Skin Color and Intelligence in African Americans: A Reanalysis of Lynn's Data

Mark E. Hill
The Pennsylvania State University

Finding a modest yet statistically significant correlation between skin tone and vocabulary test scores among African Americans, Lynn (2002) concludes that "intelligence in African Americans is significantly determined by the proportion of Caucasian genes" (p. 365). In this reanalysis of Lynn's data, I demonstrate that his bivariate association disappears once childhood environmental factors are considered. Therefore, a genetic link between skin color and intelligence among African Americans cannot be supported in his data. Investigators seeking to establish a genetic connection between racial ancestry and intelligence must move beyond simple bivariate results to address the confounding influence of environmental conditions that affect cognitive development.

KEY WORDS: skin color; intelligence; African Americans; cognitive skill.

In his recent study based on unique data from the 1982 General Social Survey (GSS82), Lynn (2002) uncovers a modest yet statistically significant correlation between skin tone and vocabulary test scores among African Americans ($r = .17$; $p < .01$). Relying on Rushton's (2000) theory that persons of African ancestry are genetically predisposed to lower intelligence than persons of Asian or European descent, Lynn concludes that "intelligence in African Americans is significantly determined by the proportion of Caucasian genes" (p. 365). In this reanalysis of Lynn's data, I present evidence indicating that a genetic link between skin color and intelligence

Please address correspondence to Mark Hill, Population Research Institute, The Pennsylvania State University, 514 Oswald Tower, University Park, PA 16802-6210; e-mail: mhill@pop.psu.edu.

among African Americans cannot be supported. Rather, I demonstrate that family background and educational attainment entirely explain the bivariate association between skin tone and cognitive ability.

SKIN COLOR AND TEST SCORES

Table 1 presents my replication of Lynn's bivariate results comparing mean vocabulary test scores by skin color for African American respondents in the GSS82 data. The vocabulary test score refers to the respondent's total number of correct answers on a 10-item multiple-choice word association test administered during the interview. For self-identified African Americans, skin color was assessed by trained African American interviewers on a five-point scale: 1 = very dark brown, 2 = dark brown, 3 = medium brown, 4 = light brown, 5 = very light brown. (Lynn erroneously states that skin color was self-reported by survey respondents.)

My bivariate results differ slightly from Lynn's because he apparently omitted seven respondents with no correct answers on the vocabulary test. Nonetheless, the overall pattern is highly consistent with his bivariate findings. Although results lack a compelling monotonic association, they indicate that African Americans with light skin tones tended to score higher on the 10-item vocabulary test than darker African Americans. The largest difference in mean test scores occurred between respondents coded "dark brown" ($m = 4.01$) and those coded "light brown" ($m = 5.25$). The statistically significant Pearson correlation coefficient indicates that light skin color modestly correlates with higher vocabulary scores ($r = .164$, $p < .001$).

TABLE 1

Mean Scores on 10-Point Vocabulary Test by Skin Color: African Americans in the 1982 General Social Survey

Skin Color	Mean	SD	*N*
Very Dark Brown	4.43	1.98	42
Dark Brown	4.01	1.76	106
Medium Brown	4.91	2.24	208
Light Brown	5.25	2.16	67
Very Light Brown	5.00	2.29	14
Total	4.70	2.14	437

Note: *F*-test = 4.82; $p > .001$.

THE CONFOUNDING ROLE OF CHILDHOOD ENVIROMENT

Lynn concludes that the significant correlation between skin color and test scores provides compelling scientific evidence that non-African ancestry imparts genetically derived cognitive advantages to African Americans. However, by ending his study without expanding beyond simple bivariate results, he perilously disregards the body of research showing that environmental factors such as family background and educational opportunities influence cognitive development (Fischer et al., 1996; Jencks & Phillips, 1998). As a legacy of slavery and racial subordination, light-skinned African Americans are more likely to be born into higher status families than their darker counterparts (Hill, 2000; Hughes & Hertel, 1990; Keith & Herring, 1991; Mullins & Sites, 1984; Williamson, 1980). As such, they enjoy childhood environments and educational backgrounds more conducive to the development of cognitive skill. I hypothesized, therefore, that Lynn's modest association between skin color and test scores could be explained by color differences in childhood social and educational environments that affect the acquisition of cognitive skill.

To examine this possibility, I used multiple regression analysis to determine whether a statistically significant association between skin color and test scores persisted once education and other childhood background characteristics were controlled. Appendix A presents summary statistics for control variables used in my analysis. To avoid severe reduction in sample size and statistical power, I imputed missing values for age (2 missing values imputed), education (1 missing value imputed) and mother's education (107 missing values imputed) using the NORM multiple imputation software package (Schafer, 2000). Five sets of imputations were made. The datasets were analyzed separately and the results were combined to yield regression results that incorporate uncertainty about missing data. (For more information on multiple imputation, see Schafer, 1997).

