THE DECREASING EFFECT OF SKIN TONE ON WOMEN'S FULL-TIME EMPLOYMENT

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The authors investigate the effect of skin tone on labor market outcomes to determine the extent to which differences in full-time employment probabilities are due to the persistence of racial and gender discrimination or other unobserved differences. Using the Coronary Artery Risk in Young Adults (CARDIA) survey for the period spanning 1985 to 2000, which includes both African American and white young adults, as well as an objective measure of skin tone from a light-spectrometer and a self-reported measure of race, they find that the effect of skin tone on employment diminished over time. These results hold across both samples as well as within the African American subsample. Further investigation indicates that all the labor market gains can be attributed to African American women, whose outcomes converged with those of their white counterparts by 2000. Similarly, within the subsample, the employment outcomes of darker-toned women converged with those of lighter-toned women. There were no changes in the employment probabilities for African American men in the 15-year panel data. The expansion of full-time employment opportunities occurred primarily in the low-skilled service occupations.

In the United States there has been a long history of racial discrimination in areas such as employment, wages, housing, and voting. The passage in the United States of the Civil Rights Act of 1964 explicitly outlawed these discriminatory practices. Nevertheless, there are persistent differences across gender and racial groups in the United States even today.

In the decades since the passage of the Civil Rights Act, economists have conducted both theoretical and empirical research to explain the persistence of labor market differences by gender and race. Finding differences in labor market outcomes across these different groups, however, is not definitive proof of the continued presence of discrimination. Important unobserved characteristics, unrelated to discrimination, may actually be driving these observed labor market differences. Empirical researchers have focused on finding effective controls for the unobserved individual characteristics

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that may be highly correlated with skin tone, gender or race.[1] Controlling for these unobserved characteristics is essential to any understanding of differences in labor market outcomes by gender or racial minorities. In our analysis, we will control for unobserved individual premarket characteristics as well as for time-variant measures of human capital.

We contribute to the literature on skin tone effects on labor market outcomes in two ways. First, the panel data set we use, Coronary Artery Risk in Young Adults (CARDIA), allows us to control for time invariant individual characteristics such as childhood experiences, family background and preferences that often confound the research on this topic. Our panel data contains a sample of young adult (African American and white) males and females in four U.S. cities in six survey waves over a 15-year period. To our knowledge, this is the first research to use such a long panel dataset to examine the role of skin tone on labor market outcomes. Second, we use an objective measure of skin tone obtained from a light spectrometer along with a self-reported measure of race. Using these data, we investigate the effect of skin tone on full-time employment probabilities over time for men and women. In addition, we use the information on variation in skin tones in our data to examine the role of skin tone on full-time employment probabilities within the African-American subsample.

Theoretical Context and Previous Research

Because of the U.S. experience with segregation based on skin tone and race and the prevalence of explicit racial discrimination in hiring practices, it is useful to examine the theoretical foundations of discrimination in the labor market. Almost fifty years after the banning of discriminatory employment practices in the United States, exploring whether skin tone or ethnic group discrimination persists in the labor market continues to be an important area of research.

Becker (1971) described labor market discrimination where an employer prefers to employ one type of worker to the exclusion of another based solely on group membership. In this scenario, the profits of nondiscriminating firms should be larger over time as they can pay a lower wage for their employees; in the long-run the discriminating firms should go out of business. If there is no free-entry of nondiscriminating firms, then wage gaps may endure and the discriminating firms may not be driven out of business over time.

A second source of discrimination, known as statistical discrimination, comes from employers that have imperfect information about potential employees. Employers use a rule of thumb to evaluate potential employees based on the average attributes of their group. Coate and Loury (1993)

[1]See, for instance, Goldsmith, Hamilton, and Darity (2006,2007). In their analysis, these authors control for a number of important premarket characteristics that may be highly correlated with racial group preferences.

have shown that it is possible for these perceptions about particular groups to persist and become further entrenched. In their model, individuals from a minority group face lower returns to education, and consequently they will tend to underinvest in their own human capital and thereby reinforce the perceived stereotype. There may be a high correlation of skin tone or race with important labor market characteristics, such as childhood income, parental education levels, and investment in their own human capital. The observed differences in wages and full-time employment may be due to these differences in pre–labor market conditions at the household level.

In addition to employer and coworker discrimination, minorities can also face customer discrimination in the labor market. Using a general equilibrium model, Kahn (1991) shows that customer prejudice is theoretically distinct from both employer and coworker discrimination. Kahn points out that while constant returns to scale and market forces drive out employer and coworker discrimination in the long-run, customer prejudice may continue to exist even under such conditions. Therefore, in contrast to other forms of discrimination, customer discrimination may generate long-run wage differentials between the majority and minority groups in the society.

Altonji and Pierret (2001) explored the possibility that at first firms may learn about individuals' productivity from their easily identifiable characteristics, but ultimately it will be their unobserved characteristics that will drive wage differences. Using longitudinal data from the National Longitudinal Study of Youth (NLSY), the authors find little evidence that easily observable characteristics, such as education or even race, play a long-run role in wage determination. This finding is consistent with their hypothesis that while firms may engage in statistical discrimination at first, over time they learn about the productive qualities of individuals and this will drive wages in the long run. Therefore, as firms learn over time there should be a decrease in the race wage gap if race is not correlated with productivity.

Empirical research on this topic continues to find evidence of differences in labor market outcomes by skin tone and race. There is some limited evidence that skin tone has an effect on full-time employment probability in a static setting. Johnson, Bienstock, and Stoloff (1995) find that darker skinned men in Los Angeles were 52% less likely to be working than their lighter skinned counterparts in the same community. Hersch (2008) used data for the United States from 2003 to find that there is no effect of skin tone on full-time employment probability for immigrants.[2] But there has been no research to date that has shown the effect of skin tone over time on full-time employment probabilities.

The majority of empirical research has been conducted on the effect of skin tone on wages. Goldsmith et al.(2006, 2007), working with two different data sets, find evidence of a preference for whiteness in wages. Individuals with lighter skin tend to earn higher wages, ceteris paribus; these results

[2]This result is consistent with our finding that there is a reduction in the importance of skin tone on full-time employment from 1985 to 2000.

hold up both between the African American and white communities and within the African American community. Fairlie (2009) uses the new ethnic and racial categories available in the 2000 U.S. Census to examine whether biracial individuals of African American and white heritage earn wages closer to that of whites or single race African Americans. Interestingly, he finds evidence that education levels for the biracial group is halfway between that of the two single race groups but that the wages of the biracial group are closer to that of single race African Americans. These recent studies indicate that analysis of even current U.S. data sets provides evidence of an effect of skin tone and race on wages.[3]

Other researchers have focused specifically on the role of skin tone on educational attainment in the United States. Loury (2009) has shown that there have been gains in educational attainment for African Americans over time. Specifically, she finds that the gains differ by skin tone within this group: most gains accrue to individuals with medium to light skin tones. Even after significant desegregation laws governing U.S. schools were established, there remain persistent gaps in educational attainment for darker skinned African Americans. Gullickson (2005) also finds evidence for a lessening of the effect of skin tone on educational attainment over time for cohorts born after 1953. Taken together these studies suggest, at least for some segment of the African American population, that over time there has been a convergence in educational levels with that of the majority white population.

This convergence in educational attainment over time, however, does not appear to have translated into parity with regard to full-time employment or wages across groups as we noted earlier.[4] One potential explanation for this continued difference is that there are still significant levels of discrimination in the labor market. A series of audit studies has provided evidence that there is a difference in job offers when individuals from different ethnic groups but otherwise similar qualifications show up for hiring interviews (Turner, Fix, and Struyk 1991; Cross, Kenney, Mell, and Zimmerman 1990; Neumark 1996). Bertrand and Mullainathan (2004) sent out résumés that differed only in their degree of ethnic-sounding names to prospective employers. They found that the more ethnic-sounding names had fewer invita-

[3]Several other authors find evidence of the effect of skin tone or ethnic identity in other groups as well. Espino and Franz (2002) find that the lighter skinned Mexican and Cuban immigrants in the United States tend to have higher occupational prestige scores than their darker skinned counterparts. Arias, Yamada, and Tejerina (2004) find that in Brazil there is evidence for a difference in the return to education by skin tone. Hersch (2008) finds that newly arrived legal immigrants to the United States in 2003 are paid differently according to their skin tone. Darker skinned immigrants earn lower wages, ceteris paribus. Finally, Frank, Akresh, and Lu (2010) find that there is a wage penalty for darker skinned Latino immigrants in the United States.

