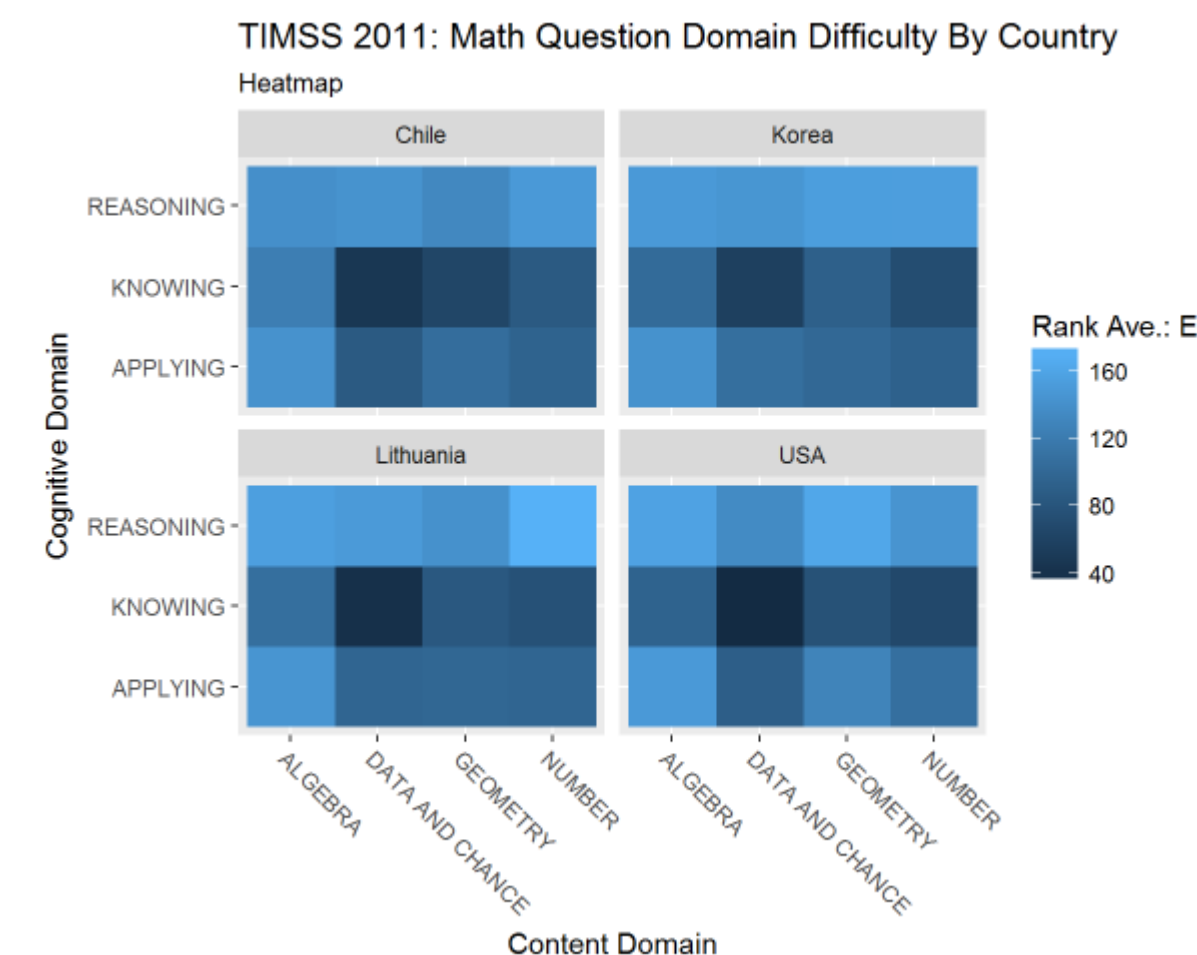
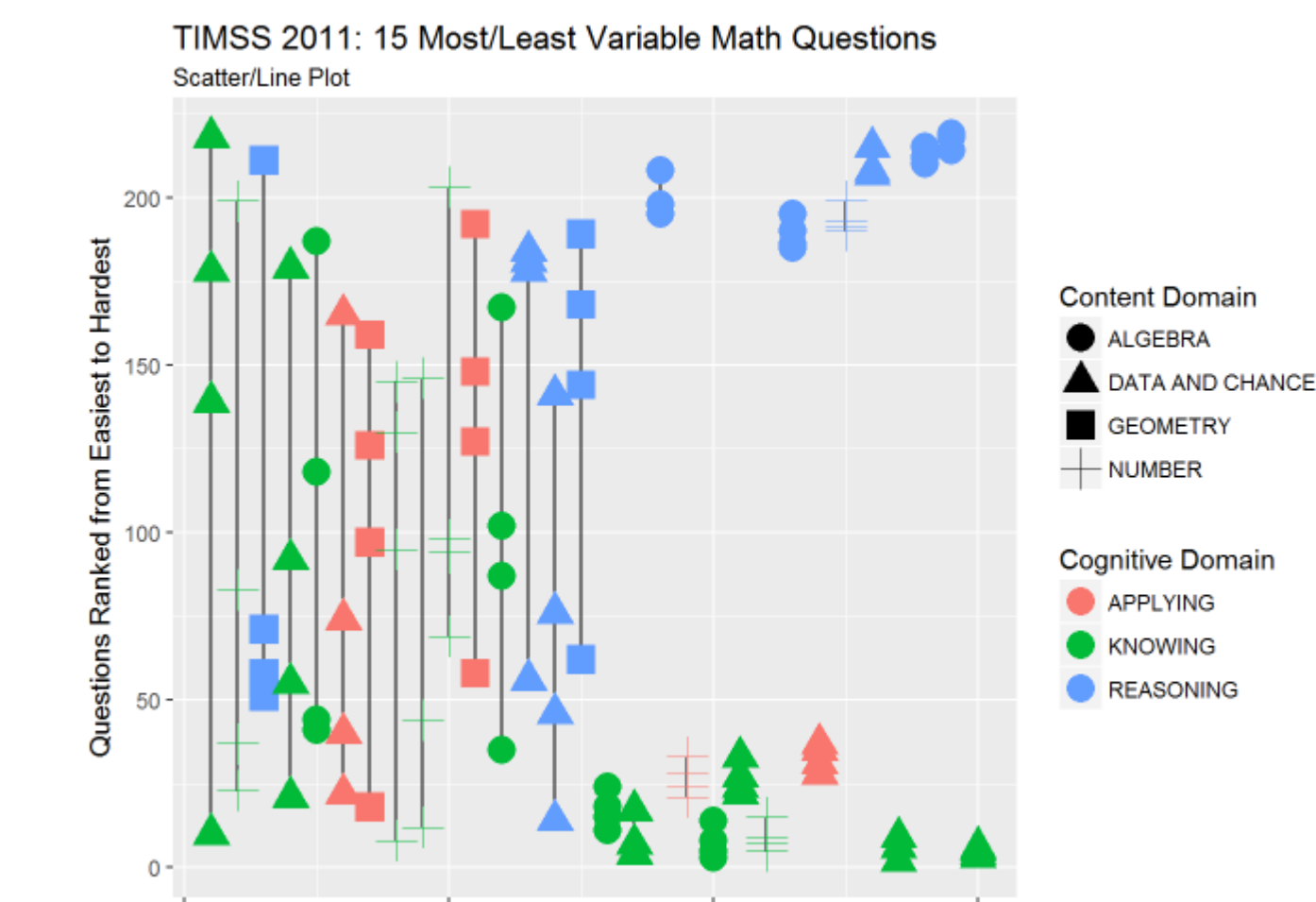
