ETS 2018 Research Publications — Year in Review

Since its founding in 1947, ETS has conducted and disseminated scientific research to support its products and services and to advance the measurement and education fields.

In keeping with these goals, ETS is committed to making its research freely available to the professional community and to the general public.

This is a list of 2018 ETS research publications – those that ETS published as well as those that appeared in independent journals and books. In most cases, ETS staff members or affiliates were the lead authors of the independent publications listed. Publication titles link to abstracts, citation records, or full text where available.

Published accounts of ETS research, including papers in the ETS Research Report series, undergo a formal peer-review process by ETS staff to ensure that they meet established scientific and professional standards.

All such ETS-conducted peer reviews are in addition to any reviews that outside organizations may provide as part of their own publication processes.

Due to production deadlines, some 2018 ETS publications may not be listed. Find citations in this guide and many more — as well as access to the full text for ETS-published works — at http://search.ets.org/researcher.
Contents

This guide to 2018 ETS research publications list works in these areas:

K-12 Teaching, Learning, and Education Policy ..................................................... 3
Cognitive Science ........................................................................................................ 7
Accessibility ............................................................................................................... 11
English Language Learning and Assessment ......................................................... 11
Language Learning and Assessment ....................................................................... 14
International and National Large-Scale Assessment ........................................... 14
Automated Scoring, Natural Language Processing, and Multimodal ................. 15
Higher Education and Workforce Readiness ....................................................... 19
Technology ............................................................................................................. 23
Validity Research ..................................................................................................... 24
Statistics and Psychometrics .................................................................................. 25
K-12 Teaching, Learning, and Education Policy

Real World Compromises: Policy and Practice Impacts of Kindergarten Entry Assessment-Related Validity and Reliability Challenges

D. J. Ackerman

Comparing the Potential Utility of Kindergarten Entry Assessments to Provide Evidence of English Learners’ Knowledge and Skills

D. J. Ackerman

A System’s View of California’s Teacher Education Pipeline

C. A. Bell, R. S. White, & M. E. White
Getting Down to Facts II: Technical Report, p1–90

What Are the Most Significant Aspects of the Advancing Human Assessment Book? (Short Video)

R. E. Bennett

Significant Aspects in ETS’s Seven Decades of Advancing Human Assessment (Short Video)

R. E. Bennett

An Engineering Design Formative Assessment: A Work in Progress

D. Brockway & K. Llort

The Challenges of Writing in School: Conceptualizing Writing Development Within a Sociocognitive Framework

P. Deane
Educational Psychologist, v53 n4, p280–300

Writing Processes in Short Written Responses to Questions Probing Prior Knowledge

P. Deane, T. O’Reilly, S.-F. Chao, & K. Dreier
ETS Research Report No. RR-18-39
Behavioral Differences Between Retyping, Drafting, and Editing: A Writing Process Analysis

P. DEANE, A. ROTH, A. LITZ, V. GOSWAMI, F. STECK, M. LEWIS, & T. RICHTER
ETS Research Memorandum No. RM-18-06

The Case for Scenario-Based Assessment of Written Argumentation

P. DEANE, Y. SONG, P. VAN RIJN, T. O’REILLY, M. E. FOWLES, R. E. BENNETT, J. P. SABATINI, & M. ZHANG
Reading and Writing, Online First

The Reading for Understanding Initiative: Key Findings and Implications for States and Districts

EDUCATIONAL TESTING SERVICE & COUNCIL OF CHIEF STATE SCHOOL OFFICERS (CCSSO)

ETS’s Contributions to Education Policy (Short Video)

M. E. GOERTZ

Changes and Challenges in Education Policy (Short Video)

M. E. GOERTZ

The Development of a Quadratic Functions Learning Progression and Associated Task Shells

E. A. GRAF, J. H. FIFE, H. HOWELL, & E. MARQUEZ
ETS Research Report No. RR-18-47

Modeling Basic Writing Processes From Keystroke Logs

H. GUO, P. DEANE, P. VAN RIJN, M. ZHANG, & R. E. BENNETT

Reaping the Benefits of Assessment for Learning: Achievement, Identity, and Equity

M. HERITAGE & E. C. WYLIE
ZDM, v50 n4, p729–741

Alignment Between the ProEthica® Program and the Model Code of Ethics for Educators

T. HUTCHINGS, C. REESE, & J. STERN
ETS Research Memorandum No. RM-18-12
Anchored Graphical Representations: A Graphical Alternative to Traditional Just Qualified Candidate Descriptors for Licensure Tests

P. KANNAN, R. J. TANNENBAUM, & D. HEBERT
ETS Research Report No. RR-18-40

Providing Formative Feedback to Pre-service Teachers as they Practice Facilitation of High-Quality Discussions in Simulated Mathematics and Science Methods Classrooms

P. KANNAN, D. ZAPATA-RIVERA, J. MIKESKA, A. BRYANT, R. LONG, & H. HOWELL
Paper in Proceedings of Society for Information Technology & Teacher Education International Conference, p1570–1575

Educational Testing Service

I. R. KATZ & J. P. JOHNSON

Abbott Preschool at 20: Building on Success

S. KENYON
ETS Policy Notes, v25 n1

Formative Assessment and the Role of Teachers’ Content Area

C. J. LYON, E. C. WYLIE, D. BROCKWAY, & E. MAVRONIKOLAS
School Science and Mathematics, v118 n5, p144–155

Investigating Science Content Knowledge and Teaching Practices for Beginning Elementary School Teachers

M. MARTIN-RAUGH, J. MIKESKA, J. STEINBERG, & J. MINSKY
ETS Research Memorandum No. RM-18-08

Assessing Elementary Teachers’ Content Knowledge for Teaching Science for the ETS® Educator Series: Pilot Results

