



CREATING STRONG
SCHOOLS & COMMUNITIES

Ethnicity-Related Achievement Gaps: A Longitudinal Study From Hawaii

Malkeet Singh & Hella Bel Hadj Amor

Education Northwest

Shuqiang Zhang

University of Hawaii at Manoa



Better Outcomes for All Kids

- Goal: Improved outcomes for disadvantaged groups and reduced gaps



Better Outcomes for All Kids

- Goal: Improved outcomes for disadvantaged groups and reduced gaps
- How:
 - Testing in multiple grades
 - Assessments aligned with state academic standards
 - Subgroup performance
 - Incentives and sanctions

The design of NCLB limits its ability to achieve its goal

Limitations with regard to:

- Diversity of Hawaii's Asian population
- Pacific Islander population
- Early academic foundation, low SES
ELL status
- Nested structure of the data



These limitations can be addressed

Outcomes

- Reading HSA in grade 8 (2009)
- Reading HSA in grade 10 (2011)

These limitations can be addressed

Outcomes

- Reading HSA in grade 8 (2009)
- Reading HSA in grade 10 (2011)

Predictors

- Reading HSA in grade 3 (2004)
- Ethnicity (Hawaiian, East Asian, Filipino or white)
- Gender
- SES (FRPL)
- School SES (% FRPL)

Multilevel Model I

Level 1

$$Y_{i(jk)} = \beta_{0(jk)} + \beta_{1(jk)}(\text{HSA 3R})_i + \beta_{2(jk)}(\text{SES})_i + \beta_{3(jk)}(\text{East Asian})_i + \beta_{4(jk)}(\text{Filipino})_i + \beta_{5(jk)}(\text{Hawaiian})_i + \beta_{6(jk)}(\text{Gender})_i + r_{i(jk)}$$

Level 2

$$\begin{aligned} \beta_{0(jk)} &= \gamma_{00} + \gamma_{01}(\text{SchSES-3})_j + \gamma_{02}(\text{SchSES-8})_k + \mu_{0j} + \mu_{0k} \\ \beta_{m(jk)} &= \gamma_{m0} \quad m = 1..6 \end{aligned}$$

Reduced

$$Y_{i(jk)} = \gamma_{00} + \gamma_{10}(\text{HSA 3R})_i + \gamma_{20}(\text{SES})_i + \gamma_{30}(\text{East Asian})_i + \gamma_{40}(\text{Filipino})_i + \gamma_{50}(\text{Hawaiian})_i + \gamma_{60}(\text{Gender})_i + \gamma_{01}(\text{SchSES-3})_j + \gamma_{02}(\text{SchSES-8})_k + \mu_{0j} + \mu_{0k} + r_{i(jk)}$$

Where $i = i^{\text{th}}$ student, $j = j^{\text{th}}$ elementary school, $k = k^{\text{th}}$ middle school, $Y_{i(jk)}$ = Grade 8 HSA score of the i^{th} student from the j^{th} elementary and the k^{th} middle schools