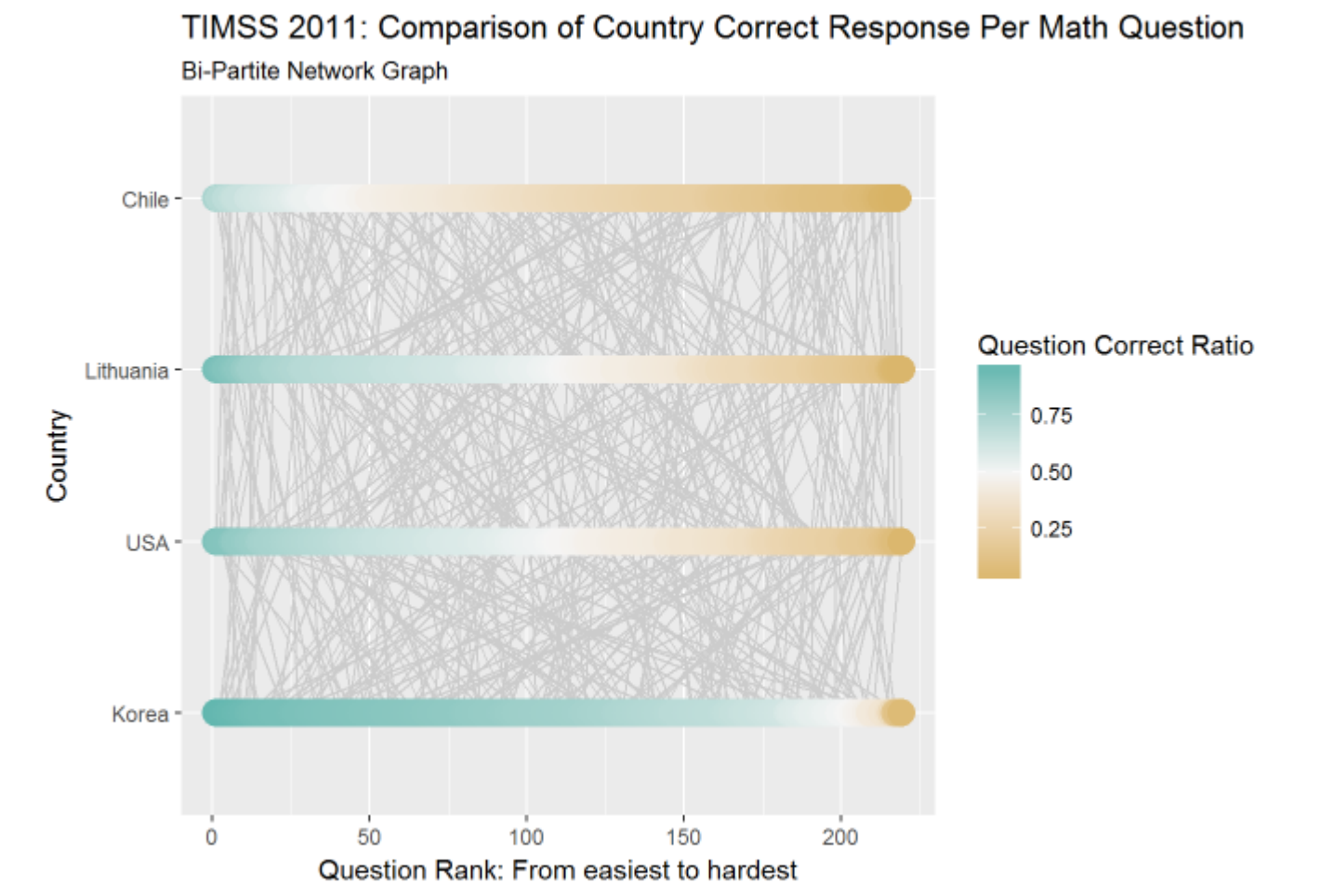