J. N. MIKESKA, C. KURZUM, J. H. STEINBERG, & J. XU
ETS Research Report No. RR-18-20

Assessing the Writing Process: A Review of Current Practice

N. ODENDAHL & P. DEANE
ETS Research Memorandum No. RM-18-10
How Do People Read the Passages During a Reading Comprehension Test?
The Effect of Reading Purpose on Text Processing Behavior

T. O’REILLY, G. FENG, J. P. SABATINI, Z. WANG, & J. GORIN
*Educational Assessment*, v23 n4, p277–295

2017 Society for Text and Discourse Conference Special Issue:
Introductory Remarks

T. O’REILLY, D. N. RAPP, & J. P. SABATINI
*Discourse Processes*, v55 n5–6, p443

Administrators’ Uses of Teacher Observation Protocol in Different Rating
Contexts

Y. QI, C. A. BELL, N. D. JONES, J. M. LEWIS, M. W. WITHERSPOON, & A. REDASH
ETS Research Report No. RR-18-18

Crosscutting Literature on STEAM Ecosystems, Expectancy Value Theory,
and Social Emotional Learning: A Metadata Synthesis

S. H. RIKOON, B. FINN, T. JACKSON, & P. INGLESE
ETS Research Report No. RR-18-33

Retooling Literacy Education for the Twenty-First Century: Key Findings of
the Reading for Understanding Initiative and Their Implications

J. P. SABATINI, T. O’REILLY, & N. A. DOOREY
ETS Center for Research on Human Capital and Education Policy Report/Council of Chief State
School Officers (CCSSO)

Relating Reading Comprehension to Oral Reading Performance in the NAEP
Fourth-Grade Special Study of Oral Reading

J. P. SABATINI, Z. WANG, & T. O’REILLY
*Reading Research Quarterly*, Online First

A Focus on Educational Assessment: Advancing African-American
Education Excellence

S. SAUNDERS
*ETS Policy Notes*, v24 n2

Improving STEM Program Quality in Out-of-School-Time: Tool Development
and Validation

A. M. SHAH, E. C. WYLIE, D. H. GITOMER, & G. NOAM
*Science Education*, v102 n2, p238–259
An Exploration of Preservice Teachers’ Reasoning About Teaching Mathematics to English Language Learners

S. TURKAN & E. J. DE JONG
Teacher Education Quarterly, v45 n2, p37-60

Agreement of Teachers on Evaluating Assessments of Learning Progressions in English Language Arts and Mathematics

P. W. VAN RIJN, E. A. GRAF, M. ARIELI-ATTALI, & Y. SONG
ETS Research Report No. RR-18-11

Decoding and Reading Comprehension: A Test of the Decoding Threshold Hypothesis

Z. WANG, J. P. SABATINI, T. O’REILLY, & J. P. WEEKS
Journal of Educational Psychology, Online First

Defining Personalized Writing Burst Measures of Translation Using Keystroke Logs

M. ZHANG, J. HAO, P. DEANE, & C. LI
Paper in Proceedings of the 11th International Conference on Educational Data Mining, p549–552

Cognitive Science

Technology Enhanced Innovative Assessment: Development, Modeling, and Scoring From an Interdisciplinary Perspective

IN H. JIAO & R. W. LISSITZ (EDS.)
Book; Information Age Publishing

ETS staff members were coauthors of three chapters in this 11-chapter volume:

C. AGARD & A. A. VON DAVIER
The Virtual World and Reality of Testing: Building Virtual Assessments, Chapter 1, p1–30

R. E. BENNETT, R. ZWICK, & P. VAN RIJN
Innovations in K-12 Assessment: A Review of CBAL Research, Chapter 9, p197–247

V. J. SHUTE, A. C. JEONG, & D. ZAPATA-RIVERA
Visualizing the Process of Change in Learner Beliefs, Chapter 11, p265–295

Exploring Social and Cognitive Dimensions of Collaborative Problem Solving in an Open Online Simulation-Based Task

J. ANDREWS-TODD & C. M. FORSYTH
Computers in Human Behavior, Online First
Identifying Profiles of Collaborative Problem Solvers in an Online Electronics Environment

J. Andrews-Todd, C. M. Forsyth, J. Steinberg, & A. A. Rupp
Paper in Proceedings of the 11th International Conference on Educational Data Mining, p 239–245

The Effect of Unsuccessful Retrieval on Children’s Subsequent Learning

P. Carneiro, A. Lapa, & B. Finn
Journal of Experimental Child Psychology, v166, p400–420

Handbook of Multiple Source Use

In J. L. G. Braasch, I. Bråten, & M. T. McCrudden (eds.)
Book; Routledge

Five ETS staff members contributed to this 29-chapter volume:

J. Coiro, J. R. Sparks, & J. M. Kulikowich
Assessing Online Collaborative Inquiry and Social Deliberation Skills as Learners Navigate Multiple Sources and Perspectives, Chapter 27, p485–501

J. P. Sabatini, T. O’Reilly, Z. Wang, & K. Dreier
Scenario-Based Assessment of Multiple Source Use, Chapter 25, p447–465

Metacognitive Evaluations During Science Simulations: How Do Ratings of Confidence and Understanding Relate to Science Assessment Inquiry Processes?

