

What about differences between
teacher candidates when considering
gender?

But wait, there's
more!



But wait, there is more...

<i>Independent-Samples t-Test – Gender</i>								
	Group	N	Mean	SD	SE	T	df	Sig.
English & LA	1	753	231	23.73	.86			
	2	214	236	23.68	1.62			
	Paired		-4.73		1.84	-2.58	965	.01
Math	1	764	200	31.99	1.16			
	2	218	218	33.36	2.26			
	Paired		-17.47		2.48	-7.04	980	.00
Science	1	750	219	29.32	1.07			
	2	218	235	31.70	2.15			
	Paired		-15.85		2.30	-6.90	966	.00
Social Studies	1	749	214	29.44	1.08			
	2	216	236	31.20	2.12			
	Paired		-22.05		2.31	-9.57	963	.00
Writing	1	751	230	28.87	1.05			
	2	220	229	31.23	2.11			
	Paired		1.73		2.26	.77	969	.44

Significant differences found in MOGEA

- By gender

and Social Studies ($p < .01$). Female candidates would therefore be eliminated from EPPs at a higher rate than their male counterparts should statewide cut scores be set. Only on the Writing subtest did female teacher candidates score higher than their male counterparts, and the two-tailed probability level was not statistically significant for this subtest ($p = .44$).

- *Edmonds recommends not using MOGEA as a screen for teacher candidates in Missouri's EPP's.*
- *Further research should be conducted about relationships and differences between and among groups and by gender for Missouri Content Assessment (MEGA).*

Conclusions from quant
analysis in MO

MoGEA Updates!

- There have been changes to the MoGEA since Fall 2015!
- Four subtests (combined Social Science and Science)
- Other modified
- What is the impact on bias?

What about the New MoGEA? MoCA?

- No research done yet on impact on bias for either assessment

Research Questions



Research Questions

- RQ1: What is the difference between old and new MoGEA subtest scores based on candidate race and ethnicity?
- RQ2: What is the relationship between new MoGEA subtests and MoCA passage rates based on candidate race and ethnicity?

Methodology

- Rudimentary check for normality (no review of skew/kurtosis)
 - All tests skewed to the left due to ceiling effect
- Z test of proportions
- Independent samples t test

RQ1: What Is The Difference Between Old And New MoGEA Subtests Based On Candidate Race And Ethnicity?

- Methodology:
 - Compare new and old MoGEA scores of candidates of different races and ethnicities from a moderately-selective Missouri EPP
 - Compare these scores based on candidate race and ethnicity

