

Quantitative Reasoning Assessment at James Madison University and Beyond: A Progress Report

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www.jmu.edu/assessment/

NNN Annual Meeting: New York City



Quantitative Reasoning Test (QR-9):

Turning Japanese.....



General Education: Assessment of Scientific and Quantitative Reasoning

- These are among the skills most valued by employers
- What could be more important than Quantitative Reasoning?
- These are thinking skills, not math computation skills
- We want these skills to last a life time
- We had the opportunity to partner with Soka University in Japan

Our Collaboration Results:

- All measures converted to metric
- A data collection design for SOKA
- Placement of test on web server
- Review and pilot of test by SOKA faculty
- Successful administration of test to students
- Comparisons of results for several samples

QR Goes Metric

- Conversations with Soka University-Tokyo, Japan
- Conversion of items to metric scalars
 - Miles to Kilometers
 - Pounds to Kilograms
 - Inches to Centimeters
 - “Miles per gallon” to “Kilometers per liter”
- Thought about a full translation to Japanese

Results from our Studies

- Three student samples
 - Soka University: N=26 Honors Students
 - Global Citizenship Program: 14 First-year; 12 Sophomores
 - JMU: N=1,072 Sophomore/Juniors
 - Random sample from Spring 2012 Assessment Day
 - JMU: N=219 Senior STEM Majors
 - Physics, Chemistry, Biology & Psychology



Student Learning Objectives

- This is the Engine that drives assessment

- **QR Learning Objectives:**
 1. Use graphical, symbolic, and numerical methods to analyze, organize, and interpret natural phenomenon.
 2. Discriminate between association and causation, and identify the types of evidence used to establish causation.

Soka University Honors Students

Learning Objectives	Items Assessing Objective	Scores
5. Use graphical, symbolic, and numerical methods to analyze, organize, and interpret natural phenomenon.	2-13, 18-26 (21 items)	M = 15.12 (72% correct) SD = 1.90
6. Discriminate between association and causation, and identify the types of evidence used to establish causation	1, 14-17, 20, 23-26 (10 items)	M = 5.88 (59% correct) SD = 1.51
Quantitative Reasoning	1-26 (26 items)	M = 18.62 (72% correct) SD = 2.52