B. Finn
Archives of Scientific Psychology, v6 n1, p117–129

Learning More From Feedback: Elaborating Feedback With Examples Enhances Concept Learning

B. Finn, R. Thomas, & K. A. Rawson
Learning and Instruction, v54, p104–113

Improving the Measurement of Cognitive Skills Through Automated Conversations

G. T. Jackson, K. E. Castellano, D. Brockway, & B. Lehman

Measures of Agreement to Assess Attribute-Level Classification Accuracy and Consistency for Cognitive Diagnostic Assessments

M. S. Johnson & S. Sinharay
Journal of Educational Measurement, v55 n4, p635–664
Personality Assessment

**H. J. Kell**

**Unifying Vocational Psychology’s Trait and Social–Cognitive Approaches Through the Cognitive-Affective Personality System**

**H. J. Kell**
*Review of General Psychology*, v22 n3, p343–354

**The Great Debate: General Ability and Specific Abilities in the Prediction of Important Outcomes (Editorial)**

**H. J. Kell & J. W. B. Lang**
*Journal of Intelligence*, v6 n3, Article 39, p1–8

**Terman Study of the Gifted**

**H. J. Kell & J. Wai**

**Student Emotions in Conversation-Based Assessments**

**B. Lehman & D. Zapata-Rivera**
*IEEE Transactions on Learning Technologies*, v11 n1, p41–53

**Deep Comprehension: Multi-Disciplinary Approaches to Understanding, Enhancing, and Measuring Comprehension, 1st Edition**

In K. K. Millis, D. L. Long, J. P. Magliano, & K. Wiemer (eds.)
Book; Routledge

Six ETS staff members contribute to this 20-chapter volume:

**K. K. Millis, C. M. Forsyth, K. Wiemer, P. Wallace, & C. Steciuch**
*Learning Scientific Inquiry from a Serious Game that Uses AutoTutor*, Part 2, Chapter 14, p180–194

**T. O’Reilly, J. P. Sabatini, & Z. Wang**
*Using Scenario-Based Assessments to Measure Deep Learning*, Part 3, Chapter 15, p 197–208

**B. Lehman & G. T. Jackson**
*Eliciting Deeper Evidence through Conversation-Based Assessments*, Part 3, Chapter 16, p209–223

**Sociocognitive Foundations of Educational Measurement**

**R. J. Mislevy**
Book; Routledge
Facilitating Graph Comprehension Using a Cognitive Model of Successful Solution Processes

J. MOON, G. FENG, J. LENTINI, & D. ZAPATA-RIVERA
ETS Research Memorandum No. RM-18-07

Simulations of Thought: The Role of Computational Cognitive Models in Assessment

J. MOON, B. FINN, M. LAMAR, & I. R. KATZ
R&D Connections, n26

Affordances of Item Formats and Their Effects on Test-Taker Cognition Under Uncertainty

J. MOON, M. KEEHNER, & I. R. KATZ
Educational Measurement: Issues and Practice, Online First

Essay Items

J. A. RIOS & T. WANG

The Influences of Communication and Group Dynamics on Collaborative Problem Solving Task Performance

J. STEINBERG, J. ANDREWS-TODD, & C. M. FORSYTH
Paper in NERA Conference Proceedings 2018

What Was Striking About Early Creativity Research? (Short Video)

L. J. STRICKER

Why Does "Cognitive Styles" Research Matter? (Short Video)

L. J. STRICKER

Giftedness

J. WAI & H. J. KELL

Identifying and Addressing Unexpected Responses in Conversation-Based Assessments

D. ZAPATA-RIVERA, B. LEHMAN, J. R. SPARKS, H.-H. POR, & K. JAMES
ETS Research Memorandum No. RM-18-13
Accessibility

Trends in Performance and Growth by Students With and Without Disabilities on Five State Summative Assessments

H. M. BUZICK & J. P. WEEKS
*Applied Measurement in Education*, v31 n4, p269–282

Usability of American Sign Language Videos for Presenting Mathematics Assessment Content

E. G. HANSEN, R. C. LOEW, C. C. LAITUSIS, P. KUSHALNAGAR, C. M. PAGLIARO, & C. KURZ
*Journal of Deaf Studies and Deaf Education*, v23 n3, p284–294

Framework for the Design of Accessible Intelligent Tutoring Systems

E. G. HANSEN, D. ZAPATA-RIVERA, & J. WHITE

Fair Testing and the Role of Accessibility

E. A. STONE & L. L. COOK

English Language Learning and Assessment

Domain Description: Validating the Interpretation of the TOEFL iBT® Speaking Scores for International Teaching Assistant Screening and Certification Purposes

E. COTOS & Y.-R. CHUNG
ETS Research Report No. RR-18-45, TOEFL-RR-85

Designing a Prototype Tablet-Based Learning-Oriented Assessment for Middle School English Learners: An Evidence-Centered Design Approach

ETS Research Report No. RR-18-46

Analytic, Holistic, and Primary Trait Marking Scales

L. DAVIS
In J. I. Liontas (ed.) *The TESOL Encyclopedia of English Language Teaching*. Wiley, p1–6
Useful Assessment and Evaluation in Language Education

In J. McE. Davis, J. M. Norris, M. E. Malone, T. H. McKay, & Y.-A. Son (Eds.)
Book; Georgetown University Press

Three ETS staff members are coauthors of one chapter and one ETS staff member is author of another chapter in this 14-chapter book:

L. Davis, V. Timpe-Laughlin, L. Gu, & G. Ockey
*Face-to-Face Speaking Assessment in the Digital Age: Interactive Speaking Tasks Online*, Part 2, Chapter 7, p115–130

M. T. Kane
*Validating Assessments for Meaning and Usefulness*, Part 3, Chapter 14, p235–248

Exploring the Factor Structure of a K–12 English Language Proficiency Assessment

M. Faulkner-Bond, M. K. Wolf, C. S. Wells, & S. G. Sireci
*Language Assessment Quarterly*, v15 n2, p130–149

Evaluating English Language Learners’ Conversations: Man vs. Machine

C. M. Forsyth, C. Luce, D. Zapata-Rivera, G. T. Jackson, K. Evanini, & Y. So
*Computer Assisted Language Learning*, Online First

