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## **Ethnic/Race Differences in Aptitude by Generation in the United States: An Exploratory Meta-analysis**

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### **Abstract**

Cognitive ability differences between racial/ethnic groups are of interest to social scientists and policy makers. In many discussions of group differences, racial/ethnic groups are treated as monolithic wholes. However, subpopulations within these broad categories need not perform as the racial/ethnic groups do on average. Such subpopulation differences potentially have theoretical import when it comes to causal explanations of racial/ethnic differentials. As no meta-analysis has previously been conducted on the topic, we investigated the magnitude of racial/ethnic differences by migrant generations (first, second, and third+). We conducted an exploratory meta-analysis using 18 samples for which we were able to decompose scores by sociologically defined race/ethnicity and immigrant generation. For Blacks and Whites of the same generation, the first, second, and third+ generation B/W d-values were 0.79, 0.79, and 1.00. For Hispanics and Whites of the same generation, the first, second, and third+ generation H/W d-values were 0.76, 0.67, and 0.57. For Asians and Whites of the same generation, the first, second, and third+ generation d-values were -0.08, -0.21, and 0.00. Relative to third+ generation Whites, the average d-values were 0.99, 0.84, and 1.00 for first, second, and third+ generation Black individuals, 1.04, 0.71, and 0.57 for first, second, and third+ generation Hispanic individuals, 0.16, -0.18, and -0.01 for first, second, and third+ generation Asian individuals, and 0.24 and 0.04 for first and second generation Whites.

Keywords: Immigrants, group differences, race, ethnicity, aptitude, National IQ

### **Introduction**

There are well known ethnic and racial aptitude differentials in the U.S. Most notably, self-identified non-Hispanic Black (from now on “Black”) and Hispanic Americans score, respectively, approximately 1 and 0.7 standard deviations below non-Hispanic White (from now on “White”) Americans (Roth, 2001). These differences are of interest because they account for a large portion of numerous unwanted group outcome differences (e.g., in education, income, etc.) (Fryer et al., 2011). Various etiological accounts of the aptitude differentials have been offered. When it comes to adjudicating between accounts, the performance of groups by immigrant generation can be of relevance, as a number of causal hypotheses (e.g., involuntary minority, legacy of slavery, historic discrimination, cultural bias, epigenetics, genetics, etc.) make predictions regarding differences across migrant generations. For example, John Ogbu’s involuntary minority hypothesis attributes low African American performance to oppositional differences arising from being members of an involuntary diaspora (Gibson and Ogbu, 1991). This hypothesis would not obviously predict similarly low aptitude for first and second generation individuals of the same minority group, individuals who freely migrated to the

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U.S. Unfortunately, no one has meta-analytically explored the magnitude of aptitude differences by race/ethnicity and generation in the U.S. As such, these various claims and positions, insofar as they relate to migrant generations, are difficult to evaluate. To address the hole in the literature, we conducted a meta-analysis of race x generation differences in the U.S.

## **Method**

We conducted a meta-analysis based on results from 18 samples for which we were able to decompose scores by sociological race/ethnicity and immigrant generation. The following surveys were included:

1. Beginning Postsecondary Students 2004-2009 Survey <http://nces.ed.gov/surveys/bps/>  
Analyzed with an online statistical tool (PowerStats).
2. The National Postsecondary Student Aid Study 2008 (NPSAS 2008)  
<http://nces.ed.gov/surveys/npsas>  
Analyzed with an online statistical tool (PowerStats).
3. The National Postsecondary Student Aid Study 2012 (NPSAS 2012)  
<http://nces.ed.gov/surveys/npsas/>  
Analyzed with an online statistical tool (PowerStats).
4. TIMSS 1995 & 1999 grade 8 <http://nces.ed.gov/nationsreportcard/naepdata/>  
Analyzed with an online statistical tool (International Data Explorer (IDE)).
5. TIMSS 2007 & 2011 grade 8 <http://nces.ed.gov/nationsreportcard/naepdata/>  
Analyzed with an online statistical tool (International Data Explorer (IDE)).
6. TIMSS 1995 and 2003 grade 4 <http://nces.ed.gov/nationsreportcard/naepdata/>  
Analyzed with an online statistical tool (International Data Explorer (IDE)).
7. TIMSS 2007 and 2011 grade 4 <http://nces.ed.gov/nationsreportcard/naepdata/>  
Analyzed with an online statistical tool (International Data Explorer (IDE)).
8. PIRLS 2006 <http://nces.ed.gov/nationsreportcard/naepdata/>  
Analyzed with an online statistical tool (International Data Explorer (IDE)).
9. PIRLS 2011 <http://nces.ed.gov/nationsreportcard/naepdata/>  
Analyzed with an online statistical tool (International Data Explorer (IDE)).
10. PISA 2009 <http://nces.ed.gov/nationsreportcard/naepdata/>  
Analyzed with SPSS using publicly available data.
11. PISA 2012 <http://nces.ed.gov/nationsreportcard/naepdata/>  
Analyzed with SPSS using publicly available data.
12. National Assessment of Adult Literacy <http://nces.ed.gov/NAAL/>  
Analyzed with AM software using publicly available data.
13. Program for the International Assessment of Adult Competencies  
<http://nces.ed.gov/surveys/piaac/>  
Analyzed with SPSS using publicly available data.

14. National Longitudinal Study of Adolescent Health (Add Health)  
<http://www.cpc.unc.edu/projects/addhealth>  
Analyzed with SPSS using publicly available data.
15. General Social Survey (GSS 1972-2010) <http://www3.norc.org/gss+website/>  
Analyzed with an online statistical tool (SDA).
16. National Longitudinal Survey of Freshmen (NLSF) <http://nlsf.princeton.edu/>  
Analyzed with SPSS using publicly available data.
17. High School Longitudinal Study of 2009 (HSL:09) <http://nces.ed.gov/surveys/hsls09/>  
Analyzed with SPSS using publicly available data.
18. National Education Longitudinal Study of 1988 <https://nces.ed.gov/surveys/nels88/>  
Used data provided in a published paper.

These surveys in particular were chosen because: (a) they allowed for scores to be decomposed by three generational groups (first, second, and third+) and four racial/ethnic groups (Whites, Blacks, Hispanics, and Asians), (b) they were mostly representative either of the U.S. national population or of the U.S. university population, (c) the data was publicly available, and (d) the tests involved were at least fair measures of general aptitude. We looked into other surveys but those did not meet one of the four criteria mentioned above or, alternatively, they were too difficult to analyze. For example, the New Immigrant Survey did not contain third+ generation data and the National Longitudinal Survey of Youth '97 did not readily allow for a decomposition by generations. As for published results, we did not conduct a complete review, thus we classify this as a non-systematic exploratory meta-analysis. Generally, the research which we did find and did not include did not meet one of our inclusion criteria.