[4]At least for the gender wage gap, there is some evidence that observable characteristics have played an important role in a diminishment of the difference. Blau and Kahn (1997) and O'Neill and Polachek (1993) have found evidence for a closing of the male-female education gap and consequently found evidence for a narrowing of the male-female wage gap as well.

tions for interviews than their similarly qualified counterparts.[5] In an audit study, Pager (2003) shows that white men with criminal records were more likely to be called back for further interviews than observationally equivalent African American men without a criminal record (white, 17%, African American, 14%). Giuliano, Levine, and Leonard (2009) have found that the hiring manager's own race appears to play a role in the hiring of retail staff—managers show a clear preference for their own race, regardless of whether the manager is white, Hispanic, or African American.

These differences in preferences can ultimately lead to segregation across occupations. Darity and Patrick (1998) have found evidence of occupational segregation and concluded that African American males, in particular, earn 12% to15% less than their white counterparts. Bayard, Hellerstein, Neumark, and Troske (2003) have arrived at similar results using a different dataset for both Hispanic and African American workers, both men and women. The authors conclude that occupational segregation may account for one-third to one-half of the wage gap for African American men. Juhn (1992, 2003) has shown that a large proportion of African American men have increasingly become disconnected from the formal labor market and that including these individuals in typical calculations would over time tend to moderate the gains in the wage gap between African Americans and whites. Neal (2004) finds that, while there are persistent gaps in wages between African Americans and whites, these gaps may in fact be larger than they appear if selection into labor force participation is not accounted for. Specifically, there may be individuals in the African American community who are increasingly separated from the formal labor market, and accounting for these individuals and their characteristics would tend to increase the apparent size of the wage gap. He finds a larger wage gap between African American men and white men than between the two groups of women.[6]

Like previous researchers, we are interested in determining whether there is an effect of skin tone on labor market outcomes. Given our panel data, we can look at the effect of skin tone on full-time employment over time. The panel structure of our data allows us to control for household and cultural characteristics that are fixed over time. These unobserved fixed effects have often confounded previous research analyzing cross-sectional data. Therefore, our main focus is on the effect of skin tone and race on full-time employment probability as we hold pre–labor market conditions constant for individuals over time. Loury (2009) and Gullickson (2005) have found that there is a reduction in the importance of skin tone on education over time in the United States, and this leads us to expect to find a similar outcome with respect to full-time employment probabilities in our

[5]Blau and Kahn (2006) have also concluded that occupational segregation may be responsible for differences in the gender wage gap. Goldin and Rouse (2000) have shown that blind auditions for U.S. orchestra positions have tended to increase the probability of hiring a female.

[6]Mulligan and Rubinstein (2008) find similar results for the gender wage gap. Accounting for the positive selection of women into the labor force over time, the authors find that the median woman still earns less than the median male.

sample. Our framework will allow us to detect whether there has been a divergence, convergence, or no change in full-time employment probabilities by skin tone.

Empirical Specifications

In the regressions that follow, we employ fixed-effects regression models to account for the potential unobserved heterogeneity at the individual level. We employ two regression equations:

$$\text{Employment}_{it} = \alpha_i + \alpha_t + \beta X_{it} + \delta_1 \times \text{Black} \times \text{Year1} + \ldots + \delta_5 \times \text{Black} \times \text{Year5} + \varepsilon_{it} \quad (1)$$

$$\text{Employment}_{it} = \alpha_i + \alpha_t + \beta X_{it} + \delta_1 \times \text{SkinTone} \times \text{Year1} + \ldots + \delta_5 \times \text{SkinTone} \times \text{Year5} + \varepsilon_{it} \quad (2)$$

In the first equation, we use a simple indicator variable, Black, which is self-reported in the data. The indicator variable is interacted with a year variable, and each coefficient indicates how being black (African American), ceteris paribus, affects full-time employment probabilities for each survey year relative to the most current year, 2000. It is important to note that our coefficients of interest measure the effect of being African American on full-time employment probability at each survey year relative to the final year in our dataset, 2000. We do not estimate the overall black-white difference or the overall effect of skin tone on full time employment because we are measuring a relative change of the effect of being African American on full-time employment from 1985 to 2000.

The second equation uses a continuous variable for skin tone that ranges in values from 43 to 93, where higher numbers indicate darker skin tone. We interact the skin tone variable with a survey year indicator variable and include these five in regression (2). Each coefficient indicates how different skin tones affect the probability of full-time employment at different points in time relative to the final survey year, 2000.

Employment is a simple indicator variable which takes on values of 1 when an individual is employed full-time in our data and a value of 0 otherwise.[7] The vector X controls for time variant characteristics, such as age, household size, whether there are children in the household, the respondent's current school status, and marital status.

Time invariant characteristics such as gender and race are controlled for by the fixed effects variable, α_i. In addition, the individual fixed effect controls for other unobserved childhood characteristics and preferences. Using a fixed effects regression model allows us to explicitly control for unobserved parental effects, such as parental attitudes toward employment, pa-

[7]Alternative measures of employment, which include full- and part-time employment, provide qualitatively similar results.

rental education, childhood educational inputs, and preferences for work that do not change over time.

We employ a linear probability model with fixed effects. A fixed-effects logit model provides qualitatively similar results. Because of the age distribution (18 to 30), there are quite a few individuals who were continuously employed in all survey waves, and this omits a relatively large number of observations. The standard errors are clustered at the individual level to account for correlations in outcomes for the same individual over time. Models with bootstrapped standard errors provide qualitatively similar results.

Data and Descriptive Statistics

The CARDIA data comprise a longitudinal data set initiated in 1985 in four U.S. cities: Birmingham, Alabama; Oakland, California; Minneapolis, Minnesota; and Chicago, Illinois. A cohort of 5,115 men and women was recruited and followed for the next 15 years until 2000. The age of individuals within the cohort at intake ranged from 18 to 30 years; samples were collected to get a balance of age, gender, education, and race; by the final survey year, 2000, these individuals ranged in age from 32 to 45 years.[8] The data were primarily for use in a long-run health study on cardiovascular health.[9] (For a fuller description of the survey methodology, see G. D. Friedman et al. 1988). In our study, we focus on the human capital and full-time employment variables that were collected in all survey waves.[10]

There were six survey waves in total conducted in the following years: 1985, 1986, 1990, 1992, 1995, 2000. Self-reported ethnic classifications were collected in each survey wave. In the fourth survey wave (1992), however, the researchers took a light spectrometer reading of the skin tone of survey participants. These spectrometers provide an additional, and objective, measure of skin tone.

Figure 1 provides a graph of the distribution of skin tone for both the white and African American subsamples.[11] Note that there is significant

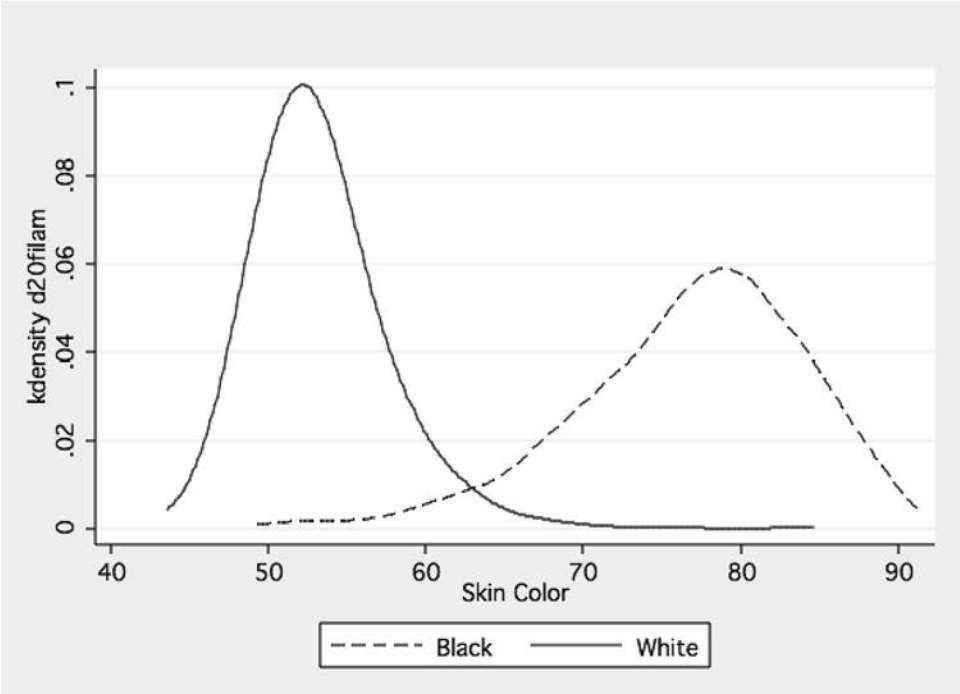
[8]For the purposes of the analysis that follows the terms *African Americans* and *black* will refer to the same group. Other racial groups (except for whites) were explicitly omitted from the CARDIA survey; therefore, other ethnic groups that also self-identify as black and Hispanic would not be included in this data by construction.