Examining the Applications and Opinions of the TOEFL ITP® Assessment Series Test Scores in Three Countries

J. Golubovich, F. Tolentino, & S. Papageorgiou
ETS Research Report No. RR-18-44, TOEFL-RR-84

A Minority Within a Minority

E. Jenner & M. Konkel
*Language Magazine*

Evaluating Invariance in Test Performance for Adolescent Learners of English as a Foreign Language

V. Manna, H. Yoo, & L. Monfils
ETS Research Report No. RR-18-21, TOEFL-RR-82

An Investigation of the Predictive Validity of the TOEFL iBT® Test at an English-Medium University in Turkey

J. O’Dwyer, E. Kantarcioğlu, & C. Thomas
ETS Research Report No. RR-18-43, TOEFL-RR-83
Adding Value to Second-Language Listening and Reading Subscores: Using a Score Augmentation Approach

S. PAPAGEORGIOU & I. CHOI

The Research Foundation for the TOEIC® Tests: A Compendium of Studies: Volume III

D. E. POWERS & J. SCHMIDGALL (eds.)
Book; ETS

ETS staff members were lead authors or coauthors of the 13-chapter volume, which covers such topics as expanding the question formats of the TOEIC® Speaking Test, the statistical analyses for the updated TOEIC® Listening and Reading Test, and the consistency of TOEIC® speaking scores across ratings and tasks.

Do the TOEFL iBT® Section Scores Provide Value-Added Information to Stakeholders?

Y. SAWAKI & S. SINHARAY
*Language Testing*, v34 n4, p529–556

Best Practices for Comparing TOEIC® Speaking Test Scores to Other Assessments and Standards: A Score User's Guide

J. SCHMIDGALL
ETS Research Report No. RM-18-05

A Good Fit? Examining the Alignment Between the TOEFL Junior® Standard Test and the English as a Foreign Language Curriculum in Berlin, Germany

V. TIMPE-LAUGHLIN
ETS Research Memorandum No. RM-18-11

Universal Design for Learning: Review and Recommendations for EFL Instruction

V. TIMPE-LAUGHLIN, & M. K. LAUGHLIN
*Inklusiver Englischunterricht*, p161–173

Young Adolescent EFL Students’ Writing Skill Development: Insights from Assessment Data

M. K. WOLF, S. OH, Y. WANG, & F. S. TSUTAGAWA
*Language Assessment Quarterly*, v15 n4, p311–329
Measuring English Language Proficiency Across Subgroups: Using Score Equity Assessment to Evaluate Test Fairness

H. Yoo, V. F. Manna, L. F. Monfils, & H.-J. Oh

*Language Testing*, Online First

Language Learning and Assessment

Developing C-tests for Estimating Proficiency in Foreign Language Research

J. M. Norris (Ed.)

R. Grotjahn, C. Harsch, & G. Sigott (series eds.) Language Testing and Evaluation series. v39

Book; Peter Lang International Academic Publishers

An ETS staff member is author of the introductory chapter:

J. M. Norris

*Developing and Investigating C-tests in Eight Languages*, Chapter 1, p7–33

Test Review: TestDaF

J. M. Norris & A. Drackert

*Language Testing*, v35 n1, p149–157

Pragmatics in Task-Based Language Assessment: Opportunities and Challenges

V. Timpe-Laughlin

*Task-Based Approaches to Teaching and Assessing Pragmatics*, Chapter 12, p288–304

Formative Assessment of Mathematics and Language: Applying Companion Learning Progressions to Reveal Greater Insights to Teachers

E. C. Wylie, M. I. Bauer, A. L. Bailey, & M. Heritage


International and National Large-Scale Assessment

Large-scale Assessments in Education

D. Hastedt & E. Gonzalez (eds.-in-chief)

Journal; Springer Open

How Have Assessments Helped Us Understand Adult Literacy? (Short Video)

I. S. Kirsch
How Have Large-Scale Surveys of Adults Evolved? (Short Video)

I. S. Kirsch

Data Analytics and Psychometrics: Informing Assessment Practices

In H. Jiao, R. W. Lissitz, & A. Van Wie (Eds.)
Book; Information Age Publishing

Two ETS staff members contributed to this 10-chapter volume:

R. J. Mislevy
On Integrating Psychometrics and Learning Analytics in Complex Assessments, Chapter 1, p1–52

Q. He, M. von Davier, & Z. Han
Exploring Process Data in Problem-Solving Items in Computer-Based Large-Scale Assessments: Case Studies in PISA and PIAAC, Chapter 2, p53–76

Bridging Validity and Evaluation to Match International Large-Scale Assessment Claims and Country Aims

M. E. Oliveri, D. Rutkowski, & L. Rutkowski
ETS Research Report No. RR-18-27

Development and Implementation of a Machine-Supported Coding System for Constructed-Response Items in PISA

K. Yamamoto, Q. He, H. J. Shin, & M. von Davier
Psychological Test and Assessment Modeling, v60 n2, p145–164

Automated Scoring, Natural Language Processing, and Multimodal

A Corpus of Non-Native Written English Annotated for Metaphor

B. Beigman Klebanov, C. W. Leong, & M. Flor

Developing an E-rater® Advisory to Detect Babel-Generated Essays

A. Cahill, M. Chodorow, & M. Flor
The Journal of Writing Analytics, v2, p203–224

End-to-End Neural Network Based Automated Speech Scoring

L. Chen, J. Tao, S. Ghaffarzadegan, & Y. Qian
Automated Scoring of Nonnative Speech Using the *SpeechRater℠ v.5.0* Engine

ETS Research Report No. RR-18-10

Improvements to an Automated Content Scoring System for Spoken CALL Responses: The ETS Submission to the Second Spoken CALL Shared Task