For our race variable, we used U.S. sociologically defined race/ethnicity (i.e., non-Hispanic Asians (“Asians”), which includes individuals of mostly south and east Asian descent, non-Hispanic Whites (“Whites”), which includes individuals of mostly West Eurasian — minus South Asian — descent, non-Hispanic Blacks (“Blacks”), which includes individuals of mostly Sub Saharan African descent, ones largely from Africa and the West Indies, and Hispanics (“Hispanics”), which includes individuals of Latin American origin, regardless of historic biogeographic ancestry). Self-reported race/ethnicity was used for all studies. Regarding generations, we defined these as follows:

First generation — born outside the U.S. with at least one parent also born outside the U.S.

Second generation — born inside the U.S. with at least one parent born outside the U.S.

Third+ generation — born inside the U.S. with two parents also born inside the U.S.

For a couple of the studies, the definition of generation deviated from that mentioned above. For example, in the BPS study, first generation was defined as being non-U.S. born and having two non-U.S. born parents. In this instance, this was done as the survey variables did not allow for

the analysis to be conducted otherwise. When, for specific surveys, generation definitions deviated from the ones noted above, this was noted in the data file.

We were unable to compute sample sizes for a number of the studies, as many were analyzed with online statistical tools and as these tools did not provide the necessary statistical options to generate sample sizes; as such, we did not report them in Table 2 and we did not weight the survey d-values when computing meta-analytic averages; even if sample sizes were available for all surveys, doing otherwise arguably would have been undesirable given the heterogeneity of the samples, which varied in birth year, age, test type, representativity, and sample size.

Standardized differences were computed relative to White 3rd+ generation scores. For simplicity's sake, pooled standard deviations were not used. For all studies except BPS (2004-2009), NPSAS (2008), and NPSAS (2012), White 3rd+ generation standard deviations were employed instead. For the three above mentioned studies, total sample standard deviations were used as the online statistical program did not provide subgroup values. Generally not using pooled standard deviations had little effect as the White 3rd+ generation sample sizes overwhelmed the comparison group ones.

The survey characteristics (name, whether the survey was nationally representative, name of test given, the age when the test was taken by participants, and the total sample size) are listed in Table 1. Fourteen of the eighteen surveys were nationally representative; three were nationally representative of the university population, and one was not representative. Across all surveys, the total sample size was about 400,000.

**Table 1: Survey Characteristics**

Survey	National representivity	Test	Age at test	Total survey sample
BPSS	Of university students	SAT/ACT	mostly HS	16k
NPSAS2012	Of university students	SAT/ACT	mostly HS	95k
NPSAS2008	Of university students	SAT/ACT	mostly HS	113k
TIMSS Grade 8 '95 & '99	yes	Math/Science	grade 4	7k & 9k
TIMSS Grade 8 '07 & '11	yes	Math/Science	grade 4	7k & 10k
TIMSS Grade 4 '95 & '03	yes	Math/Science	grade 8	7k & 10k
TIMSS Grade 4 '07 & '11	yes	Math/Science	grade 8	8k & 13k
PIRLS Grade 4 2006	yes	Reading	grade 4	5k
PIRLS Grade 4 2011	yes	Reading	grade 4	13k
PISA 2009	yes	R/M/S*	age 15	5k
PISA 2012	yes	R/M/S*	age 15	6k
NAAL 2003	yes	Literacy/Numeracy	16+	19k
PIAAC 2012	yes	Literacy/Numeracy	16-65	5k
Add Health	yes	PPVT	12-18	6k
GSS	yes	Wordsum	18+	27k
NLSF	no	SAT/ACT	High School	4k
HSLs 2009	yes	Math test	High School	23k
NELS88	yes	Math test	High School	25k

\*Reading/Math/Science

Both to increase reliability and to keep a balance of surveys, Grade 8 1995 and 1999 TIMSS, Grade 8 2007 and 2011 TIMSS, Grade 4 1995 and 2003 TIMSS, and Grade 4 2007 and 2011 TIMSS d-values were combined.

## Results

The results are presented in Table 2 below. The values approximate Cohen's d values; these were computed by subtracting the non-White subgroup scores from the third+ generation White scores and then dividing the differences by the third+ generation White standard deviations. These results, along with computations for each of the surveys, can be found in the supplementary file. When sample sizes were too small to generate reliable results, scores were left blank in the chart and were not factored into the meta-analytic averages. NAEP's data

explorers only generate values if the sample sizes are 62 or more. For analyses conducted with SPSS, we reported results if individual sample sizes were equal to or greater than 30.

**Table 2: Summary Results**

Survey	Black				
	First Gen	Second Gen		Third+ Gen	
		One Parent	Two Parents	One or Two Parents	
BPSS*	1.08	0.89	0.91	0.90	1.10
NPSAS2012*	0.70	0.69	0.68	0.69	0.75
NPSAS2008*	0.89	0.77	0.68	0.73	0.91
TIMSS Grade 8 '95 & '99				1.04	1.32
TIMSS Grade 8 '07 & '11	1.19			0.91	1.12
TIMSS Grade 4 '95 & '03	1.74			1.16	1.17
TIMSS Grade 4 '07 & '11	1.51			0.92	1.07
PIRLS Grade 4 2006				0.82	0.89
PIRLS Grade 4 2011	1.35			0.97	0.79
PISA 2009	0.28			0.91	1.13
PISA 2012	0.73			0.59	1.03
NAAL 2003	1.15			0.75	1.00
PIAAC 2012	1.16				1.00
Add Health				1.06	1.08
GSS	1.01			0.99	0.69
NLSF	1.05			0.89	1.39
HSLs 2009	0.58			0.35	0.70
NELS88	0.48			0.59	0.86
<b>Ave. (compared to third+ gen Whites)</b>	<b>0.99</b>			<b>0.84</b>	<b>1.00</b>
<b>Median d-value</b>	<b>1.05</b>			<b>0.90</b>	<b>1.02</b>