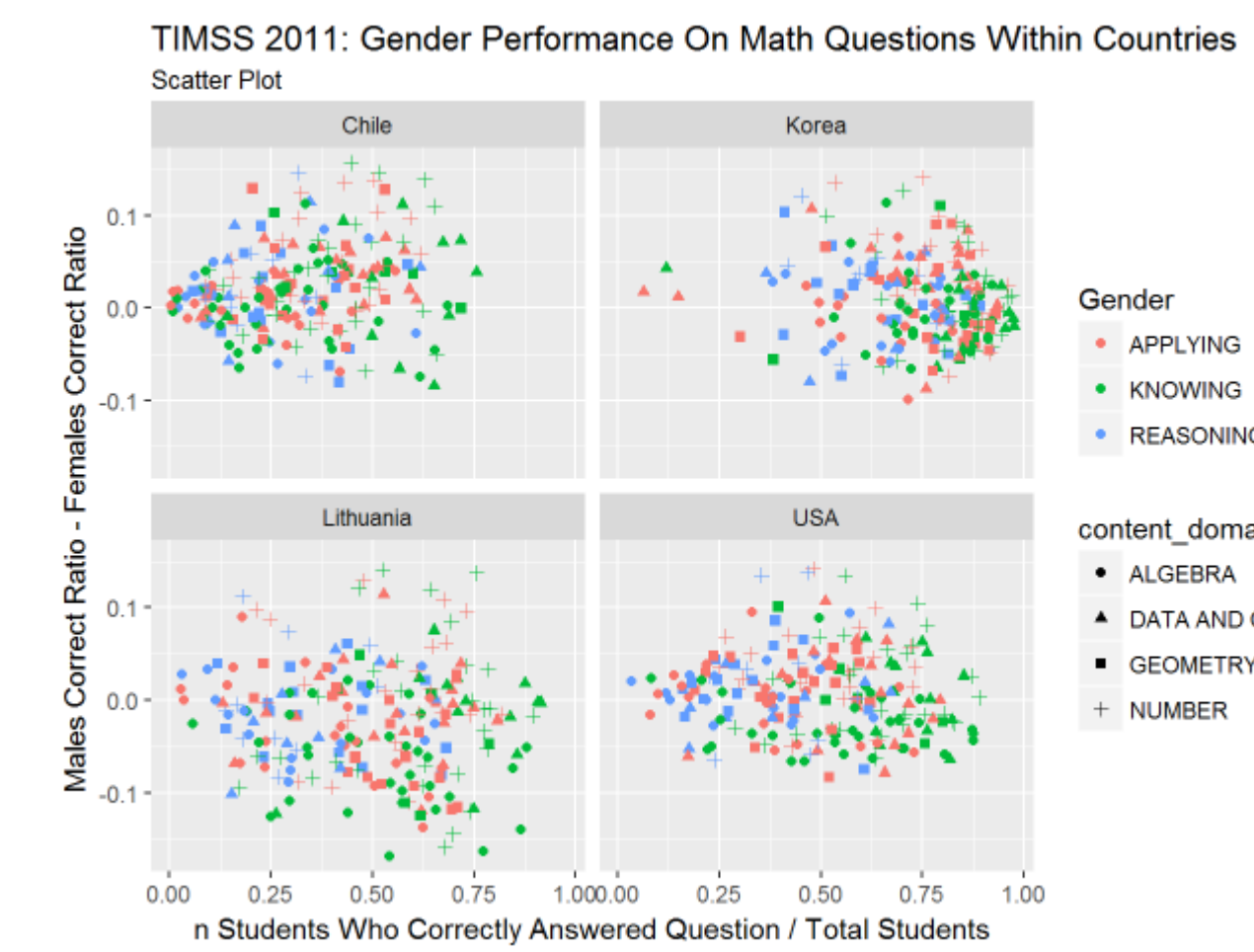
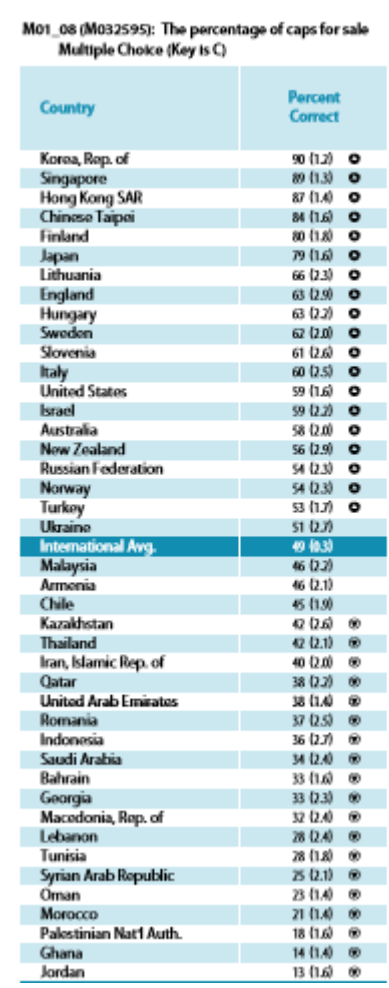