[9]See Borrell, Kiefe, Williams, Diez-Rouz, and Gordon-Larsen (2006) for a study of the effect of skin tone on mental and physical health using the CARDIA dataset. The authors find no effect of skin tone on mental or physical health whether or not they control for socio-economic conditions. Our work contrasts with theirs in that we use full-time employment as the outcome variable for our analysis.

[10]There is a public use data set, which is available via the following website: http://www.cardia.dopm.uab.edu/index.htm

[11]The light spectrometer measures the percent of light reflected back; therefore the range of values is between 0 and 100. We have recoded the values so that higher numbers indicate darker skin tone. For the purposes of our study, we use the amber measure as this is the commonly used measure. Measures are taken on the underside of an individual's upper arm so that it is the area that has the least long-term variation in skin tone. Halder and Nootheti (2003) indicate that ethnic skin tone tends to get darker over time; but this starts after 50 years of age which is outside our survey ages. Additionally, we find it highly unlikely that a large proportion of our sample would change their skin tones in a sustained manner over

Figure 1. Skin Tone Distribution by Race



overlap between the two different racial groups at the point at which skin tone falls in the range of 60 to 70. Beyond that specific skin tone range there are very few individuals that identify as the other racial group.

In addition, we also incorporate in our regressions other data, such as age, educational attainment, household size, whether there are any children in the household, whether the individual is currently in school, and marital status. Our measure of education records the highest level of education attained as of the survey date and is divided into the following five dummy variables: less than a high school education, a high school diploma, an associate's degree, a bachelor's degree, and a doctorate degree. For our regressions, we take less than a high school education as the reference category. The household size variable is a count variable, while the remaining variables are all binary indicator variables.

We use a balanced panel for our analysis; individuals in our analysis are present in all survey years. We find that the female full-time employment probabilities from the balanced panel approximate the general trends found in the United States as a whole over this time period. Specifically, as

a long period of time. For instance, de Souza (2008) discusses skin bleaching in Africa and the long-run health consequences. The occurrence of skin bleaching in the United States is low; but there are no large scale studies on the topic. Skin bleaching appears to be a much bigger issue in developing countries such as India, the Phillipines, and the countries of sub-Saharan Africa.

Figure 2. Full-Time Employment for Women, CARDIA Data 1985–2000

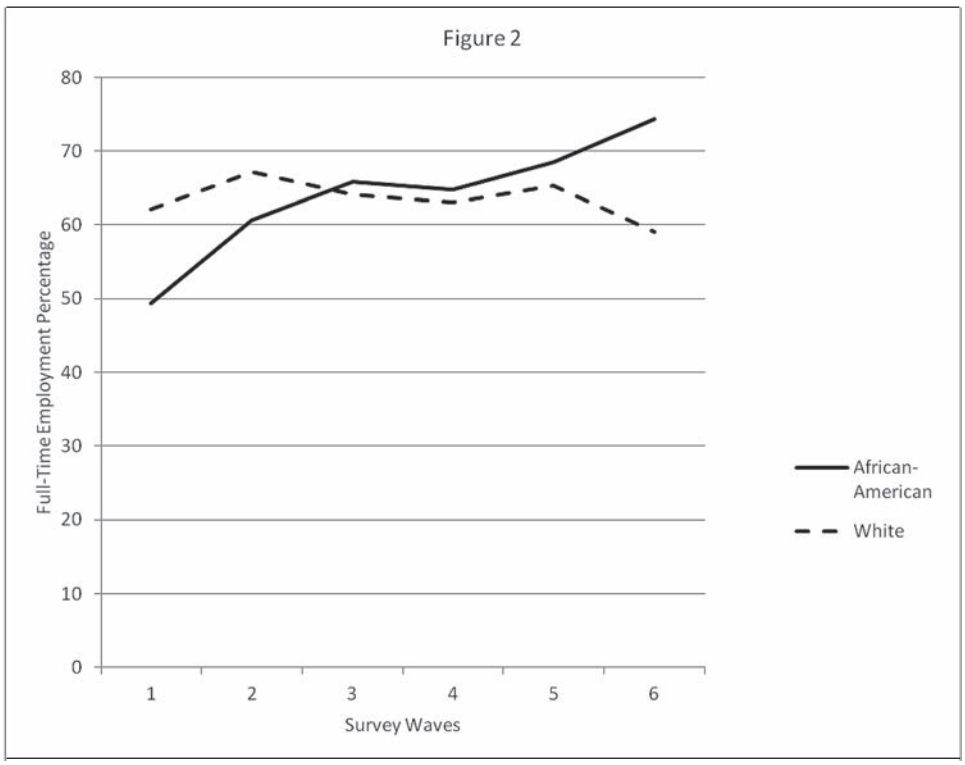
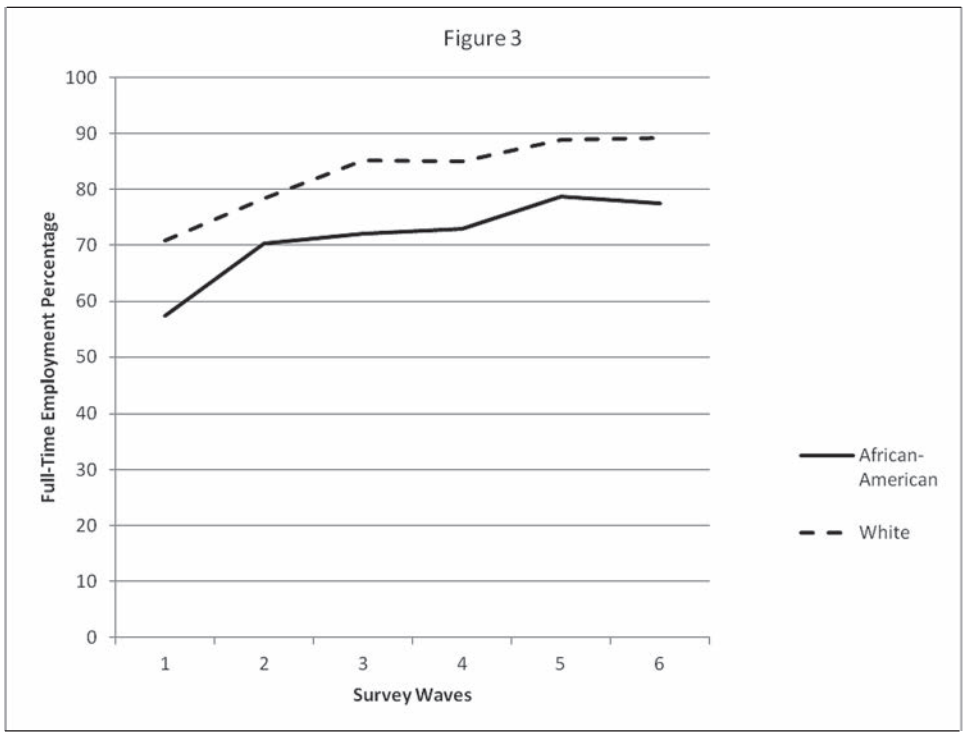


Figure 2 shows, we find that African American women tend to increase their full-time employment probability over time, while there is little or no change for white women in the period from 1985 to 2000.[12] In the initial survey year, African American women have a full-time employment probability of only 50%, while white women had a full-time employment probability of 62%. The figure indicates that there is a convergence in employment probability over time for African American women and a slight divergence in employment probabilities by the final survey year. An ordinary least squares regression of full-time employment for the first survey year on skin tone, age, education, marital status, and current schooling status indicates that women with darker skin tones are less likely to be full-time employed, ceteris paribus. The coefficient on skin tone is -0.001; an increase of one standard deviation in skin tone (13 points) is associated with a decrease in full time employment by 1.3%. The results for women, however, are not statistically significant at conventional levels. Using a measure of African American status provides qualitatively similar results for women. The ordinary least squares results for men are negative and statistically significant. While this cross-

[12]Using data from the 1980, 1990, and 2000 U.S. Census, we find a similar trend for adult females in the United States.