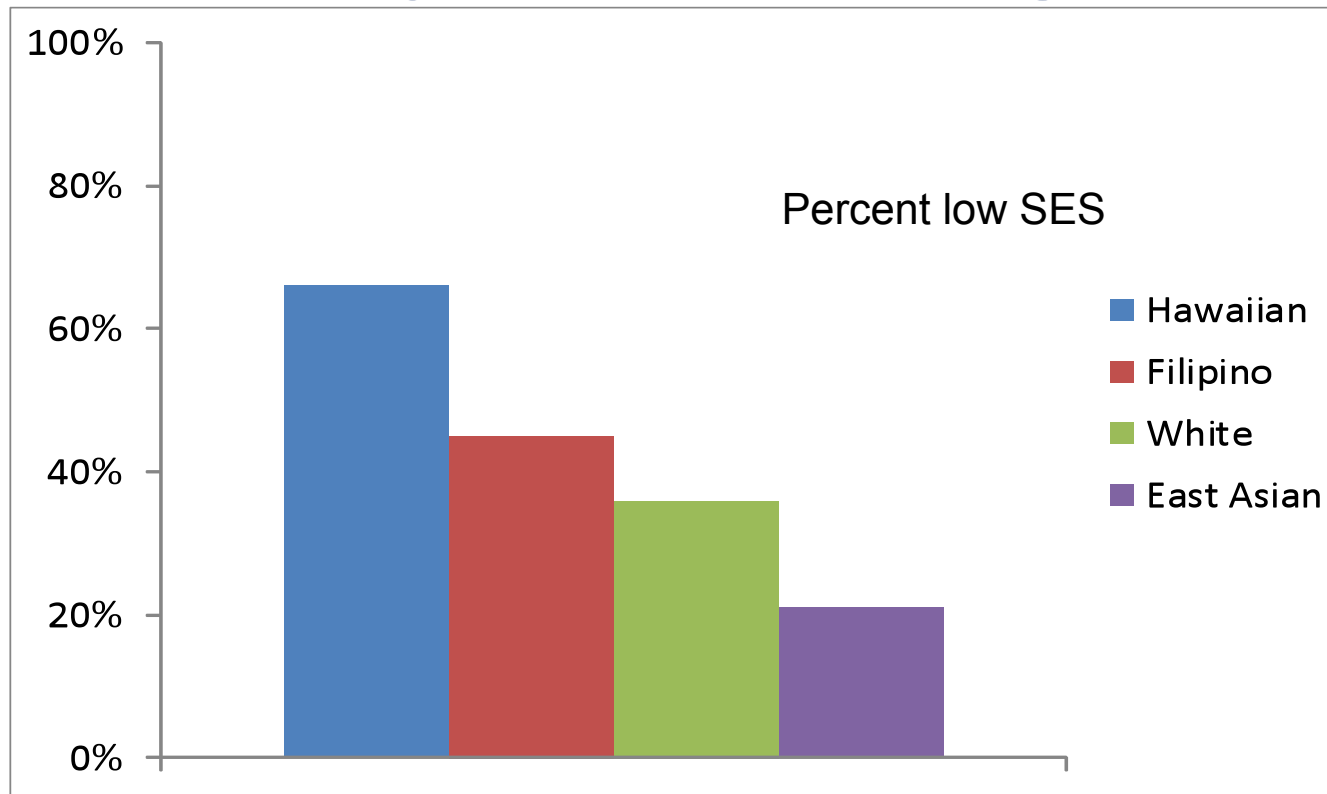
Achievement – Cohort

	Analytical Sample		
Grade	N	Mean	SD
3	5285	303.07	57.65
8	5285	322.50	29.93
10	5285	315.07	26.00

Achievement – Subgroups

Grade	East Asian			Filipino			Hawaiian			White		
	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
3	1188	328.84	55.99	1642	299.08	54.12	1841	283.19	53.26	614	323.45	57.37
8	1188	337.22	29.63	1642	322.98	27.28	1841	310.58	27.71	614	328.47	28.98
10	1188	328.82	25.09	1642	313.71	22.27	1841	304.48	24.37	614	323.76	26.70

