
Race/Ethnicity	White	61	87.1	67	90.5	44	83.0
	African American	2	2.9	1	1.4	2	3.8
	Hispanic/Latino	4	5.7	3	4.1	1	1.9
	Asian American	2	2.9	2	2.7	3	5.7
	American Indian	—	—	—	—	1	1.9
	Other	1	1.4	—	—	—	—
Parental Education	Less than 12th grade	—	—	—	—	1	1.9
	High school grad/GED	4	5.7	3	4.1	2	3.8
	1–3 years college	10	14.3	17	23.0	11	20.8
	4+ years college	56	80.0	53	71.6	37	69.8

Note. Percentages for some variables do not sum to 100% because of missing data.

[1] All parental education data reported in this chapter are based on the higher level of educational attainment between the parents.

Tables 5.6, 5.7, and 5.8 display, for the Level 1, Level 2, and Level 3 samples, the means and standard deviations for the two administrations of the test, the gain scores, and the test-retest reliability coefficients (which are the correlations between scores on the two administrations of the test). The trend toward small gains in mean scores was expected due to practice effects. At all three test levels, all test-retest stability coefficients were statistically significant ($p < .001$). Of the 27 total test-retest coefficients, 24 were .70 or greater, and 20 were .80 or greater. These high overall reliability values serve as an indication of the stability of BASI scores over time.

TABLE 5.6 Test-Retest Data for BASI Level 1 (Form A)

BASI Subtest or Total Score	First Test		Retest			
	Mean	*SD*	Mean	*SD*	Gain	Reliability
Vocabulary	112.2	11.6	114.6	11.0	2.4	.80
Spelling	111.8	14.5	112.7	12.6	0.9	.85
Language Mechanics	109.7	13.5	112.9	13.2	3.2	.82
Reading Comprehension	111.3	15.1	115.1	16.6	3.8	.83
Math Computation	106.1	12.2	109.3	12.3	3.2	.54
Math Application	105.4	15.1	105.3	15.8	–0.1	.74
Reading Total	110.4	12.8	113.6	13.0	3.2	.90
Written Language Total	110.3	14.2	112.9	12.9	2.6	.86
Math Total	105.0	14.5	106.8	15.1	1.8	.70

Note. $N = 70$. All reliability coefficients are statistically significant at $p < .001$.

TABLE 5.7 Test-Retest Data for BASI Level 2 (Form A)

BASI Subtest or Total Score	First Test		Retest			
	Mean	*SD*	Mean	*SD*	Gain	Reliability
Vocabulary	106.6	15.8	111.4	14.8	4.8	.80
Spelling	107.7	14.2	108.8	14.7	1.1	.87
Language Mechanics	108.6	15.5	109.4	14.4	0.8	.83
Reading Comprehension	106.8	15.3	107.9	16.9	1.1	.74
Math Computation	104.8	11.0	103.9	12.2	–0.9	.64
Math Application	105.6	14.9	106.9	13.7	1.3	.67
Reading Total	107.0	14.6	110.2	14.8	3.2	.82
Written Language Total	108.3	14.9	109.4	14.6	1.1	.90
Math Total	105.1	14.2	105.2	13.5	0.1	.78

Note. $N = 74$. All reliability coefficients are statistically significant at $p < .001$.

TABLE 5.8 Test-Retest Data for BASI Level 3 (Form A)

BASI Subtest or Total Score	First Test Mean	First Test *SD*	Retest Mean	Retest *SD*	Gain	Reliability
Vocabulary	105.8	13.7	107.9	14.4	2.1	.83
Spelling	105.1	13.9	105.7	14.5	0.6	.88
Language Mechanics	105.9	14.1	104.8	13.7	–1.1	.89
Reading Comprehension	102.1	15.6	100.6	16.8	–1.5	.84
Math Computation	106.2	12.3	108.1	13.8	2.0	.81
Math Application	102.5	14.7	101.3	15.9	–1.2	.84
Reading Total	103.6	14.1	104.0	15.4	0.4	.89
Written Language Total	104.6	12.9	104.4	13.6	–0.2	.92
Math Total	104.5	13.7	105.1	15.5	0.5	.89

Note. $N = 53$. All reliability coefficients are statistically significant at $p < .001$.

Alternate-Forms Reliability

The alternate-forms reliability of the BASI Level 1, Level 2, and Level 3 tests was established by examining the performance of samples of students who took both Form A and Form B during the same week. In all cases, Form A was administered first, followed by Form B. This was necessary due to practical and logistical considerations at the sites that agreed to participate.

The Level 1 sample consisted of 94 students, 44 (46.8%) third graders and 50 (53.2%) fourth graders. There were 39 (41.5%) male and 52 (55.3%) female students (gender was not identified for the remaining 3 students). Ten students were identified as receiving special education services. The sample for Level 2 consisted of 88 students, 48 (54.5%) fifth graders and 40 (45.5%) sixth graders. There were 45 (51.1%) male and 38 (43.2%) female students (the gender of the other 5 students was not identified). Finally, the alternate-forms reliability for Level 3 was examined in a sample of 78 students, 38 (48.7%) seventh graders and 40 (51.3%) eighth graders. There were 39 (50.0%) male and 36 (46.2%) female students (gender was not identified for 3 students). Six students were identified as receiving special education services, and one was identified as gifted.

In each of the three samples, the students' standard scores for subtests and total composites were correlated between Form A and Form B to yield the alternate-forms reliability coefficients. These coefficients are shown in Table 5.9. All coefficients were statistically significant at $p < .001$, with values ranging between .57 and .87. These values demonstrate a high level of reliability between BASI Forms A and B.

TABLE 5.9 Alternate-Forms Reliability Coefficients for BASI Levels 1, 2, and 3

BASI Subtest or Total Score	Level 1 *N* = 94	Level 2 *N* = 88	Level 3 *N* = 78
Vocabulary	.72	.57	.59
Spelling	.80	.64	.73
Language Mechanics	.67	.69	.76
Reading Comprehension	.64	.67	.72
Math Computation	.74	.61	.65
Math Application	.62	.68	.61
Reading Total	.78	.74	.79
Written Language Total	.87	.79	.81
Math Total	.79	.73	.67

Note. All coefficients are statistically significant at $p < .001$.

Validity

"Validity refers to the degree to which evidence and theory . . . provide a sound scientific basis for the proposed score interpretations" (American Educational Research Association et al., 1999, p. 9). The validity of a test therefore refers to the quality of inferences that can be made from the test score(s) and the evidence that is presented to support these inferences. In this respect, test validation is a continuous process of data gathering for various uses across settings, individuals, and situations.

The BASI Comprehensive test was designed to evaluate the test taker's achievement across three broad academic areas—reading, written language, and math—using a variety of grade-appropriate academic tasks in the subject areas of vocabulary, spelling, language mechanics, reading comprehension, math computation, and math application. The validity evidence for the BASI test as a comprehensive achievement test includes evidence of its content validity, relationships to other group-administered achievement tests, relationships to individually administered tests, performance of students with learning impairments, and performance of bilingual students.

Content Validity

Content validity refers to the degree to which the test items represent the achievement domains or content areas that the test is designed to measure. This section describes the specification of the content domains for the BASI subtests and the procedures that were followed to ensure that these domains were validly represented in the final test.

Test Content Specification

The content of each BASI subtest was determined using a test blueprint (called the "test specification matrix") that was developed and further refined in consultation with content experts using the Model Curriculum and Assessment Database (MCAD). The MCAD, a proprietary database of NCS Pearson California, is an amalgamation of local, state, and national educational standards from U.S. schools. Content area standards (called "achievement areas") were selected for each BASI subtest across grades 3 through 12. Tables 5.10 through 5.15 present the test specification matrices that guided the development of the BASI Comprehensive test across the four test levels.