K. EVANINI, M. MULHOLLAND, R. UBALE, Y. QIAN, R. A. PUGH, V. RAMANARAYANAN, & A. CAHILL

Game-Based Spoken Dialog Language Learning Applications for Young Students

K. EVANINI, V. TIMPE-LAUGHLIN, E. TSUPRUN, I. BLOOD, J. LEE, J. BRUNO, V. RAMANARAYANAN, P. LANGE, & D. SUENDERMANN-OEFT
Paper in *Proceedings from the 2018 Interspeech Conference*, p548–549

Catching Idiomatic Expressions in EFL Essays

M. FLOR & B. BEIGMAN KLEBANOV
Paper in *Proceedings of the Workshop on Figurative Language Processing*, p34–44

A Semantic Role-Based Approach to Open-Domain Automatic Question Generation

M. FLOR & B. RIORDAN

Towards an Intelligent Tutor for Teamwork: Responding to Human Sentiments

J. HAO, D. ZAPATA-RIVERA, A. C. GRAESSER, Z. CAI, X. HU, & B. GOLDBERG
In R. A. Sottilare, A. C. Graesser, X. Hu, & A. M. Sinatra (eds.) *Design Recommendations for Intelligent Tutoring Systems: Team Tutoring*. U.S. Army Research Laboratory, v6, Section III, Chapter 14, p151–159

A Report on the 2018 VUA Metaphor Detection Shared Task

C. W. LEONG, B. BEIGMAN KLEBANOV, & E. SHUTOVA
Paper in *Proceedings of the Workshop on Figurative Language Processing*, p56–66
Toward Large-Scale Automated Scoring of Scientific Visual Models
C. W. Leong, L. Liu, R. Ubale, & L. Chen
Paper in Proceedings of the Fifth Annual ACM Conference on Learning at Scale, p1-4

Evaluating On-Device ASR on Field Recordings From an Interactive Reading Companion
A. Loukina, N. Madnani, B. Beigman Klebanov, A. Misra, G. Angelov, & O. Todic
Paper in Proceedings of the IEEE Workshop on Spoken Language Technology (SLT), p964–970

Using Exemplar Responses for Training and Evaluating Automated Speech Scoring Systems
A. Loukina, K. Zechner, J. V. Bruno, & B. Beigman Klebanov
Paper in Proceedings of the 13th Workshop on Innovative Use of NLP for Building Educational Applications, p1–12

Writing Mentor: Self-Regulated Writing Feedback for Struggling Writers
N. Madnani, J. Burstein, N. Elliot, B. Beigman Klebanov, D. Napolitano, S. Andreyev, & M. Schwartz

Automated Scoring: Beyond Natural Language Processing
N. Madnani & A. Cahill
Paper in Proceedings of the 27th International Conference on Computational Linguistics, p1099–1109

A Robust Microservice Architecture for Scaling Automated Scoring Applications
ETS Research Report No. RR-18-14

Validation of Automated Scoring for a Formative Assessment That Employs Scientific Argumentation
L. Mao, O. L. Liu, K. C. Roohr, V. Belur, M. Mulholland, H.-S. Lee, & A. Pallant
Educational Assessment, v23 n 2, p121–138

FACTS: A Hierarchical Task-Based Control Model of Speech Incorporating Sensory Feedback
B. Parrell, V. Ramanarayanan, S. Nagarajan, & J. Houde
Interview With an Avatar: A Real-Time Cloud-Based Virtual Dialog Agent for Educational and Job Training Applications

V. RAMANARAYANAN, D. PAUTLER, P. LANGE, & D. SUENDERMANN-OEFT
ETS Research Memorandum No. RM-18-02

Toward Scalable Dialog Technology for Conversational Language Learning: A Case Study of the TOEFL® MOOC

V. RAMANARAYANAN, D. PAUTLER, P. LANGE, E. TSUPRUN, R. UBALE, K. EVANINI, & D. SUENDERMANN-OEFT

Analysis of Speech Production Real-time MRI

V. RAMANARAYANAN, S. TILSEN, M. PROCTOR, J. TÖGER, L. GOLDSTEIN, K. S. NAYAK, & S. S. NARAYANAN
Computer Speech & Language, v52, p1–22

Understanding Mean Score Differences Between the e-rater® Automated Scoring Engine and Humans for Demographically Based Groups in the GRE® General Test

C. RAMINENI & D. WILLIAMSON
ETS Research Report No. RR-18-12, ETS GRE-18-01

Designing, Evaluating, and Deploying Automated Scoring Systems with Validity in Mind: Methodological Design Decisions

A. A. RUPP
Applied Measurement in Education, v31 n3, p191–214

Using Automated Systems to Evaluate Spoken English

H. SANDBERG
Focus on ETS R&D, n9

Towards Evaluating Narrative Quality in Student Writing

S. SOMASUNDARAN, M. FLOR, M. CHODOROW, H. MOLLOY, B. GYAWALI, & L. MCCULLA
Transactions of the Association for Computational Linguistics, v6, p91–106

Simulated Speaking Environments for Language Learning: Insights from Three Cases

T. SYDORENKO, T. F. H. SMITS, K. EVANINI, & V. RAMANARAYANAN
Computer Assisted Language Learning, Online First
Comparison of Human Rater and Automated Scoring of Test Takers’ Speaking Ability and Classification Using Item Response Theory

Z. Wang & Y. Sun

*Psychological Test and Assessment Modeling*, v60 n1, p81–100

A Comparison of Grammatical Proficiency Measures in the Automated Assessment of Spontaneous Speech

S.-Y. Yoon & S. Bhat

*Speech Communication*, v99, p221–230

Word-Embedding Based Content Features for Automated Oral Proficiency Scoring

S.-Y. Yoon, A. Loukina, C. M. Lee, M. Mulholland, X. Wang, & I. Choi

Paper in *Proceedings of SemDeep-3, the 3rd Workshop on Semantic Deep Learning*, p12–22