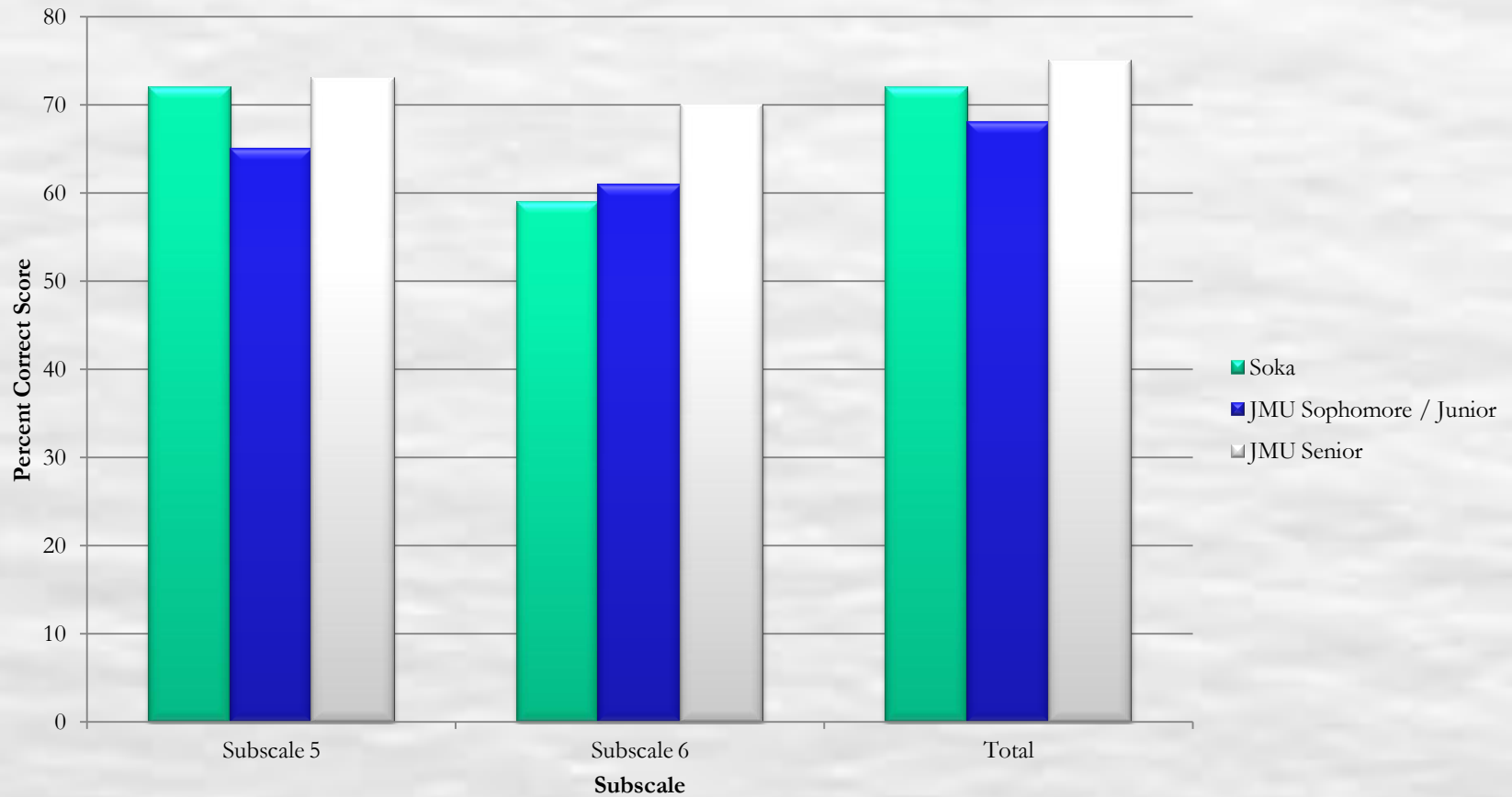
JMU Sophomores/Juniors

Learning Objectives	Items Assessing Objective	Scores
5. Use graphical, symbolic, and numerical methods to analyze, organize, and interpret natural phenomenon.	2-13, 18-26 (21 items)	M = 13.68 (65% correct) SD = 3.08
6. Discriminate between association and causation, and identify the types of evidence used to establish causation	1, 14-17, 20, 23-26 (10 items)	M = 6.13 (61% correct) SD = 1.88
Quantitative Reasoning	1-26 (26 items)	M = 17.59 (68% correct) SD = 3.74

JMU Seniors

Learning Objectives	Items Assessing Objective	Scores
5. Use graphical, symbolic, and numerical methods to analyze, organize, and interpret natural phenomenon.	2-13, 18-26 (21 items)	M = 15.32 (73% correct) SD = 2.69
6. Discriminate between association and causation, and identify the types of evidence used to establish causation	1, 14-17, 20, 23-26 (10 items)	M = 7.03 (70% correct) SD = 1.76
Quantitative Reasoning	1-26 (26 items)	M = 19.59 (75% correct) SD = 3.09

QR-9 Scores for Soka University and JMU Students



Conclusions

- The Soka students performed brilliantly
- The QR Test operated effectively in Japan
- JMU seniors score a little bit higher than our sophomores—and slightly higher than Soka Honors students
- We see similar patterns in scores with students scoring slightly lower on Objective 6-discrimination between correlation and causation
- We are exploring this finding at JMU with faculty



Questions? Comments?

The QR and SR instruments are available at
Madisonassessment.com

Center for Assessment and Research Studies

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www.jmu.edu/assessment/