TABLE 5.10 Test Specification Matrix for the Vocabulary Subtest

Achievement Area	Level 1	Level 2	Level 3	Level 4
Meaning, context, idioms	x	x	x	
Similar words, synonyms, antonyms	x	x	x	x
Prefixes, suffixes, roots	x	x	x	x
Verbal analogies		x	x	x

TABLE 5.11 Test Specification Matrix for the Spelling Subtest

Achievement Area	Level 1	Level 2	Level 3	Level 4
Prefixes and suffixes	x	x	x	x
Commonly misspelled words	x	x	x	x
Spelling rules	x	x	x	x

TABLE 5.12 Test Specification Matrix for the Language Mechanics Subtest

Achievement Area	Level 1	Level 2	Level 3	Level 4
Grammar				
Nouns, pronouns, articles	x	x	x	x
Subject/verb agreement	x	x	x	x
Adjectives, adverbs	x	x	x	x
Double negatives		x	x	
Syntax				
Capitalization	x			x
Internal punctuation	x	x	x	x
Ending punctuation	x			

TABLE 5.13 Test Specification Matrix for the Reading Comprehension Subtest

Achievement Area	Level 1	Level 2	Level 3	Level 4
Literal Comprehension				
Plot, main idea, topic sentence	x		x	x
Order of events, steps in process	x	x		
Relevant details	x	x		
Written directions	x	x		
Inferential Comprehension				
Theme, plot elements	x	x	x	x
Cause, effect	x	x	x	x
Compare, contrast			x	x
Probable outcome	x	x		
Inferences, conclusions	x	x	x	x
Purpose, technique, tone		x	x	x
Fact, opinion, persuasion, bias		x	x	x
Figurative language			x	x
Setting			x	x

TABLE 5.14 Test Specification Matrix for the Math Computation Subtest

Achievement Area	Level 1	Level 2	Level 3	Level 4
Whole numbers	x	x	x	x
Fractions	x	x	x	x
Decimals, order of operations, percents	x	x	x	x
Integers, absolute value		x	x	x
Algebra		x	x	x

TABLE 5.15 Test Specification Matrix for the Math Application Subtest

Achievement Area	Level 1	Level 2	Level 3	Level 4
Whole numbers, money	x	x	x	
Fractions, proportions	x	x	x	
Decimals, percents	x	x	x	
Word problems	x			
Measurement[a]	x	x	x	
Algebra, graphs, tables	x			
Algebra		x	x	x
Statistics, probability		x	x	x
Geometry			x	x
Word problems, exponents				x

[a] For Level 1 only, this achievement area is divided into three categories: Length, Weight, and Perimeter.

Item Development

The first step in developing the BASI item pool was to set a target number of final test items for each achievement area shown in Tables 5.10 through 5.15. Then multiple candidate items were written for each final item that was to appear on one of the subtests. For example, for every one item that was to be used on the final form of a Spelling subtest, two or three items were written and pilot tested. In addition, when standards overlapped between test levels, approximately 20% of the items were shared between levels. For example, in the Math Computation subtest, a few arithmetic operations items were shared between Levels 1 and 2 (resulting in a difficult item for Level 1 and an easy item for Level 2).

A total of 2,665 items were written and pilot tested for potential inclusion in the BASI test. Table 5.16 shows the total number of items written and piloted for each of the six subtests across all four test levels.

The item writers were teachers in the subject matter areas covered by the BASI test. They received extensive item-writing training from NCS Pearson California and had participated in other academic achievement test development projects. Each item writer was assigned to a team that was coordinated by a Pearson Education professional with extensive background in the respective content area. Before an item was submitted for consideration for the test item pool, the Pearson content expert reviewed the item, provided any necessary feedback to the item writer, and reviewed any revisions to the item. Then a team of four to five Pearson Education professionals with content expertise reviewed each item before it was submitted as a potential item for the BASI test.

All submitted items were further reviewed by the author and the Pearson Assessments BASI test development team. Furthermore, a team of teachers at various grade levels and with appropriate content area expertise served as consultants and reviewed the test items and the content coverage of the BASI achievement areas and test booklets. At each review cycle, all items were checked for possible race, gender, and regional bias.

TABLE 5.16 Number of Items on Pilot Forms of the BASI Subtests

Subtest	Number of Items Across Levels 1–4
Vocabulary	435
Spelling	435
Language Mechanics	448
Reading Comprehension	471
Math Computation	426
Math Application	450
All six subtests	2,665

Pilot Study and Item Selection

The purpose of the pilot study was to collect data on a large group of potential BASI test items from a national sample of students in grades 3 through 12. Although the final BASI Comprehensive test consists of subtests at four grade-specific levels, during the pilot study students were grouped into only three levels: grades 3–4, 5–8, and 9–12. After all initial item reviews were completed, the candidate test items for grades 3–4, 5–8, and 9–12 were distributed across six test forms for each grade range. Each test form included three of the six subtests.

The main pilot study was conducted in the fall of 2001 using a convenience sample consisting of schools and individuals recruited from across the country. The 18 test forms (6 forms at each of 3 grade-specific levels) were administered to a total of 1,874 students in grades 3 through 12 with no time limits so that individual item statistics for all items within each subtest could be calculated. A student was excluded from data analyses if his or her parents reported on the parental consent form that he or she had a learning disability or other diagnosis and/or used prescribed medication that could influence test performance. Students receiving services under English as a Second Language (ESL) programs and students who engaged in obvious response patterns (e.g., chose A as the response to every item) were also excluded from the analyses.

Traditional item analysis statistics were calculated, and each item was reviewed for its psychometric properties. On the basis of this review it was determined that there were enough items with sound psychometric properties in each content area from which to select items for the final standardization version of the test. It was also decided that separate test levels would be used for grades 5–6 and grades 7–8 in the final BASI test, a decision that was encouraged and supported by external consultants who taught grades 5–8. Finally, an additional smaller pilot study was conducted in the spring of 2002 with 450 students in grades 9–12, all of whom were tested solely on reading comprehension items. Some of these items were carried over from the first pilot study and some were created in response to the results of the study.

Following the pilot testing, the final version of the BASI test was developed. Two forms, A and B, were developed at each of four levels: Level 1 for grades 3–4, Level 2 for grades 5–6, Level 3 for grades 7–8, and Level 4 for grades 9–12. To create Forms A and B, items were matched on difficulty and discrimination within each achievement area, and pairs of items with similar values were assigned to different test forms. Form A was standardized in the fall of 2002 and Form B in the spring of 2003, as described in Chapter 4. Table 5.17 lists the final number of items for each subtest for each of the eight level-by-form combinations that make up the BASI Comprehensive test.

TABLE 5.17 Number of Items on the Final BASI Subtests

	Level 1		Level 2		Level 3		Level 4	
Subtest	**Form A**	**Form B**	**Form A**	**Form B**	**Form A**	**Form B**	**Form A**	**Form B**
Vocabulary	40	40	40	40	40	40	44	44
Spelling	46	46	40	40	40	40	40	40
Language Mechanics	38	38	39	39	38	38	40	40
Reading Comprehension	44	44	44	44	43	43	41	41
Math Computation	36	36	30	30	30	30	32	32
Math Application	30	30	30	30	36	36	36	36

Construct Validity

Current conceptions of construct validity emphasize the breadth of evidence that should be considered when evaluating how well a test measures the constructs it was designed to measure. For the BASI Comprehensive test, data concerning intercorrelations of test scores, relationships with scores on other tests of academic achievement, and performance of special populations is presented to support construct validity.

Intercorrelations of BASI Scores

The intercorrelations among the six BASI subtests and three total scores are shown separately for Levels 1, 2, 3, and 4 in Tables 5.18 through 5.21. Each table includes the values for Form A and for Form B, based on data from the standardization samples for the two forms at that test level. The values in these tables show that the two math subtests (Math Computation and Math Application) tend to correlate more highly with each other than with any of the verbal subtests (Vocabulary, Spelling, Language Mechanics, Reading Comprehension) and that most of the intercorrelations among the verbal subtests are .60 or greater. Thus, the subtest intercorrelations fit the expected pattern of significant positive relationships among all achievement areas, with a tendency for measures to correlate particularly highly within the broad areas of verbal skills and math skills.

TABLE 5.18 Intercorrelations Among BASI Subtests and Total Scores for Level 1

BASI Subtest or Total Score	1	2	3	4	5	6	7	8	9
1 Vocabulary		.79	.74	.68	.56	.58	.93	.83	.61
2 Spelling	.63		.72	.63	.53	.54	.78	.93	.59
3 Language Mechanics	.78	.62		.70	.59	.57	.78	.93	.63
4 Reading Comprehension	.72	.58	.72		.53	.62	.90	.72	.63
5 Math Computation	.53	.47	.51	.46		.67	.58	.60	.92
6 Math Application	.61	.39	.55	.58	.52		.64	.58	.91
7 Reading Total	.92	.65	.81	.93	.53	.65		.84	.67
8 Written Language Total	.78	.90	.89	.72	.54	.52	.81		.65
9 Math Total	.65	.49	.61	.59	.87	.87	.67	.60	

Note. Correlations for Form A ($N = 620$) are below the diagonal, and correlations for Form B ($N = 562$) are above the diagonal.