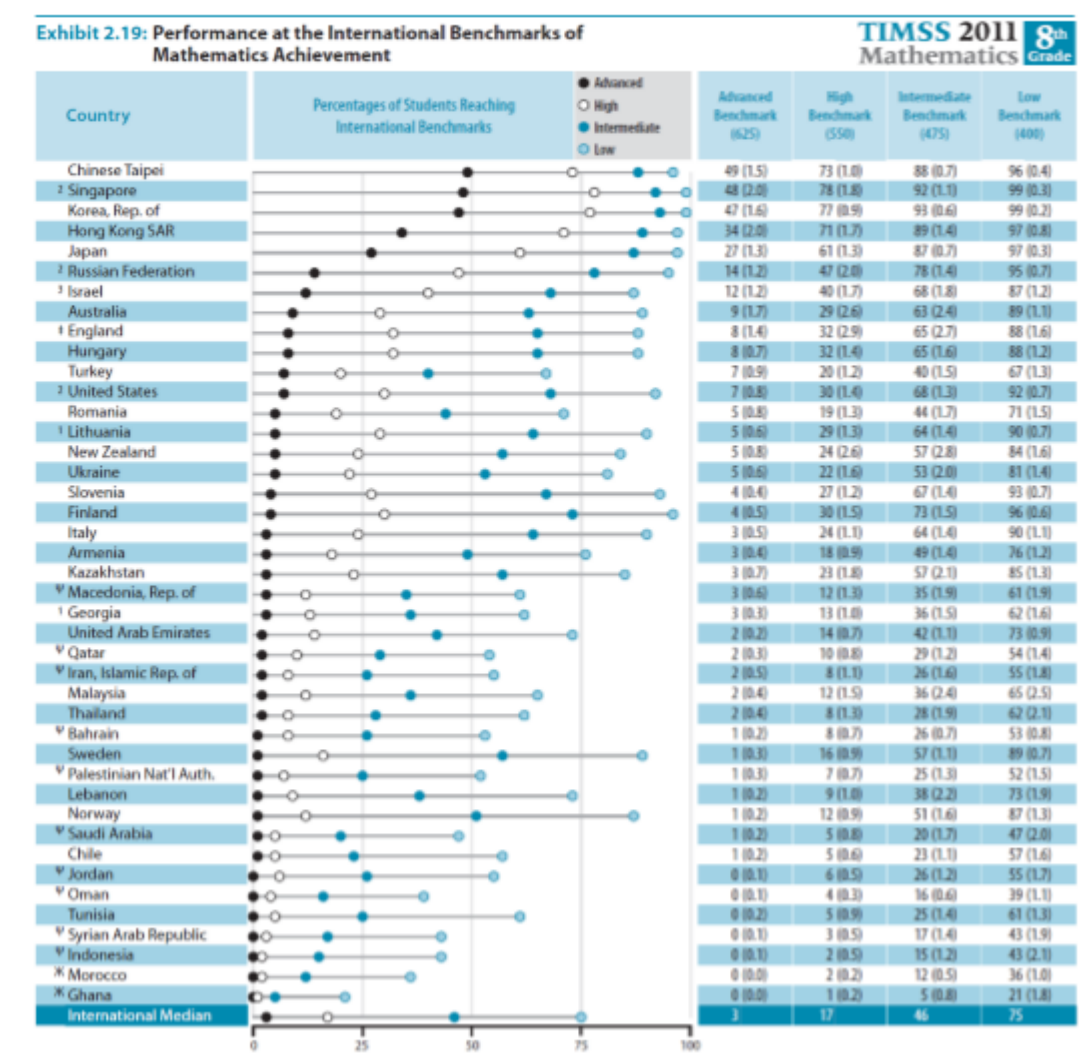