Analysis

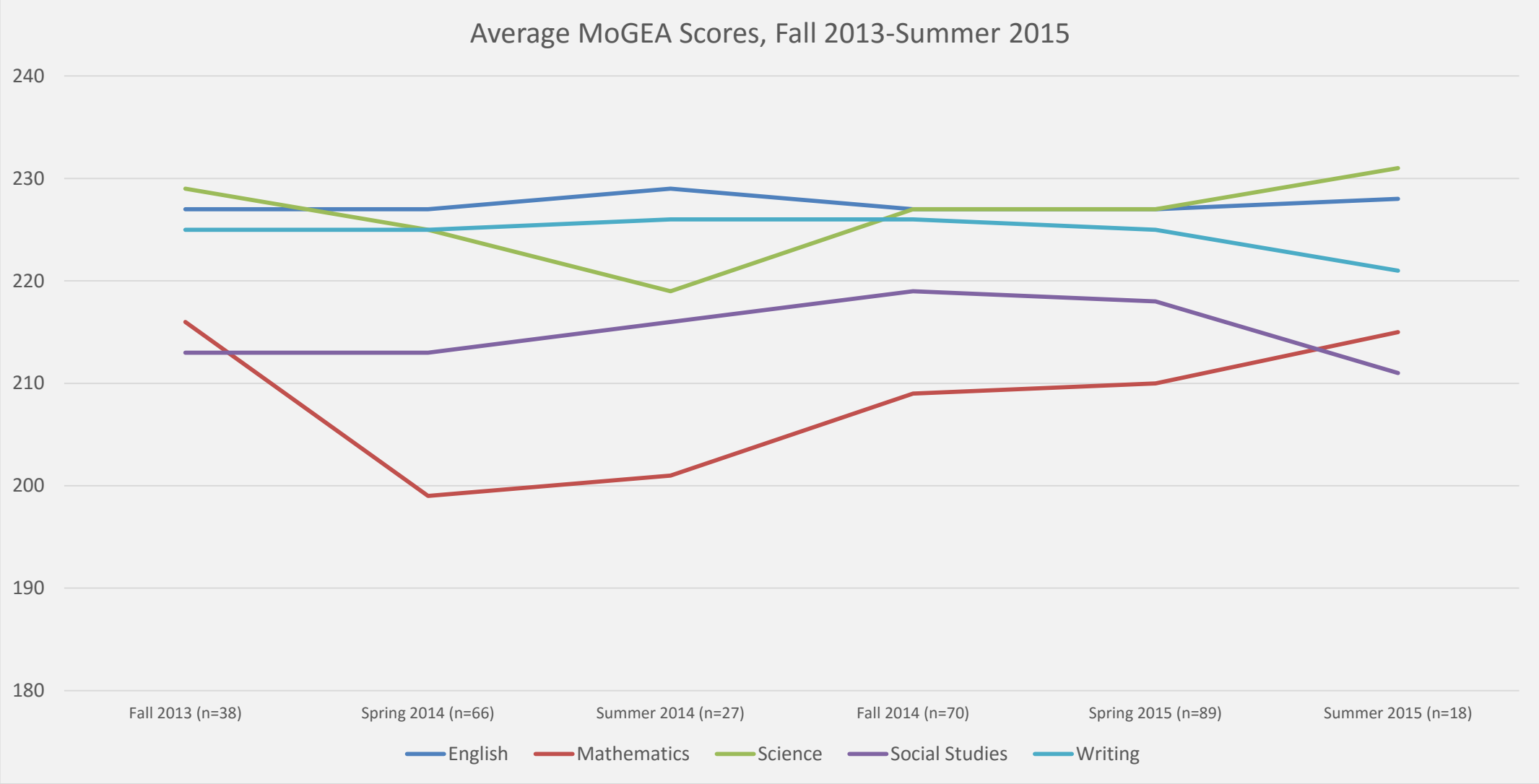


RQ1: What Is The Difference Between Old And New MoGEA Subtests Based On Candidate Race And Ethnicity?