TABLE 5.19 Intercorrelations Among BASI Subtests and Total Scores for Level 2

BASI Subtest or Total Score	1	2	3	4	5	6	7	8	9
1 Vocabulary		.58	.73	.65	.52	.56	.90	.72	.60
2 Spelling	.59		.63	.52	.52	.45	.60	.90	.54
3 Language Mechanics	.66	.62		.71	.61	.59	.79	.90	.67
4 Reading Comprehension	.67	.59	.60		.55	.58	.91	.68	.62
5 Math Computation	.40	.41	.44	.46		.64	.59	.62	.92
6 Math Application	.47	.41	.50	.53	.52		.63	.58	.89
7 Reading Total	.91	.65	.69	.91	.47	.55		.77	.67
8 Written Language Total	.69	.90	.89	.66	.48	.50	.74		.67
9 Math Total	.50	.47	.55	.58	.85	.87	.59	.56	

Note. Correlations for Form A ($N = 451$) are below the diagonal, and correlations for Form B ($N = 495$) are above the diagonal.

TABLE 5.20 Intercorrelations Among BASI Subtests and Total Scores for Level 3

BASI Subtest or Total Score	1	2	3	4	5	6	7	8	9
1 Vocabulary		.50	.73	.66	.58	.59	.90	.68	.64
2 Spelling	.63		.65	.48	.52	.39	.54	.91	.50
3 Language Mechanics	.75	.69		.71	.59	.57	.79	.90	.64
4 Reading Comprehension	.66	.63	.69		.57	.63	.92	.65	.66
5 Math Computation	.52	.46	.50	.54		.64	.62	.62	.91
6 Math Application	.56	.51	.61	.65	.66		.66	.53	.90
7 Reading Total	.91	.69	.79	.92	.58	.67		.74	.71
8 Written Language Total	.74	.89	.92	.71	.52	.60	.80		.63
9 Math Total	.59	.53	.61	.65	.91	.91	.68	.62	

Note. Correlations for Form A (N = 480) are below the diagonal, and correlations for Form B (N = 422) are above the diagonal.

TABLE 5.21 Intercorrelations Among BASI Subtests and Total Scores for Level 4

BASI Subtest or Total Score	1	2	3	4	5	6	7	8	9
1 Vocabulary		.52	.65	.62	.54	.47	.87	.64	.56
2 Spelling	.68		.65	.49	.44	.38	.54	.91	.45
3 Language Mechanics	.74	.70		.64	.56	.44	.70	.90	.55
4 Reading Comprehension	.66	.57	.68		.50	.48	.91	.62	.53
5 Math Computation	.55	.50	.56	.59		.67	.57	.55	.91
6 Math Application	.49	.41	.48	.56	.68		.52	.45	.91
7 Reading Total	.92	.69	.78	.90	.62	.57		.68	.60
8 Written Language Total	.75	.88	.92	.66	.57	.48	.78		.55
9 Math Total	.56	.50	.56	.62	.93	.90	.64	.57	

Note. Correlations for Form A (N = 888) are below the diagonal, and correlations for Form B (N = 651) are above the diagonal.

Relationships With Group-Administered Achievement Tests

The BASI and the Iowa Achievement Tests (ITBS® and ITED®)

This study examined the relationships between the BASI Form A tests at Levels 1, 2, and 3 and the Iowa Tests of Basic Skills® (ITBS) and between BASI Level 4 (Form A) and the Iowa Tests of Educational Development® (ITED). The samples consisted of a total of 285 students attending grades 3 through 10. Table 5.22 presents the demographics of the students who took BASI Levels 1, 2, and 3 (i.e., the third through eighth graders in the sample). The BASI Level 4 sample consisted of 1 ninth grader and 100 tenth graders, of whom 44 (43.6%) were males and 57 (56.4%) were females, with 8 receiving special education services and 3 identified as gifted. Data on race/ethnicity and parental education were missing for too many of these students to allow meaningful breakdowns.

The BASI test was administered by school personnel as part of the standardization data collection process. The data for the Iowa tests were provided by the schools for the purpose of this study. All students took the two tests within a six-week period.

The means shown in Table 5.23 indicate that the students who took BASI Levels 1 through 3 scored above average on all BASI measures. Those who took BASI Level 4 received mostly below average mean scores, as shown in Table 5.24. The correlations between the BASI subtest and total scores and the Iowa subtest and total scores are shown for BASI Levels 1 through 4 in Tables 5.25 through 5.28. Statistically significant correlations were observed between subtests and total scores measuring similar constructs.

TABLE 5.22 Student Samples' Demographics for a Study Relating BASI Levels 1–3 to the ITBS

		Level 1 Sample *N* = 65		Level 2 Sample *N* = 69		Level 3 Sample *N* = 50	
	Subgroup	***n***	**%**	***n***	**%**	***n***	**%**
Gender	Male	36	55.4	35	50.7	20	40.0
	Female	29	44.6	34	49.3	30	60.0
Grade	3	31	47.7				
	4	34	52.3				
	5			33	47.8		
	6			36	52.2		
	7					29	58.0
	8					21	42.0
Race/Ethnicity	White	55	84.6	63	91.3	42	84.0
	African American	1	1.5	1	1.4	1	2.0
	Hispanic/Latino	4	6.2	3	4.3	1	2.0
	Asian American	2	3.1	2	2.9	3	6.0
	Other	2	3.1	—	—	1	2.0
Educational Placement	Regular education	61	93.8	59	85.5	38	76.0
	Special education	4	6.2	7	10.1	10	20.0
	Gifted	—	—	3	4.3	2	4.0
Parental Education	Less than 12th grade	1	1.5	1	1.4	4	8.0
	High school grad/GED	4	6.2	2	2.9	2	4.0
	1–3 years college	7	10.8	16	23.2	10	20.0
	4+ years college	53	81.5	50	72.5	34	68.0

Note. Percentages for some variables do not sum to 100% because of missing data. ITBS = Iowa Tests of Basic Skills.

TABLE 5.23 Student Samples' Performance on BASI Levels 1–3 and the ITBS

	Level 1 Sample *N* = 65		Level 2 Sample *N* = 69		Level 3 Sample *N* = 50	
BASI Test	**Mean**	***SD***	**Mean**	***SD***	**Mean**	***SD***
Vocabulary	112.8	11.2	107.2	16.1	106.1	13.6
Spelling	111.8	14.5	108.0	14.4	105.4	13.9
Language Mechanics	110.0	12.1	109.0	15.7	106.7	13.2
Reading Comprehension	111.4	15.1	107.0	15.7	103.1	14.9
Math Computation	106.4	12.1	104.8	11.1	106.7	11.9
Math Application	105.8	14.6	105.4	15.2	103.3	14.4
Reading Total	110.8	12.5	107.4	14.9	104.3	13.7
Written Language Total	110.5	13.7	108.7	15.1	105.2	12.5
Math Total	105.4	14.0	105.0	14.4	105.3	13.4
ITBS						
Vocabulary	200.5	18.9	232.4	22.0	257.2	23.3
Reading Comprehension	206.0	28.4	240.8	27.9	257.2	29.7
Total Reading	203.1	22.5	236.6	22.5	257.2	25.4
Spelling	201.9	26.7	235.0	27.6	251.7	33.9
Capitalization	192.3	31.3	234.8	36.7	266.2	53.3
Punctuation	197.7	28.7	242.8	34.6	270.5	41.9
Usage and Expression	212.4	31.1	245.2	39.2	275.7	40.1
Total Language	201.1	25.4	239.8	29.0	267.9	34.1
Math Concepts	196.6	18.5	223.9	22.5	255.0	25.9
Math Problem Solving	201.1	24.0	233.5	29.4	264.3	33.7
Math Computation	185.4	15.5	219.1	18.4	261.9	31.7
Total Math	198.9	20.3	228.7	24.2	259.6	28.1

Note. ITBS = Iowa Tests of Basic Skills.