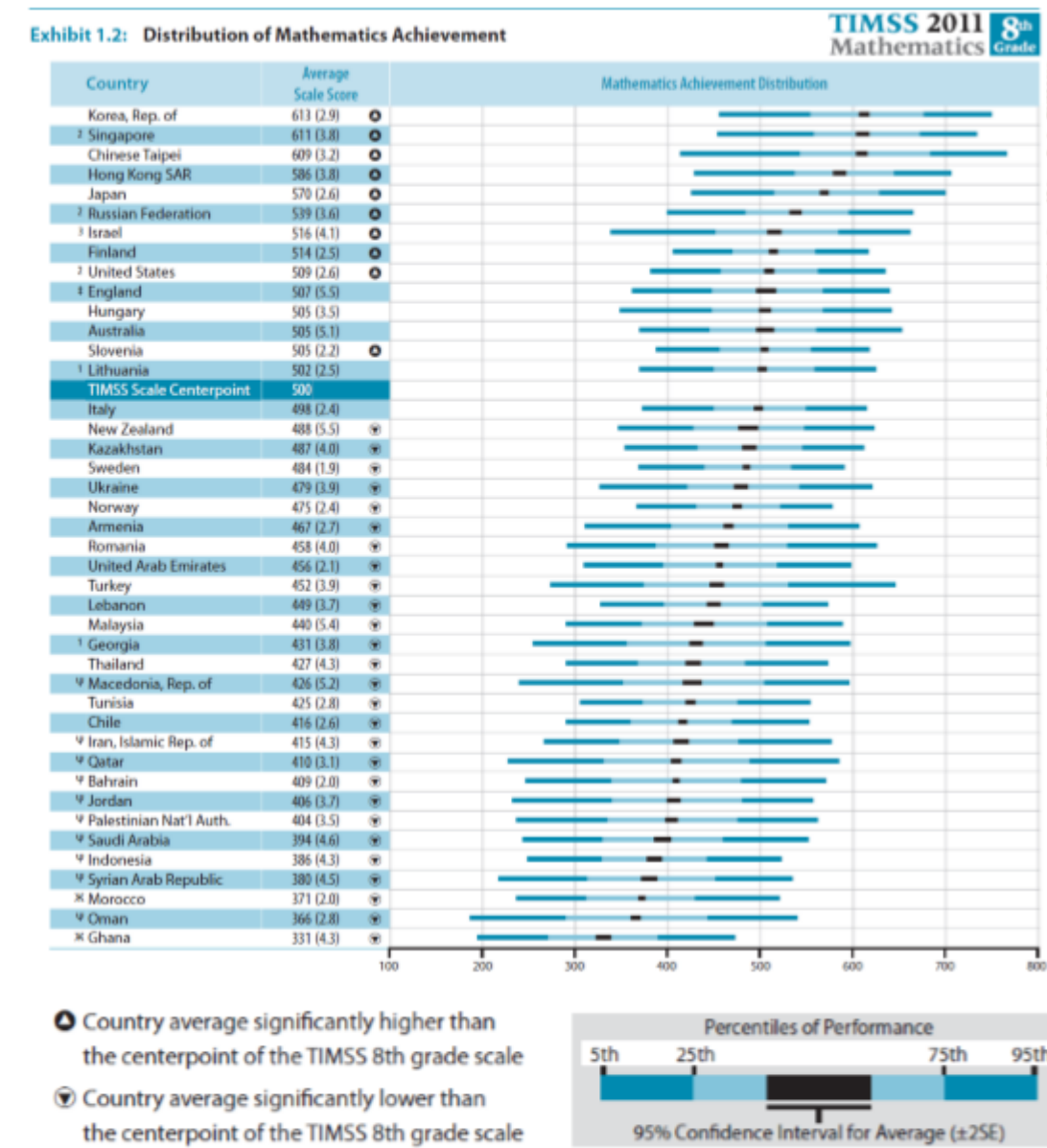
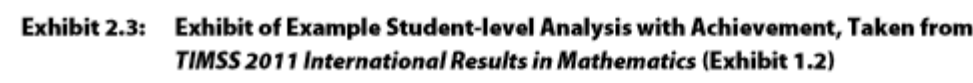