Figure 3. Full-Time Employment for Men, CARDIA Data 1985–2000



sectional analysis cannot control for unobserved fixed effects, it does hold other observable characteristics constant and provides qualitatively similar results to the raw differences presented in Figure 2.

Figure 3 shows the general trend for full-time employment probability for men in the same time period. We find that the difference in full-time employment probability is constant over time for men across the two racial groups; the initial probability of full-time employment for African American men is 57% and 71% for white men. This is inconsistent with previous research (Juhn 1992, 2003; Holzer, Offner, and Sorensen 2005; Borjas, Grogger, and Hanson 2009), which has found a strong divergence in full-time employment probabilities; African American men have had a steady decline in labor force participation over time.[13] Examining our data, we find that African American men are also the most likely to be missing from future survey waves. Therefore, in our balanced panel and the results we conclude that our findings apply to the subset of men who have a higher probability of being employed full-time (and consequently included in our data) over time. We expect that the results for women are probably closer to the true effect of skin tone on full-time employment probability over time.

[13]An important caveat is that our data focus on young men (initially age 18 to 30 in 1985) and not on the entire distribution of working age men as is the case in these other studies.

Table 1. Individual Characteristics for All Survey Years

	White Sample				*African-American Sample*			
Variable	*Mean*	*Std. Dev.*	*Min*	*Max*	*Mean*	*Std. Dev.*	*Min*	*Max*
Full Time Employed	0.728	0.445	0	1	0.671	0.470	0	1
Age	32.096	6.029	18	47	31.023	6.263	18	49
Less Than High School Diploma	0.015	0.122	0	1	0.047	0.212	0	1
High School Diploma	0.366	0.482	0	1	0.622	0.485	0	1
Associate's Degree	0.059	0.235	0	1	0.120	0.325	0	1
Bachelor's Degree	0.413	0.492	0	1	0.179	0.384	0	1
Doctorate Degree	0.147	0.354	0	1	0.031	0.174	0	1
In School	0.167	0.373	0	1	0.173	0.378	0	1
Marital Status	0.470	0.499	0	1	0.342	0.474	0	1
Have Any Kids?	0.360	0.480	0	1	0.528	0.499	0	1
Household Size	2.672	1.314	1	6	3.259	1.438	1	6
Male	0.479	0.500	0	1	0.402	0.490	0	1
Survey Year 1985	0.169	0.375	0	1	0.170	0.376	0	1
Survey Year 1987	0.166	0.372	0	1	0.164	0.371	0	1
Survey Year 1990	0.170	0.375	0	1	0.170	0.376	0	1
Survey Year 1992	0.169	0.375	0	1	0.170	0.376	0	1
Survey Year 1995	0.163	0.369	0	1	0.164	0.371	0	1
Survey Year 2000	0.163	0.370	0	1	0.160	0.367	0	1
Skin Tone - Spectrometer Measure	53.883	4.160	43.6	85.6	77.944	7.231	49.3	92.9

Notes: The table includes percentages, means, and standard deviations for individuals from all survey years from CARDIA data set. Sample size is 9,672 for whites and 7,725 for African-Americans.

We present the survey means for our balanced panel by race for all panel years in Table 1. The white sample is more likely to be employed full-time than the African American sample and about one year older. The white sample has higher levels of human capital than the African American sample; fully 40% of the sample observations of white individuals have a bachelor's degree, while more than 60% of the African American sample has a high school diploma or less. The African Americans in this sample are more likely to be married than their white counterparts and tend to have more children. Household sizes appear to be approximately the same across the two groups. Finally, the average skin tone for whites is 53 while it is 78 for African Americans.

Empirical Results

Regression Results for Complete Sample

In order to account for the potential correlation between race and other unmeasured time invariant characteristics, we employ a fixed-effects regression for our panel data. We first investigate whether being African American has an effect on full-time employment probabilities for our total sample. In Table 2, we provide the results from the simple analysis of race and skin tone on full-time employment probabilities. Because this is a fixed-effect regression, we do not include the simple indicator variable of race that is

Table 2. Changes in the Effect of Skin Tone on Full-Time Employment, Years 1 to 15

	(1)	*(2)*	*(3)*
Age	0.0067	0.0063	0.0063
	(0.0095)	(0.0094)	(0.0094)
Less than High School	reference	reference	reference
High School Diploma	0.0401	0.0359	0.0363
	(0.0312)	(0.0312)	(0.0312)
Associate's Degree	0.117***	0.114***	0.114***
	(0.0378)	(0.0377)	(0.0378)
Bachelor's Degree	0.244***	0.242***	0.242***
	(0.0386)	(0.0386)	(0.0386)
Doctorate Degree	0.324***	0.322***	0.323***
	(0.0442)	(0.0442)	(0.0443)
In School	–0.198***	–0.199***	–0.198***
	(0.0127)	(0.0127)	(0.0127)
Marital Status	0.0107	0.0106	0.0110
	(0.0115)	(0.0114)	(0.0114)
Any Kids	–0.0570***	–0.0568***	–0.0570***
	(0.0141)	(0.0140)	(0.0140)
Household Size	–0.0348***	–0.0347***	–0.0346***
	(0.0041)	(0.0041)	(0.0041)
Year 1	0.0973	0.378**	0.2740
	(0.1450)	(0.1530)	(0.1790)
Year 2	0.1190	0.327**	0.352**
	(0.1250)	(0.1330)	(0.1600)
Year 5	0.0908	0.224**	0.254*
	(0.0968)	(0.1060)	(0.1400)
Year 7	0.0704	0.215**	0.216*
	(0.0776)	(0.0891)	(0.1260)
Year 10	0.0689	0.157**	0.1230
	(0.0498)	(0.0656)	(0.1070)
Year 15	reference	reference	reference
Black x Year 1	–0.140***		–0.0597
	(0.0237)		(0.0544)
Black x Year 2	–0.0905***		0.0145
	(0.0228)		(0.0510)
Black x Year 5	–0.0570***		0.0170
	(0.0212)		(0.0510)
Black x Year 7	–0.0652***		0.0009
	(0.0204)		(0.0487)
Black x Year 10	–0.0446**		–0.0196
	(0.0189)		(0.0463)
Black x Year 15	reference		reference
Skin Tone x Year 1		–0.0059***	–0.0034
		(0.0009)	(0.0021)
Skin Tone x Year 2		–0.0039***	–0.0044**
		(0.0009)	(0.0020)
Skin Tone x Year 5		–0.0025***	–0.0031
		(0.0008)	(0.0019)
Skin Tone x Year 7		–0.0027***	–0.0028
		(0.0008)	(0.0018)
Skin Tone x Year 10		–0.0017**	–0.0010
		(0.0007)	(0.0018)
Skin Tone x Year 15		reference	reference

continued

Table 2. Continued.

	(1)	*(2)*	*(3)*
Constant	0.4670	0.4830	0.4830
	(0.3840)	(0.3810)	(0.3820)
Number of Obs	17,397	17,397	17,397
R-Squared	0.095	0.095	0.096

Notes: The table reports the change of the effect of race and skin tone on employment. Clustered standard errors at the individual level are reported in parentheses . *Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

part of the fixed effect. Instead, we employ an interaction variable for race-year effects. This variable is intended to measure the effect of identifying as African American on full-time employment at each survey year relative to the final survey year, 2000; we include a total of five interaction variables. Our findings indicate that conditional on the other covariates, the effect of African American identity on full-time employment is at first negative and statistically significant relative to the year 2000. In the first year, identifying as African American reduces the probability of full-time employment, ceteris paribus, by more than 14%, which is quite significant given that only 70% of the sample is employed full-time. This negative effect, however, diminishes in magnitude and statistical significance in the subsequent survey waves. We interpret this as evidence that, for our sample, the effect of race has diminished in relation to full-time employment probabilities. This finding is the result of using a balanced panel; using an unbalanced panel only strengthens our results.

