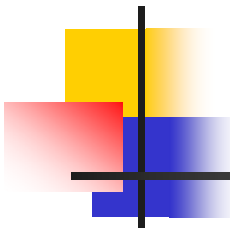




Have Black-White Gaps in IQ and Achievement Narrowed?

Linda S. Gottfredson
University of Delaware
Newark, DE 19716 USA
ISIR 2003



1960s—IQ Gap

- Public (e.g., Coleman Study)
- Pressing national issue
- Nature: depressed learning ability
- Policy aim: prevent/boost low IQs
 - Intensive pre-K intervention
 - Equal school resources
 - Anti-discrimination/integration
- Success? Nil



2000s—Achievement Gap

- Public (e.g., NAEP—the “Nation’s Report Card”)
- Pressing national issue
- Nature: depressed learning ~~ability~~
- Policy aim: close the gap
 - Intensive pre-K intervention
 - Adequate school resources
 - Anti-racism/inclusion

- Prospects?

Optimistic, but bad portent: gaps tend to be bigger, not smaller, at higher SES levels.



IQ Gap Now Ignored

Why?

- “Abilities are equal”

Quotes from latest Phi Delta Kappan magazine

Editorial column: “Because achievement is not innately determined, children will achieve when they are effectively taught how to learn.” (MSAN’s Core Belief #1)

Article advocating intensive pre-K: “Children from low-income communities lack knowledge—not the ability to learn....Something other than innate talent must be at work.”



IQ Gap Now Ignored

Why?

- “Abilities are equal”
- “IQ is nothing but achievement”
- “Achievement differs because exposure to and support for learning differs”
- “More support and less ‘hypocrisy and rhetoric’ could close the gap completely”
- “Achievement gap has been closing”



How Much? At What Rate?

- Ability and achievement are not the same thing, but ability level is best predictor of academic achievement.
 - Is IQ gap closing?
 - Is achievement gap closing?
 - If yes, have the gaps changed in tandem?

B-W IQ Gaps:

How Large? How Stable?

- Data

- ~Representative samples
- ~All that available in 20th Century
- Caution: some non-comparability

- Standardized mean differences

White mean – Black mean

Total SD

Table 1: Standardized B-W IQ Gap

Army	WWI	1.16	DAS (1986)	2.6-3.5	.77
	WWII	1.25		3.6-5.11	1.13
	1980	1.21		6-17	.90
Coleman (1965)	G1	.92	SB-IV (1986)	2-6	.86
	G12	1.12		7-11	.62
NLS1972	G12	1.16		12-23	1.09
WISC-R (1974)	6-16.5	1.06	WISC-III (1991)	6-16	.99
WAIS-R (1981)	16-19	.93	PPVT-R (1986-94, NLSY Children)	3-4	1.20
	20-34	.99			
	35-54	.99		5-6	1.13
	55-74	.96			



Summary (IQ)

- B-W IQ gaps are 1.0 ± 0.2 SD
 - All decades
 - All ages
- “Seemingly impervious to time”
(Kaufman & Lichtenberger, 2001)
- In mental age, this is 2-year gap in elementary school and 4-year gap by Grade 12



B-W Achievement Gaps: How Large? How Stable?

- Data

- NAEP trend series, 1971-1999 (latest)
- White, Black (also Hispanics, Asians)
- Reading, Math, Science
- Ages 9, 13, and 17 (all on same scale)

- Standardized mean differences

$$\frac{\text{White mean} - \text{Black mean}}{\text{Total SD}}$$

Table 2: Standardized B-W Achievement Gap

NAEP Test	Decade	Age		
		9	13	17
Reading	1970s	.98	1.05	1.17
	1980s	.78	.73	.84
	1990s	.81	.73	.73
Math	1970s	.88	1.08	1.07
	1980s	.79	.91	.96
	1990s	.79	.92	.87
Science	1970s	1.22	1.10	1.23
	1980s	.95	1.03	1.13
	1990s	.97	1.09	1.08

Summary (Achievement)

■ Standardized B-W achievement gaps

■ Subject	<u>Md.</u>	<u>Range</u>
■ Reading	.79	(.53-1.19)
■ Math	.89	(.68-1.08)
■ Science	1.04	(.86-1.25)
■ Decade		
■ 1970s	1.08	(.88-1.23)
■ 1980s	.86	(.53-1.25)
■ 1990s	.88	(.58-1.18)
■ Age		
■ 9	.845	(.71-1.22)
■ 13	.955	(.53-1.16)
■ 17	.995	(.55-1.25)

- Narrowed most in reading
Reading 25% (1.06-.79)
Math 20% (1.07-.87)
Science 15% (1.22-1.04)
- Still smallest in reading

- Most narrowing by mid 1980s
- Little change after that
- Hints of increase now

- Gaps usually larger with age
- Other data show no change



What Achievement Gaps Would a 1.20 SD Gap in g Predict?

- 1.20 is reasonable estimate of B-W gap in g
- Maximum expected (if g gap is the only group difference)
 - 1.20
- Minimum expected (if g the only difference)
 - Depends on IQ/achievement correlation
 - Correlations differ by subject: higher correlation means bigger minimum expected gap
 - Need to correct for artifacts that understate the min.
 - IQ is not perfect measure of g
 - Achievement tests not perfectly reliable

**Table 3: Minimum Expected Achievement Gaps
When Gap in g is 1.20 SDs
(Based on Correlations of Achievement with IQ)**

The tests being correlated with an IQ composite		Correlation		Disat tenu ated	Min. exp. gap
		IQ	g		
IQ scales	Second composite IQ	.85	.92	.96	1.15
	"Academic" subtests	.76	.83	.87	1.04
Achieve- ment	Math/Arithmetic	.63	Raises minimum about 4%		.84
	Reading	.61		.82	
	Language	.57		.77	
	Writing	.56		.76	
	Spelling	.42		.57	

Table 4: Are Observed NAEP Gaps As Expected?

NAEP test		Observed gap 1990s		Subject	Expected range
	9	13	17	Spelling	.57 – 1.20
Reading	.80	.73	.73	Writing	.76 – 1.20
				Language	.77 – 1.20
Math	.82	.93	1.06	Reading	.82 – 1.20
Science	.97	1.06	1.07	Math/arith	.84 – 1.20



Summary (IQ vs. achievement)

- NAEP achievement gaps mostly within the ranges expected for a 1.20 *g* gap
 - All 3 subjects, 3 decades, 3 ages
- As of the 1990s:
 - Reading: around the expected minimum
 - Math: somewhat above the minimum
 - Science: midway between minimum & maximum



Conclusion

- No evidence that IQ gap has changed in last century
- NAEP achievement gaps vary by subject and decade
- NAEP gaps have narrowed
- But NAEP gaps seldom larger or smaller in last 3 decades than IQ gap would predict



So What?

- Gaps in g will limit how much the achievement gaps can be narrowed
- Achievement gaps will narrow less:
 - On more g loaded subjects and tests
 - When cut score for “proficiency” is higher



Demonstration in Progress?

- No Child Left Behind Act requires:
 - *All* achievement gaps be closed (race, language, etc.)
 - *All* students be at “proficient” level by 2014 (even special education students)
 - Schools will be punished unless they make steady progress—and punishments will escalate until staff replaced and schools restructured



Déjà vu all over again

- Schools already protesting that NCLB is unreasonable
- State standards for “proficiency” are already dropping
- NAEP will become the yardstick for comparing state standards
- NAEP will reveal more hollow “miracles”
- Gaps will remain “huge”



2040s

The “Nature Gap”?