# Exploring TIMSS With R

*Benjamin Ortiz Ulloa*

The IEA and Boston College publicize the amazing TIMSS dataset every 4 years. The study shows how students from different countries perform on the same math and science questions. The dataset comes with guides that explain how to explore the data using SPSS and SAS. While the dataset is typically explored using those languages, I will show that TIMSS can be explored as well, if not better, using R.

## GIVEN VISUALIZATIONS



Tool	Description
ggplot2	Implementation of the "Grammar of Graphics" in R

# EXPLORATION LOOP

Tool	Description
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shiny	Create interactive graphics in R
d3.js	NOT AN R LIBRARY: Create interactive graphics in javascript

## GIVEN DATA

Tool	Description
<code>haven::read_spss</code>	Convert SPSS data into R dataframe
<code>haven::read_sas</code>	Convert SAS data into R dataframe
<code>readxl::read_excel</code>	Convert Excel data into R dataframe

Tool	Description
tidyr::separate	Expand single character column to multiple columns
tidyr::gather	Take multiple columns and collapse them into key-value pairs
tidyr::nest	Create a list of dataframes containing all the nested variables
dplyr::mutate	Add new variables while preserving existing ones
dplyr::filter	Return rows with matching conditions
dplyr::select	Keep only the queried variables
dplyr::left_join	Join two dataframes by matching variables
stringr::str_detect	Detect substring and return boolean
stringr::str_extract	Extract and return substring
stringr::str_replace	Replace substring with declared string
base::supply	Create a vector as a result of a row-wise function

2015 TIMSS: International Comparison of Math Questions

