

The gray area: high school dropout likelihood among skin tone levels of black males

**Yariv Fadlon¹
Sophie Tripp²**

Abstract

We evaluate the role skin tone plays in the likelihood of dropping out of high school for black male respondents in the NLSY97. We find that blacks are 11 percent more likely to drop out of high school. This gap almost disappears after controlling for key family background variables. In addition, we find that light skinned blacks are less likely to drop out compared to whites, while dark skinned blacks are more likely to drop out compared to whites after controlling for the same family background variables. Therefore, after controlling for family background, the dropout likelihood of both light and dark skinned blacks “cancel out” and thus the bi-racial gap mistakenly seems to disappear.

Keywords: Black-White Dropout; Skin Tone; FGLS.

JEL Codes: I2, C1.

Doi: [10.5455/Elet](https://doi.org/10.5455/Elet).

¹ (Corresponding Author) Claremont Graduate University Department of Economics 150 E 10th Street, Claremont, CA 91711 USA, e-mail: yariv.fadlon@cgu.edu..

²Graduate student, Claremont Graduate University, Department of Economics, 150 E 10th Street, Claremont, CA 91711 USA, e-mail: sophie.tripp@cgu.edu..

1. Introduction

This study analyzes the effect of skin tone on the likelihood of dropping out of high school. A growing field of research shows that not only are racial disparities in education a continuing issue, but disparities based on variation in skin tone within racial groups are also present.

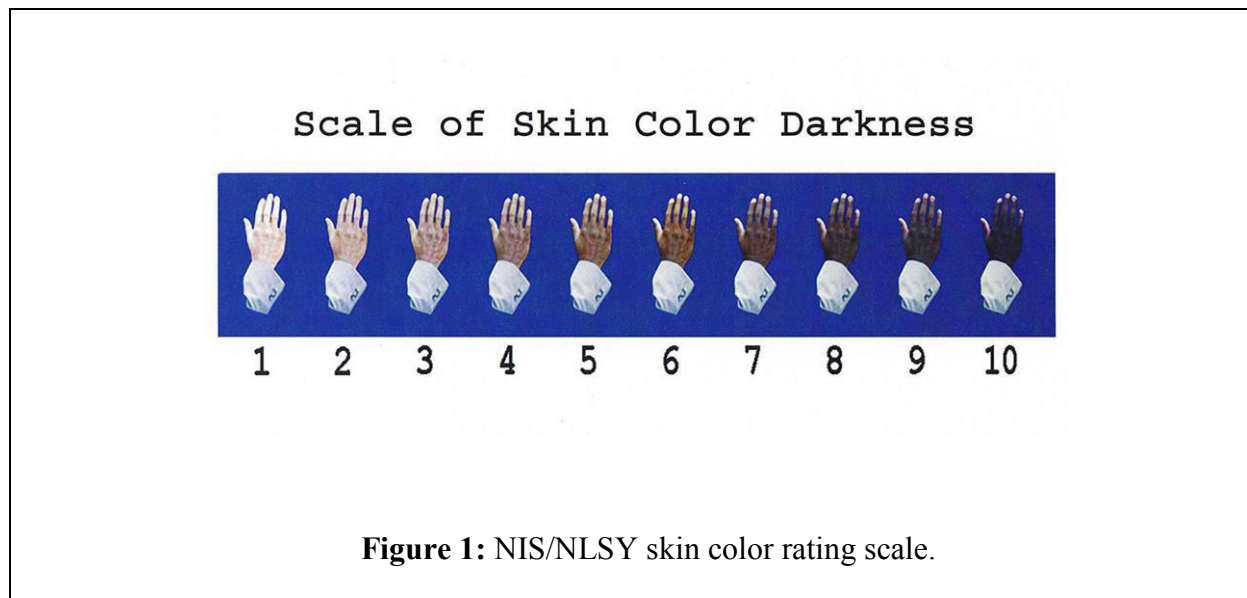
The literature on skin tone effects finds differences in economic and social outcomes, such as years of schooling (Loury, 2009; Hughes & Hertel, 1990; Keith & Herring, 1991), school suspensions (Hannon et. al., 2013) and wages (Kresiman & Rangel, 2014; Goldsmith et. al., 2006) due to the variation in skin tone within racial groups. According to Hughes and Hertel (1990), the effects of skin tone on socioeconomic outcomes have changed little from the start of the twentieth century to the end of it, with years of schooling and income being higher for light skinned blacks. Hersch (2006) finds that light skinned blacks have higher educational attainment than dark skinned blacks. More recently, Loury (2009) finds that the educational disadvantages of dark and very dark skinned blacks continued between older and younger cohorts of the NSBA.