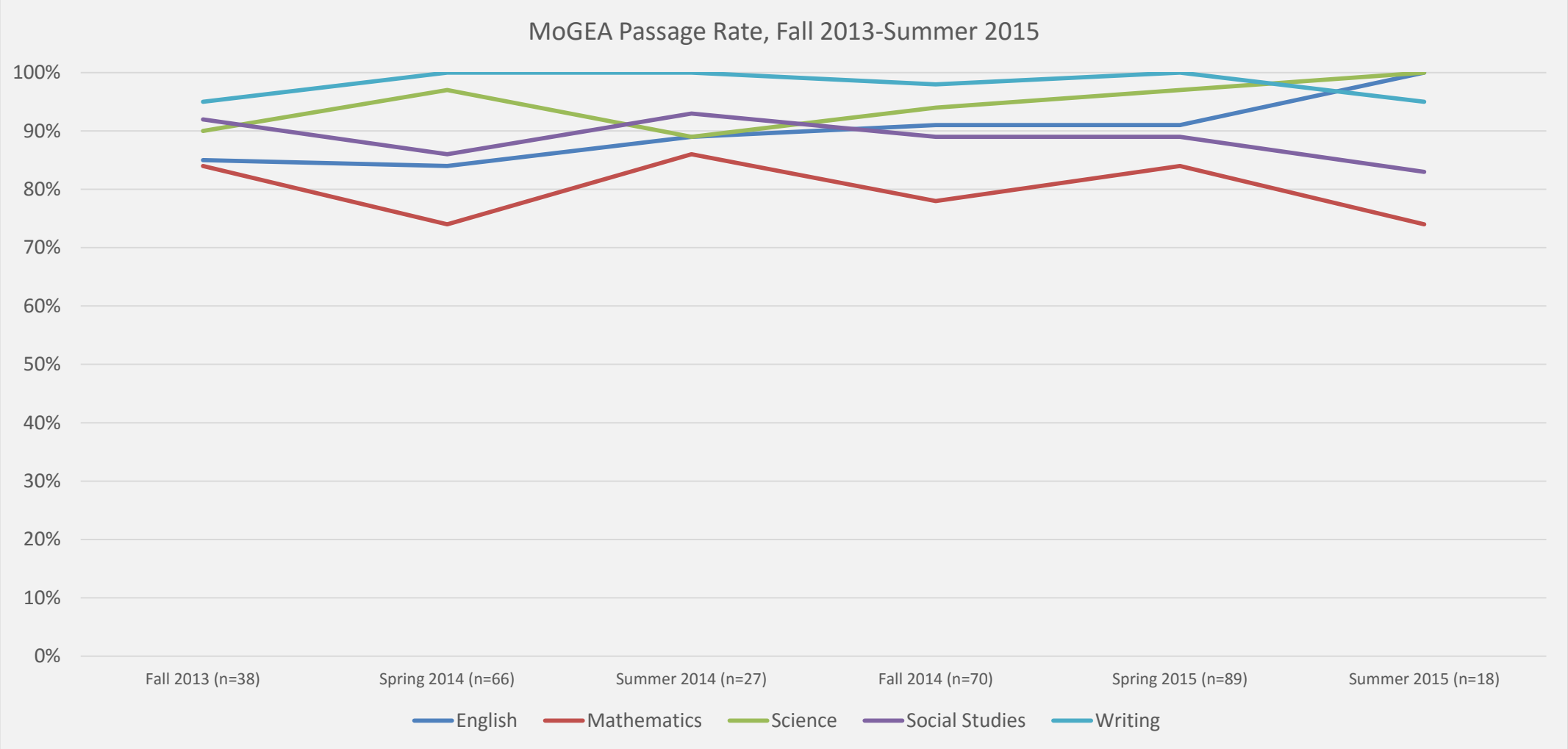
MoGEA Fall 2013-Summer 2015 NW Cut Score

English	203
Mathematics	183
Science	183
Social Studies	183
Writing	193

RQ1: What Is The Difference Between Old And New MoGEA Subtests Based On Candidate Race And Ethnicity?



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Fall 2015 Cut Score	
Mathematics	220
Reading Comprehension and Interpretation	220
Science and Social Studies	204
Writing	220

RQ1: What Is The Difference Between Old And New MoGEA Subtests Based On Candidate Race And Ethnicity?

% Pass all attempts	Fall 2015 (n=55 candidates)
Mathematics Subtest	93%
Reading Comprehension and Interpretation Subtest	89%
Science and Social Studies Subtest	92%
Writing Subtest	78%

RQ1: What Is The Difference Between Old And New MoGEA Subtests Based On Candidate Race And Ethnicity?

% reach panel based cut score	220
Old MoGEA (n=1577 attempts)	56%
New MoGEA (n=241 attempts)	86%

Comparing Proportions

- We will use an alpha (possibility that this difference happened by chance) of 5% (1 in 20)
- Used a z score to compare proportions
- $H_0: p_1 - p_2 = .05$
- $H_a: p_1 - p_2 > .05$

Method (we used this, except subtracting the numerator by .05)

$$z_1 = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\frac{\hat{p}_1(1 - \hat{p}_1)}{n_1} + \frac{\hat{p}_2(1 - \hat{p}_2)}{n_2}}}$$

RQ1: What Is The Difference Between Old And New MoGEA Subtests Based On Candidate Race And Ethnicity?

- Is there a significant difference between the old and new MoGEA according to passage rate?
 - Z score=10.56
 - Significant difference at $p < 0.0001$
 - *large sample size

So...

- Candidates more likely to pass new MoGEA subtests

MoGEA Old vs. MoGEA New? Bias?

