

# Skin Color and Social Mobility: Evidence from Mexico\*

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## Abstract

In many Latin American countries, census data on race and skin color is scarce or non-existent. In this paper we contribute to the literature by estimating how skin color affects intergenerational social mobility in Mexico. Using a novel dataset, we provide evidence of profound social stratification by skin color, even after controlling for very specific individual characteristics that previous work has not been able to include, such as individual cognitive and non-cognitive abilities, parental education and wealth, and measures of stress and parenting style at the home of origin. Results indicate that people in the lightest skin color category have an average of 1.5 additional years of schooling and 53% more in hourly earnings than their darkest-skinned counterparts. Social mobility is also related to skin color. Individuals in the darkest category are 20 percentile ranks lower in the current wealth distribution than those in the lightest category, conditional on parental wealth. In addition, results of a quantile regression indicate that the darkest group shows higher downward mobility.

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## 1. Introduction

Racial stratification is a key component in understanding a country's inequality. In the United States, for example, which includes racial characteristics in official surveys, it has consistently been found that African-Americans have less of a chance to climb the socioeconomic ladder than whites (Mazumder 2014; Jencks and Phillips 2011; Sawhill et al. 2012). In most Latin American countries, such analyses are not possible, as official surveys do not include racial or skin color identification.<sup>1</sup> This practice results from an ideology of *mestizaje*, or racial mixing, which promoted the idea that stratification was driven only by class and wealth, and not by skin color (González Casanova 1965). However, this assumption has recently been challenged as new data sources that include skin color show its relevance to life outcomes throughout Latin America, including in Mexico (Aguilar 2011; Trejo and Altamirano 2016; Arceo-Gomez and Campos-Vazquez 2014; Flores and Telles 2012; Telles et al. 2015; Telles 2014; Telles and Bailey 2013; Telles and Sue 2009; Villarreal 2010). Building on this recent work, we use a novel data source in Mexico to understand not only the effect of skin color on life outcomes like schooling and earnings, but also its relationship to social mobility.

This relationship is an important object of study for Mexico. The country's Spanish colonial experience left a society highly stratified on the basis of racial features. The colonial period (1521-1821) was one of a race-based and highly unequal social, economic, and political order. It was not until the country achieved independence in 1821 that the legal basis for discrimination by race (the *casta* system)<sup>2</sup> was eliminated and a new social hierarchy was imposed, based on wealth and education (Lomnitz 1993). However, racial inequality was deeply rooted in the society, and preferences for white skin and the European phenotype continued to play an important role (Villarreal 2010). After the Mexican Revolution

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<sup>1</sup> The exception is Brazil, where information on skin color is available in the official census and is incorporated into public policy (Bailey 2009; Daniel 2006; Schwartzman 2007).

<sup>2</sup> Legal restrictions, for example, prohibited the members of the lower *castas* from occupying important government positions or living in certain neighborhoods (Meyer, Sherman, and Deeds 2013; Villarreal 2010).

(1910-1917), the government promoted the ideology of *mestizaje* as the foundation of national identity in the mixture of races. Post-revolutionary Mexico no longer recognized ethnic or racial categories.<sup>3</sup> Contemporary official criteria only classify the population into indigenous or non-indigenous by using the self-reported ability to speak an indigenous language (Villarreal 2010).

Recent studies of Mexico show the persistence of skin color distinctions in daily life. Although Mexicans describe themselves as *mestizos*, they also express a preference for European features and lighter skin colors, and they acknowledge the presence of discrimination against ethnic and racial minorities (Trejo and Altamirano 2016; Telles 2014; Telles and Bailey 2013; Telles and Sue 2009; Wade 1993). Anthropological studies have shown that the epithets describing people with darker skin colors, like *indio*, *negro*, and *prieto*, are often pejorative terms or insults, and are assumed to be negative values and qualities, while terms like *güera* mean both "light-skinned" and "pretty." The ordinary use of these meanings reflects a deeply-rooted cultural structure (Feagin and McKinney 2002; Oehmichen 2006) that could affect socioeconomic outcomes through pure discrimination or unconscious biases favoring light-skinned individuals. Indeed, recent research has shown that darker-skinned individuals attain lower educational levels and earnings (Trejo and Altamirano 2016; Flores and Telles 2012; Telles 2014; Villarreal 2010).

A key question, and a neglected one, is whether skin color affects intergenerational mobility: whether darker-skinned individuals progress socially and economically at the same rate as their lighter-skinned counterparts across the distribution of parental socioeconomic status. This paper contributes to the literature with an empirical evaluation of the relationship between skin color and social mobility in Mexico. We first corroborate the effect of skin color on life outcomes (educational attainment and hourly

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<sup>3</sup> Loveman (2014) provides an extensive analysis of this topic for the entire Latin American region, noting that census queries about skin color and other phenotypic features disappeared in the mid-twentieth century mainly because domestic political agendas followed international definitions of modernization and development. She also argues that twenty-first-century efforts to increase racial and ethnic data collection reflect recent shifts in international norms regarding the meaning of nationality, and also in the criteria of international development organizations that promote the reduction of racial and ethnic inequality.

earnings) described in recent literature (Trejo and Altamirano 2016; Flores and Telles 2012; Villarreal 2010), but using a greater volume of information and introducing new variables, including cognitive and non-cognitive skills, parental education and wealth, and measures of stress and parenting style in the home of origin. We then estimate whether skin color has an effect on social mobility for similar individuals.