We use a very rich and detailed sample from the National Longitudinal Survey of Youths 1997 (NLSY97). NLSY97 is a representative sample of the U.S. population, which recently includes a skin tone rating varying from 1 to 10.³ Using this newly added variable, we are able to add to the literature on educational differences both inter- and intra- racially. We create three groups of black skin tones based on the distribution of skin tone rating. Our results follow the literature on skin tone effects and colorism in which the majority finds lighter skin tones face better outcomes.

³ The test was conducted privately by the interviewer.

2. Data

The data are taken from the National Longitudinal Study of Youth 1997 (NLSY97), a nationally representative sample of individuals born between 1980 and 1984. The sample contains 8,984 youths who were first interviewed in 1997 and have continued to be interviewed annually. The data collected provide detailed information on respondents' home environment, education, and labor market outcomes, among many other variables. Starting in 2008, the NLSY includes a skin tone measurement. This new variable is measured on a scale ranging from 0 (albinism) to 10 (darkest). Figure 1 shows the implanted scale that had also been previously used in a New Immigrant Survey commissioned by the National Opinion Research Center in 2003.



Interviewers memorize the scale and note the respondents' skin tone only if the data collection is done in person. Our sample is a cross-section of the year 2011 and consists only of male respondents to control for differences in academic achievements by gender and the potential effects of double discrimination for black female respondents. We divide the black

respondents into three variables. The lightest represents skin tone ratings 1 through 4 (*light*) and the darkest represents skin tone ratings 8 through 10 (*dark*).

The dependent variable, high school *dropout*, is a binary variable equal to unity if the reported highest grade completed is smaller than twelve and no GED certificate has been received. Our family background variables include a binary variable measuring if the respondent's residential mother dropped out of high school, a binary variable equal to unity if the respondent lived with both parents at twelve years of age, the log of family income in the year 1996, and a binary variable for whether the income is earned by the child. The last variable is important to eliminate endogeneity of the family income variable. That is, it is plausible to assume that in low-income families, high-school students are expected to support the family financially. Therefore, family income might be correlated with indicators for whether the child is facing pressure to earn income and support the family, and these indicators are likely to be in the error term. But controlling for whether the income is earned by the child eliminates this chain effect.

About 18 percent of the black respondents with a skin tone rating are in the *light* group and 49 percent are in the middle, *medium*, group, with the rest falling into the darkest group, *dark* (summary statistics in Table 1). Table 1 also presents the dropout rates by race and skin tone groups. When looking at the dropout rates by skin tone among blacks the likelihood increases from the *light* to *dark* groups.

Table 1: Summary statistics – means and standard deviations of male respondents.