The additional covariates in this regression are of the expected signs and magnitude. The coefficient on age is positive but not statistically significant; as the age range is only 12 years, it is not surprising that these results are not strong. The education dummy variables indicate that highly educated people are likely to be employed full-time relative to individuals with less than a high school diploma. The coefficient on whether a person is currently in school has a negative sign, as we would expect; individuals who are enrolled in school are much less likely to be employed full-time.[14] We find no significant effect of marital status on full-time employment probabilities; however, we find strongly negative effects of household size and the presence of any children in the household on full-time employment probabilities.

The second column in this table gives results from repeating this analysis but using instead an interaction variable of skin tone and survey year. In the first year, an increase in skin tone of one standard deviation (13 points on the light spectrometer measure) results in a reduction in the probability of full-time employment by almost 7%. This is a large effect; it is almost twice as large, in absolute terms, as the effect of having a high school diploma on

[14]The results are robust to omitting individuals who are currently in school as well.

full-time employment, ceteris paribus. The size of the effect of skin tone decreases over time; by the fifth survey year, the effect of an increase in skin tone of one standard deviation reduces the probability of full-time employment by only 2.2% relative to the sixth survey year.[15] The results are similar those found using the race variable. In fact, in the third column, we show results of including both the skin tone–year interaction variables and the race-year interaction variables, and we find that the skin tone–year interaction coefficients are the only ones that are statistically significant. This may indicate that the race-year interaction variables are just a proxy for skin tone.[16]

Regression Results by Gender and Race

Having found that the effect of skin tone appears to be lessening over time for the full sample, we analyze the effect of skin tone on full-time employment probability by gender.

Table 3 provides the results for women alone (inclusive of both white and African American). African American women are less likely to be full-time employed relative to white women (African American 50%, white 62%) at survey intake in 1985. The regression results in Table 3 indicate that in the first two survey years there is a large effect of skin tone on full-time employment probabilities. An increase in skin tone of one standard deviation (13 points on the light spectrometer measure) results in a reduction in full-time employment probability of almost 10 % relative to the last survey year.[17] This result is almost double the size, in absolute terms, of the effect of having a high school diploma. In the next three survey years, the effect of skin tone diminishes, and a corresponding increase in skin tone of one standard deviation is associated with a reduction in full-time employment probability of only about 5%. These results are robust to the inclusion of the race-year interaction variables as well. In Table 3, column 2, we restrict the analysis to the men. We do not find any systematic results with regard to changes in the effect of skin tone–year interaction effects on male full-time employment probability over time.

[15]We calculate the effect of skin tone on full-time employment probability in the following manner: one standard deviation in skin tone x estimated coefficient = effect of a change in skin tone on full-time employment. For the computation here (7%), we multiply the standard deviation of skin tone by the estimated coefficient of skin tone in the first survey wave (0.00538 x 13 = 0.0689). For the second computation (2.2%), we multiply the standard deviation of skin tone by the estimated coefficient of skin tone in the fifth survey wave (0.0017 x 13 = 0.022).

[16]We find additional evidence for this by restricting the sample just to the region where there is an overlap of skin tones (in the range 60–70) for both ethnic groups, we find that the ethnic indicator is not statistically significant at all.

[17]For the computation here (10%), we multiply the standard deviation of skin tone by the estimated coefficient of skin tone in the first survey wave (0.00764 x 13 = 0.099). For the second computation (4.4%), we multiply the standard deviation of skin tone by the estimated coefficient of skin tone in the fifth survey wave (0.00337 x 13 = 0.044).

Table 3. Changes in the Effect of Skin Tone on Full-Time Employment, Years 1 to 15, by Gender for All Races

	Females	*Males*
Age	–0.00718	0.0179
	(0.0135)	(0.0129)
Less than High School	reference	reference
High School Diploma	0.0456	0.0326
	(0.0458)	(0.0431)
Associate's Degree	0.144***	0.0758
	(0.0540)	(0.0519)
Bachelor's Degree	0.262***	0.219***
	(0.0546)	(0.0551)
Doctorate Degree	0.306***	0.323***
	(0.0625)	(0.0620)
In School	–0.190***	–0.221***
	(0.0163)	(0.0202)
Marital Status	–0.0406***	0.0626***
	(0.0154)	(0.0159)
Any Kids?	–0.171***	0.0565***
	(0.0206)	(0.0176)
Household Size	–0.0418***	–0.0308***
	(0.00584)	(0.00551)
Skin Tone x Year 1	–0.00764***	–0.00170
	(0.00127)	(0.00122)
Skin Tone x Year 2	–0.00665***	2.54e–05
	(0.00126)	(0.00115)
Skin Tone x Year 5	–0.00341***	–0.00102
	(0.00115)	(0.00109)
Skin Tone x Year 7	–0.00392***	–0.00100
	(0.00112)	(0.00101)
Skin Tone x Year 10	–0.00337***	0.000273
	(0.00103)	(0.000974)
Skin Tone x Year 15	reference	reference
Constant	1.063*	0.0197
	(0.547)	(0.522)
Number of Obs	9,654	7,743
R-Squared	0.112	0.127

Notes: The table reports change of the effect of skin tone on employment. Clustered standard errors by individual are reported in parentheses. Regressions also include survey year dummy variables. *Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

We divide the sample between the white and African American respondents. Table 4 provides the analysis for the African American sample. In the first column, the regression indicates that the effect of skin tone, even within the African American group, diminishes in size and statistical significance over time relative to final survey year. In the first column, we examine the total African American sample. The effect of an increase in skin tone of one standard deviation in the first survey year (7 points on the light spectrometer measure for this subsample) results in reduction in full-time employment probabilities of almost 3%, which would be equivalent to the effect of having a high school diploma. While none of these survey-year coefficients

Table 4. Changes in the Effect of Skin Tone on Full-Time Employment, Years 1 to 15, for African-American Males and Females

	Total *(1)*	*Males* *(2)*	*Females* *(3)*
Age	0.0188	0.0392**	–0.00808
	(0.0129)	(0.0170)	(0.0182)
Less than High School	reference	reference	reference
High School Diploma	0.0294	0.0271	0.0422
	(0.0364)	(0.0532)	(0.0501)
Associate's Degree	0.116**	0.0667	0.149**
	(0.0454)	(0.0654)	(0.0614)
Bachelor's Degree	0.246***	0.270***	0.241***
	(0.0511)	(0.0799)	(0.0668)
Doctorate Degree	0.220***	0.264**	0.215***
	(0.0640)	(0.103)	(0.0830)
In School	–0.136***	–0.128***	–0.146***
	(0.0181)	(0.0300)	(0.0225)
Marital Status	0.0343**	0.0836***	–9.26e–05
	(0.0166)	(0.0265)	(0.0212)
Any Kids?	–0.0163	0.0456	–0.0801***
	(0.0191)	(0.0279)	(0.0266)
Household Size	–0.0200***	–0.0282***	–0.0146*
	(0.00541)	(0.00767)	(0.00765)
Skin Tone x Year 1	–0.00366	–0.000715	–0.00605*
	(0.00252)	(0.00379)	(0.00338)
Skin Tone x Year 2	–0.00309	0.00261	–0.00775**
	(0.00238)	(0.00339)	(0.00327)
Skin Tone x Year 5	–0.00218	–0.00101	–0.00355
	(0.00238)	(0.00327)	(0.00328)
Skin Tone x Year 7	–0.00271	–6.65e–05	–0.00495
	(0.00224)	(0.00274)	(0.00321)
Skin Tone x Year 10	–0.000542	0.000700	–0.00243
	(0.00218)	(0.00300)	(0.00304)
Skin Tone x Year 15	reference	reference	reference
Constant	–0.0199	–0.844	1.065
	(0.514)	(0.679)	(0.726)
Number of Obs	7,725	3,107	4,618
R-Squared	0.081	0.095	0.085

Notes: The table reports change of the effect of skin tone on employment for African Americans. Clustered standard errors by individual are reported in parentheses. Regressions also include survey year dummy variables. *Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

is statistically significant at conventional levels, they are monotonically decreasing in magnitude.