Achievement Mirrors Differences in Poverty Across Subgroups



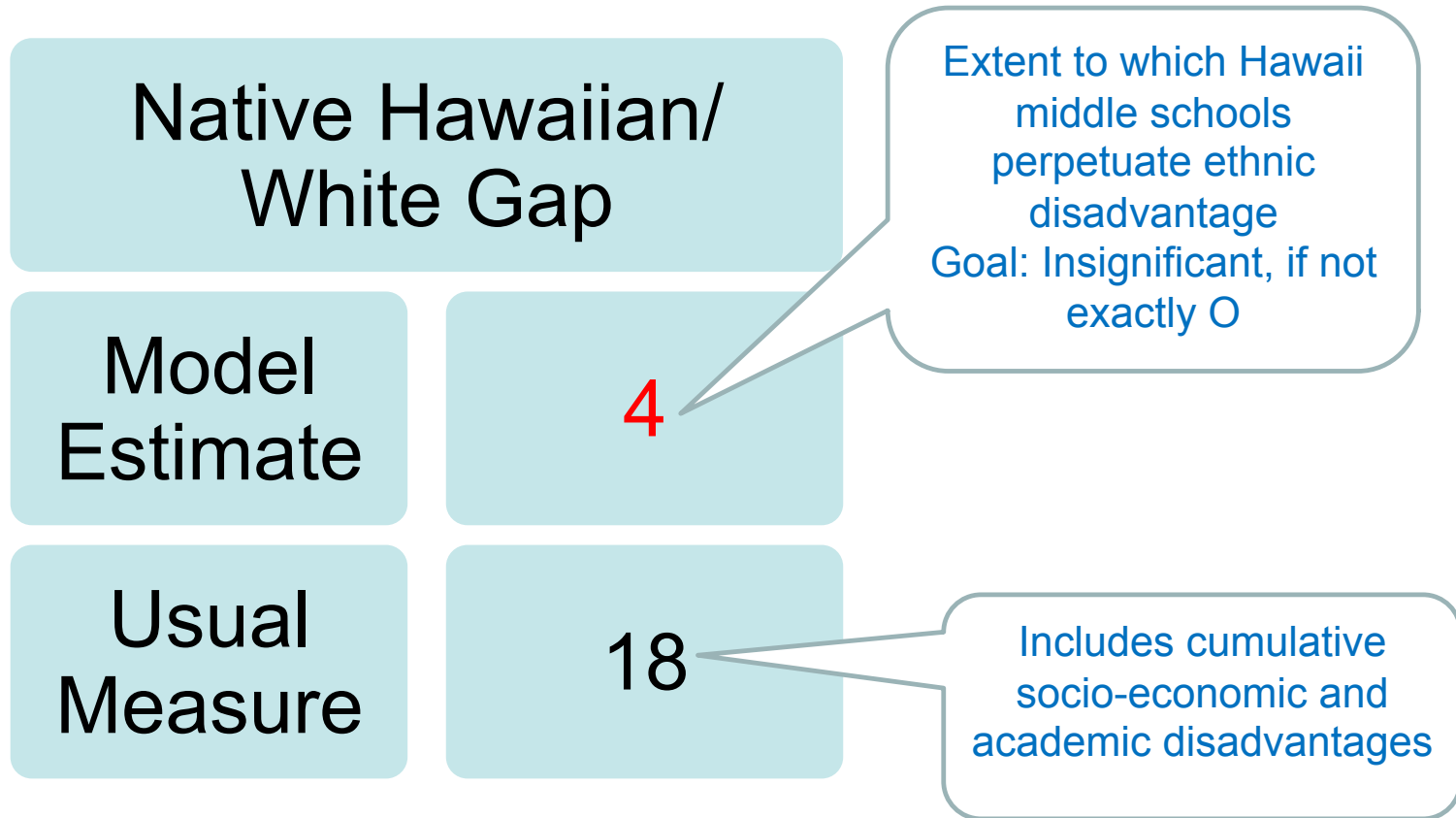
HLM Results		
Year/Grade	2009 (8)	2011 (10)
Intercept	338.89***	328.88***
HSA 3R	0.33***	0.27***
Gender	-5.83***	-1.23*
Hawaiian	-3.90***	-6.90***
Filipino	0.81n.s.	-3.83***
East Asian	4.93***	2.81**
SES	-2.39***	-2.55***
SchSES-3	-0.22***	-0.20***
SchSES-8	-0.03n.s.	-0.05n.s.
SchSES-10	N.A.	0.07n.s.
Random Effect	Variance Components	Variance Components
μ_{0j}	13.08***	10.12***
μ_{0k}	15.68***	0.06n.s.
μ_{0l}	N.A.	11.99**
Residual	436.59***	342.55***
R^2	0.52	0.50

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, n.s. not significant, N.A. not applicable.
Numbers in parentheses are standard errors.