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Survey	Hispanic				
	First Gen	Second Gen		Third+ Gen	
		One Parent	Two Parents	One or Two Parents	
BPSS*	0.63	0.52	0.76	0.64	0.58
NPSAS2012*	0.61	0.48	0.64	0.56	0.55
NPSAS2008*	0.62	0.52	0.70	0.61	0.55
TIMSS Grade 8 '95 & '99	1.39			1.16	0.81
TIMSS Grade 8 '07 & '11	1.09			0.86	0.73
TIMSS Grade 4 '95 & '03	1.27			0.89	0.64
TIMSS Grade 4 '07 & '11	1.18			0.79	0.60
PIRLS Grade 4 2006	0.87			0.71	0.45
PIRLS Grade 4 2011	0.95			0.77	0.59
PISA 2009	0.76			0.72	0.74
PISA 2012	0.87			0.61	0.48
NAAL 2003	1.98			0.48	0.51
PIAAC 2012	1.81			0.64	0.61
Add Health	1.67			0.89	0.58
GSS	1.12			0.75	0.38
NLSF	0.86			0.62	0.53
HSLs 2009	0.37			0.46	0.35
NELS88	0.68			0.53	0.56
<b>Ave. (compared to 3rd+ gen Whites)</b>	<b>1.04</b>			<b>0.71</b>	<b>0.57</b>
<b>Median d-value</b>	<b>0.91</b>			<b>0.68</b>	<b>0.57</b>

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Survey	Asian				
	First Gen	Second Gen		Third+ Gen	
		One Parent	Two Parents	One or Two Parents	
BPSS*	0.08		-0.27	-0.27	-0.43
NPSAS2012*	0.08	0.07	-0.09	-0.01	-0.19
NPSAS2008*	0.08	0.02	-0.19	-0.09	-0.15
TIMSS Grade 8 '95 & '99	0.42			-0.08	-0.09
TIMSS Grade 8 '07 & '11	0.05			-0.23	
TIMSS Grade 4 '95 & '03	0.63			0.16	0.47
TIMSS Grade 4 '07 & '11	-0.07			-0.33	0.26
PIRLS Grade 4 2006				-0.03	
PIRLS Grade 4 2011	0.14			-0.21	0.14
PISA 2009	-0.05			-0.09	
PISA 2012	-0.12			-0.52	
NAAL 2003					
PIAAC 2012	0.34			-0.20	
Add Health	0.82			0.26	0.23
GSS	0.85			0.34	
NLSF	0.05			-0.20	-0.26
HSLs 2009	-0.51			-0.83	
NELS88	-0.17			-0.66	-0.06
<b>Ave. (compared to 3rd+ gen Whites)</b>	<b>0.16</b>			<b>-0.18</b>	<b>-0.01</b>
<b>Median d-value</b>	<b>0.08</b>			<b>-0.20</b>	<b>-0.08</b>

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Survey	White			
	First Gen	Second Gen		One or Two Parents
		One Parent	Two Parents	
BPSS*	0.01	-0.09	-0.11	-0.10
NPSAS2012*	-0.06	-0.06	0.01	-0.03
NPSAS2008*	0.11	-0.08	0.11	0.02
TIMSS Grade 8 '95 & '99	0.47			0.15
TIMSS Grade 8 '07 & '11	0.16			0.12
TIMSS Grade 4 '95 & '03	0.98			0.39
TIMSS Grade 4 '07 & '11	0.68			0.38
PIRLS Grade 4 2006	0.62			0.18
PIRLS Grade 4 2011	0.82			0.52
PISA 2009	0.24			-0.02
PISA 2012	-0.25			-0.15
NAAL 2003	0.52			0.16
PIAAC 2012	-0.13			-0.17
Add Health				0.01
GSS	0.72			-0.26
NLSF	-0.41			-0.11
HSLs 2009	-0.14			-0.20
NELS88	-0.23			-0.18
<b>Ave. (compared to 3rd+ gen Whites)</b>	<b>0.24</b>			<b>0.04</b>
<b>Median d-value</b>	<b>0.16</b>			<b>0.00</b>

\*Used average of 2nd-gen one/two parent score for "One or Two" parent scores.

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Relative to third+ generation Whites, the average d-values were 0.99, 0.84, and 1.00 for first, second, and third+ generation Black individuals, 1.04, 0.71, and 0.57 for first, second, and third+ generation Hispanic individuals, 0.16, -0.18, and -0.01 for first, second, and third+ generation Asian individuals, and 0.24 and 0.04 for first and second generation White individuals. On a reviewer's request, median d-values were also reported in Table 2.

One can also compare scores by generation using the d-values given in Table 2. For the third+ generation, the value is simply the average Black, Hispanic, and Asian third+ generation d-value. For the first generation, it is the average of the differences between the White first/White third+ generation d-values and the respective Black, Hispanic, and Asian first/White third+ generation d-values. For the second generation, it is the average of the differences between the White second/White third+ generation d-values and the respective Black, Hispanic, and Asian second/White third+ generation d-values. For Whites and Blacks of the same generation, the first, second, and third+ generation B/W d-values were 0.79, 0.79, and 1.00. For Hispanics and Whites of the same generation, the first, second, and third+ generation H/W d-values were 0.76, 0.67, and 0.57. For Asians and Whites of the same generation, the first, second, and third+ generation A/W d-values were -0.08, -0.21, and 0.00.

## **Discussion**

In the case of Blacks, Whites, and Asians there was a high degree of cross generational stability in aptitude. Across generations, scores were much more variable for Hispanics. No obvious pattern that allows for a relatively simple comprehensive explanation stood out. Specific group differences are discussed below.

### **White-White gaps**

On average, first, second, and third+ generation Whites performed similarly. As such, comparisons between Whites and other groups were largely unaffected by taking into account generation with respect to Whites. The cross-generational similarity in performance is somewhat surprising given that national backgrounds differ substantially across generations. Third+ generation Whites are almost entirely of European extraction while first and second generation Whites include a substantially larger number of greater Middle Eastern and Central Asian immigrants. The latter individuals substantially differ from the former in genetic, cultural, religious, and linguistic background. Generally, based on the reported regional ability differences (e.g., Lynn and Vanhanen, 2012) and the ethnic compositions of the different generations, one might expect first and second generation Whites to non-trivially under-perform third+ generation ones. This seems to not be the case, at least for 2nd generation individuals. This issue is difficult to investigate further using the data sets utilized in the present study, so a more detailed exploration of it will have to wait for a future analysis.