In the next two columns of Table 4, we divide our sample of African Americans by gender, and we find that there are differential results within these two smaller subgroups. For men, there is no difference in the effect of skin tone on full-time employment probabilities over time; none of the skin tone–year interaction coefficients are statistically significant in Table 4 column 2. We find that married men appear to have a higher likelihood of full-time employment than their unmarried counterparts. The estimated coefficient on marital status is twice as large as it is for white men in Table 5,

Table 5. Changes in the Effect of Skin Tone on Full-Time Employment, Years 1 to 15, for White Males and Females

	Total (1)	*Males* (2)	*Females* (3)
Age	–0.00268	–0.00616	0.0106
	(0.0136)	(0.0174)	(0.0198)
Less than High School	reference	reference	reference
High School Diploma	0.0719	0.0530	0.106
	(0.0593)	(0.0755)	(0.0964)
Associate's Degree	0.139**	0.118	0.186*
	(0.0685)	(0.0878)	(0.109)
Bachelor's Degree	0.259***	0.203**	0.318***
	(0.0662)	(0.0857)	(0.105)
Doctorate Degree	0.363***	0.320***	0.386***
	(0.0716)	(0.0915)	(0.113)
In School	–0.249***	–0.279***	–0.230***
	(0.0175)	(0.0263)	(0.0229)
Marital Status	–0.00984	0.0469**	–0.0779***
	(0.0156)	(0.0197)	(0.0218)
Any Kids?	–0.0844***	0.0630***	–0.229***
	(0.0203)	(0.0218)	(0.0308)
Household Size	–0.0495***	–0.0331***	–0.0727***
	(0.00603)	(0.00786)	(0.00864)
Skin Tone x Year 1	–0.00120	0.00197	0.00101
	(0.00365)	(0.00499)	(0.00487)
Skin Tone x Year 2	–0.00592*	–0.00468	–0.00279
	(0.00338)	(0.00410)	(0.00507)
Skin Tone x Year 5	–0.00456	–0.00676*	–0.00163
	(0.00335)	(0.00405)	(0.00529)
Skin Tone x Year 7	–0.00233	–0.00437	–0.000681
	(0.00311)	(0.00365)	(0.00496)
Skin Tone x Year 10	–0.00200	–0.00288	–0.000604
	(0.00277)	(0.00359)	(0.00421)
Skin Tone x Year 15	reference	reference	reference
Constant	0.841	1.007	0.317
	(0.561)	(0.716)	(0.815)
Number of Obs	9,672	4,636	5,036
R-Squared	0.121	0.165	0.164

Notes: The table reports change of the effect of skin tone on employment for white sample. Clustered standard errors by individual are reported in parentheses. Regressions also include survey year dummy variables. *Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

column 2. This perhaps indicates that for prospective employers evaluating African American men marital status serves as an additional indicator of labor market attractiveness.

In the third column of Table 4, we examine African American women. The skin tone–year interactions are large in magnitude and statistically significant. We find that an increase in skin tone of one standard deviation results in reduction of full-time employment probability of women of about 4.3% in the first survey year relative to the last survey year. This effect is also equivalent, in absolute terms, to that of having a high school diploma. By the fifth survey year, this effect had diminished in size and statistical signifi-

cance to less than half that original amount,1.7%.[18] Overall, these findings indicate that, conditional on the other individual characteristics, there is reduction in the importance of skin tone on full-time employment probabilities for African American women of different skin tones. We find no evidence for the effect of marital status on the full-time employment probability.

Table 5 shows the results of replicating this analysis for the white sample. Our results here differ from those found previously for African American women in the third column of Table 4. White married women are more likely not to be employed full-time. In the first column of Table 5, we examine the role of skin tone for the entire white sample and find no conclusive results with regard to skin tone–year interactions. The second and third columns provide the analysis for the male and female subsamples respectively. Once again, there do not appear to be any systematic results with regard to the effect of skin tone–year interaction effects over time. This is strong evidence that the initial results found in Table 2 are due almost exclusively to improvements in the full-time employment probabilities of African American women in our data.

Overall, the results from these analyses indicate that there has been no change in the role of skin tone on male full-time employment probabilities over time. But there appears to be conclusive evidence that effect of skin tone on full-time employment has been decreasing for African American women in our data, both in comparison to white women and within the African American sample. Given that women with darker skin tones tend to be full-time employed at lower rates in the first survey year, our results indicate that there is a reduction in the importance of skin tone on full-time employment probabilities for women with darker skin tones relative to those with lighter skin tones.

Robustness Checks

We use several different age cohorts from several different data sets, including the CARDIA data, to examine whether the results found above are driven purely by an aging cohort effect. Using the National Survey of Black Americans, survey years 1979–80 and 1987–88, and the Multi-City Survey of Urban Inequality in 1992, we find that there is no evidence in these data sets to indicate that the results are driven by an aging effect over this time period. Tables A.1 and A.2 provide the regression results for the National Survey of Black Americans with an interaction effect between skin tone and different age cohorts. The results for the Multi-City Survey of Urban Inequality are presented in Table A.3. These three tables indicate that there is

[18]For the computation above (4.3%), we multiply the standard deviation of skin tone by the estimated coefficient of skin tone in the first survey wave (0.00605 x 7.2 = 0.043). For the second computation (1.7%), we multiply the standard deviation of skin tone by the estimated coefficient of skin tone in the fifth survey wave (0.00243 x 7.2 = 0.017).

no difference with regard to employment for African American women by skin tone and age cohorts.

We have also used the CARDIA data to test whether our results are driven by an aging cohort effect. In Table A.4 we create constant age groupings in the first three columns (23- to 30-year-olds; 28- to 35-year-olds; 32- to 40-year-olds) and examine the effect of skin tone on employment. The results are generally consistent with the results from our full sample. In columns 4 and 5, we divide our data by the initial ages of the survey respondents (column 4 presents the results from the youngest age cohort age 18 to 23 years, while column 5 restricts analysis to those who are initially 24 to 30 years old). We find that the results are not driven by a particular age cohort. There is a marked decrease in the effect of skin tone on employment over time in the results in columns 4 and 5. In columns 6 and 7, we restrict analysis to a relatively constant age cohort of individuals who are 20 to 30 years old at all survey waves.[19] The results indicate that there is a decreasing effect of skin tone on employment over time for this relatively constant age cohort. Column 7 restricts analysis to a slightly older cohort, age 25 to 35, because this allows us to use all survey waves in our analysis; we find a decreasing effect of skin tone on employment over time as well for this relatively constant age cohort.

Overall, the results do not indicate that the different age cohorts differ in their experience with regard to full-time employment and skin tone. This is additional evidence that the role of skin tone for women has decreased for our sample in the years from 1985 to 2000 and is not due to the simple aging effect of cohort.

While we find no results for men, this does not appear to be due to the use of our balanced panel or to the selective attrition in our data. African American men are less likely to be present in all survey waves; they have much higher rates of attrition than the other three groups. As we have said, we have found that the full-time employment probabilities remain roughly constant over time between the two ethnic groups for men, and this is inconsistent with previous findings. As a robustness check, we employed inverse probability weighting for the probability that an individual will appear in subsequent survey waves, as suggested by Fitzgerald, Moffitt, and Gottschalk (1999), and we find that the results are consistent with our balanced panel. These results are presented in Table A.5.

Discussion of Potential Mechanisms

Changes in Welfare Program and Labor Supply of Women

Our primary results indicate that there is a decrease in the effect of skin tone on the full-time employment probabilities of African American women;

[19]By the final survey year, all respondents are older than 30,and hence this wave is not included in the regression.

Table 6. Skin Tone Effects on Full-Time Employment by Marital Status in Last Two Survey Years

	African-American Females	
	Unmarried and HS Diploma or Less	*Unmarried and More Than High School Diploma*
	Coefficient	Coefficient
Skin Tone x Year 1	–0.00387	–0.00454
	(0.00576)	(0.00522)
Skin Tone x Year 2	–0.00766	–0.00765
	(0.00600)	(0.00534)
Skin Tone x Year 5	–0.00259	0.000197
	(0.00510)	(0.00542)
Skin Tone x Year 7	–0.00824	–0.00435
	(0.00564)	(0.00533)
Skin Tone x Year 10	–0.00173	–0.00502
	(0.00548)	(0.00471)
Skin Tone x Year 15	reference	reference
Number of Individuals	350	315

Notes: The table reports change of the effect of skin tone on employment for African Americans by marital status. Clustered standard errors at the individual level are reported in parentheses. Regressions control for schooling indicators; age, household size, in school dummy variable and having children dummies, year dummies; individual fixed effects. *Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

no comparable results occur for African American men. What are the potential explanations for our observed results?

