CURRICULUM VITAE

PERSONAL INFORMATION

Name	William R. Buchanan, Ph.D.
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EDUCATION

Year	2011
Degree	**Ph.D.**
Institution	TUI University (Cypress, CA)
Advisor	Cynthia García Coll
Concentration	K–12 Educational Leadership
Dissertation	*Statistical Modeling of The Effects of Micro-, Meso-, and Exosystem Poverty on Academic Achievement in Music.*

Year	2010
Degree	**A.M.**
Institution	Brown University (Providence, RI)
Advisor	John Tyler
Major	Urban Education Policy

Year	2008
Degree	**M.A.Ed.**
Institution	TUI University (Cypress, CA)
Advisor	Leon Abbott
Major	Teaching and Instruction

Year	2006
Degree	**B.M.**
Institution	Berklee College of Music (Boston, MA)
Advisor	Dick Lowell (Jazz Composition) & Ronald Mahdi (Instrument — Bass)
Major	Jazz Composition

DISSERTATION

Title	*Statistical Modeling of The Effects of Micro-, Meso-, and Exosystem Poverty on Academic Achievement in Music*
Year	2011
Institution	TUI University
Committee Chair	Cynthia García Coll, Ed.D. (Brown University)

Committee Member	Kathleen Camara, Ph.D. (Tufts University)
Committee Member	Deborah Schreiber, Ph.D. (TUI University)

PUBLICATIONS
PEER REVIEWED

Article	**Buchanan, W. R.**, Secolsky, C., Yager, C., Wang, S., Schoen, M., & Siddiqi, M. (*under review*). Improving Pass/Fail Decisions for Classroom Assessments Another Look at Angoff and Contrasting Groups Standard Setting Methods.
Article	**Buchanan, W. R.** (in revision). The brewscheme toolkit for Data Visualization in Stata. Submitted to *The Stata Journal*
Article	Del Campo, R., **Buchanan, W. R.**, Abbott, R. D., & Berninger, V. W. (2014). Levels of phonology related to reading and writing in middle childhood. *Reading and Writing: An Interdisciplinary Journal.* DOI: 10.1007/s11145-014-9520-5

PAPER PRESENTATIONS

Article	Secolsky, C., **Buchanan, W. R.**, & Drane, W. (2015). The evolution of validity and modern psychometrics: Do we need to revisit item validity? *Paper presented at the International Association for Educational Assessment Annual Conference (Lawrence, KS).*
Article	**Buchanan, W. R.** (2013, April). The Effect of Instrument Ownership on Musical Achievement. *Paper presented at the Proceedings of the American Educational Research Association Annual Conference (San Francisco, CA).*
Research Report	**Buchanan, W. R.**, Del Campo, R., and Morse, C. A. (2009). Designing a comprehensive assessment strategy for Rhode Island. *Presented at Race To The Top Assessment Competition Public Commentary Session (Boston, MA)*

INVITED PRESENTATIONS

2019 Lexington, KY	KYACAC 38th Annual Conference: Being Ethical & Authentic in Higher Ed Panelist
2018 Mesa, AZ	Hoonuit's Infinity Conference Keynote Panelist
2018 Lexington, KY	National Student Clearinghouse's Using Data Analytics to Close Achievement Gaps for your Institution & Kentucky Keynote Panelist
2016 Louisville, KY	Strategic Data Project Cohort 7 Workshop Working in the [Data] Mines