Higher Education and Workforce Readiness

Social Networks and Minority Male College Access: The “Tip of the Iceberg” Phenomena

D. Cárdenas Elliott, M. W. Brenneman, L. Carney, & S. B. Robbins

*Urban Education*, v53 n10, p1210–1237

Moving Forward: Policies, Planning, and Promoting Access of Hispanic College Students

A. G. de los Santos, Jr., L. I. Rendón, G. F. Keller, A. Acereda, E. M. Bensimón, & R. J. Tannenbaum (Eds.)

Book; Bilingual Press

New Directions: Assessment and Preparation of Hispanic College Students

A. G. de los Santos, Jr., L. I. Rendón, G. F. Keller, A. Acereda, E. M. Bensimón, & R. J. Tannenbaum (Eds.)

Book; Bilingual Press

One ETSer contributed the foreword and five ETSers coauthored a chapter in this 12-chapter book:

W. Macdonald

Foreword, pp. ix–x

A. Acereda, J. Ríos, R. Markle, M. E. Oliveri, & O. L. Liu

*Signaling Success for Hispanic Students in a Changing Higher Education Landscape*, Chapter 1, p13–34
Providing a Context for Interpreting Predictions of Job Performance

**N. J. Dorans**
ETS Research Report No. RR-18-38

Skills and Earnings in the Full-Time Labor Market

**N. Fogg, P. Harrington, & I. Khatiwada**
The Impact of Human Capital in the American Labor Market Series
ETS Center for Research on Human Capital and Education

Shifting Paradigms of Student Success: Integrating Noncognitive Assessment Into Hispanic-Serving Institutions

**M. Holzman & R. Markle**
ETS Research Memorandum No. RM-18-09

Investigating the Factor Structure of the iSkills™ Assessment

**I. R. Katz, F. Rijmen, & Y. Attali**
ETS Research Report No. RR-18-25

A Psychological Approach to Human Capital

**H. J. Kell, S. B. Robbins, R. Su, & M. Brenneman**
ETS Research Report No. RR-18-30

Springboard for Success: How Social and Emotional Learning Helps Students in Getting to, Through and Beyond College

**S. Kenyon**
*ETS Policy Notes*, v25 n2

The Validity of GRE® General Test Scores for Predicting Academic Performance at U.S. Law Schools

**D. M. Klieger, B. Bridgeman, R. J. Tannenbaum, F. A. Cline, & M. Olivera-Aguilar**
ETS Research Report No. RR-18-26

Development of the Behaviorally Anchored Rating Scales for the Skills Demonstration and Progression Guide

ETS Research Report No. RR-18-24

Inequality, Education, Workforce Preparedness, and Complex Problem Solving

**P. C. Kyllonen**
*Journal of Intelligence*, v6 n3, Article 33, p1–17
Statistical Properties of the GRE® Psychology Test Subscores

Y. LIU, F. ROBIN, H. YOO, & V. MANNA
ETS Research Report No. RR-18-19, ETS GRE-18-02

Assessing Civic and Intercultural Competency in Higher Education: The ETS HEIghten® Approach

O. L. LIU, K. C. ROOHR, & J. A. RIOS
ETS Research Report No. RR-18-23

Assessing College Critical Thinking: Preliminary Results from the Chinese HEIghten® Critical Thinking Assessment

*Higher Education Research & Development*, v37 n5, p999–1014

Noncognitive Skills and Student Success: Relevance, Assessment, and Strategies

R. MARKLE & S. H. RIKOON
In R. C. Black (ed.) *Critical Assessment and Strategies for Increased Student Retention*. IGI Global, Section 1, Chapter 1, p1–19

A Generalizability Theory Study to Examine Sources of Score Variance in Third-Party Evaluations Used in Decision-Making for Graduate School Admissions

D. F. MCCAFFREY, M. E. OLIVERI, & S. HOLTZMAN
ETS Research Report No. RR-18-37, ETS GRE-18-03

Doesn’t Get Better With Age: Predicting Millennials’ Disconnection

C. M. MILLETT & M. J. C. KEVELSON

The Experts Weigh in: High-Achieving, Low-Income Students Reflect on Their Experience in and the Impact of a College Access Program

C. M. MILLETT & M. J. C. KEVELSON
ETS Research Report No. RR-18-04

Positioning for College Success: The Evaluation of the Princeton University Preparatory Program’s Work With High-Achieving, Low-Income Students

C. M. MILLETT & M. J. C. KEVELSON
ETS Research Report No. RR-18-03
Parents' Insights on Their Perceptions of and Their Children's Experiences in a College Access Program

C. M. MILLETT, E. ROJAS, & M. J. C. KEVELSON
ETS Research Report No. RR-18-05

Examining How College Promise Programs Promote Student Academic and Financial Readiness

C. M. MILLETT, S. R. SAUNDERS, & D. FISHTIEIN

The Logic Underlying a Research-Based College Access Program: Depicting the Theory of Change of the Princeton University Preparatory Program

C. M. MILLETT, S. R. SAUNDERS, & M. J. C. KEVELSON
ETS Research Report No. RR-18-07

College Access Program Alumni Reflect on Their Experiences in the Program and Its Impact on Their Skills and College Outcomes

C. M. MILLETT, S. R. SAUNDERS, & M. J. C. KEVELSON
ETS Research Report No. RR-18-06

Using the SuccessNavigator® Assessment to Assess Change Over Time: A Longitudinal Measurement Invariance Study

S. H. RIKOON & B. MIDKIFF
ETS Research Report No. RR-18-29

Developing the HEIghten® Civic Competency and Engagement Outcomes Assessment: Prototypes and Structured Interviews

K. C. ROOH, K. BURKANDER, & J. BOCHENEK
ETS Research Memorandum No. RM-18-04

A Preliminary Investigation of the Factors Related to the Design and Scoring of Video-Based Oral Communication Performance Tasks in Higher Education

K. C. ROOH, K. BURKANDER, & L. MAO
ETS Research Report No. RR-18-09

College Admissions: Is There a Better Way?