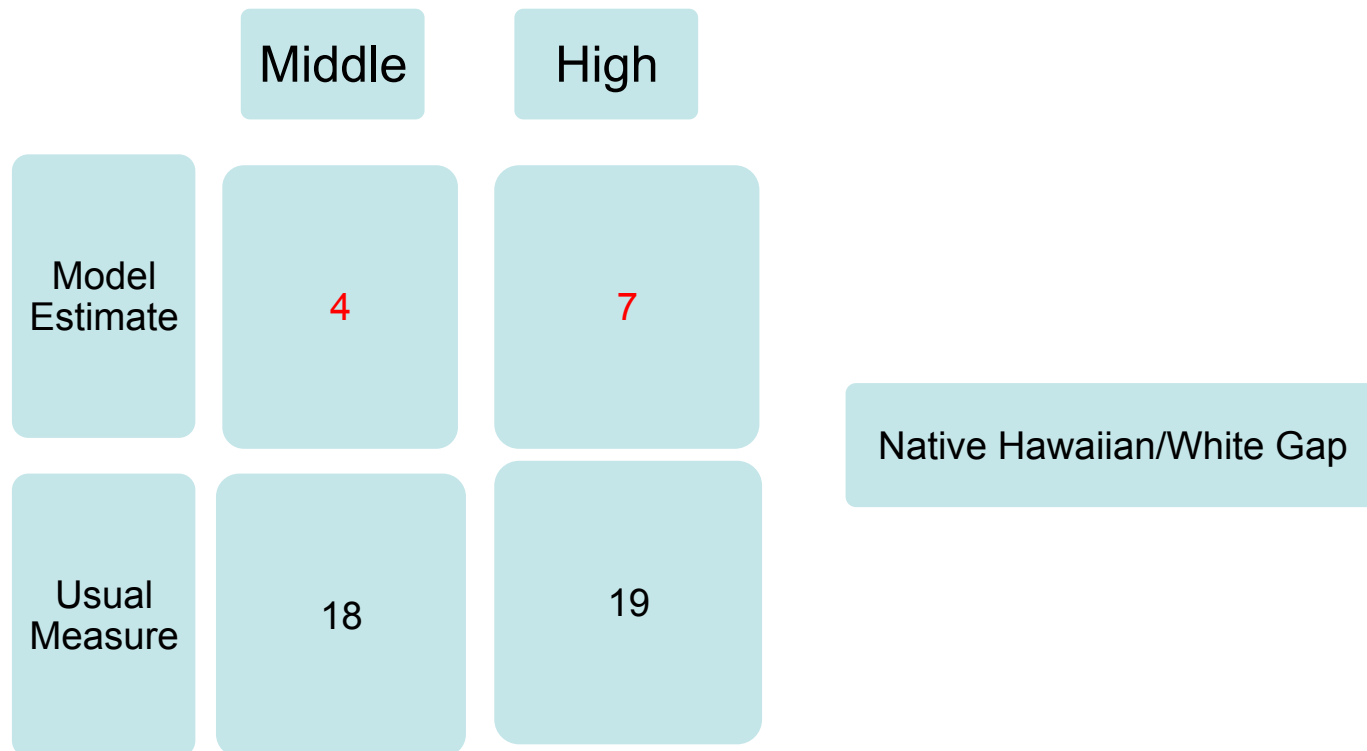
Standardized Weights (Z)

Predictor	Standardized Coefficients		Percentage change
	Grade 8	Grade 10	
HSA 3R	0.01	0.01	0%
Gender	-0.19	-0.05	74%
Hawaiian	-0.13	-0.27	108%
Filipino	n.s.	-0.15	N.A.
East Asian	0.16	0.11	31%
SES	-0.08	-0.10	14%