TABLE 5.24 Student Sample's Performance on BASI Level 4 and the ITED

BASI Test	Mean	*SD*
Vocabulary	92.0	16.7
Spelling	96.3	13.0
Language Mechanics	94.4	14.3
Reading Comprehension	98.0	15.8
Math Computation	101.0	15.1
Math Application	96.4	13.7
Reading Total	95.4	13.9
Written Language Total	93.6	12.5
Math Total	98.2	14.1
ITED		
Reading Vocabulary	245.4	31.5
Reading–Literary Materials	256.6	36.2
Iowa Reading Total	250.9	31.5
Expression Advanced Skills	259.0	48.2
Expression Total	261.6	36.3
Quantitative Thinking Advanced Skills	258.6	45.2
Quantitative Thinking Advanced Skills Total	265.2	31.5

Note. $N = 101$. ITED = Iowa Tests of Educational Development.

TABLE 5.25 Correlations Between BASI Level 1 (Form A) and the ITBS

	BASI Test								
ITBS	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Vocabulary	.48**	.24	.29*	.45**	.22	.31*	.51**	.25*	.33**
Reading Comprehension	.49**	.26*	.49**	.57**	.34**	.48**	.60**	.37**	.49**
Total Reading	.51**	.26*	.43**	.55**	.31*	.43**	.59**	.33**	.45**
Spelling	.30*	.42**	.27*	.33**	.18	.14	.36**	.36**	.21
Capitalization	.28*	.21	.35**	.36**	.23	.26*	.35**	.27*	.30*
Punctuation	.31*	.25*	.34**	.37**	.28*	.34**	.38**	.29*	.38**
Usage and Expression	.47**	.39**	.39**	.46**	.28*	.37**	.52**	.40**	.40**
Total Language	.40**	.36**	.40**	.44**	.29*	.33**	.47**	.38**	.38**
Math Concepts	.36**	.22	.39**	.38**	.40**	.49**	.41**	.30*	.53**
Math Problem Solving	.38**	.20	.43**	.44**	.41**	.49**	.46**	.31*	.53**
Math Computation	.15	.25*	.21	.21	.34**	.25*	.20	.24	.35**
Total Math	.39**	.22	.43**	.43**	.43**	.51**	.46**	.32**	.56**

Note. $N = 65$. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. ITBS = Iowa Tests of Basic Skills.

* $p < .05$. ** $p < .01$.

TABLE 5.26 Correlations Between BASI Level 2 (Form A) and the ITBS

	BASI Test								
ITBS	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Vocabulary	.59**	.45**	.40**	.52**	.33**	.43**	.65**	.46**	.46**
Reading Comprehension	.53**	.53**	.64**	.67**	.42**	.63**	.68**	.64**	.61**
Total Reading	.61**	.55**	.59**	.67**	.42**	.60**	.73**	.62**	.61**
Spelling	.21	.65**	.31*	.36**	.33**	.45**	.33**	.52**	.46**
Capitalization	.24	.47**	.49**	.37**	.44**	.43**	.35**	.52**	.50**
Punctuation	.32**	.49**	.52**	.47**	.46**	.52**	.45**	.55**	.58**
Usage and Expression	.31**	.59**	.44**	.51**	.35**	.55**	.47**	.55**	.54**
Total Language	.34**	.66**	.55**	.52**	.47**	.58**	.50**	.65**	.62**
Math Concepts	.39**	.47**	.41**	.49**	.56**	.61**	.51**	.47**	.68**
Math Problem Solving	.29*	.45**	.44**	.45**	.51**	.72**	.43**	.48**	.72**
Math Computation	.27*	.28*	.42**	.40**	.53**	.42**	.39**	.38**	.55**
Total Math	.36**	.49**	.46**	.50**	.56**	.72**	.49**	.51**	.75**

Note. $N = 69$. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. ITBS = Iowa Tests of Basic Skills.

* $p < .05$. ** $p < .01$.

TABLE 5.27 Correlations Between BASI Level 3 (Form A) and the ITBS

	BASI Test								
ITBS	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Vocabulary	.75**	.60**	.71**	.66**	.49**	.56**	.80**	.76**	.60**
Reading Comprehension	.69**	.63**	.76**	.77**	.47**	.58**	.83**	.81**	.60**
Total Reading	.75**	.64**	.77**	.76**	.51**	.60**	.86**	.82**	.63**
Spelling	.48**	.91**	.51**	.55**	.56**	.40**	.60**	.83**	.53**
Capitalization	.27	.32*	.30*	.29*	.42**	.37**	.34*	.39**	.45**
Punctuation	.31*	.65**	.60**	.48**	.40**	.32*	.47**	.74**	.41**
Usage and Expression	.52**	.64**	.70**	.66**	.44**	.49**	.67**	.78**	.53**
Total Language	.49**	.82**	.66**	.63**	.54**	.45**	.64**	.87**	.56**
Math Concepts	.46**	.44**	.53**	.55**	.65**	.70**	.59**	.59**	.76**
Math Problem Solving	.52**	.40**	.62**	.61**	.64**	.67**	.64**	.60**	.74**
Math Computation	.30*	.48**	.48**	.43**	.59**	.42**	.43**	.58**	.57**
Total Math	.52**	.44**	.62**	.63**	.68**	.72**	.66**	.64**	.80**

Note. $N = 50$. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. ITBS = Iowa Tests of Basic Skills.

* $p < .05$. ** $p < .01$.

TABLE 5.28 Correlations Between BASI Level 4 (Form A) and the ITED

	BASI Test								
ITED	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Reading Vocabulary	.80	.49	.57	.57	.44	.51	.76	.59	.54
Reading–Literary Materials	.69	.49	.59	.64	.34	.49	.73	.60	.47
Iowa Reading Total	.79	.53	.62	.65	.42	.54	.80	.64	.54
Expression Advanced Skills	.67	.51	.60	.70	.51	.56	.75	.62	.61
Expression Total	.70	.55	.62	.69	.54	.54	.77	.66	.61
Quantitative Thinking Advanced Skills	.60	.37	.51	.48	.59	.58	.59	.49	.66
Quantitative Thinking Advanced Skills Total	.60	.40	.53	.52	.66	.57	.63	.52	.70

Note. $N = 101$. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. All correlations are statistically significant at $p < .01$. ITED = Iowa Tests of Educational Development.

BASI Level 4 (Form A) and the Tests of Adult Basic Education (TABE®)

In this study, BASI Level 4 (Form A) was administered to 40 high school students in grades 9 (n = 14; 35%), 10 (n = 8; 20%), 11 (n = 10; 25%), and 12 (n = 8; 20%). Three students were identified as receiving special education services, and one was identified as gifted. There were 22 (55%) male and 18 (45%) female students. The group consisted of 17 (42.5%) whites, 1 (2.5%) African American, 3 (7.5%) American Indians, 3 (7.5%) "other," and 16 (40.0%) Hispanics. The parents of these individuals reported their own educational background as follows: 2 (5.0%) less than 12th grade, 18 (45.0%) high school graduate or GED, 13 (32.5%) 1–3 years of college, 4 (10.0%) 4 or more years of college. Parental education was not reported for the remaining 3 (7.5%) students.

These students completed the TABE 7/8 Complete Battery and BASI Level 4 (Form A) within a period of six weeks. TABE scores were made available by the school district for the purpose of this study. Table 5.29 shows the sample's BASI and TABE subtest and total scores. The sample performed in the lower end of the average range across the majority of the BASI subtests, scoring lowest on Reading Comprehension and Math Computation.

Table 5.30 provides correlations between the BASI subtest and total scores and those for the TABE. Despite the somewhat restricted range of many of the BASI scores (as indicated by standard deviations less than 15), many statistically significant correlations of moderate magnitude were obtained between the two instruments.

TABLE 5.29 Student Sample's Performance on BASI Level 4 (Form A) and the TABE

BASI Test	Mean	*SD*
Vocabulary	92.9	14.4
Spelling	97.7	9.3
Language Mechanics	92.7	14.1
Reading Comprehension	88.1	15.0
Math Computation	87.7	12.9
Math Application	90.9	13.4
Reading Total	90.7	12.0
Written Language Total	91.4	11.2
Math Total	88.7	12.3
TABE		
Reading Comprehension	528.0	70.8
Math Computation	512.1	82.9
Math Application	523.4	72.4
Language	521.9	83.6
Spelling	520.7	77.5
Total Math	517.5	72.7
Total Battery	522.2	68.6

Note. N = 40. TABE = Tests of Adult Basic Education.