H. SANDBERG
Focus on ETS R&D, n8
Measuring What Students Learn in College

H. Sandberg

Focus on ETS R&D, n10

Too Big to Fail: Millennials on the Margins

A. Sands & M. Goodman

The ETS Center for Research on Human Capital and Education Report

Predicting Student Success in a Major's Introductory Biology Course via Logistic Regression Analysis of Scientific Reasoning Ability and Mathematics Scores

E. D. Thompson, B. V. Bowling, & R. E. Markle

Research in Science Education, v48 n1, p151–163

How Do Percent Plans and Other Test-Optional Admissions Programs Affect the Academic Performance and Diversity of the Entering Class?

R. Zwick


Technology

CPSX: A Tool for Online Collaborative Problem-Solving in Open edX

Y. Bergner

ETS Research Memorandum No. RM-18-03

The Evidence Trace File: A Data Structure for Virtual Performance Assessments Informed by Data Analytics and Evidence-Centered Design

J. Hao & R. J. Mislevy

ETS Research Report No. RR-18-28

When Should an Adaptive Assessment Care?

B. Lehman, J. R. Sparks, & D. Zapata-Rivera


ITEMS Corner New ITEMS Portal: Taking ITEMS into the 21st Century

A. A. Rupp

Educational Measurement: Issues & Practice, v37 n2, p70
Welcome to the ITEMS Portal!

A. A. RUPP
*Instructional Topics in Educational Measurement Series (ITEMS)*

**Simulated Dialogues With Virtual Agents: Effects of Agent Features in Conversation-Based Assessments**

J. R. SPARKS, D. ZAPATA-RIVERA, B. LEHMAN, K. JAMES, & J. STEINBERG

**Preface of Exploring Opportunities for Caring Assessments**

D. ZAPATA-RIVERA & J. VASSILEVA

**Validity Research**

**What Have We Learned About Assessment Validity? (Short Video)**

M. T. KANE

**What's Surprising About ETS's Research in the Area of Validity? (Short Video)**

M. T. KANE

**Interpretation of Score Reports by Diverse Subgroups of Parents**

P. KANNAN, D. ZAPATA-RIVERA, & E. A. LEIBOWITZ
*Educational Assessment*, v23 n3, p173–194

**Effects of Situational Judgment Test Format on Reliability and Validity**

M. P. MARTIN-RAUGH, C. ANGUIANO-CARRASCO, T. JACKSON, M. W. BRENNEMAN, L. CARNEY, P. V. BARNWELL, & J. KOCHERT

**The Validity of Inferences From Locally Developed Assessments Administered Globally**

M. E. OLIVERI & R. LAWLESS
ETS Research Report No. RR-18-35
Incorporating Emotional Intelligence into Assessment Systems

H.-H. Por & A. Cahill

Score Reporting Research and Applications

In D. Zapata-Rivera (ed.)
In B. E. Clauser, H. Braun, R. L. Brennan, F. Drasgow, M. J. Kolen, & R. Michel (series eds.)
Book; Routledge

Ten ETS staff members and a former ETS staff member contributed to this 10-chapter volume:

I. Katz
Foreword

D. Zapata-Rivera
Introductory Chapter: Why is Score Reporting Relevant? p1–5

R. J. Tannenbaum
Validity Aspects of Score Reporting, Section 1, Chapter 1, p9–18

S. Sinharay, G. Puhan, S. J. Haberman, & Ronald K. Hambleton
Subscores: When to Communicate Them, What Are Their Alternatives, and Some Recommendations, Section 1, Chapter 3, p35–39

D. Zapata-Rivera, P. Kannan, & R. Zwick
Communicating Measurement Error Information to Teachers and Parents, Section 1, Chapter 5, p63–73

S. Slater, S. A. Livingston, & M. Silver
Score Reports for Large-scale Testing Programs: Managing the Design Process, Section 2, Chapter 7, p91–106

Designing and Evaluating Reporting Systems in the Context of New Assessments

D. Zapata-Rivera, P. Kannan, C. M. Forsyth, S. Peters, A. D. Bryant, E. Guo, & R. Long

Statistics and Psychometrics

Automatic Item Generation Unleashed: An Evaluation of a Large-Scale Deployment of Item Models

Y. Attali
Using Response Time Data to Reduce Testing in Cognitive Tests

**M. Bertling & J. P. Weeks**

*Psychological Assessment*, v30, n3, p328–338

Application of Asymmetric IRT Modeling to Discrete-Option Multiple-Choice Test Items

**D. M. Bolt, S. Lee, J. A. Wollack, C. Eckerly, & J. Sowles**

*Frontiers in Psychology: Quantitative Psychology and Measurement*, Online First

Primary Trait Scoring

**L. Davis**


The Linkage Between Equating and Fairness (Short Video)

**N. J. Dorans**

Score Linking

**N. J. Dorans**


Scores, Scales, and Score Linking

**N. J. Dorans**


Who Was Involved in Research on Score Linking? (Short Video)

**N. J. Dorans**

Fairness Concerns of Discrete Option Multiple Choice Items

**C. Eckerly, R. Smith, & J. Sowles**

*Practical Assessment, Research & Evaluation*, v23 n16, p1–10

Does the Time Between Scoring Sessions Impact Scoring Accuracy? An Evaluation of Constructed-Response Essay Responses on the GRE® General Test