Key Findings – Middle School



Key Findings – High School



Conclusion

1. NCLB reauthorization is unlikely to eliminate the Native Hawaiian historical disadvantage challenge

Conclusion

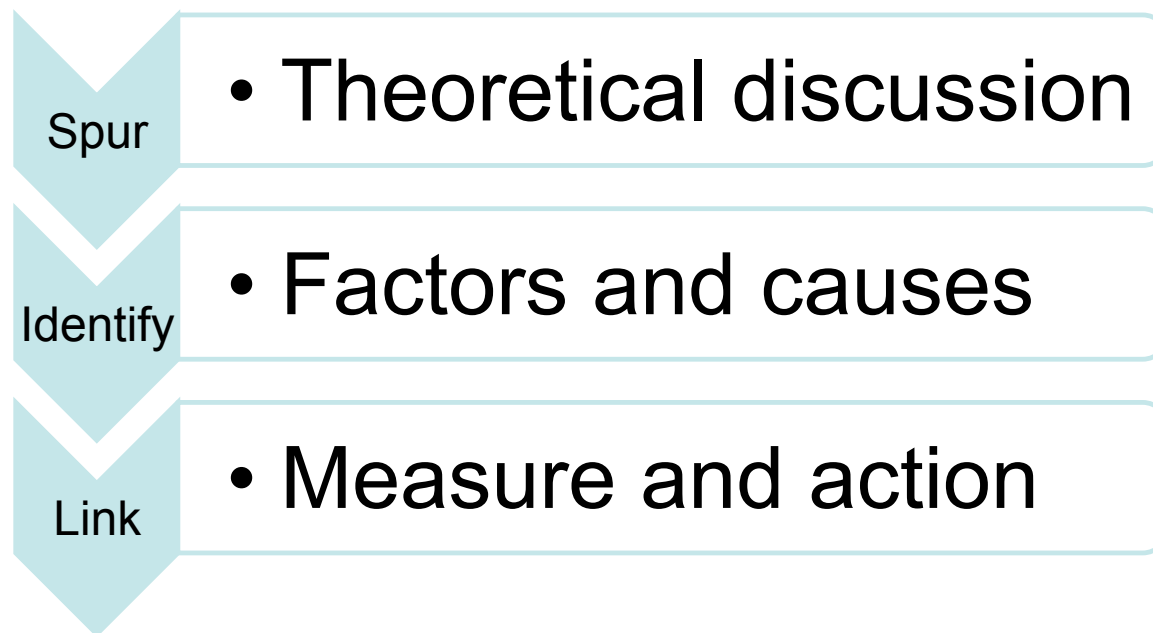
1. NCLB reauthorization is unlikely eliminate the Native Hawaiian historical disadvantage challenge
2. NCLB definition of the achievement gap ~~stimulates~~ discourages education reformers

Conclusion

1. NCLB re-authorization is unlikely eliminate the Native Hawaiian historical disadvantage challenge.
2. NCLB definition of the achievement gap ~~stimulates~~ discourages education reformers.
3. How do we ~~measure~~ conceptualize and isolate the ethnicity-related disadvantage?

Conclusion (Continued)

Quantitative attempt to reconceptualize



Systemic rejuvenation

Recommendations

1. Measure ethnicity-related disadvantages

By subgroup of AAPI

By grade level

Isolating them from academic readiness



Design specific tailored interventions

Recommendations (Continued)

2. Publicize the correct, less overwhelming gap and engage administrators, teachers, and staff in closing it within a reasonable number of years

Native Hawaiian/
White Gap

Model
Estimate

MS:4
HS:7

Usual
Measure

MS:18
HS:19

Limitations

1. Small number of cohorts to inform policy approach likely not applicable at the individual teacher or principal level
2. Dichotomous coding of SES consistent with NCLB but imprecise
3. Assumption that the grade 3 socioeconomic status was stable across the years