### **Black-White gaps**

**First generation.** The first generation Black- 3rd+ generation White differential is surprisingly small at 0.99 SD given the National IQs reported for Black majority countries. Rindermann (2013) reports an average Black African regional IQ of 75, while Lynn and Vanhanen's (2012) estimates give a Caribbean regional IQ of approximately 82. (Presumably the average Black Caribbean IQ

would be slightly lower as it is generally found that Black West Indians perform less well than non-Black ones (Lynn, 2008)). Taking into account the distribution of Black immigrants by region of origin, one would predict a first generation Black IQ of about 80 were regional IQ estimates accurate, were migrants representative with respect to region of origin aptitude, and were U.S. tests relatively psychometrically unbiased for first generation individuals of this group. Thus Black immigrants perform about 0.33 SD better than one would expect based on Lynn and Vanhanen's (2012) and Rindermann's (2013) estimates. Black migration to the U.S. and to Europe both from Africa and from the West Indies is, however, very selective with respect to human capital (Model, 2008; Easterly and Nyarko, 2008). This selectivity could account for some of the difference. Alternatively, the latent ability of Black majority nations could be underestimated and the higher than predicted Black immigrant ability could reflect this. This issue will require more investigation.

**Second generation.** The second generation Black/ third+ generation White gap is around 0.84 SD. It is not obvious why this is smaller than both the first and third+ generation gaps. Perhaps psychometric bias (e.g., linguistic bias) artificially lowers first generation Black aptitude scores; such bias would be expected to be lower in the second generation. If so, the second generation Black aptitude might be closer to the unbiased migrant group aptitude. Alternatively, there might have been a genuine first to second generational cognitive ability gap narrowing in unbiased aptitude and 3rd+ generation Blacks might not have experienced the positive effect of U.S. residency due to mitigating factors such as historic discrimination.

If there was a genuine first to second generation aptitude narrowing, this could in part be due to intermixture, since second generation individuals are more likely have mixed heritages than are first generation ones. An admixture effect is unlikely to account for much of the difference, though, since, for many of the studies, mixed race individuals were excluded. Nonetheless, to explore this possibility, we took a closer look at the National Postsecondary Student Aid Study which conveniently had a very large overall sample size (of 95,000). Results are shown below in Table 3. ACT and SAT d-values were computed relative to Whites of the same generation and then averaged. As can be seen, both second and third+ generation mixed non-Hispanic B+W individuals performed roughly intermediate to second and third+ generation mono-race individuals. Thus there was an intermixing effect for both generations.

**Table 3: Mixed Race Performance in the National Postsecondary Student Aid Study**

	<b>First Generation</b>	<b>Second Generation</b> (U.S. born; <i>both</i> parents FB)
	SAT/ACT (average) d-value	SAT/ACT (average) d-value
NH White	reference	reference
NH Black	0.77	0.67
NH White & Black		
Hispanic or Latino	0.68	0.62
White Hispanic	0.62	0.62
Black Hispanic	0.95	0.66
	<b>Second Generation</b> (U.S. born; <i>one</i> parent FB)	<b>Third+ Generation</b>
	SAT/ACT (average) d-value	SAT/ACT (average) d-value
NH White	reference	Reference
NH Black	0.75	0.75
NH White & Black	0.38	0.31
Hispanic or Latino	0.54	0.55
White Hispanic	0.48	0.53
Black Hispanic	0.78	0.65

This finding is consistent with that of Fuerst (2014), who found, in the NLSF, a color-IQ correlation for second generation Blacks but not for first generation ones. The author proposed that the color-IQ association was due to White (cultural and/or genetic) admixture and that this did not show up among first generation Blacks because many of them, at least in the sample analyzed, came from countries (e.g., Nigeria) in which there was very little admixture.

Despite there being an admixture effect, this counted for little of the first to second generation difference. Table 4 below shows NPSAS 2012 scores by generation for individuals aged 15 to 23 with Blacks defined both inclusively (including self-reported mixed race individuals) and exclusively (excluding self-reported mixed race individuals). Because there were relatively few second generation Black individuals who reported being mixed race, using an inclusive definition had little effect on the overall scores

**Table 4: Mixed Race Results by Generation for NPSAS 2012**

	Generation 1		Generation 2 (Both FB)*		Generation 2 (1 FB)**		Generation 3+	
	SAT	ACT	SAT	ACT	SAT	ACT	SAT	ACT
NH Black, not-White	898.8	18.7	924.6	19.6	919.5	19.3	900.8	19.0
NH Black (inclusive)	905.1	18.8	924.2	19.6	927.6	19.5	907.4	19.2
NH Black + White					975.0	20.5	988.9	21.2
NH White, not Black	1062.3	23.0	1042.9	22.5	1053.4	22.9	1038.4	22.5

\* Both parents foreign born

\*\*One parent foreign born

Filter: Age 15-23

SAT Stand Dev. =195.4

ACT Stand Dev. = 4.83

These results suggest that admixture is not driving much of the apparent first to second generational narrowing of the B/W gap.

**Third+ generation.** The found third+ generation gap of 1.00 SD is consistent with other reviews which also report a 1 standard deviation difference. Unfortunately, it is nearly impossible to disentangle third generation Black individuals from greater than third generation ones. Thus it is impossible to ascertain if there is a narrowing between the second and third generation.

### **African versus West Indian origin Blacks**

It has been suggested that the African migrant IQ might be on par with that of Whites; if so, the first and second generation Black /third+ generation White gaps would have to be driven by the underperformance of West Indian and other origin Blacks. This isn't inherently statistically implausible since Black African immigrants, as shown below in Table 5, comprised only between 8 and 24% of the Black immigrant pool between 1980 and 2000, the immigrant cohorts which would have birthed most of the survey participants for the surveys analyzed. (Table 5 was based on the immigrant numbers presented in Capps et al. (2012); percentages were computed from immigrant numbers.) Of course, the conjecture becomes less and less plausible as time goes on — as Black Africans comprise a larger percent of the Black immigrant pool and as the Black immigrant performance fails to increase.

**Table 5: Percent of Black Immigrants to the U.S. by Region of Origin, 1980 to 2008\***

Regional groups	Year			
	1980	1990	2000	2008
Black Africans	7.8	12.7	23.6	33.1
Black Caribbean	55.5	62.0	58.6	52.1
Other Regions	36.6	25.3	17.8	14.8

Source: Based on Capps et al. (2012).

Whatever the case, we can look at what little data there is. Richwine (2009) reported aptitude scores calculated based on digit span backwards subtest results. These results come from the New Immigrant Survey. On this subtest, first generation individuals of Sub Saharan African origin (n=54) scored 0.3 standardized units (SD) below the US average, while first generation individuals of Central American and Caribbean origin (n=96) scored 0.51 SD below the US average. Adjusting for g-loadedness, Richwine (2009) found that these differences came out to about 0.73 and 1.2 SD below the average. Unfortunately, scores were not decomposed by race/ethnicity.