Not Enough Data to Tell, But Looks Promising

%Pass	Fall 2013- Summer 2015	Fall 2015
Total	90%	89%
White	91%	88%
Black or Hispanic	78%	n too small
Non-White		92%

RQ1: What Is The Difference Between Old And New MoGEA Subtests Based On Candidate Race And Ethnicity?

- Looks promising, but...
- ...Need more data
- But, is the damage done?
 - “We can’t pass that test”.

RQ2: What Is The Relationship Between New MoGEA Subtests And MoCA Passage Rates Based On Candidate Race And Ethnicity?

Not enough candidates have taken both the NEW MoGEA and the MoCA.

But...

We can do some preliminary analysis using the ACT

Why the ACT? ACT Related to MEGA (old and new MoGEA and MoCA)

Above/Below PBCS (with some MoCA's removed)	ACT Comp Average	s ²
all MEGA, Below PBCS (n=779)	20.56	7.38
All MEGA, Above PBCS (n=1387)	23.43	11.12

Independent t test

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2} \right) \left(\frac{1}{N_1} + \frac{1}{N_2} \right)}}$$

Independent t test

- $Df = n_1 + n_2 - 2$
 - $Df = 2164$

T test statistic = 20.52, significant $p < 0.001$, two tailed test

SO, there is a significant difference between ACT scores of students who pass the MEGA standardized assessments vs. those that fail

Why the ACT? ACT Related to Race and Ethnicity, Like all Standardized Exams

All MEGA (with some MCA's removed)	ACT Comp Average
White (n=2006)	22.44
Black and Hispanic (n=21)	19.38

*t test stat = 4.07, df = 2025
P<.001

Why the ACT? ACT Related to Race and Ethnicity, Like all Standardized Exams

% Above/Below PBCS (with some MoCA's removed)	% Pass PBCS
White (n=2085)	88.01%
Black and Hispanic (n=21)	85.71%
Z test, p=.1816 NOT significant*	

*BUT: Is there a gatekeeper effect
by the MoGEA?

Why the ACT? ACT Related to Race and Ethnicity, Like all Standardized Exams

% Above/Below PBCS (MoGEA Only, Pre Fall 2015)	% Pass PBCS
White (n=1675)	90.21%
Black and Hispanic (n=18)	77.78%
Z test , $z=1.26$, $p=.1038$, two tailed*	