Presentations

2019	Strategic Data Project Annual Convening
Boston, MA	Fighting the Good Fight: Organizing Market Forces for Data Interoperability, Integration, & Privacy
Presenters	Amelia Vance, Erin Mote, Sean Casey, Mark Luetzelschwab, & **William Buchanan**
Role	Panel Organizer
2018	NCES STATS-DC Conference
Washington, D.C.	Identity: Let's Secure and Operationalize That!
Presenters	Shannon Kerlick & **William Buchanan**
2018	NCES STATS-DC Conference
Washington, D.C.	Link Violence & Crime Data with Student Outcomes at School
Presenters	Shanshan Wang & **William Buchanan**
2018	18th Annual North American Stata User's Group Conference
Columbus, OH	Automating exploratory data analysis tasks with eda
2018	Strategic Data Project Annual Convening
Boston, MA	How can we make our data talk to one another? The perils and promise of data integration efforts.
Presenters	**William Buchanan**, Stephen Fedore, David Hersh, Christopher Leake, Alyssa Reinhart, & Bryan Shelly
2017	17th Annual North American Stata User's Group Conference
Baltimore, MD	Stata extensibility with the Java API: Tools, examples, and advice
2017	Strategic Data Project Annual Convening
Boston, MA	Using Git to Promote Collaboration and Reproducible Research
2017	Strategic Data Project Annual Convening
Boston, MA	Open Agenda: Developing a Research Agenda in Your Education Agency
2016	Scott Trimble Assessment Workshop
Louisville, KY	Intro to Item Response Theory Using Open Source Solutions
2016	16th Annual North American Stata User's Group Conference
Chicago, IL	Interactive data visualization for the web: Using jsonio, libd3, and libhtml to create reusable D3js graphs
2016	Beyond the Numbers Convening at the Center for Education Policy Research's Strategic Data Project
Boston, MA	Becoming a Better Data Communicator: Stata Data Visualization

2015	15th Annual North American Stata User's Group Conference
Columbus, OH	Brewing color schemes in Stata: Making it easier for end users to customize Stata graphs.
2014	14th Annual North American Stata User's Group Conference
Boston, MA	Using Stata for educational accountability and compliance reporting.
2013	Society for Research in Child Development Biennial Meeting
Seattle, WA	Musical Development in Context: Mesosystem Poverty and the 2008 NAEP Music Assessment.
2013	American Educational Research Association Annual Conference
San Francisco, CA	The Effects of Instrument Ownership on NAEP 2008 Music Assessment.
2013	Northwest Division of the National Association for Music Education Conference
Portland, OR	Program Evaluation in Music Education
2010	Facing New Challenges in Urban Education Policy
Brown U.	Developing a Curriculum Framework for Urban Music Educators: The Role of Student and Community Cultural Capital in Supporting Learning
2010	Rhode Island Music Educators Association (RIMEA) Spring In-Service Conference
RI College	Cultural Relevance in Music Education: Implications for Teachers of Diverse Learners
2009	Public Commentary for Race To The Top Assessment Competition
Boston, MA	Developing a Robust System of Educational Standards and Assessment: Suggestions for Race To The Top Assessment Competition
2009	Annenberg Institute for School Reform Summer Practicum Conference
Brown U.	Expanded Learning Time Initiative: Results from Urban Education Policy Summer Practicum

SOFTWARE

STATA

Data Visualization	brewscheme: A Toolkit for data visualization
Data Visualization	eda: Exploratory Data Analysis
Data Processing	Tools for normalizing and munging Kentucky School Report Card Data
Data Visualization	D3 Mata Library
Development Tools	HTML Mata Library
Data Processing	irscharities: Accessing 501(c)(3) Tax Data from Stata

R

Data Munging	Regular Expressions with Pipes
Data Visualization	Data Visualization Illustration of Equipercentile Linking
Data Visualization	Mississippi Statewide Accountability System Explorer

Webscraping	Scraping Publicly Released Data Files from Rhode Island Department of Education

Java

Development Tools	Stata Maven Archetype for Java Plugins
System Tools	Stata File System Tools
Data Processing	JSON Serializer/Deserializer for Stata
Development Tools	Java API for Simplified Access to Stata's Java API
Data Processing	Phonetic String Encoding and String Distance Metrics for Stata
Data Processing	Interface to Java Regular Expression Tools from Stata
System Tools	A JavaMail Interface for Stata
System Tools	Operating System Access Tools for Stata
Psychometrics	Stata Interface to the Java Psychometrics Library

Python

Webscraping	Example of using Selenium for Webscraping in Python
Webscraping	Scraping Data From US State Education Agency Websites

SQL

Data Modeling	PostgreSQL Common Education Data Standards

Javascript

Data Visualization	D3.js Example of FCPS Polygon Layers
Data Visualization	D3.js Interactive Map of MS Accountability System Results

Teaching

Period	2013–2015
Position	Adjunct Professor
Institution	Jackson State University (Jackson, MS)
Department	College of Education and Human Development
Courses	Elementary Statistics (ED514)
Level	Graduate