Some information can be extracted from the General Social Survey. Wordsum (a short vocabulary test) results for African and West Indian Blacks are shown below in Table 6. The third+ generation White mean was 6.43 (SD 1.78). First and second generation Black Sub-Saharan Africans (n=40) and Black West Indians (n=32) scored, respectively 1.2 and 1.1 SD below third+ generation Whites.

**Table 6: General Social Survey (1972-2012) Wordsum Scores for First and Second Generation Blacks by Region of Origin**

Regional groups	1 <sup>st</sup> generation		2 <sup>nd</sup> generation	
	Mean	N	Mean	N
Black Africans	4.92	9	4.11	31
Black Caribbean	4.46	8	4.45	24

The sample sizes were small and so the results cannot be given much weight, but they do not suggest the existence of large region of origin differences. We also computed scores using the (non-nationally representative) NLSF sample. These are presented below in Table 7. The third+ generation White mean was 30.42 (SD 3.13). First and second generation Black Sub-Saharan

Africans (n=67) and Black West Indians (n=93) scored, respectively, 0.9 and 0.9 SD below third+ generation Whites.

**Table 7: ACT/SAT Scores for First and Second Generation Self-Reported Black Americans in the NLSF\***

Regional groups	1 <sup>st</sup> generation			2 <sup>nd</sup> generation		
	Mean	N	S.D.	Mean	N	S.D.
West Indies	28.40	25	3.04	25.78	18	3.69
Sub-Saharan Africa	27.13	68	3.29	28.35	49	3.15

\*Source: Based on Ennis, et al. (2011).

Again there was no evidence of a region of origin difference. This issue deserves further investigation.

### Hispanic-White gaps

The multi-racial U.S. Hispanic population is largely of Mexican (63%) and Puerto Rican (9%) extraction. Roth et al. (2001) reported a meta-analytic Hispanic/non-Hispanic White d-value of 0.72 for g across all generations.

**First generation.** First generation Hispanics score 1.04 standard deviations below third+ generation (non-Hispanic) Whites. This score is larger than the roughly 0.87 predicted by L&V's National IQs. The L&V (2012) estimate is calculated as shown in Table 8 below. Linguistic bias most likely depresses the mean performance of first generation Hispanics, at least on verbally loaded tests, and this bias probably accounts for a non-trivial percent of the unexpectedly low first generation Hispanic scores.

**Table 8: Largest U.S. Hispanic Groups and L&V's 2012 National IQs\***

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Largest U.S. Hispanic Groups and L&V's 2012 National IQs

<u>Nation</u>	<u>2010 Population</u>	<u>2010 Percent</u>	<u>L&amp;V Estimated National IQs</u>
Mexican	31798258	63.0	87.8
Puerto Rican	4623716	9.2	83.5
Cuban	1785547	3.5	85.0
Other Hispanic	12270073	24.3	
Sum	50477594	100.0	
N IQ Predicted IQ (Other Hispanic excluded)			87.0

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\*Source: Based on Ennis, et al. (2011) and Lynn and Vanhanen (2012).

While on average Latin Americans are less selected than individuals from other regions, they are not negatively selected – that is, they don't have lower levels of human capital than those left behind (see: Feliciano, 2005). Kaestner and Malamud (2010) used the Mexican Family Life Survey (MxFLS) to investigate this issue further. They found that, relative to stayers, Mexican migrants were positively selected in education and neutral with respect to cognitive ability (as measured by Raven's matrices). The authors noted:

[M]igrants are relatively similar to non-migrants with respect to cognitive ability. Rates of migration do not differ significantly by categories of cognitive ability, although there is some evidence of positive selection for women. The absence of any strong evidence for the selection of migrants with respect to cognitive test scores is surprising given the selection on education and the relatively high positive correlation between years of schooling and cognitive test score ( $r=0.49$ ). This finding implies that education and cognitive ability do not have similar associations with the costs and benefits of migration even though the two variables are correlated.

Negative selection, then, is not likely a good explanation for the low performance.

**Second generation.** The second generation Hispanic/ third+ generation White gap is around 0.71 SD. There is a first to second generation reduction in the size of the gap of about one third of a standard deviation. This likely is due, in part, to a lessening of linguistic bias. There are three reasons to suspect that such bias is minimal by the second and subsequent generations. For one, when second+ generation math scores are adjusted for potential psychometric bias in the



form of differential item function, the differences remain large (see, Richwine, 2009, Table 2.11). For another, in a recent study based on a large norming sample, measurement invariance (MI) has been found to hold between non-Hispanic Whites and (presumably mostly second+ generation) Hispanics (Trundt, 2013); MI indicates that group differences are of the same psychometric nature as differences within groups and thus that there is no detectable psychometric bias. Third, the differences between English-only speaking 2nd+ generation Hispanics and Whites is about as large as the difference between all 2nd+ generation Hispanics and Whites.

**Third+ generation.** The third+ generation difference, at 0.57, was found to be slightly smaller than the second generation difference. Based on findings reported by others, it appears that the generational decrease stalls between the second and third generation. For example, Hansen et al. (2010) report scores for male children of natives (i.e., fourth+ generation) based on the NLSY79 and NLSY97 surveys; the scores were, respectively, 0.8 and 0.53 SD below the non-Hispanic White fourth+ generation ones. Holding generational effects constant, there appeared to be some secular narrowing. The results are shown in Table 9.

**Table 9: AFQT Scores by Ethnicity and Generation for Males 16 and Younger in the NLSY '79 and '97 \***

	NLSY79		NLSY97	
	AFQT	Cohen's d	AFQT	Cohen's d
White				
Children of immigrants	167.01	0.17	183.57	-0.34
Children of Natives	172.95	-0.01	172.60	Reference
Hispanic				
Children of immigrants	145.06	0.86	151.04	0.67
Children of Natives	146.73	0.81	155.64	0.53

\* From Hansen et al. (2010)

Some might maintain that language is behind the low scores of third+ generations Hispanics. However, the relative performance of English-only speaking Hispanics suggests otherwise. For example, third+ generation English-only speaking Hispanics perform only marginally better than all Hispanics of the same generation. TIMSS (2007) results are shown below in Table 10.