* Low population issue possible

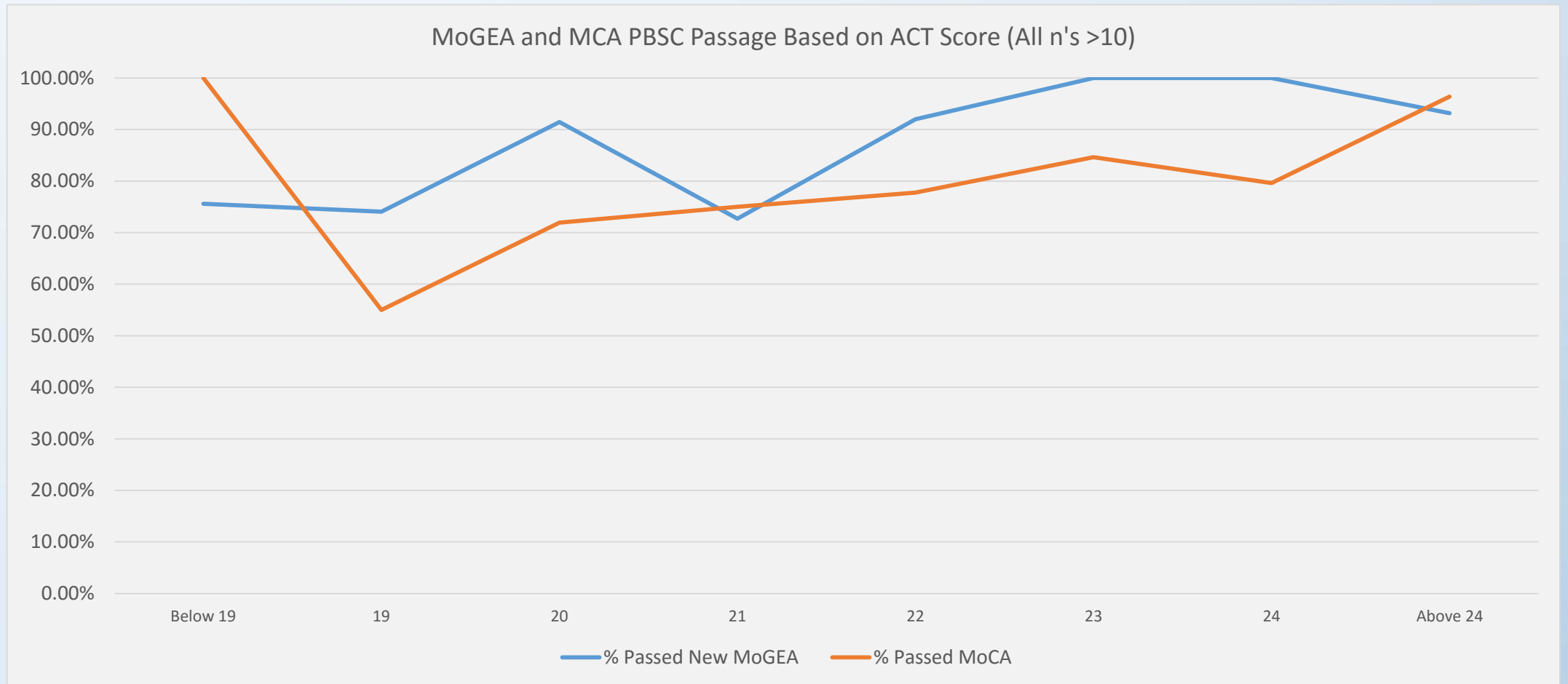
ACT: The Equalizer

- Same candidates haven't taken the new MoGEA and MoCA yet
- But, we know that ACT is related to both
 - Correlation between ACT and all MEGA standardized assessments
 - $r = 0.516$
 - LARGE effect size, according to Field (2013)
- Let's see how well students do in each test, according to their ACT

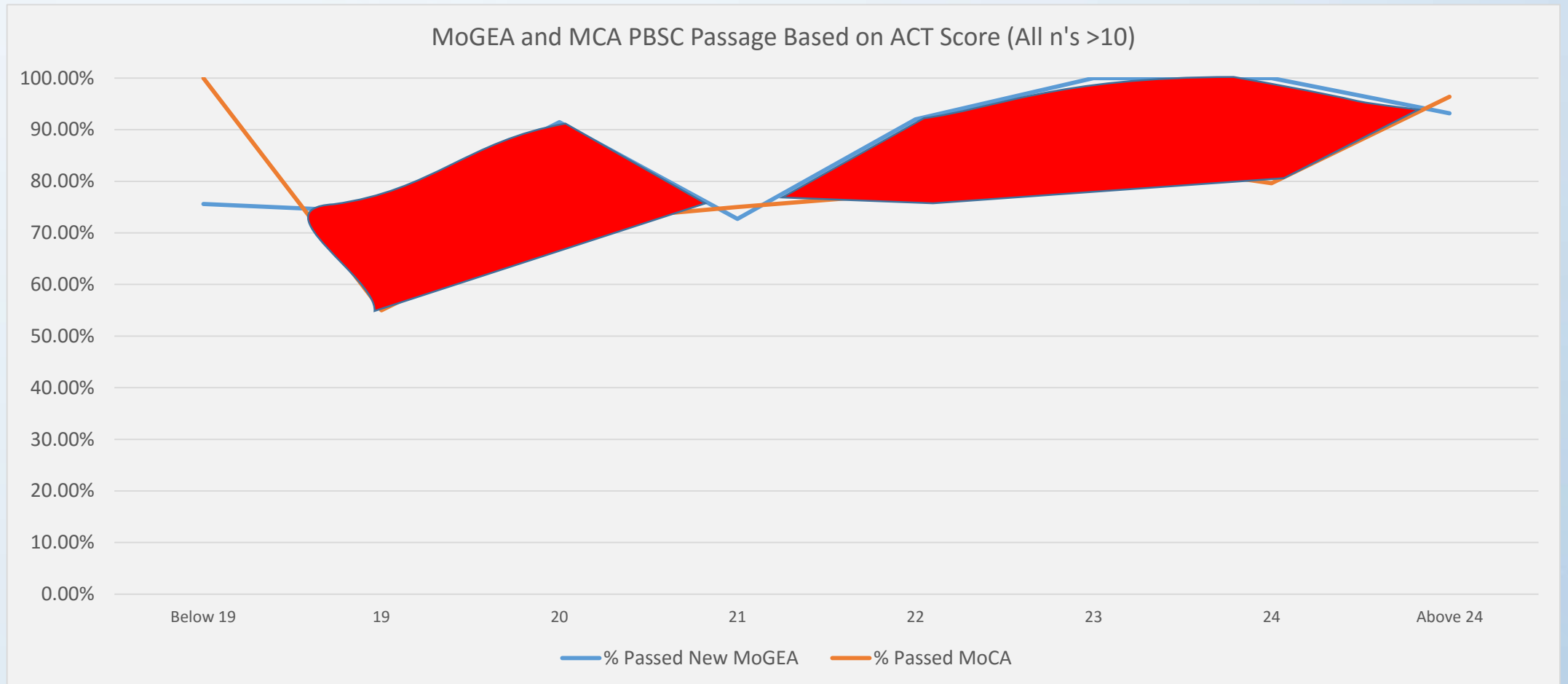
% Passed PBCS on New MoGEA and MoCA, by ACT