One potential explanation may be the significant changes to the U.S. welfare program in the late 1990s. This mechanism is a labor supply one, and for this to be driving our results, it would require that the reform would have had to have affected the full-time employment probabilities of African American women significantly more than for white women. Potentially this could be the case if there were very few or no white women on welfare. Unfortunately, the data do not provide any direct information on whether an individual receives welfare.

Instead, we focus on single women. The specific changes of the welfare reform after the 1996 reform propelled individuals on welfare to work. A woman is much more likely to be on welfare if she is single and has a low level of education. We examine whether our results in Table 3 are being driven by a movement of these women into full-time employment in response to changes in welfare. We separate the single women in Table 6 into two groups: relatively highly educated (more than a high school diploma) and less educated (high school diploma or less). The results indicate that single women are not driving the effects found in our main analysis. Therefore, we conclude that welfare reform, while a potential explanation for changes in African American female full-time employment over time, does not appear to be driving our results.

Table 7. Changes in the Effect of Skin Tone on Full-Time Employment, Years 1 to 15, in Different Industries by Gender

	Professional Coefficient	*Sales Coefficient*	*Services Coefficient*	*Precision Production Coefficient*	*Labor Coefficient*
	Panel A: Females				
Skin Tone x Year 1	–0.140	–0.0703	–0.297***	0.0477*	–0.0251
	(0.117)	(0.128)	(0.0826)	(0.0281)	(0.0515)
Skin Tone x Year 2	–0.127	–0.0517	–0.173**	0.00641	0.0266
	(0.117)	(0.130)	(0.0822)	(0.0381)	(0.0489)
Skin Tone x Year 5	–0.146	–0.0178	–0.104	–0.00621	0.0393
	(0.113)	(0.119)	(0.0814)	(0.0380)	(0.0477)
Skin Tone x Year 7	–0.0498	–0.122	–0.165**	–0.0272	0.0650
	(0.108)	(0.117)	(0.0770)	(0.0340)	(0.0498)
Skin Tone x Year 10	–0.354***	0.140	–0.0868	0.0277	0.0129
	(0.102)	(0.109)	(0.0707)	(0.0362)	(0.0484)
Skin Tone x Year 15	reference	reference	reference	reference	reference
Number of Obs	9655	9655	9655	9655	9655
	Panel B: Males				
Skin Tone x Year 1	0.0718	0.0863	–0.0945	–0.0265	–0.136
	(0.116)	(0.118)	(0.0928)	(0.0733)	(0.106)
Skin Tone x Year 2	0.0101	0.124	0.0365	0.0546	–0.0764
	(0.114)	(0.119)	(0.0946)	(0.0905)	(0.102)
Skin Tone x Year 5	–0.0766	0.0852	–0.0466	–0.0236	0.0557
	(0.117)	(0.112)	(0.0829)	(0.0860)	(0.0870)
Skin Tone x Year 7	0.00728	0.0690	–0.00769	0.0127	–0.00640
	(0.107)	(0.104)	(0.0805)	(0.0860)	(0.0905)
Skin Tone x Year 10	–0.0353	0.00624	0.0763	0.00279	0.00248
	(0.105)	(0.107)	(0.0766)	(0.0781)	(0.0862)
Skin Tone x Year 15	reference	reference	reference	reference	reference
Number of Obs	7743	7743	7743	7743	7743

Notes: The table reports change of the effect of skin tone on different occupations for African Americans by gender. Clustered standard errors by individual are reported in parentheses. Regressions control for schooling indicators; age; a marriage, household size, in school and having children dummies; and individual fixed effects. *Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

Changes in Labor Demand for Service Occupations

The CARDIA data set provides some limited information on the occupational status of individuals. In this section, we examine whether there are certain occupations that are responsible for this expansion of full-time employment for African American women. For the first five survey waves, the CARDIA data provides information on occupation at the one-digit level.[20] The five occupational categories available are professional, sales, services, precision production, and general labor. Table 7 provides the estimated coefficients from the skin tone–year interactions for each of the six occupational categories in the data by gender. The results indicate that the effects

[20]The sixth survey wave contains information about occupation at the three-digit level, but since that information was only provided in this final survey wave, we use occupational categories at the single-digit level for consistency across all survey waves.

of skin tone–year interactions are decreasing over time for female full-time employment in the services industries. It appears that African American women are finding increased full-time employment opportunities in service occupations over time; it is this movement into service occupations that is responsible for the reduction in skin tone effects on full-time employment in our data. We find no other change in occupations for the male or female subsamples.

A possible explanation of this observed movement into service occupations comes from research that examines the differential rate of full-time employment expansion in the United States from 1980 on. Autor and Dorn (2011) have found significant evidence that technological change in the United States, primarily automation of middle-skill tasks, has led to job growth in high skilled occupations and in low-skilled service occupations; full-time employment in service occupations increased by 11% from 1980 to 2005 while it decreased for other occupations such as production, laborers, farming. Only managers and professional occupations enjoyed a similar expansion in full-time employment, 10.3% during this same time period. The authors explain that service occupations have expanded as these tasks have been difficult, if not impossible, to automate.

Along with the increase in labor demand for service occupations over time, we find an increased inflow of African American women into these occupations. Examining the full-time employment probabilities for women by race across all survey waves, we find that for white women there is virtually no change in full-time employment probabilities over time (in percentile terms, these hover in the low 60%). But there is a large increase in full-time employment probabilities for African American women in the same time period. Figure 2 shows these results. The full-time employment probability of African American women converges with that of white women, and in the final survey year of our data, surpasses that of white women from 1985 to 2000.

We believe that, from the 1980s on, as labor demand increased for service occupations and the supply of white female employees neared the full-employment level, employers turned to very close substitutes in these service occupations. As Figure 2 shows, the full-time employment level of African American women had been steadily increasing during most of this period; in the final survey year, African American women are actually more likely to be employed full time than white women. Figure 3 shows that men, of either race, do not appear to be a reasonable or close substitute in these service occupations, and we find no evidence for their inflow into these occupations over time. There is evidence that the perception of African Americans as workers has been improving over time. Using the General Social Survey (GSS) data, we find that the responses to survey questions that asked whether African Americans were hard-working or lazy tended to improve from 1990 to 2000. On a 7 point scale, with 1 representing hard-working and 7 representing lazy, there was a slight improvement in perceptions from 4.357 in 1990 to 4.306 in 1994, and 4.224 in 1996, 4.2 in 1998, and 4.177 in 2000.

Unfortunately, it is not possible to distinguish whether the improved perception is causing the increase in full-employment levels or vice versa.[21]

Conclusion

We find that for African American women skin tone has diminished in importance over the period from 1985 to 2000. At the initial survey year, African American women had at least a 12 % lower probability of being employed full time employed than their white counterparts. Our results indicate that this has meant that there has been a catch up over the 15 years recorded in our data set. African American women's full-time employment status has converged with that of white women in our sample; in fact, by the final survey year there is some evidence that African American women had slightly employment higher rates than their white counterparts. We find that the effect of skin tone on full-time employment diminished within the African American group of women as well; darker skinned African American women tended to converge in full-time employment probabilities with those of their lighter skinned counterparts. No similar convergence occurred for the men in our sample even when accounting for sample attrition; there is a level difference of approximately 10 percentage points between African American and white men at each survey year.

Our results, while broadly consistent with Loury (2009), indicate that on at least one dimension African American women have found improved labor market outcomes. While we do not have data on wages or salaries and cannot comment on whether there is continued evidence of a wage gap, our findings suggest that the expansion of full-time employment opportunities occurred primarily in the low-skill service occupations. Nevertheless, for the African American women in our sample, there appears to be a consistent reduction in the importance of skin tone with respect to full-time employment probabilities over time.