Table 2 presents results for two ordinary least squares regression models estimating the association between skin color and vocabulary test scores for African Americans in the GSS82, net of control variables. Controlling for only age and sex, results for Model 1 indicate the association between skin tone and test scores is statistically significant ($p < .001$, two-tailed *t*-test), suggesting that test scores increased an average of .39 points for every one-category increase in skin lightness. However, when additional controls are included in Model 2 for the respondent's educational attainment, region of residence at age 16 (South vs. non-South), immigrant status, and mother's educational attainment, the size of the skin color coefficient falls by almost 60% and fails to be a significant predictor of test scores at

TABLE 2

Vocabulary Test Scores Regressed on Skin Color, Controlling for Education and Childhood Characteristics: African Americans in the 1982 General Social Survey

	Model 1		*Model 2*	
Variable	*b*	*Beta*	*b*	*Beta*
Skin Color	.386***	.168	.160	.070
	(.110)		(.099)	
Age (in years)	−.006	−.045	.022***	.163
	(.006)		(.006)	
Sex (female = 1)	−.273	−.063	−.094	−.022
	(.207)		(.184)	
Education (in years)			.293***	.426
			(.032)	
Living in South at Age 16			−.707**	−.160
			(.218)	
Born in the U.S. (yes = 1)			.421	.041
			(.517)	
Mother's Education[a]				
9 to 11 Years			.057	.011
			(.246)	
12 Years			.361	.069
			(.271)	
13 to 15 Years			.664*	.091
			(.333)	
16+ Years			.070	.009
			(.349)	
Constant	4.308***		.765	
	(.519)		(.817)	
Adjusted R^2	.026		.255	

Note: $N = 437$; *b* = unstandardized regression coefficient with standard error in parentheses; *Beta* = standardized regression coefficient.
[a]Mother's education less than 9 years serves as reference category.
*$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests).

the $p < .10$ level (two-tailed *t*-test). In other words, the association between skin color and test scores is fully explained by educational and other childhood advantages enjoyed by lighter-skinned African Americans. This finding is strong evidence of the spurious nature of Lynn's simple bivariate results. Indeed, the large impact of the childhood environmental variables is reflected by the more than eightfold increase in the proportion of variance explained by Model 2 (adjusted $R^2 = .26$) compared with Model 1 (adjusted $R^2 = .03$).

CONCLUSION

As Lynn notes in his paper, "[I]f the evidence showed that there is no association between light skin color and IQ, the genetic hypothesis would be disconfirmed" (p. 372).[1] Yet, his study is flawed because it fails to address the confounding affect of childhood environmental conditions influencing cognitive development. In this reanalysis of Lynn's GSS82 data, I have demonstrated that his simple association between skin tone and vocabulary test scores is fully explained by differences in family background and educational attainment favoring lighter African Americans. Hence, there is no evidence to support his genetic hypothesis that racial admixture promotes higher intelligence in African Americans. Because advantaged social and educational origins have been shown to foster cognitive development (Fischer et al., 1996; Jencks & Phillips, 1998), researchers wishing to establish a credible genetic link between racial ancestry and intelligence must move beyond simple bivariate correlations to address the important confounding influence of early-life conditions.

ACKNOWLEDGMENT

Thanks to Alan Booth for comments and suggestions.

APPENDIX A

Summary Statistics for Control Variables used in Analysis: African Americans in the 1982 General Social Survey

Variable	Mean	SD
Age (in years)	40.616	16.030
Sex (female = 1)	.604	.490
Education (in years)	11.766	3.111
Living in South at Age 16 (yes = 1)	.653	.477
Born in the U.S. (yes = 1)	.954	.209
Mother's Education		
Less than 9 Years	.382	.487
9 to 11 Years	.218	.414
12 Years	.255	.436
13 to 15 Years	.082	.275
16+ Years	.064	.244

Note: Means and standard deviations for non-missing values only.

ENDNOTE

1. However, Lynn is incorrect when he argues, "[E]vidence that a statistically significant correlation is present confirms the genetic hypothesis" (p. 372). Such a finding, net of controls for education and family background, would also be consistent with the environmental hypothesis asserting that dark-skinned African Americans experience color-based discrimination inhibiting the development and maintenance of cognitive skill (see Nisbett, 1998).

REFERENCES

Fischer, C. S., Hout, M., Sanchez, M. S., Lucas S. R., Swidler, A., & Voss, K. (1996). *Inequality by Design: Cracking the Bell Curve Myth*. Princeton, NJ: Princeton University Press.

Hill, M. E. (2000). Color differences in the socioeconomic status of African American men: Results of a longitudinal study. *Social Forces*, *78*, 1437–60.

Hughes, M., & Hertel, B. R. (1990). The significance of color remains: A study of life chances, mate selection, and ethnic consciousness among black Americans. *Social Forces*, *68*, 1105–20.

Jencks, C., & Phillips, M. (Eds.) (1998). *The Black-White Test Score Gap*. Washington, DC: Brookings Institution Press.

Keith, V. M., & Herring, C. (1991). Skin tone and stratification in the black community. *American Journal of Sociology*, *97*, 760–78.

Lynn, R. (2002). Skin color and intelligence in African Americans. *Population and Environment*, *23*, 365–375.

Mullins, E. I., & Sites, P. (1984). The origins of contemporary eminent black Americans: A three-generation analysis of social origin. *American Sociological Review*, *49*, 672–685.

Nisbett, R. E. (1998). Race, genetics, and IQ. In C. Jencks & M. Phillips (Eds.) *The Black-White Test Score Gap* (pp. 86–102). Washington, DC: Brookings Institution Press.

Rushton, J. P. (2000). *Race, Evolution, and Behavior: A Life History Perspective*, 3rd ed. Port Huron, MI: Charles Darwin Research Institute.

Schafer, J. L. (1997). *Analysis of Incomplete Multivariate Data*. London: Chapman and Hall.

Schafer, J. L. (2000). NORM: Multiple imputation of incomplete multivariate data under a normal model, version 2.03. [Computer Software] *http://www.stat.psu.edu/%7Ejls/misoftwa.html*.

Williamson, J. (1980). *New People: Miscegenation and Mulattoes in the United States*. New York: Free Press.