Experience

Period	2018–present
Organization	**Relay Graduate School of Education**, New York City, NY
Title	Consultant
Duties	Support internal staff in the development of automated reporting systems
	Provide training in computer programming to internal staff to develop internal capacity and ensure seamless project handoff
	Assist internal staff in developing workflow documents, unit and smoke tests, and reporting tools to monitor data quality in batch processes

Period	2016–present
Employer	**Fayette County Public Schools**, Lexington, KY
Title	Director of Data, Research, & Accountability

Duties	Leading the development and deployment of predictive analytic models to improve services and supports provided to 42,000+ students
	Represents the district in international standards organizations focusing on data integration
	Developing psychometric training opportunities for classroom educators to learn how implementing the modified Angoff method can improve the quality of the assessments developed at the building and classroom levels
	Leading the development and implementation of an enterprise-class data warehouse to increase access and availability of data and analytical tools for all staff in the district
Period	2015–2016
Employer	**Minneapolis Public Schools**, Minneapolis, MN
Title	Data Scientist, Office of Research, Evaluation, & Assessment
Duties	Developed programs to expand Item Response Theory capabilities of Stata
	Developed a complete port of the D3js API in Mata (`https://github.com/wbuchanan/d3mata`) along with examples to help others use object oriented approaches to developing reusable data visualizations (`https://github.com/wbuchanan/d3mata-examples`)
	Developing and writing stored procedures and functions for SQL Server RDBMS implementation
	Ported the Common Education Data Standards database Schema to PostgreSQL (free and open source relational data base management system)
	Provide analytical support to the Office of Black Male Student Achievement
	Developed program to automate exploratory data analysis to reduce analyst time/effort to generate comprehensive visualizations and tables from data set (`https://github.com/wbuchanan/eda`)
Period	2013–2015
Employer	**Mississippi Department of Education**, Jackson, MS
Title	Strategic Data Project Data Fellow
Duties	Reviewed RFP submissions for grade level and end of course general education assessments for technical rigor, psychometric soundness, and alignment with State and Federal school accountability requirements
	Reviewed RFP submissions for grade level and end of course alternate assessments for technical rigor, psychometric soundness, and alignment with State and Federal school accountability requirements
	Programmed State of Mississippi's School and District Accountability System
	Developed interactive training materials and led data analysis workshops to improve capacity for data analysis
	Built customized analytics stack on Ubuntu server to provide increased access to GIS, statistical analysis, text analysis, and data visualization applications to internal staff
	Developed interactive tools for displaying, reporting, and analyzing data about schools and communities
	Developed R package for accessing, storing, and cleaning legislative data
	Developed Stata program for accessing, cleaning, and formatting data on non-profit organizations to facilitate community-school partnerships

Period	2012–2013
Employer	**Brown University**, Providence, RI
Title	Consultant
Duties	Research and review best-practices in University–Community partnerships and public policy focused on increasing high school graduation
	Collaborate with members of the Brown University faculty/staff and representative's from Mayor Taveras' office to organize and implement a comprehensive and systemic array of programs to support the Mayor's *Graduate Providence* campaign
	Develop and draft internal and external communications to build widespread support for program development, engagement, and innovation
	Assisted the Director of Education Outreach in the coordination of education outreach events and programs, such as the Day at College program for local middle school students
	Drafted, proofread, and edited outgoing correspondence to alumni, students, and other stakeholders in the Urban Education Policy Program, including a program oriented newsletter
	Developed, implemented, and analyzed an alumni survey assessing program quality and post-program success
Period	2012–2013
Employer	**The BERC Group**
Position	Research Associate
Duties	Created data visualizations for Seattle Public School's Arts program funded by the Wallace Foundation
	Programmed data analysis required for WA state arts education initiatives being evaluated by the BERC Group
	Led several mixed-methods needs assessments of focus/priority schools across WA State
	Analyzed data in support of US Department of Education Arts in Education Model Development and Dissemination grant
	Developed custom web-scrapers in Python to collect and build a large longitudinal database from WA State Department of Education (OSPI) school report cards
	Authored a custom suite of programs for data management, cleaning, processing, and graphic production using Stata 12 MP resulting in 99% decrease in production time for the company's major workflow
Period	2011–2012
Employer	**Help With Statistics**, http://www.helpwithstatistics.com
Title	Independent Contractor/Consultant