**Table 10: TIMSS Math and Science Performance by Home Language Use for Grade 8 3<sup>rd</sup>+ Generation non-Hispanic Whites and Hispanics**

<u>Student speak language of test at home</u>						
<u>Regional groups</u>	<u>White</u>		<u>Black</u>		<u>Hispanic</u>	
	<u>Mean</u>	<u>S.D.</u>	<u>Mean</u>	<u>S.D.</u>	<u>Mean</u>	<u>S.D.</u>
Always speaks English	533	67	456	68	483	73
Almost always	547	71			478	67

Assuming that there is a robust second to third+ generation cognitive ability narrowing, some of this could be due to cultural and genetic assimilation. There is some evidence in support of this view. First, individuals with two Hispanic parents perform worse than ones with one White and one Hispanic parent. Table 11 shows NLSY 97 scores for individuals with two NH White parents, one NH White and one Hispanic parent, and two Hispanic parents. White parentage is associated with a substantial increase in ability.

**Table 11: NLSY 97 IQ and Achievement Scores by Parent’s Race and Ethnicity**

<u>Test</u>	<u>Parent Ethnicity</u>		<u>Score</u>	<u>SD</u>	<u>d-value</u>	<u>N</u>
	<u>Parent 1</u>	<u>Parent 2</u>				
AFQT	White	White	58.6	27.3	reference	2771
PIAT	White	White	99.2	13.8	reference	2181
AFQT	White	Hispanic	50.9		0.28	209
PIAT	White	Hispanic	96.0		0.19	175
AFQT	Hispanic	Hispanic	33.2		0.93	586
PIAT	Hispanic	Hispanic	88.8		0.75	531

Similar results show up in the Add Health sample and in the HSLS 2009 sample. The latter are shown below in Table 12.

**Table 12: Math Scores by Parental Ethnicity by Generation in the HSLs 2009**

Generation & Parent Ethnicity		Mathematics Theta Score	Standard Deviation
White-White couple	1 <sup>st</sup>	0.38	1.10
	2 <sup>nd</sup>	0.52	0.85
	3 <sup>rd</sup>	0.22	0.91
White-Hispanic couple	1 <sup>st</sup>	0.27	1.10
	2 <sup>nd</sup>	0.18	0.90
	3 <sup>rd</sup>	0.06	0.97
Hispanic-Hispanic couple	1 <sup>st</sup>	0.01	0.85
	2 <sup>nd</sup>	-0.20	0.88
	3 <sup>rd</sup>	-0.21	0.89

Second, the self-identifying Hispanic population increasingly becomes genetically Europeanized with generations. That is, the portion of non-Hispanic White ancestry that self-identifying U.S. Hispanics have increases with generation. For example, the percent of self-identifying Hispanic individuals (hailing from two parent households) in the HSLs 2009 survey with one non-Hispanic White parent is given below by generation in Table 13. As can be seen, with increasing generations, an increasing portion of self-identified Hispanics have one non-Hispanic White parent. Since White parentage is associated with increased scores, it would not be unreasonable to conjecture that a beneficial generation x assimilation effect exists.

**Table 13: Percent of Self-Identified Hispanics in the High School Longitudinal Study of 2009 with non-Hispanic White Parents**

	Generation 1	Generation 2	Generation 3+	All
Percent with one NH White Parent	0.04	0.10	0.42	0.17

Such an effect could readily account for the generational narrowing. If the second generation Hispanic/White difference of 0.71 standard deviations was fully inherited (environmentally and/or genetically), given that 32% more of third+ generation Hispanics have one non-Hispanic White parent, one would expect a generational increase in Hispanic scores of about 0.11 SD, going from the second to third+ generation, solely owing to the increase in non-Hispanic White parentage ( $0.32 \times \frac{1}{2} \times 0.71 \text{ SD} = 0.11 \text{ SD}$ ), an increase which is not significantly different from

the Hispanic second to third+ generation difference found ( $0.71 - 0.57 = 0.13$  SD). Whatever the case, the effect of assimilation across generations on the overall scores differences requires a thorough investigation, one which stands outside the narrow scope of this paper.

### **Asian-White gaps**

“Asian Americans” are a genetically, culturally, and linguistically heterogeneous group which include East Asians, South Asians, and (in many surveys) Pacific Islanders. First generation Asians perform slightly worse than 3rd+ generation White Americans; the gap comes out to about 0.16 standard deviations. Second generation Asians tend to perform better by 0.18 SD, while third+ generation Asians perform on par. Across all generations, the average Asian performance is non-trivially higher than their Lynn and Vanhanen estimated nation of origin IQs would predict. Table 14 below shows the national origins of Asian Americans along with the corresponding L&V (2012) national IQs.

**Table 14: Largest U.S. Asian Groups and L&V's 2012 National IQs\***

<u>Largest U.S. Asian Groups and L&amp;V's 2012 National IQs</u>			
<u>Nation</u>	<u>2010 Population</u>	<u>2010 Percent</u>	<u>L&amp;V Estimated National IQs</u>
Chinese+Taiwanese	4010114	22.4	105.8
Filipino	3416840	19.1	86.1
Indian	3183063	17.8	82.2
Vietnamese	1737433	9.7	92.0
Korean	1706822	9.5	104.6
Japanese	1304296	7.3	104.2
Pakistani	409163	2.3	84.0
Cambodian	276667	1.5	92.0
Thai	237583	1.3	89.9
Laotian	232130	1.3	89.0
Bangladeshi	147300	0.8	81.0
Burmese	100200	0.6	85.0
Indonesian	95270	0.5	85.8
Nepalese	59490	0.3	78.0
Sri Lankan	45381	0.3	79.0
Malaysian	26179	0.1	91.7
Bhutanese	19439	0.1	78.0
Mongolian	18344	0.1	100.0
Other Asian	900646	5.0	
Sum	17926360	100	
N IQ Predicted IQ (Other Asian excluded)			94.0

\*Source: Based on Hoeffel, et al. (2012).