**B. Finn, C. Wendler, K. L. Ricker-Pedley, & B. Arslan**

ETS Research Report No. RR-18-31
A Comparison of Score Aggregation Methods for Unidimensional Tests on Different Dimensions

J. Fu & Y. Feng
ETS Research Report No. RR-18-01

A Review of Subscore Estimation Methods

J. Fu & Y. Qu
ETS Research Report No. RR-18-17

A Simulation-Based Method for Finding the Optimal Number of Options for Multiple-Choice Items on a Test

H. Guo, J. Zu, & P. C. Kyllonen
ETS Research Report No. RR-18-22

Diagnostic Test Score Validation With a Fallible Criterion

P. A. Jewsbury
Applied Psychological Measurement, Online First

Measures of Agreement to Assess Attribute-Level Classification Accuracy and Consistency for Cognitive Diagnostic Assessments

M. S. Johnson & S. Sinharay
Journal of Educational Measurement, v55, n4, p635–664

The Pseudo-Equivalent Groups Approach as an Alternative to Common-Item Equating

S. Kim & R. Lu
ETS Research Report No. RR-18-02

The Impact of Aberrant Responses and Detection in Forced-Choice Noncognitive Assessment

S. Kim & T. Moses
ETS Research Report No. RR-18-32

Digital ITEMS Module 1: Reliability in Classical Test Theory

C. Lewis, M. Chajewski, & A. A. Rupp
Educational Measurement: Issues and Practice, v37 n2, p71–72

Test Reliability—Basic Concepts

S. A. Livingston
ETS Research Memorandum No. RM-18-01
Flexible Bayesian Models for Inferences from Coarsened, Group-Level Achievement Data

J. R. Lockwood, K. E. Castellano, & B. R. Shear
Journal of Educational and Behavioral Statistics, v43 n6, p663–692

A Simulation Study to Compare Nonequivalent Groups With Anchor Test Equating and Pseudo-Equivalent Group Linking

R. Lu & H. Guo
ETS Research Report No. RR-18-08

Assessing Measurement Invariance in Multiple-Group Latent Profile Analysis

M. Olivera-Aguilar & S. H. Rikoon

Bias, Type I Error Rates, and Statistical Power of a Latent Mediation Model in the Presence of Violations of Invariance

M. Olivera-Aguilar, S. H. Rikoon, O. Gonzalez, Y. Kisbu-Sakarya, & D. P. MacKinnon
Educational and Psychological Measurement, v78 n3, p460–481

Modeling Growth With Adaptive Longitudinal Large-Scale Assessments

J. Qian
ETS Research Report No. RR-18-34

Applying Social Context to Psychometric Modeling in Educational Assessment

H. Sandberg
Focus on ETS R&D, n11

On the Performance of the Marginal Homogeneity Test to Detect Rater Drift

A. Sgambaro & J. R. Donoghue
Applied Psychological Measurement, v42 n4, p307–320

A New Person-Fit Statistic for the Lognormal Model for Response Times

S. Sinharay
Journal of Educational Measurement, v55 n4, p457–476

A New Interpretation of Augmented Subscores and Their Added Value in Terms of Parallel Forms

S. Sinharay
Journal of Educational Measurement, v55 n2, p177–193
Application of Bayesian Methods for Detecting Fraudulent Behavior on Tests

S. Sinharay
Measurement: Interdisciplinary Research and Perspectives, v16 n2, p100–113

Extension of Caution Indices to Mixed-Format Tests

S. Sinharay
British Journal of Mathematical and Statistical Psychology, v71 n2, p363–386

On the Choice of Anchor Tests in Equating

S. Sinharay
Educational Measurement: Issues and Practice, v37 n2, p64–69

Detecting Fraudulent Erasures at an Aggregate Level

S. Sinharay
Journal of Educational and Behavioral Statistics, v43 n3, p286–315

Higher-Order Asymptotics and Its Application to Testing the Equality of the Examinee Ability Over Two Sets of Items

S. Sinharay & J. L. Jensen
Psychometrika, Online First

Comparing Computer Adaptive Testing Stopping Rules Under the Generalized Partial-Credit Model

R. E. Stafford, C. R. Runyon, J. M. Casabianca, & B. G. Dodd
Behavior Research Methods, Online First


P. W. van Rijn & U. S. Ali
ETS Research Report No. RR-18-15

The Effects of Vignette Scoring on Reliability and Validity of Self-Reports

M. von Davier, H.-J. Shin, L. Khorramdel, & L. Stankov
Applied Psychological Measurement, v42 n4, p291–306

Grouping Effects on Jackknifed Variance Estimation for Item Response Theory Scaling and Equating With Cluster-Based Assessment Data

L. Wang, J. Qian, & Y.-H. Lee
ETS Research Report No. RR-18-16
Comparison of Human Rater and Automated Scoring of Test Takers' Speaking Ability and Classification Using Item Response Theory

**Z. Wang & Y. Sun**
_Psychological Test and Assessment Modeling, v60 n1, p81–100_

An Application of Multidimensional Vertical Scaling

**J. P. Weeks**
_Measurement: Interdisciplinary Research and Perspectives, v16 n3, p139–154_

Introducing Multistage Adaptive Testing into International Large-Scale Assessments Designs Using the Example of PIAAC

**K. Yamamoto, L. Khorramdel, & H. J. Shin**
_Psychological Test and Assessment Modeling, v60 n3, p347–368_

Penalized Best Linear Prediction of True Test Scores

**L. Yao, S. J. Haberman, & M. Zhang**
_Psychometrika, Online First_

Aggregating Polytomous DIF Results Over Multiple Test Administrations

**R. Zwick, L. Ye, & S. Isham**
_Journal of Educational Measurement, v55 n1, p132–151_