Duties	Provided consulting services to PhD students in the area of research methodology, quantitative analysis, qualitative analysis, and scientific computing leading to a 100% of clients successfully completing and defending their dissertations
	Provided consulting services to college/university Faculty and independent researchers focused on quantitative analysis, research methodology, and programming data cleaning/analysis tasks
	A list of selected projects, along with the institutional affiliation and role of clients is provided below:

Institution	Columbia U
Role	Faculty
Field	Urban Planning/Design
Methods	Panel Data Econometrics; Data Munging; Data Management
Summary	Recommended and programmed the methodology used to estimate longitudinal community effects on business development and growth

Institution	U Penn
Role	Faculty
Field	Business/Marketing
Methods	Panel Data Econometrics; Model Cross Validation
Summary	Recommended and programmed the methodology and analysis to estimate the effectiveness of different marketing strategies on Broadway plays/musicals

Institution	UC Riverside
Role	PhD Student
Field	Higher Education
Methods	SEM; ANOVA; ANCOVA
Summary	Assisted with developing methodology used to measure professionalism in undergraduate students and estimate differences in professionalism across academic majors

Institution	UGA/Federal Bureau of Prisons
Role	PhD Student / Pre-Doc Intern
Field	Psychology
Methods	SEM; Mediation / Moderation; Bootstrapping
Summary	Programmed and modified the methodology used for a study how problematic alcohol use mediates the effect of psychopathic traits on alcohol related aggression

Institution	U of Cincinnati
Role	PhD Student
Field	Clinical Psychology
Methods	Data Management / Programming
Summary	Wrote a program to perform all of the data cleaning/munging tasks needed for the research team

Institution	U Illinois at Chicago
Role	PhD Student

Field	Special Education
Methods	Nonparametric statistics; social networking; bootstrapping; programming
Summary	Developed customized programs to implement bootstrap methods on non-parametric procedures used to test hypotheses regarding the differences in social networks between students with ASD diagnoses and other students

Institution	Wagner College
Role	Faculty
Field	Business Management
Methods	Measurement tool development; t-Tests
Summary	Recommended and programmed methodology used to study inter-rater reliabilities of partial-credit rating scale as well as testing program effects across intervention/control groups

Institution	Argosy U
Role	PhD Student
Field	Education
Methods	SEM; Measurement Invariance
Summary	Programmed multi-group SEM models to test for cross-cultural measurement invariance of a leadership measurement tool

Institution	GWU
Role	Staff
Field	Public Policy/Higher Education
Methods	Nonlinear predictive modeling
Summary	Built models to test the predictive properties of student demographic and survey data on the probability of being an alumni donor

Institution	U Maryland College Park
Role	PhD Student
Field	Business
Methods	Survival Analysis; Data Management/Munging
Summary	Provided programming support to manage and set up data to fit a Cox proportional Hazards model to the data and mentored the student in the interpretation of the model and results

Institution	UT Dallas
Role	PhD Student
Field	Public Policy / Political Economy
Methods	SEM; Mediation Analysis; Survey Data Analysis
Summary	Worked with student to develop an SEM to test hypotheses regarding the mediating effect from an additional program on job wages of youth job corps participants

Institution	Syracuse U
Role	PhD Student
Field	Business / Management
Methods	Data Reduction; random/fixed effects models; panel data econometrics

Summary	Provided recommendations for implementing data reduction methods for student to complete dissertation research related to the role corporate boards play in executive compensation and effectiveness in context of firms within industries and across time
Institution	NY Medical College
Role	PhD Student
Field	Public Health, Health Policy / Management
Methods	Mixed-methods; case study
Summary	Provided guidance in using administrative data from private health providers along with interviews to study village models of hospice care
Institution	U of Ghent-Belgium
Role	Faculty
Field	Community Health
Methods	Measurement Models
Summary	Selected and implemented methodology from the medical literature used to determine the reliability of physiological measurement tools (e.g., height/weight) used in field hospital locations
Institution	DOD
Role	Staff
Field	Clinical Psychology
Methods	Nonlinear predictive modeling
Summary	Guided researcher affiliated with DoD on the selection, fitting, and evaluation of models used to predict the effect of the length of a spouse's deployment on the development of depressive symptomology
Period	2011–present
Employer	**Performing Arts & Creative Education Services Consulting**
Title	Executive Director
Duties	Founded 501(c)(3) dedicated to supporting educational research with an emphasis on the Fine and Performing Arts
	Established research partnership with Evergreen Learning to support implementation of early childhood education professional development and research programs in the Commonwealth of the Northern Mariana Islands
Period	2010–2012
Employer	**Self**
Title	Independent Consultant
Duties	A list of selected projects is provided below:
Client	Brown University
Project	Graduate Providence Campaign