Based on the National IQs, one would predict a mean Asian American aptitude nearly 0.4 standard deviations below that of Whites — not 0.16 below for the first generation and then approximate 0.18 SD and 0.01 SD above for, respectively, the second and third+ generations. As the discrepancy can be found among first generation Asian immigrants, it cannot fully be ascribed to generational factors e.g., better rearing environments and cultural assimilation; in short, Asian immigrants come to the U.S. with higher aptitudes than one would predict based on L&V's (2012) estimated National IQs. Some of this could be accounted for by immigrant selection, which is substantial for this region of the world (see: Feliciano, 2005). There also could be an ethnic composition effect; for example, many Filipino and Vietnamese Americans, two of the largest ethnic groups, are of Han ethnicity. Perez and Hirschman (2009) note, for example:

The Chinese diaspora in many Asian countries has intermarried with other national-origin populations and is well represented in several immigrant streams from Southeast Asia, especially from the Philippines and Vietnam. We suspect that the Chinese/Japanese multiethnic population is a product of intermarriage among long-resident Asian populations in the United States.... The much higher report of 23 percent multiethnic composition among the small Malaysian American population undoubtedly reflects the tendency of many Malaysian Chinese to report their ethnicity (Chinese) and their country of origin (Malaysia)

Thus, for cultural and genetic reasons, one might expect slightly higher than predicted aptitudes from these groups, as Han Chinese generally exhibit superior performance. A more likely possibility is that many of Lynn and Vanhanen's (2012) South East Asian scores are unreliable; either values were inferred (e.g., Cambodia and Burma) or they were based on small and unreliable samples (e.g., Laos and Vietnam). More recent analyses indicate that some of these estimated national aptitudes need to be revised (Malloy, 2014a; Malloy, 2014b).

To get better insight into the situation, we examined the performance of Asian subgroups (Chinese, Japanese, Koreans, Vietnamese, Asian Indians, Laotians, Cambodians, Other Asians, Hawaiians, Guamanians, Samoans, Other Pacific Islanders, and Filipinos) on California's California Achievement Test. The data used was originally presented in Pang et al. (2011). The authors analyzed 5 years of results, from 2003 to 2008. We compared the various Asian-White d-values with ones derived from the National and Racial IQ scores presented by Lynn and Vanhanen (2012) and Lynn (2008). Table 15 below depicts the results. Column A lists the race/ethnicity, B the sample size, C the reading d-value relative to Whites, D the math d-value relative to Whites, E the average d-value relative to Whites, F Lynn's estimated d-value, G the amount that Lynn's global estimates under-predict U.S. Asian performance (column F minus column E). Since d-values were computed by subtracting the non-White ethnic group scores from the White score and dividing the difference by the White standard deviation, a negative d-value indicates that the non-White ethnic group scored higher than the White group. As can be seen, Pacific Islanders (Hawaiians, Guamanians, Samoans, and Other Pacific Islanders), Vietnamese, Asian Indians, and Filipinos performed substantially better than Lynn's estimates would have predicted. Lynn estimates a Pacific Islander IQ 1 SD below the White mean, yet Pacific Islander Americans score about 0.5 below on the Californian CAT. Globally, Vietnamese, Asian Indians, and Filipinos are estimated to have national IQs, respectively, 0.40, 1.19, and 0.93 SD below the White mean and yet the Californian CAT differences between American Whites and American individuals of these nationalities is, respectively, - 0.13, -0.11, and 0.13.

**Table 15: Asian/White Achievement Test Score Math and Reading Differences in California from 2003-2008**

A Race/Nationality	B N	C Reading* d-values	D Math* d-values	E Average* d-values	F Lynn IQ d-values	G Magnitude of under- prediction
Whites	752729	Reference	Reference	Reference	Reference	Reference
All Asians	272476	0.07	-0.23	-0.08	0.40	-0.48
Chinese	54330	-0.23	-0.69	-0.46	-0.39	-0.07
Japanese	10905	-0.24	-0.56	-0.40	-0.28	-0.12
Koreans	21362	-0.15	-0.66	-0.41	-0.31	-0.10
Vietnamese	28737	0.07	-0.33	-0.13	0.40	-0.53
Asian Indians	18816	0.02	-0.24	-0.11	1.19	-1.30
Laotians	6763	0.66	0.48	0.57	0.73	-0.16
Cambodians	7009	0.61	0.41	0.51	0.53	-0.02
Other Asians	45748	0.14	-0.12	0.01		
Hawaiians	1961	0.34	0.31	0.32	1.00	-0.68
Guamanians	1169	0.31	0.30	0.31	1.00	-0.69
Samoans	3505	0.82	0.70	0.76	1.00	-0.24
Other Pac. Is.	8311	0.51	0.44	0.48	1.00	-0.52
Filipinos	63860	0.24	0.03	0.13	0.93	-0.80

\*California Achievement Test (2003-2008); Based on Table 1 and 2 in Pang et al. (2011)  
 "Asian American and Pacific Islander Students: Equity and the Achievement"

The Californian sample obviously was not nationally representative; this situation could introduce sampling error. For a more accurate estimate of the Pacific Islander American scores, we examined the nationally representative National Assessment of Educational Progress (NAEP) 2011 and 2013 reports. From 2011 on, the NAEP's racial/ethnic taxonomy allows one to disaggregate non-Hispanic Pacific Islanders from non-Hispanic Asians. We computed d-values for racial and ethnic groups for 2011 and 2013 for grades 4, 8, and 12 for math and reading. The computations are presented in the supplementary file. As can be seen in Table 16, averaged across all samples, Pacific Islanders scored 0.52 standard deviations below Whites. This magnitude of difference is almost identical to that found between Whites and Pacific Islander on the California CAT. Thus, for this group at least, sampling does not seem to be an issue.