	Whites	All Blacks	Blacks by Skin Tone		
			Light (1-4)	Medium (5-7)	Dark (8-10)
Dropout	0.214 (0.41)	0.324 (0.468)	0.264 (0.442)	0.316 (0.466)	0.369 (0.483)
Both Parents (age 12)	0.618 (0.486)	0.257 (0.437)	0.239 (0.428)	0.279 (0.449)	0.233 (0.424)
Mother Dropout	0.144 (0.351)	0.2 (0.401)	0.166 (0.373)	0.212 (0.410)	0.202 (0.402)
Ln(Family Income)	8.163 (4.561)	6.796 (4.672)	6.827 (4.734)	6.391 (4.839)	7.390 (4.318)
Child Income	0.010 (0.102)	0.016 (0.125)	0.018 (0.135)	0.016 (0.127)	0.014 (0.118)
Observations	2,682	833	163	433	287

Notes: Dropout is a proxy created to measure if the respondent did not complete 12 years of school or receive a GED certificate.

3. Methodology

Our question is whether or not there are significant differences in the likelihood of dropping out of high school among the different skin tones of blacks both inter- and intra- racially. To measure differentials we estimate the following model:

$$Y_i = \alpha + \beta_1 \text{light}_i + \beta_2 \text{mid}_i + \beta_3 \text{dark}_i + \gamma_4 X_i + \varepsilon_i \quad (1)$$

where Y refers to the dependent variable of dropping out of high school. The vector X contains the variables to control for family background. To find differentials intra-racially, we drop the lightest skin tone category. By dropping the *light* skin tone dummy variable, we are trying to find differences in the likelihood of dropping out for the medium and dark skin tone groups compared to the light skin tone group.

To estimate the model in (1), we use the Linear Probability Model (LPM). As is well known, the LPM model is heteroskedastic with the following formula

$$\text{Var}(\varepsilon|X) = \Pr(Y=1|X) * [1 - \Pr(Y=1|X)] \quad (2)$$

Wooldridge (2010) argues that since we know the conditional variance formula, a Feasible Generalized Least Square (FGLS) estimator provides efficient estimates with low size distortion for associated test statistics and is superior to the standard White-Huber robust standard errors approach. All of our reported results are based on an FGLS estimator. One common concern with FGLS estimators is that the transformations of the variables can lead to very different estimates compared to other models for binary outcomes, including OLS with robust standard errors. Therefore, for robustness checks we report the marginal effects estimates from a logit regression, but our preferred model is the FGLS.

4. Results

The inter-racial estimates of the likelihood of dropping out of high school are reported in Table 2. The first four columns report the racial gap of males in the likelihood of dropping out, ignoring skin tone. The last four columns report the differences of dropout likelihood across different skin tones compared to white males. Therefore, in Columns 1-4, the main coefficient of interest is on the dummy variable *Black*, which captures the black-white gap in the likelihood of dropping out of high-school holding all other control variables fixed (i.e., ceteris paribus). In columns 5-8, the base category is whites, and the main coefficients of interest are on the three skin tone dummy variables. These three variables capture the skin tone-white gap in the likelihood of dropping out of high school ceteris paribus.

When comparing black and white males without controlling for family background, the racial gap in the likelihood of dropping out is statistically and economically significant. Specifically, black males are about 11 percent more likely to drop out compared to white males. This result is closer to what is reported in Heckman and LaFontaine (2010). When family background is added, however, this difference disappears. When comparing black males with different skin tones, light skinned blacks and whites have similar likelihoods of dropping out, whereas medium and dark skinned blacks are more likely to drop out. After

controlling for family background, light skinned blacks are 3.2 percent less likely to drop out compared to whites and dark skinned blacks are 6.6 percent more likely to drop out compared to whites. These results give a different reasoning as to why the black-white dropout likelihood gap almost disappears when family background is controlled for. That is, after controlling for family background, the dropout likelihood of both light and dark skinned blacks “cancel out” and thus the bi-racial gap seems to disappear.

Table 2: Estimated effects of explanatory variables on likelihood of dropping out of high school for inter-racial analysis.