Responsibilities	

- Research and review best-practices in University–Community partnerships and public policy focused on increasing high school graduation

- Collaborate with members of the Brown University faculty/staff and representative's from Mayor Taveras' office to organize and implement a comprehensive and systemic array of programs to support the Mayor's Graduate Providence campaign

- Develop and draft internal and external communications to build widespread support for program development, engagement, and innovation

Client	Brockton Public Schools
Project	Program Evaluation of 21st Century Community Learning Centers (CCLC)
Responsibilities	

- Analyzed data to support causal inferences of the effectiveness of the district's 21st CCLC program using quasi-experimental methods

- Provided client with scripts that would allow the analysis to be replicated

- Developed comprehensive data visualizations and tabular displays of disaggregated survey data

- Provided client with policy recommendations and interpretation of the analysis centered on policy implications

Client	Rhode Island College Crusade
Project	Analysis to support GEARUP Application
Responsibilities	

- Prepared focus group findings for use and support of a $6m GEARUP grant application

- Conducted focus groups with program participants in the 12th and 8th grades

- Analyzed, transcribed, and reported findings from the focus groups to identify emerging themes focused on areas for improvement, success of the program, and strengths of the program

Client	Providence Public Schools Department
Project	Data Packet Development for Turnaround Schools

Responsibilities	

- Worked independently to help produce data packets for five turnaround schools in a mid-sized urban district ($> 24{,}000$ students)

- Gathered and analyzed data from parent surveys to assess and evaluate parent inclusion and participation in school reform practices

- Used SPSS to provide comprehensive overview of three years of assessment data (including DIBELS, SAT10, NECAP, and English Language Proficiency assessments) including overall and disaggregated descriptions of the data

Period	2009–2010
Employer	**Office of U.S. Senator Sheldon Whitehouse (D-RI)**, Providence, RI
Title	Intern/Research Fellow
Duties	Provided education research and policy analysis support to the Senator and legislative staff.
	Created policy briefs on Out of School Time (OST) and Extended Learning Time (ELT) programs and policies.
	Reviewed pending legislation and made recommendations for legislative amendments to bills.

Period	2006-2009
Employer	**US Army**, Wiesbaden, Germany
Title	1$^{\text{st}}$ Armored Division Band Training Non-Commissioned Officer
Duties	Developed concert band arrangement of the Kurdish national anthem for 1st Armored Division band performances across the Kurdish Regional Government territories in Northern Iraq
	Composed and Premiered original music for cultural diplomacy mission across Multi National Division North
	Performed for Iraqi civilians and political leaders throughout provinces across northern Iraq
	Coordinated, planned, and implemented training programs in accordance with US Army regulations
	Provided customized training and instruction in music performance while deployed to Iraq
	Volunteered with members of US Department of State to develop protocols for the transfer of musical instruments to Iraqi civilian organizations and support music education opportunities for Iraqis

Period	2010–2010
Employer	**Providence After School Alliance**, Providence, RI
Title	Consultant

Duties	Prepared reports and presentations for a variety of audiences using summarized findings, graphic representations of the data, and detailed reporting of all data mining tasks and procedures
	Analyzed longitudinal data for over 3,000 students in Stata to assess whether programming was related with changes in behavioral outcomes
	Provided assisstance to senior level staff to better understand the statistical methods