**Table 16: U.S. 2011 and 2013 National Math and Reading Achievement Scores with Pacific Islanders**

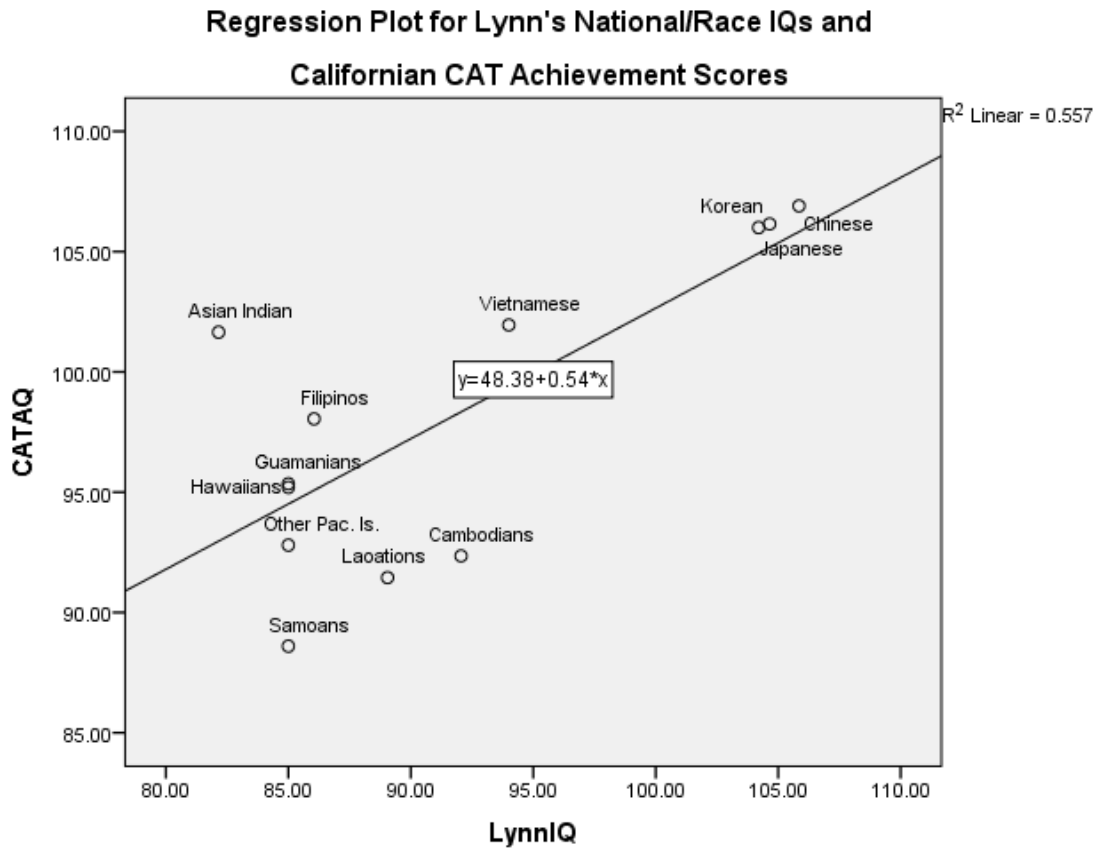
Race/Ethnicity	Reading d-value	Math d-value	Average d-value
non-Hispanic White	Reference	Reference	Reference
non-Hispanic Black	0.80	0.96	0.88
Hispanic	0.69	0.71	0.70
non-Hispanic Asian (exclude PI)	-0.11	-0.37	-0.24
non-Hispanic Amer-Indian	0.75	0.81	0.78
non-Hispanic Pacific Islander	0.49	0.54	0.52

Variables: SRACE10 (Race/ethnicity using 2011 guidelines, school-reported)  
 NAEP MAIN (Measure: Composite scale; Jurisdiction: National)

The analyses above point to the Asian sub-groups which are primarily behind the National IQ mis-prediction: Vietnamese, Asian Indians, and Filipinos, which, as of 2010, happen to be, respectively, the 4<sup>th</sup>, 3<sup>rd</sup>, and 2<sup>nd</sup> largest Asian American groups. This issue will have to be further explored in a future study. It should be noted that while National IQs greatly under-predict these Asian sub-group scores, they still predict Asian immigrant scores on average. For example, the regression plot in Figure 1 shows the relation between Lynn’s National IQs and the Asian subgroup CAT d-values from Table 15. This was significant at  $r(df = 10) = 0.75, p < 0.05$  and  $\rho(df = 10) = 0.59, p < 0.05$ .



**Figure 1: CAT Achievement Quotient Versus Lynn's Global IQs for Asian Subgroups in California**



Replacing the Cambodian and Vietnamese National IQs with those proposed by Malloy (2014a) and (Malloy, 2014b) does not substantially change the results. It will be noticed that the within country difference is, on average, about half of that between countries. This agrees with the results of Fuerst and Kirkegaard (2014) and suggests that the transferability of National IQs is around 50%, meaning that, for example, a 20 point between nation difference is, on average, associated with a 10 point between diaspora within nation difference.

As for the rank order relation among Asian ethnicities, the Californian CAT results roughly agree with ones based on national surveys. Table 17 presents d-values, relative to either Chinese or North East Asians, for achievement or SAT tests based on the scores of the individuals who participated in the National Education Longitudinal Study of 1988 (NELS:88), the Education Longitudinal Study of 2002 (ELS:2002), and The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K). As with the tables above, positive d-values mean lower scores relative to the reference. In these surveys, N.E. Asians performed about 0.5 standard deviations better than S.E. and Other Asians.

**Table 17: Asian Subgroup Performance Based on Three National Samples**

Sample	Year	Subgroup	Test	d	N
Sample 1 (a)	NELS (1988)	N.E. Asian	Chinese	Reference	238
			Koreans	-0.02	156
			Weighted average	-0.01	
		S.E. Asian	Filipinos	0.34	211
			South East Asians	0.48	174
			Weighted average	0.41	
Sample 2 (b)	ELS (2002)	North East Asians	SAT d		
			Reference (c)		556
		Other Asians (S.E. + Other)	0.70	654	
		Whites	0.47	6188	
Sample 3 (d)	ECLS (1998)	N.E. Asian	Chinese	Reference	198
			Japanese	0.20	88
			Koreans	0.03	71
			Weighted average	0.06	
		S.E. Asian	Filipinos	0.39	239
			Southeast Asians	0.56	143
			Weighted average	0.46	
		S. Asian	Asian Indians	0.02	118
Other Asian	Other Asians	0.56	124		

(a) Data from: Corwyn and Bradley (2008), Table 1

(b) Data from: Byun and Park (2012), Table 1

(c) Standard deviations were not reported; a standard deviation of 200 was used as this is the typical Math + Reading SAT SD.

(d) Data from: Yang (2013), Table 1 and Table 2; total group standard deviations were used.

Based on the scores discussed in tables 15 to 17, it is clear that there is significant between group variation within the broad Asian category. For example, the difference between North East Asian and Pacific Islander Americans approaches 1 standard deviation.

## Summary

We conducted a cross generational exploratory meta-analysis of the magnitude of aptitude differences between sociologically defined racial and ethnic groups in the U.S. Our analysis led to a number of questions which will need to be answered with future research. These include:

- (1) Is there a nation of origin effect for first generation White immigrants?
- (2) Are Black first generation immigrant cognitively selected?
- (3) Is there a region of origin effect (African versus West Indies) for Black immigrants?
- (4) What accounts for the first to second generation Black aptitude difference?
- (4) To what extent do first generation Hispanic scores suffer from psychometric bias?
- (5) What accounts for the first to second generation Hispanic aptitude difference?
- (6) How does genetic and cultural assimilation affect Hispanic scores across generations? (7)
- What accounts for the higher than predicted (by national IQs) Asian performance?

Such topics will have to be explored using alternative data sets.

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