	Racial Gap				Racial Gap by Skin Tone			
	FGLS (1)	Logit (2)	FGLS (3)	Logit (4)	FGLS (5)	Logit (6)	FGLS (7)	Logit (8)
Black	0.107*** (0.0175)	0.100*** (0.0154)	0.0179 (0.0171)	0.00937 (0.0162)				
Black - Light					0.0551 (0.0354)	0.0547* (0.0328)	-0.032 (0.030)	-0.0354 (0.0327)
Black - Medium					0.0930*** (0.0235)	0.088*** (0.0205)	0.003 (0.022)	0.000255 (0.0209)
Black - Dark					0.158*** (0.0296)	0.141*** (0.0234)	0.066** (0.029)	0.0465* (0.0238)
Both Parents (age 12)			-0.130*** (0.0152)	-0.136*** (0.0152)			-0.131*** (0.015)	-0.136*** (0.0152)
Mother Dropout			0.177*** (0.0225)	0.151*** (0.0176)			0.177*** (0.022)	0.151*** (0.0176)
Ln(Family Income)			-0.0507*** (0.00738)	-0.0483*** (0.00822)			-0.050*** (0.0074)	0.0477*** (0.00820)
Child Income			0.171** (0.0747)	0.135** (0.0556)			0.170** (0.075)	0.136** (0.0554)

Note: The dependent variable is a dummy equal to unity if the respondent dropped out of high school. All regressions control for indicators for missing any of the family background variables. The FGLS estimates use the weighting $p(x)[1-p(x)]$. The estimates from the logit regressions are the marginal effects evaluated at the means.

Table 3 reports the results for our estimation of the likelihood of dropping out of high school using skin tone to compare intra-rationally. Column (1) shows dark skinned black males are

10.3 percent more likely to drop out compared to light skinned black males. The result remains significant and drops to 9.7 percent after controlling for family background.

Table 3: Estimated effects of explanatory variables on likelihood of dropping out of high school for intra-racial analysis.

	FGLS (1)	Logit (2)	FGLS (3)	Logit (4)
Black – Medium	0.0378 (0.0411)	0.0403 (0.0445)	0.0346 (0.0364)	0.0388 (0.0453)
Black – Dark	0.103** (0.0448)	0.104** (0.0465)	0.0973** (0.0409)	0.101** (0.0473)
Both Parents (age 12)			-0.101*** (0.0322)	-0.118*** (0.0408)
Mother Dropout			0.160*** (0.0427)	0.156*** (0.0395)
Ln(Family Income)			-0.0669*** (0.0164)	-0.0613*** (0.0173)
Child Income			0.245* (0.131)	0.232* (0.121)

Note: The dependent variable is a dummy equal to unity if the respondent dropped out of high school. All regressions control for indicators for missing any of the family background variables. The FGLS estimates use the weighting $p(x)[1-p(x)]$. The estimates from the logit regressions are the marginal effects evaluated at the means.

5. Robustness

The results so far suggest that the black-white gap in the likelihood of dropping out of high school cannot be explained by the student's family background. Specifically, the likelihoods change based on the student's skin tone. In this section we test the robustness of the estimates to a different scale of the skin tone. That is, we use the skin tone rating as it was reported in the NLSY97 from 1 to 10, with skin tones 1 to 3 and 9 to 10 combined for sufficient sample size.⁴

Table 4 reports the estimates from the FGLS regressions, where columns 1 and 2 re-estimate the FGLS regressions from Table 2 to test the inter-racial gap, and columns 3 and 4

⁴ In the NLSY97 only 2 students are of skin tone rating 1, 27 of skin tone rating 2, and 23 of skin tone rating 10.

re-estimate the FGLS regressions from Table 3 to test the intra-racial gap. In column 1, we do not control for family background, and find that blacks of all skin tones are more likely than whites to drop out of high school. The estimates are stronger for darker skinned blacks than lighter skinned blacks. When we control for family backgrounds, however, we find that light skinned blacks are less likely to drop out of high school than whites, but the results are statistically insignificant. In addition, dark skinned blacks are more likely than whites to drop out of high school.

Table 4: Robustness checks to longitudinal skin tone index.