AWARDS

2013	Strategic Data Project Data Fellow (Center for Education Policy Research at Harvard Graduate School of Education)
2010	Inducted into Kappa Delta Pi International Honors Society in Education
2010	Inducted into Pi Lambda Theta International Honors Society in Education
2009	Urban Education Fellow in Urban Education Policy (Brown University)
2009	Good Conduct Medal (US Army)
2008	Combat Action Badge (US Army)
2008	Personal Recognition from US Ambassador to Iraq (US Army)
2008	Army Commendation Medal 3rd Award (US Army)
2008	Army Achievement Medal (US Army)
2006	Berklee Achievement Scholarship (Berklee College of Music)
2005	Berklee Achievement Scholarship (Berklee College of Music)
2004	Berklee Achievement Scholarship (Berklee College of Music)
2003	RI College Crusade Scholarship (Providence, RI)
2001	Charles A. Morvillo Memorial Scholarship (Providence, RI)
2001	John Hope Settlement House Alumni Scholarship (Providence, RI)
2001	Dr. Vincent A. Cianci Memorial Scholarship (Providence, RI)
2001	American Greetings Scholarship for Community Service (Providence, RI)

SKILLS

Statistical Software	Stata, MPlus, HLM, LISREL, R, Python, Julia, QGIS, Tableau, G*Power, NVivo8, WEFT QDA,& TAMS Analyzer
Programming Languages	Stata (Advanced), R(Intermediate), Java(Intermediate), Javascript (Intermediate), & Julia (Beginning)
Web, Design, and Publishing Software	Dreamweaver, LaTeX2ε, Adobe InDesign, Adobe Illustrator, Adobe Photoshop, & MS Publisher 2010

PROFESSIONAL AFFILIATIONS

2019–Present	**Ed-Fi Alliance**
Committees:	*Governance Advisory Team (**RVWG Representative**)*
Work Groups:	*Reporting & Visualization Work Group (RVWG) (**Co-Chair**)*
2018–Present	**IMS Global** — Institutional Representative
Task Forces:	*Results Management & Reporting Task Force (**Co-Chair**)*

Committees:	*Executive Board on Assessment*
	K-12 Institutional Leadership Board
	State Assessment Innovation Leadership Network
	QTI/APIP Work Groups
2016–Present	**National Council on Measurement in Education** — Member
2012–Present	**Society for Research in Child Development** — Member
Caucuses:	SRCD Latino Caucus (starting 2019)
2011–Present	**American Educational Research Association** — Member
Divisions:	*D - Measurement and Research Methodology*
	E - Counseling and Human Development
	H - Research, Evaluation, and Assessment in Schools
2011–Present	**Washington Educational Research Association** — Member
2011–Present	**American Psychological Association** — Associate Member
Division	*5 - Quantitative and Qualitative Methods*
	7 - Developmental Psychology
	10 - Society for the Psychology of Aesthetics, Creativity, and the Arts
	15 - Educational Psychology
2010–Present	**Pi Lambda Theta Intl. Honors Society in Education** — Inductee
2010–Present	**Kappa Delta Pi Intl. Honors Society in Education** — Inductee
2009–2012	**National Association for Music Educators** — Member
2009–2011	**Society for Research in Music Education** — Member
SRIG:	*Social Science, Learning and Cognition, & Human Development*
2009–2010	**Gordon Music Learning Institute** — Student Member
2009–2010	**American Orff-Schülwerk Organization** — Student Member
2009–2010	**Organization of American Kodály Educators** — Student Member
2009–2011	**RI Music Educators Association** — Student Member

Service

Professional	Reviewer
2018	USED Expert Peer Reviewer for ESSA Accountability Plan and Innovative Assessment Demonstration Plans
2017	Reviewed chapter on multilevel modeling appearing in : Lu, Y., Weinberg, S. L., & Scott, M. A. (2017). Multilevel Linear Modeling in Higher Education Contexts. In *Handbook on Measurement, Assessment, and Evaluation in Higher Education*, Eds. Charles Secolsky & Denison, D. B.
2013–Present	Teachers' College Record
2013–Present	Conference proposals for 2013 AERA Annual Meeting: Division C Section 1b – Humanities, Social Sciences, and Fine Arts; Division G Section 5 – Social Context of Research on Schools and Communities; Division L Section 3 – Curriculum, Testing, and Instructional Practice; Adolescent and Youth Development (SIG); Arts and Learning (SIG); Charter School Research and Evaluation (SIG); NAEP Studies (SIG); and Urban Learning, Teaching, and Research (SIG)
2013–Present	Conference proposals for 2013 SRCD Annual Meeting: Ethnicity Race and Culture panel