TABLE 5.30 Correlations Between BASI Level 4 (Form A) and the TABE

	BASI Test								
TABE	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Reading Comprehension	.52**	.38*	.69**	.49**	.26	.35*	.59**	.61**	.33*
Math Computation	.37*	.40*	.51**	.29	.41**	.46**	.41**	.50**	.51**
Math Application	.40*	.34*	.56**	.43**	.43**	.45**	.50**	.50**	.50**
Language	.37*	.51**	.72**	.55**	.42**	.39*	.56**	.68**	.47**
Spelling	.20	.49**	.53**	.43**	.17	.20	.40*	.56**	.23
Total Math	.41**	.40*	.57**	.38*	.45**	.49**	.48**	.53**	.54**
Total Battery	.47**	.48**	.73**	.52**	.42**	.45**	.60**	.67**	.50**

Note. N = 40. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. TABE = Tests of Adult Basic Education.

* $p < .05$. ** $p < .01$.

BASI Level 4 (Form B) and the TABE

The relationship between Level 4 (Form B) of the BASI test and the TABE 7/8 Complete Battery was examined in a study with 161 high school students in grade 9 (n = 31; 19.3%), grade 10 (n = 43; 26.7%), grade 11 (n = 49; 30.4%), and grade 12 (n = 38; 23.6%). Thirty-three students were receiving special education services, and three were identified as gifted. There were 94 (58.4%) males and 67 (41.6%) females in the sample. The majority of the students were white (90 or 55.9%), and the remaining were as follows: 5 (3.1%) African American, 4 (2.5%) American Indian, 2 (1.2%) Asian American, 7 (4.3%) "other," and 53 (32.9%) Hispanic/Latino. The parental education of these individuals was as follows: 16 (9.9%) less than 12th grade, 69 (42.9%) high school graduate or GED, 50 (31.1%) 1–3 years of college, and 26 (16.1%) 4 or more years of college.

As in the study described previously, these students completed the BASI and TABE tests within a period of six weeks, and the school district provided TABE scores for the purpose of this study. Table 5.31 shows the sample's performance on the BASI test and the TABE. Overall, the sample earned BASI scores in the average range. Table 5.32 shows that statistically significant correlations were again obtained between the BASI and TABE subtest and total scores.

TABLE 5.31 Student Sample's Performance on BASI Level 4 (Form B) and the TABE

BASI Test	Mean	*SD*
Vocabulary	100.4	14.4
Spelling	96.3	13.3
Language Mechanics	100.2	12.6
Reading Comprehension	100.3	15.4
Math Computation	95.9	12.5
Math Application	95.7	10.4
Reading Total	99.1	12.9
Written Language Total	97.9	12.4
Math Total	94.5	10.7
TABE		
Reading Comprehension	534.0	74.4
Math Computation	527.6	71.4
Math Application	541.3	70.8
Language	525.9	82.1
Spelling	526.2	75.5
Total Math	534.1	66.0
Total Battery	531.0	66.5

Note. N = 161. TABE = Tests of Adult Basic Education.

TABLE 5.32 Correlations Between BASI Level 4 (Form B) and the TABE

	BASI Test								
TABE	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Reading Comprehension	.44**	.39**	.50**	.37**	.30**	.19*	.46**	.49**	.31**
Math Computation	.34**	.29**	.35**	.28**	.41**	.30**	.36**	.35**	.44**
Math Application	.39**	.34**	.41**	.32**	.39**	.24**	.41**	.42**	.40**
Language	.41**	.41**	.54**	.37**	.26**	.21**	.46**	.53**	.30**
Spelling	.25**	.57**	.36**	.30**	.15	.08	.33**	.54**	.14
Total Math	.40**	.34**	.42**	.32**	.43**	.29**	.42**	.42**	.45**
Total Battery	.47**	.42**	.55**	.40**	.36**	.25**	.50**	.54**	.39**

Note. N = 161. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. TABE = Tests of Adult Basic Education.

* $p < .05$. ** $p < .01$.

Relationships Between the BASI Comprehensive and Survey Versions

As part of the standardization of the BASI Comprehensive version and the BASI Survey version, both tests were administered to groups of students in grades 3 through 12 in various locations across the country. This allowed an analysis of the relationships between the Comprehensive and Survey versions of the test. The demographic characteristics of the 1,500 students who took Comprehensive Form A and the BASI Survey during the fall of 2002 are shown in Table 5.33. Demographics for the 1,519 students who took Comprehensive Form B and the Survey version during the spring of 2003 are shown in Table 5.34. Tables 5.35 and 5.36 show, for the Form A and Form B samples respectively, the BASI test means and standard deviations (the Vocabulary, Language Mechanics, Reading Comprehension, Math Computation, and Math Application scores for the BASI Survey are standard scores with a mean of 10 and a standard deviation of 3). Mean Total Verbal scores on the Survey were similar to mean Reading Total and Written Language Total scores on the Comprehensive test, and mean Total Math scores were similar across the two versions.

Both the Comprehensive and the Survey versions of the BASI test yield scores for Vocabulary, Language Mechanics, Reading Comprehension, Math Computation, and Math Application. Table 5.37 shows how each of these scores correlated between the two versions of the BASI test, with values provided for each of the eight student samples defined by the Comprehensive test level and form taken. All correlations obtained between the same skill areas measured by the two versions of the test were highly statistically significant ($p < .001$), providing support for the concurrent validity of both test versions. Overall, the results of this study suggest that the BASI Survey can be used with confidence when a quick estimate of verbal and math skills is needed.

TABLE 5.33 Demographic Characteristics of Students Who Completed BASI Comprehensive Form A and the BASI Survey

		Level 1 Sample *N* = 270		Level 2 Sample *N* = 237		Level 3 Sample *N* = 518		Level 4 Sample *N* = 475	
	Subgroup	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Gender	Male	125	46.3	119	50.2	251	48.5	216	45.5
	Female	145	53.7	118	49.8	267	51.5	259	54.5
Grade	3	142	52.6						
	4	128	47.4						
	5			116	48.9				
	6			121	51.1				
	7					274	52.9		
	8					244	47.1		
	9							106	22.3
	10							133	28.0
	11							118	24.8
	12							118	24.8
Race/Ethnicity	White	143	53.0	164	69.2	400	77.2	347	73.1
	African American	30	11.1	21	8.9	17	3.3	17	3.6
	Hispanic/Latino	82	30.4	37	15.6	64	12.4	75	15.8
	Asian American	7	2.6	7	3.0	19	3.7	17	3.6
	American Indian	5	1.9	1	0.4	5	1.0	9	1.9
	Pacific Islander	—	—	—	—	4	0.8	4	0.8
	Other	3	1.1	6	2.5	4	0.8	5	1.1
	Not reported	—	—	1	0.4	5	1.0	1	0.2
Parental Education	Less than 12th grade	48	17.8	27	11.4	16	3.1		
	High school grad/GED	76	28.1	63	26.6	73	14.1		
	1–3 years college	74	27.4	78	32.9	168	32.4		
	4+ years college	71	26.3	68	28.7	261	50.4		
	Not reported	1	0.4	1	0.4	—	—		

Note. Too many students in the Level 4 sample were missing parental education data to allow meaningful breakdowns.

TABLE 5.34 Demographic Characteristics of Students Who Completed BASI Comprehensive Form B and the BASI Survey

		Level 1 Sample *N* = 459		Level 2 Sample *N* = 409		Level 3 Sample *N* = 287		Level 4 Sample *N* = 364	
	Subgroup	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Gender	Male	231	50.3	195	47.7	152	53.0	181	49.7
	Female	228	49.7	214	52.3	135	47.0	183	50.3
Grade	3	216	47.1						
	4	243	52.9						
	5			237	57.9				
	6			172	42.1				
	7					145	50.5		
	8					142	49.5		
	9							68	18.7
	10							87	23.9
	11							108	29.7
	12							101	27.7
Race/Ethnicity	White	221	48.1	240	58.7	209	72.8	268	73.6
	African American	23	5.0	20	4.9	10	3.5	15	4.1
	Hispanic/Latino	184	40.1	119	29.1	45	15.7	56	15.4
	Asian American	12	2.6	12	2.9	15	5.2	10	2.7
	American Indian	9	2.0	4	1.0	4	1.4	5	1.4
	Pacific Islander	2	0.4	1	0.2	—	—	1	0.3
	Other	4	0.9	7	1.7	2	0.7	6	1.6
	Not reported	4	0.9	6	1.5	2	0.7	3	0.8
Parental Education	Less than 12th grade	72	15.7	35	8.6	4	1.4		
	High school grad/GED	80	17.4	67	16.4	36	12.5		
	1–3 years college	119	25.9	119	29.1	70	24.4		
	4+ years college	141	30.7	159	38.9	156	54.4		
	Not reported	47	10.2	29	7.1	21	7.3		

Note. Too many students in the Level 4 sample were missing parental education data to allow meaningful breakdowns.