Our findings do not appear to be driven by the changes in U.S. welfare programs initiated in the late 1990s. We find that the expansion of full-time employment increased most dramatically for married women in our sample, which is the group that is least likely to be on any welfare assistance. Instead, we find evidence, consistent with Autor et al. (2011), that there has been an expansion of full-time employment in service occupations. Our results indicate that African American women benefit most from this increase in labor demand in service occupations; we do not find any comparable change in employment for men over time. We conclude that the expansion in the service occupations over time has benefited African American women because they are the closest substitutes to white women in these occupations. In our data, white women were consistently employed full-time at a long-run rate of approximately 60%, which is very close to the U.S. average labor force

[21]This question was not asked in previous survey waves of the GSS, and there are no specific questions regarding peoples' perceptions on the industriousness of people of darker skin tones.

participation rate for women of all ages and ethnicities. Therefore, as the demand for laborers in the service occupations increased over time and white women were already very near their full full-time employment levels, employers turned to the closest substitute.

The results are broadly consistent with the theory posited by Becker (1971) that in the long run any sort of discrimination will be eliminated in an efficient market; employers who prefer to employ a single type of worker to the exclusion of another solely because of group membership will face higher marginal costs and will be driven out of business by lower-cost non-discriminating firms over time. The differential for African American men, however, remains to be explained. Instead, our results are more consistent with the model described by Kahn (1991). In that model, persistent differences across ethnic and minority groups may continue when customer discrimination exists. In our study, it is possible that customer discrimination has remained for African American men but diminished over time for African American women. While we have no conclusive evidence, this is a possible explanation for our observed results.

Appendix

Table A.1. Probit Regression of Full-Time Employment on Skin Tone and Household Characteristics Using the National Survey of Black Americans, 1979–80 Wave

	Probability of Employment, Women
Skin Tone	0.017
	(0.033)
Older Age Cohort	–0.165
	(0.156)
Skin Tone x Older Age Cohort	0.035
	(0.045)
Number of Observations	752
Pseudo R Squared	0.091

Notes: Skin tone takes on 5 values: Very Dark Brown, Dark Brown, Medium Brown, Light Brown, and Very Light Brown. Higher numeric values indicated lighter skin tone. Standard errors clustered on age. Older age cohort is ages 40 to 55; younger age cohort is ages 25 to 39 and is the reference category. Additional controls include number of children in household, age, education in years, household size and marital status.

Table A.2. Probit Regression of Full-Time Employment on Skin Tone and Household Characteristics Using the National Survey of Black Americans, 1987–88 Wave

	Probability of Employment, Women
Skin Tone	0.011
	(0.025)
Older Age Cohort	0.215
	(0.333)
Skin Tone x Older Age Cohort	–0.005
	(0.009)
Number of Observations	389
Pseudo R Squared	0.053

Notes: Skin tone takes on 5 values: Very Dark Brown, Dark Brown, Medium Brown, Light Brown, and Very Light Brown. Higher numeric values indicated lighter skin tone. Standard errors clustered on age. Older age cohort is ages 40 to 55; younger age cohort is ages 25 to 39 and is the reference category. Additional controls include number of children in household, age, education in years, household size, and marital status.

Table A.3. Probit Regression of Full-Time Employment on Skin Tone and Household Characteristics Using the Multi-City Study of Urban Inequality, 1992

	Probability of Employment, African-American Women
Skin Tone	0.075
	(0.022)
Older Age Cohort	0.079
	(0.133)
Skin Tone x Older Age Cohort	–0.066
	(0.049)
Number of Observations	1355
Pseudo R Squared	0.066

Notes: Skin tone takes on 3 values: Dark, Medium, Light. Higher numeric values indicated lighter skin tone. Standard errors clustered on age. Older age cohort is ages 40 to 55; younger age cohort is ages 25 to 39 and is the reference category. Additional controls include number of children in household, age, education in years, household size, and marital status.

Table A.4. Fixed-Effects Full-Time Employment Regressions for Three Different Year Groupings (1985–90, 1990–95, 1995–2000) for a Single Age Cohort

	Ages 23–30 (1)	*Ages 28–35* (2)	*Ages 32–40* (3)	*Less than 24 years old* (4)	*24 Years and Older* (5)	*Ages 20–30* (6)	*Ages 25–35* (7)
Skin Tone x Year 1	–0.0034			–0.0071***	–0.0032***	–0.0063**	–0.0053**
	(0.0021)			(0.0016)	(0.0011)	(0.0025)	(0.0024)
Skin Tone x Year 2	–0.0013			–0.0065***	–0.0019*	–0.0046**	–0.0037*
	(0.0018)			(0.0016)	(0.0010)	(0.0023)	(0.0022)
Skin Tone x Year 5	reference	0.0010		–0.0046***	–0.0011	–0.0031	–0.0031
		(0.0017)		(0.0015)	(0.0010)	(0.0023)	(0.0022)
Skin Tone x Year 7		–0.0004		–0.0038***	–0.0020**	–0.0020	–0.0034
		(0.0015)		(0.0014)	(0.0009)	(0.0023)	(0.0021)
Skin Tone x Year 10		reference	–0.0032	–0.0019	–0.0016*	reference	–0.0025
			(0.0025)	(0.0013)	(0.0009)		(0.0020)
Skin Tone x Year 15			reference	reference	reference		reference
Observations	5,474	5,479	3,638	5,711	11,686	7,693	10,594
R-squared	0.09	0.039	0.048	0.189	0.048	0.147	0.052
Number of pid	2973	2959	2855	985	2012	2980	2994

Notes: All regression include the full set of control variables contained in main regressions: age, education variables, marital status, presence of household children, household size and survey year indicator variables, and a constant. Clustered standard errors at the individual level presented in parentheses. *Statistically significant at the .10 level; **at the .05 level; ***at the .01 level. The first three columns do not add up to the final two columns because there is a repetition of survey years in the first three columns. Column 1 uses data for 1985–90 inclusive, column 2 uses data for 1990–95 inclusive and column 3 use data from 1995–2000 inclusive. Regressions in columns 4, 5 and 7 use data from all survey waves (1985–2000 inclusive), while column 6 uses data only from 1985–95 inclusive. Age is measured at the first survey wave in columns 4 and 5, while age is measured at the current survey wave in columns 6 and 7.

Table A.5. Fixed-Effects Full-Time Employment Regressions with Inverse Probability Weighting for Missing Observations

	Full Sample			*Males*	*Females*	*Black*	*White*	*Black Female*	*Black Male*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Black x Year 1	–0.148***		–0.0334						
	0.0198		0.0449						
Black x Year 2	–0.0990***		0.0165						
	0.0192		0.0435						
Black x Year 5	–0.0533***		0.0136						
	0.0180		0.0432						
Black x Year 7	–0.0670***		–0.0206						
	0.0173		0.0410						
Black x Year 10	–0.0459***		–0.0016						
	0.0165		0.0402						
Black x Year 15	reference		reference						
Skin Tone x Year 1		–0.0059***	–0.0048***	–0.0018*	–0.0086***	–0.0042**	–0.0045	–0.0071**	–0.0005
		0.0007	0.0017	0.0010	0.0011	0.0020	0.0032	0.0028	0.0030
Skin Tone x Year 2		–0.0043***	–0.0048***	–0.0002	–0.0072***	–0.0034*	–0.0068**	–0.0078***	0.0016
		0.0007	0.0017	0.0010	0.0011	0.0020	0.0030	0.0028	0.0028
Skin Tone x Year 5		–0.0023***	–0.0028*	–0.0006	–0.0034***	–0.0022	–0.0037	–0.0037	–0.0006
		0.0007	0.0016	0.0009	0.0010	0.0020	0.0030	0.0028	0.0027
Skin Tone x Year 7		–0.0026***	–0.0019	–0.0007	–0.0040***	–0.0020	–0.0012	–0.0043	0.0007
		0.0007	0.0016	0.0009	0.0010	0.0019	0.0027	0.0027	0.0025
Skin Tone x Year 10		–0.0019***	–0.0018	–0.0002	–0.0033***	–0.0013	–0.0028	–0.0031	–0.0001
		0.0006	0.0015	0.0008	0.0009	0.0019	0.0025	0.0026	0.0026
Skin Tone x Year 15		reference	reference	reference	reference	reference	reference	reference	reference
Observations	21,431	21,431	21,431	9,703	11,728	10,131	11,300	5,864	4,267
R-squared	0.094	0.095	0.095	0.126	0.111	0.085	0.119	0.089	0.096
Number of PID	3906	3906	3906	1777	2129	1886	2020	1084	802

Notes: All regression include the full set of control variables contained in main regressions: age, education variables, marital status, presence of household children, household size and survey year indicator variables. Clustered standard errors at the individual level presented in parentheses. *Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

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