MoGEA and MoCA PBCS Passage Based on ACT Score (All n's >10)	% Passed New MoGEA	% Passed MoCA
Below 19	75.61%	100%
19	74.07%	55%
20	91.43%	71.93%
21	72.73%	75.00%
22	92.00%	77.78%
23	100%	84.62%
24	100%	79.63%
Above 24	93.18%	96.39%

MoGEA and MoCA Passage Rates by ACT Scores



MoGEA and MoCA Passage Rates by ACT Scores



RQ2: What Is The Relationship Between New MoGEA Subtests And MoCA Passage Rates Based On Candidate Race And Ethnicity?

- ACT can be partially predicted by race/ethnicity
- ACT can predict passage of PBCS of MoGEA and MoCA
- Race/ethnicity can predict passage of MoGEA and MoCA
- There is a “gap” of students who can pass the MoGEA, but according to their ACT scores will run into trouble in the MoCA
 - This “gap” does not occur at the edges of the bell curve for ACT scores
- Won't affect EPP's, but WILL NEGATIVELY IMPACT CANDIDATES

Findings



Findings

- New MoGEA is an improvement in regard to passage rate
- Need more diverse candidate MoGEA data to determine if the new MoGEA is less biased than original
- ACT, race and MEGA standardized scores are related
- There will be a gap in students who are able to pass the new MoGEA but may run into trouble on the MoCA

Suggestions

- Let's gather more data on new MoGEA, especially among diverse candidates
- DESE should take a closer look at the new MoGEA subtest for Writing, consider more variability in scoring
- Let's also gather more MoCA data, especially among diverse candidates
- Research about gender bias in MoCA

NOT A Suggestion:

- Doesn't this show what we already know?
 - SES is the main predictor of standardized test scores, period, regardless of race
 - Students from lower SES more likely to attend poorer schools, worse prep for standardized tests
 - Black/Hispanic students more likely to be from lower SES/poorer schools
- SO, let's fix this inequality with some equity!
 - Find ways to bring more educators of color into the field, not eliminate them
 - Fix one of the roots of a deeply ingrained problems related to social inequality

What we need...



PLEASE SIR CAN I HAVE SOME MORE

DATA?



**KEEP
CALM
AND
FINISH YOUR
DISSERTATION**

Dissertation

- Search Elementary Ed. MoCA for bias
- Similar to Dr. Edmonds review of MoGEA
- But, I need YOUR data!

If you would like to be a part of this new MoCA research...

- Please sign in on the sheet we will pass or...
- Contact Mike McBride at mam77@nwmissouri.edu

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