TABLE 5.35 Student Samples' Performance on BASI Comprehensive Form A and the BASI Survey

	Level 1 Sample *N* = 270		Level 2 Sample *N* = 237		Level 3 Sample *N* = 518		Level 4 Sample *N* = 475	
Comprehensive Scores	**Mean**	***SD***	**Mean**	***SD***	**Mean**	***SD***	**Mean**	***SD***
Vocabulary	101.1	14.8	101.9	15.8	104.3	13.9	104.1	18.9
Spelling	104.4	14.6	102.7	15.9	103.7	13.4	102.4	16.0
Language Mechanics	101.8	14.2	100.9	15.3	104.2	14.5	104.0	17.7
Reading Comprehension	102.9	15.7	101.1	15.3	104.1	14.5	101.4	18.4
Math Computation	104.4	13.9	102.7	12.9	104.0	13.6	103.9	18.6
Math Application	101.4	14.7	103.1	15.0	102.7	14.4	100.5	15.2
Reading Total	100.1	14.7	101.6	14.7	104.0	13.6	102.5	16.6
Written Language Total	101.5	15.2	101.4	15.7	103.1	13.3	102.6	16.3
Math Total	101.2	15.4	102.0	15.7	103.5	14.6	102.5	16.1
Survey Scores								
Vocabulary	9.5	3.3	10.5	3.5	11.3	3.2	11.7	4.1
Language Mechanics	10.0	3.2	10.8	3.0	11.3	2.8	11.1	3.2
Reading Comprehension	10.5	2.8	10.7	3.0	10.7	2.7	10.8	3.8
Math Computation	10.0	3.1	10.7	2.8	11.4	3.0	10.5	3.3
Math Application	9.7	3.3	11.0	3.2	11.9	3.3	10.9	3.7
Verbal Skills Total	99.3	13.0	102.7	14.0	104.6	12.7	105.4	17.5
Math Skills Total	97.3	14.4	102.3	13.1	106.3	14.2	102.0	15.9

TABLE 5.36 Student Samples' Performance on BASI Comprehensive Form B and the BASI Survey

	Level 1 Sample *N* = 459		Level 2 Sample *N* = 409		Level 3 Sample *N* = 287		Level 4 Sample *N* = 364	
Comprehensive Scores	**Mean**	***SD***	**Mean**	***SD***	**Mean**	***SD***	**Mean**	***SD***
Vocabulary	102.5	17.5	103.1	14.2	106.2	14.4	102.0	16.9
Spelling	103.4	14.3	101.3	14.6	104.9	14.4	101.2	16.8
Language Mechanics	104.3	15.0	102.3	15.0	107.2	15.1	103.6	17.3
Reading Comprehension	100.7	15.3	101.4	16.4	104.9	16.1	101.3	17.1
Math Computation	105.0	17.0	104.9	16.5	107.8	16.8	101.7	15.8
Math Application	103.2	15.2	103.0	14.0	107.5	16.5	101.0	16.7
Reading Total	100.2	15.2	101.1	14.8	105.9	14.8	100.5	15.7
Written Language Total	103.0	13.7	102.6	15.4	105.9	13.8	102.2	17.1
Math Total	103.3	15.9	104.0	15.8	105.9	15.3	100.6	16.2
Survey Scores								
Vocabulary	9.4	3.4	10.0	3.5	11.3	3.3	10.6	4.2
Language Mechanics	10.0	3.4	10.3	3.2	11.4	2.8	10.2	3.3
Reading Comprehension	10.1	2.8	10.5	3.4	10.8	2.9	10.0	3.7
Math Computation	9.9	3.3	10.7	3.1	11.3	3.0	9.8	3.8
Math Application	9.4	3.3	10.8	3.3	12.0	3.2	10.1	3.9
Verbal Skills Total	98.4	14.1	100.4	15.2	105.2	13.2	100.5	17.2
Math Skills Total	96.4	14.6	101.9	14.3	106.4	14.2	97.6	18.2

TABLE 5.37 Correlations Between BASI Comprehensive and Survey Scores in the Same Skill Areas

BASI Scores	**Level 1 Form A Sample *N* = 270**	**Level 1 Form B Sample *N* = 459**	**Level 2 Form A Sample *N* = 237**	**Level 2 Form B Sample *N* = 409**	**Level 3 Form A Sample *N* = 518**	**Level 3 Form B Sample *N* = 287**	**Level 4 Form A Sample *N* = 475**	**Level 4 Form B Sample *N* = 364**
Vocabulary	.55	.47	.64	.59	.64	.54	.65	.59
Language Mechanics	.52	.57	.61	.65	.64	.60	.65	.59
Reading Comprehension	.46	.45	.45	.52	.56	.41	.57	.42
Math Computation	.39	.42	.47	.48	.56	.56	.61	.60
Math Application	.38	.30	.43	.36	.53	.50	.55	.53

Note. Correlations in the first row are between Vocabulary scores on the BASI Comprehensive version and the Survey version, those in the second row are between Language Mechanics scores on the two versions, etc. All correlations are statistically significant at $p < .001$.

Relationships With Individually Administered Achievement Tests

The BASI and the Wechsler Individual Achievement Test®–Second Edition (WIAT®-II)

One of the goals of the BASI Comprehensive test is to complement individually administered achievement tests in psychoeducational evaluations. The purpose of this study was to examine the relationships between scores on the BASI test and the WIAT-II. The WIAT-II is a widely used individually administered comprehensive test that is often used to diagnose academic difficulties and assist with the determination of possible placement in special education.

The samples consisted of 41 students in grades 3 through 8 who completed BASI Form A and the WIAT-II and another 30 third through eighth graders who completed BASI Form B and the WIAT-II. The WIAT-II was administered along with the BASI test by trained examiners in a counterbalanced order. Table 5.38 shows the demographics of the two samples.

The means and standard deviations in Table 5.39 show that the two samples performed comparably on the BASI test forms and the WIAT-II, with mean scores in the high-average to above-average range. Statistically significant correlations were obtained between the subtest scores and total scores of the two tests that measure similar achievement areas, as shown in Tables 5.40 and 5.41. These data support the use of the BASI test as a measure of academic achievement that yields results similar to those from the WIAT-II.

TABLE 5.38 Student Samples' Demographics for a Study Relating the BASI Test to the WIAT-II

		Completed BASI Form A and WIAT-II *N* = 41		Completed BASI Form B and WIAT-II *N* = 30	
	Subgroup	***n***	**%**	***n***	**%**
Gender	Male	21	51.2	15	50.0
	Female	20	48.8	15	50.0
Grade	3	9	22.0	7	23.3
	4	13	31.7	8	26.7
	5	2	4.9	2	6.7
	6	7	17.1	6	20.0
	7	4	9.8	3	10.0
	8	6	14.6	4	13.3
Race/Ethnicity	White	37	90.2	26	86.7
	African American	—	—	1	3.3
	Hispanic/Latino	1	2.4	1	3.3
	Asian American	1	2.4	1	3.3
	Other	1	2.4	—	—
Parental Education	Less than 12th grade	1	2.4	—	—
	High school grad/GED	4	9.8	2	6.7
	1–3 years college	8	19.5	6	20.0
	4+ years college	28	68.3	20	66.7

Note. Percentages for some variables do not sum to 100% because of missing data. WIAT-II = Wechsler Individual Achievement Test–Second Edition.