	Inter-Racial		Intra-Racial	
	(1)	(2)	(3)	(4)
Black, 1-3	0.0506 (0.0494)	-0.0544 (0.0377)		
Black, 4	0.0596 (0.0496)	-0.00936 (0.0430)	0.00903 (0.0693)	0.0414 (0.0594)
Black, 5	0.119*** (0.0449)	0.0442 (0.0416)	0.0682 (0.0660)	0.0867 (0.0569)
Black, 6	0.101** (0.0396)	0.00784 (0.0363)	0.0506 (0.0625)	0.0639 (0.0533)
Black, 7	0.0697** (0.0347)	0.0346 (0.0310)	0.0191 (0.0595)	0.0223 (0.0499)
Black, 8	0.136*** (0.0443)	0.0394* (0.0215)	0.0853* (0.0466)	0.0916* (0.0471)
Black, 9-10	0.175*** (0.0385)	0.0830** (0.0372)	0.124** (0.0618)	0.135** (0.0540)
Both Parents (age 12)		-0.132*** (0.0151)		-0.106*** (0.0322)
Mother Dropout		0.179*** (0.0224)		0.166*** (0.0427)
Ln(Family Income)		-0.0501*** (0.00742)		-0.0650*** (0.0163)
Child Income		0.166** (0.0748)		0.236* (0.132)

Note: The dependent variable is a dummy equal to unity if the respondent dropped out of high school. All regressions control for indicators for missing any of the family background variables. All the regressions use the FGLS estimates use the weighting $p(x)[1-p(x)]$. In columns 1 and 2, the reference group is white responders. In columns 3 and 4, the reference group is blacks with light skin tone of 1 to 3.

In columns 3 and 4, we restrict the sample to only black respondents and compare the estimates of blacks with different skin tones to blacks with a light skin tone of 1 to 3, the reference group. The estimates suggest that medium skinned blacks are more likely than light skinned blacks to drop out of high school, but the estimates are statistically insignificant. Dark skinned blacks (skin tone of 8 to 10), are statistically and economically more likely than light skinned blacks to dropout of high school.

6. Conclusions

Using a national sample, our analysis reveals there are disparities in the likelihood of dropping out of high school along the scale of skin tones of black males. In particular, our results show that the light and dark skin tone groups have opposite effects on dropout likelihoods, leading to a misleading biracial interpretation. This study highlights the importance of using data on skin tone to further analyze racial disparities due to the deeper understanding it provides.

References

- Goldsmith, A. H., Hamilton, D., & Darity, W., Jr. (2006). Shades of discrimination: Skin tone and wages. *American Economic Review*, 96(2), 242-245.
- Hersch, J. (2006). Skin-tone effects among African Americans: Perceptions and reality. *American Economic Review*, 96(2), 251-255.
- Keith, V., & Herring, C. (1991). Skin tone and stratification in the black community. *The American Journal of Sociology*, 97(3), 760-778.
- Kreisman, D., & Rangel, M. A. (2015). On the blurring of the color line: Wages and employment for black males of different skin tones. *The Review of Economics and Statistics*, 97(1), 1-13.
- Heckman, J. J., & LaFontaine, P.A. (2010). The American High School Graduation Rate: Trends and Levels. *Review of Economics and Statistics*, 92(2), 244-62.
- Hannon, L., DeFina, R., & Bruch, S. (2013). The relationship between skin tone and school suspension for African Americans. *Race and Social Problems*, 5(4), 281-295.

Hughes, M., & Hertel, B. (1990). The significance of color remains: A study of life chances, mate selection, and ethnic consciousness of black Americans. *Social Forces*, 68(4), 1105–1120.

Loury, L. D. (2009). Am I still too black for you?: Schooling and secular change in skin tone effects. *Economics of Education Review*, 28(4), 428-433.

Massey, D. & Martin, J. (2003). The nis skin color scale. NIS.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.