Introduction

• PhD student in Measurement & Statistics

• 10 years of research experience

• Dissertation Topic: Understanding math and science motivation in relation to STEM outcomes using both frequentist and Bayesian analysis methods in an SEM framework.
Overview

• Context plays a critical role in determining the specific testing, measurement, and data use knowledge and skills various stakeholders need to be assessment literate.

• Key stakeholders such as teachers, administrators, and policy makers face different questions which require different sets of knowledge and skills
Objectives

• Provide examples to distinguish between the fundamental knowledge and skills classified in our three dimensions of assessment literacy
  – Testing Literacy
  – Measurement Literacy
  – Data Literacy

• Discuss a scenario in which teachers, administrators, and policy makers need to apply assessment knowledge and skills to answer a critical question.

• Generate additional examples of questions faced and skills needed by those and other stakeholders.
Testing Literacy

• Selecting the right type of test for the intended purpose
• Knowing what information you get from different types of test questions
• Item writing principles
• Determining appropriate test administration procedures
• Scoring and evaluating responses
• Interpreting test scores – understanding what a score means or where it came from
• Understanding test content - Producing or evaluating a test blueprint
Solve for $x$ and $y$

\[3x + 6y = 1,200\]
\[x + y = 300\]

\[\text{Solve for } x \text{ and } y\]
\[3x + 6y = 1,200\]
\[x + y = 300\]

A. $x = 75$, $y = 175$
B. $x = 100$, $y = 200$
C. $x = 150$, $y = 150$
D. $x = 200$, $y = 100$

The fall play at Marion Middle School was *A Tisket, A Tasket, A Basket of Deplorables*, by playwright Al Webber. Tickets cost $6 for adults and $3 for students. The school sold 300 tickets and raised $1,200. How many adult tickets and how many student tickets were sold?
Appreciating Uncertainty
Measurement Literacy

- Reliability
- Standard Error of Measurement
- Sampling and sample size
- Generalizability
- Multiple Measures
- Correlation and Causation
Data Literacy

• Organizing and manipulating data
• Combining data from multiple sources
• Dealing with incomplete and missing data
• Understanding that there are different types of data
• Understanding the properties of different types of data
• Understanding how data were collected
• Communicating data accurately and effectively
• Protecting data appropriately
Data Literacy

The World of Data

- Number of emails sent every second: 2.9 million
- Data consumed by households each day: 375 megabytes
- Videos uploaded to YouTube every minute: 20
- Data per day processed by Google: 24 petabytes
- Tweets per day: 50 million
- Total minutes spent on Facebook each month: 700 billion
- Data sent and received by mobile internet users: 1.3 exabytes
- Products ordered on Amazon per second: 72.9 items

In the 21st century, we live a large part of our lives online. Almost everything we do is reduced to bits and sent through cables around the world at light speed. But just how much data are we generating? This is a look at just some of the massive amounts of information that human beings create every single day.
Example – What skills are needed?

Keeping students on track for college and career readiness

Policy Makers: How do we set achievement standards to ensure elementary and grade school students are on track for college and career readiness after high school?

District Administrators: How do we evaluate a remedial program designed to catch up students who are not on track?

Teachers: How do we interpret student growth scores to evaluate and improve instruction?
Other examples?

• What are some additional examples in which stakeholders use information from assessment to inform decisions?

• What knowledge and skills are needed?
For more information:

Center for Assessment
www.nciea.org