TABLE 5.39 Student Samples' Performance on BASI Forms A and B and the WIAT-II

	Form A Sample *N* = 41		Form B Sample *N* = 30	
BASI Test	**Mean**	***SD***	**Mean**	***SD***
Vocabulary	110.8	12.3	112.0	12.0
Spelling	113.5	14.2	110.1	12.6
Language Mechanics	112.1	10.6	114.6	12.0
Reading Comprehension	111.8	10.8	111.4	13.7
Math Computation	108.3	11.4	114.8	14.3
Math Application	108.0	15.5	112.4	9.6
Reading Total	110.8	10.1	110.9	11.2
Written Language Total	113.1	12.2	112.7	11.4
Math Total	108.3	13.8	113.8	9.6
WIAT-II				
Word Reading	109.4	10.2	107.9	10.2
Reading Comprehension	103.9	9.9	105.2	9.9
Numerical Operations	112.1	10.9	113.7	10.6
Math Reasoning	109.3	13.1	110.3	13.4
Math Composite	112.2	13.0	113.8	13.1
Spelling	112.6	11.9	112.6	12.1
Written Expression	106.0	10.0	106.4	8.7
Written Language Composite	110.4	12.2	110.6	11.9

Note. WIAT-II = Wechsler Individual Achievement Test–Second Edition.

TABLE 5.40 Correlations Between BASI Form A and the WIAT-II

	BASI Test								
WIAT-II	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Word Reading	.57**	.53**	.46**	.57**	.28	.25	.69**	.55**	.29
Reading Comprehension	.50**	.38*	.55**	.56**	.27	.40**	.63**	.48**	.39*
Numerical Operations	.15	.23	.39*	.44**	.40*	.41**	.37*	.33*	.47**
Math Reasoning	.35*	.28	.61**	.49**	.49**	.52**	.50**	.47**	.58**
Math Composite	.29	.30	.58**	.52**	.52**	.52**	.49**	.47**	.60**
Spelling	.46**	.69**	.53**	.57**	.26	.25	.61**	.70**	.28
Written Expression	.42**	.52**	.53**	.53**	.38*	.34*	.52**	.60**	.39*
Written Language Composite	.49**	.69**	.59**	.61**	.34*	.32*	.64**	.73**	.36*

Note. $N = 41$. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. WIAT-II = Wechsler Individual Achievement Test–Second Edition.

* $p < .05$. ** $p < .01$.

TABLE 5.41 Correlations Between BASI Form B and the WIAT-II

	BASI Test								
WIAT-II	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Word Reading	.63**	.44*	.64**	.54**	.28	.42*	.69**	.61**	.43*
Reading Comprehension	.71**	.34	.59**	.45*	.15	.71**	.66**	.50**	.48**
Numerical Operations	.09	.19	.29	.00	.43*	.20	.07	.28	.45*
Math Reasoning	.41*	.26	.49**	.20	.39*	.44*	.35	.42*	.53**
Math Composite	.30	.26	.47**	.13	.49**	.37*	.26	.42*	.57**
Spelling	.52**	.46**	.48**	.36*	.11	.36	.51**	.53**	.26
Written Expression	.48**	.40*	.50**	.54**	.10	.27	.55**	.48**	.20
Written Language Composite	.54**	.47**	.53**	.46*	.11	.33	.55**	.56**	.25

Note. $N = 30$. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. WIAT-II = Wechsler Individual Achievement Test–Second Edition.

* $p < .05$. ** $p < .01$.

BASI Form A and the Woodcock-Johnson® Psychoeducational Battery–III (WJ III®)

The WJ III (Woodcock, McGrew, & Maher, 2001) is another widely used individually administered achievement test that was studied in relation to the BASI test. Forty students in grades 3 through 8 completed BASI Form A and the WJ III battery. The tests were administered by trained examiners in counterbalanced order.

The sample consisted of 6 (15%) third graders, 8 (20%) fourth graders, 6 (15%) fifth graders, 6 (15%) sixth graders, 8 (20%) seventh graders, and 6 (15%) eighth graders. There were 17 (42.5%) males and 23 (57.5%) females. Most of the students were white (34; 85.0%), with 2 (5.0%) African Americans, 2 (5.0%) Asian Americans, 1 (2.5%) Hispanic, and 1 (2.5%) for whom race was not reported. The highest level of parental education was 1–3 years of college for 9 (22.5%) and 4 or more years of college for 30 (75.0%), with parental education not reported for 1 subject (2.5%).

Means and standard deviations on the BASI and WJ III measures are shown in Table 5.42. Overall, the mean scores were quite similar across the two tests. Table 5.43 shows that there were many statistically significant correlations between BASI and WJ III scores. These results provide further evidence that the BASI test can be used to complement individually administered achievement tests.

TABLE 5.42 Student Sample's Performance on BASI Form A and the WJ III

BASI Test	Mean	*SD*
Vocabulary	106.4	14.3
Spelling	107.8	14.9
Language Mechanics	108.1	13.1
Reading Comprehension	108.0	15.6
Math Computation	106.1	12.0
Math Application	104.9	15.1
Reading Total	106.8	14.2
Written Language Total	107.3	14.0
Math Total	105.3	13.8
WJ III		
Letter-Word Identification	104.0	10.5
Reading Vocabulary	112.7	13.6
Passage Comprehension	101.4	10.7
Reading Comprehension	108.3	13.6
Spelling	107.5	14.5
Punctuation & Capitals	108.5	14.9
Writing Samples	104.6	11.5
Editing	106.8	10.2
Basic Writing Skills	107.8	11.7
Calculation	112.5	9.0
Quantitative Concepts	102.6	13.1
Math Reasoning	102.8	10.2
Applied Problems	103.8	10.6
Academic Skills	109.8	12.7
Academic Applications	103.3	9.1

Note. $N = 40$. WJ III = Woodcock-Johnson Psychoeducational Battery–III.

TABLE 5.43 Correlations Between BASI Form A and the WJ III

	BASI Test								
WJ III	**VO**	**SP**	**LM**	**RC**	**MC**	**MA**	**Read**	**Writ**	**Math**
Letter-Word Identification	.47**	.50**	.41**	.36*	.41**	.52**	.48**	.50**	.56**
Reading Vocabulary	.44**	.43**	.31	.36*	.53**	.54**	.48**	.40*	.63**
Passage Comprehension	.47**	.53**	.42**	.53**	.46**	.64**	.57**	.52**	.66**
Reading Comprehension	.51**	.54**	.41**	.49**	.56**	.64**	.58**	.51**	.71**
Spelling	.40*	.66**	.40*	.32*	.60**	.44**	.43**	.58**	.59**
Punctuation & Capitals	.39*	.50**	.39*	.37*	.66**	.53**	.47**	.48**	.69**
Writing Samples	.18	.32*	.33*	.45**	.11	.29	.38*	.35*	.25
Editing	.47**	.71**	.31	.41**	.43**	.25	.51**	.57**	.37*
Basic Writing Skills	.51**	.77**	.43**	.41**	.63**	.42**	.54**	.66**	.60**
Calculation	.08	.10	−.02	−.03	.60**	.29	.04	.03	.53**
Quantitative Concepts	.32*	.25	.09	.14	.57**	.37*	.28	.17	.55**
Math Reasoning	.33*	.22	.03	.24	.52**	.44**	.33*	.11	.56**
Applied Problems	.25	.14	−.03	.30	.33*	.39*	.31	.04	.42**
Academic Skills	.40*	.55**	.34*	.27	.64**	.51**	.40*	.49**	.67**
Academic Applications	.45**	.44**	.28	.56**	.52**	.67**	.58**	.38*	.71**

Note. $N = 40$. VO = Vocabulary, SP = Spelling, LM = Language Mechanics, RC = Reading Comprehension, MC = Math Computation, MA = Math Application, Read = Reading Total, Writ = Written Language Total, Math = Math Total. WJ III = Woodcock-Johnson Psychoeducational Battery–III.

* $p < .05$. ** $p < .01$.

Performance of Special Education Groups

The consent form completed by parents prior to data collection for the fall 2002 standardization of BASI Form A included the following question: "Does your child receive any special services or extra help in school or has he/she been diagnosed with any of the following?" Parents who answered yes to this question were asked to choose all that applied from among 12 categories of possible services or diagnoses that included "gifted," 10 specific kinds of impairments, and "other." The accuracy of parental reports of services and diagnoses was not verified with school records.

Seven of the categories reflecting specific impairments, plus the "other" category, were identified as applicable for 20 or more students. Table 5.44 provides the gender, grade level, and parental education breakdowns for each of these eight groups.

BASI Form A means and standard deviations for each of these eight groups are shown in Table 5.45. All of the mean scores in this table are less than 100, meaning that each of the eight services/diagnoses groups scored below average on every BASI subtest and total score. The groups identified as having a learning disability in reading, writing, and math received the lowest overall mean scores, whereas the mean scores for the attention deficit disorder, hearing impaired, and "other impairment" groups were all between 93.5 and 98.7. Overall, these results suggest that the BASI test can be used effectively to identify students with learning difficulties as part of a screening process or during a comprehensive psychoeducational evaluation.

TABLE 5.44 Description of Students Receiving Special Education Services

	Learning Disability: Reading *N* = 135	Learning Disability: Writing *N* = 76	Learning Disability: Math *N* = 88	Attention Deficit Disorder *N* = 142	Hearing Impairment *N* = 24	Emotional Disability *N* = 20	Speech or Language Disability *N* = 97	Other *N* = 57
Gender								
Male	76	47	48	101	18	11	60	31
Female	59	29	40	41	6	9	37	26
Grade								
3	26	7	12	20	3	3	24	12
4	29	17	14	10	—	—	15	5
5	18	6	15	17	5	1	14	6
6	15	10	10	26	6	1	9	11
7	8	8	5	14	1	2	11	8
8	14	9	6	21	5	2	7	8
9	3	1	3	8	1	2	5	3
10	12	11	12	12	1	3	5	2
11	4	2	5	7	—	2	3	1
12	6	5	6	7	2	4	4	1
Parental Education								
Less than 12th grade	20	9	15	2	1	1	10	3
High school grad/GED	35	21	30	28	6	5	24	11
1–3 years college	47	21	22	51	4	6	26	22
4+ years college	26	20	12	58	12	6	26	20
Not reported	7	5	9	3	1	2	11	1

TABLE 5.45 BASI Form A Means and Standard Deviations of Special Education Groups

BASI Subtest or Total Score	Learning Disability: Reading *N* = 135		Learning Disability: Writing *N* = 76		Learning Disability: Math *N* = 88		Attention Deficit Disorder *N* = 142		Hearing Impairment *N* = 24		Emotional Disability *N* = 20		Speech or Language Disability *N* = 97		Other *N* = 57	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Vocabulary	83.5	12.5	82.2	12.5	82.5	12.6	98.1	16.6	96.5	18.1	86.7	14.0	90.3	15.5	97.8	15.7
Spelling	84.5	14.0	82.5	12.0	84.3	13.3	96.4	15.9	98.7	17.2	87.6	15.6	95.4	16.4	94.5	15.5
Language Mechanics	83.6	12.2	81.9	12.2	81.2	11.1	95.9	15.3	93.5	15.8	87.1	15.6	88.3	14.5	95.9	15.7
Reading Comprehension	84.8	12.1	84.1	12.9	85.1	12.5	94.1	16.5	95.3	19.7	88.2	13.8	91.7	17.1	97.0	16.4
Math Computation	93.1	14.0	92.7	12.9	88.4	11.5	98.2	14.5	97.5	16.0	89.7	11.5	98.5	13.0	98.5	14.5
Math Application	88.6	12.5	87.4	13.0	85.8	9.9	96.9	14.0	97.6	15.2	88.2	11.3	94.0	14.6	98.6	15.9
Reading Total	83.0	11.1	82.2	11.5	82.9	11.2	95.5	15.0	95.5	18.0	87.2	11.5	89.8	15.2	96.7	15.0
Written Language Total	81.1	13.0	79.4	11.8	79.7	12.1	94.7	15.6	95.1	16.2	85.7	14.7	90.1	15.7	94.0	15.7
Math Total	88.2	13.4	87.6	12.9	83.9	10.2	96.3	14.6	96.0	16.1	87.4	11.3	94.5	14.3	97.6	15.4

Performance of Bilingual Students

The parental consent form that was used in the standardization of BASI Form A asked if the child spoke another language in addition to English. A total of 402 students (194 [48.3%] males and 208 [51.7%] females) in grades 3 through 12 were reportedly bilingual. For these 402 students, BASI Level 1 was administered to 130 (32.3%), Level 2 to 95 (23.6%), Level 3 to 71 (17.7%), and Level 4 to 106 (26.4%). Three students were identified as receiving special education services, and nine were identified as gifted. The majority of the students (246; 61.2%) were Hispanic/Latino, 83 (20.6%) were white, 9 (2.2%) were African American, 5 (1.2%) were American Indian, 44 (10.9%) were Asian American, 2 (0.5%) were Pacific Islanders, 8 (2.0%) were "other," and 5 (1.2%) were missing data on race/ethnicity. The parents of these students reported their own educational background as follows: 97 (24.1%) less than 12th grade, 80 (19.9%) high school graduate or GED, 108 (26.9%) 1–3 years of college, 102 (25.4%) 4 or more years of college, and 15 (3.7%) did not report their level of education.

Table 5.46 presents the means and standard deviations of the sample's performance on Form A of the BASI test. Overall, the sample earned scores in the average range, suggesting that the BASI test is suitable for bilingual students.

TABLE 5.46 BASI Form A Means and Standard Deviations of Bilingual Students

BASI Subtest or Total Score	Mean	Standard Deviation
Vocabulary	95.8	14.8
Spelling	100.5	15.2
Language Mechanics	96.3	14.5
Reading Comprehension	97.2	15.1
Math Computation	102.1	14.3
Math Application	98.9	13.7
Reading Total	95.6	13.7
Written Language Total	97.1	14.7
Math Total	99.7	13.6

Summary of BASI Psychometric Properties

This chapter presented evidence regarding the reliability and validity of the BASI Comprehensive test. Reliability was established using estimates of internal consistency, test-retest reliability, and alternate-forms reliability. This evidence indicates that BASI test users can have confidence that the scores are highly reliable within subtests and total composites, over time, and across forms.

In addition, the chapter offered evidence for the validity of the BASI Comprehensive test as a measure of academic achievement. Validity was defined as the quality of inferences that can be made from the BASI scores. Validity evidence was established with several methods. The section on content validity described the specification of the content domains for the BASI subtests and the procedures that were followed to ensure the valid representation of these domains in the final test. Empirical studies of the relationships between the BASI Comprehensive test and other group and individually administered tests showed that the BASI test generally yields similar overall scores for students attending regular education classes. Additional studies detailed the performance of students with various impairments and of bilingual students. The findings from all of these studies provide evidence that supports the validity of the BASI test as a measure of academic achievement.

References

Aiken, L. R. (1987). *Assessment of intellectual functioning.* Boston: Allyn and Bacon.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1999). *Standards for educational and psychological testing.* Washington, DC: American Educational Research Association.

Atkinson, L. (1991). Three standard errors of measurement and the Wechsler Memory Scale–Revised. *Psychological Assessment,* 3, 136–138.

Dudek, F. J. (1979). The continuing misinterpretation of the standard error of measurement. *Psychological Bulletin, 86,* 335–337.

Glutting, J. J., McDermott, P. A., & Stanley, J. C. (1987). Resolving differences among methods of establishing confidence limits for test scores. *Educational and Psychological Measurement, 47,* 607–614.

Hood, A. B., & Johnson, R. W. (1991). *Assessment in counseling: A guide to the use of psychological assessment procedures.* Alexandria, VA: American Association for Counseling and Development.

Kaufman, A. S., & Kaufman, N. L. (1998). *Kaufman Test of Educational Achievement (K-TEA).* Circle Pines, MN: AGS Publishing.

Nitko, A. J. (2001). *Educational assessment of students* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Petersen, N. S., Kolen, M. J., & Hoover, H. D. (1989). Scaling, norming, and equating. In R. Linn (Ed.), *Educational measurement* (3rd ed., pp. 221–262). Washington, DC: American Council on Education/Macmillan.

Salvia, J., & Ysseldyke, J. E. (1981). *Assessment in special and remedial education.* Boston: Houghton Mifflin.

Sattler, J. M. (1992). *Assessment of children* (3rd ed.). San Diego, CA: Jerome M. Sattler, Publisher, Inc.

Stanley, J. C. (1971). Reliability. In R. L. Thorndike (Ed.), *Educational measurement* (2nd ed., pp. 356–442). Washington, DC: American Council on Education.

Wechsler, D. (2001). *Wechsler Individual Achievement Test–II (WIAT-II).* San Antonio, TX: Harcourt Assessment, Inc.

Woodcock, R. W., McGrew, K. S., & Maher, N. (2001). *Woodcock-Johnson Psychoeducational Battery–III (WJ III).* Itasca, IL: Riverside Publishing.


PEARSON
Assessments