In order to carry out this analysis, detailed information is required at the individual level for current and past outcomes. Such data became available only recently, in the 2015 Survey of Social Mobility in Mexico (SMS-2015), whose design and implementation was directed by the first author of this study. The survey, which is representative at the urban level (+100,000 inhabitants), is based on interviews with a parent and an adolescent aged 12-18 in each of 2,600 households. It provides detailed and innovative information for research on intergenerational social mobility. Along with questions related to current dwelling, employment, and sociodemographic characteristics, it asked respondents for retrospective information on their parental home, parental educational level, and home environment when they were 14 years old, providing data for a calculation of social mobility that compares respondents' current socioeconomic status with that of their parents in the past. Key aspects of the survey are the inclusion of measures of cognitive and non-cognitive abilities for each respondent and, for the first time in a survey of this size in Mexico, the inclusion of a reliable categorization of skin color, using the PERLA (Project on Race and Ethnicity in Latin America) scale (Telles 2014). The PERLA measure is not self-reported; it is recorded by trained interviewers.

Our results provide empirical evidence of profound social stratification by skin color in Mexico. Individuals with darker skin color have significantly lower levels of education and hourly wages than those with lighter skin. Those with the lightest skin color classification have an average of 1.5 more years of schooling and earn 53% more in hourly wages than their darkest counterparts. Social mobility is also affected. Individuals in the darkest category are 20 percentile ranks lower in the current wealth distribution

than those in the lightest, conditional on parental wealth. In addition, results of a quantile regression indicate that the darkest group shows higher downward mobility. These results are in line with previous studies showing that skin color in Mexico has an important effect on economic outcomes, and they advance our knowledge of the mechanisms through which stratification is reproduced.

This paper is ordered as follows. Section 2 presents a short review of the existing literature for Mexico and other Latin American countries. In Section 3 we describe the dataset and provide introductory statistics. Section 4 provides the econometric results of the effect of skin color on educational attainment and hourly earnings, and Section 5 the analysis for skin color and social mobility. Section 6 offers some conclusions.

## **2. Literature Review**

There have been few studies of discrimination based on appearance in Mexico. Villarreal (2010) employs a dataset of 2,395 adults initially designed to study political behavior prior to the 2006 elections, which also included information regarding skin color and socioeconomic characteristics, to examine the association between these variables. His findings highlight a strong association between skin color, educational attainment, occupational status, and the probability of living in poverty. Individuals with darker skin have substantially lower educational attainment and work in less-skilled occupations, such as domestic workers, manual laborers, drivers, and security guards, and they have a higher probability of living in poverty. Flores and Telles (2012) replicate his analysis but include controls for class origin and a more detailed measure of skin color. They analyze information from 1,562 respondents, compiled by the 2010 Americas Barometer of the Latin American Public Opinion Project (LAPOP), and find general support for the negative effect of skin color in Mexico. However, controlling for class origin, they find less of a disadvantage than Villarreal (2010).

Skin color affects other aspects of life in Mexico, such as the provision of public goods, job application callbacks, self-reported health, and electoral preferences. Trejo and Altamirano (2016), also employing the LAPOP survey data, show that access to public goods and services in Mexico is strongly conditioned by race and skin color. Dark-brown indigenous people and *mestizos* with indigenous phenotypic features systematically have less access to clean water and education than Mexicans with lighter skin. Using an audit field experiment, Arceo-Gomez and Campos-Vazquez (2014) find that Mexican employers show higher callback rates toward white than toward dark brown individuals with the same resume qualifications. Perreira and Telles (2014) study the relationship between skin color and health disparities in Mexico and other Latin American countries and find a negative association between darker skin color and self-reported health in Mexico. Aguilar (2011) uses a laboratory experiment to show that racial appearance plays an important role in contexts in which social evaluation is important. In that experiment, Mexicans tend to evaluate European-looking individuals and political candidates more positively than those who appear to be indigenous or of mixed race.

Other Latin American countries facing the same lack of official data on skin color have also received attention.<sup>4</sup> Researchers have found that racial mixing and the embracing of multiracial identities in the region have not led to an absence of racism, that racial mixing coexists with a racial hierarchy and ideologies of “whitening” (Telles 2004; Telles and Sue 2009), that skin color and racial self-categorization correlate strongly with perceived discrimination (Canache et al. 2014), and that darker skin color is negatively and consistently related to educational attainment, socioeconomic outcomes, and self-rated health (Marteleto 2012; Perreira and Telles 2014; Telles 2004; Telles et al. 2015).<sup>5</sup>

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<sup>4</sup> In general, this research is based on two datasets: the Latin American Public Opinion Project (LAPOP), based at Vanderbilt University, and the 2010 Project on Ethnicity and Race in Latin America (PERLA), based at Princeton. Together, the two databases include information for 18 of the 19 countries in Latin America, omitting only Cuba. Our dataset, Social Mobility Survey for Mexico (SMS-2015), represents an important additional resource for research on the topic.

<sup>5</sup> A separate case in Latin America is Brazil, where the relationship between skin color and ethnoracial stratification is widely acknowledged, data on skin color and other phenotypic characteristics are officially collected, and the academic and political debates on racial stratification have led to policies of affirmative action (Bailey 2009; Daniel 2006; Schwartzman 2007).

If skin color-based discrimination is present in Mexico and other Latin American countries, we should expect not only life outcomes, such as wage level and educational attainment, to be directly related to the skin color, but also the possibility of social mobility. However, to our knowledge there is only one published work that addresses the relationship between skin color and social mobility in Latin America. In this study of Brazil (published in Portuguese), Costa (2006) concludes that lighter skin color is associated with greater social mobility in wealthier households but not in poor ones.

Building on the literature described here, our study contributes to the analysis of racial stratification in two ways. First, we corroborate earlier studies by using a greater volume of information and controlling for specific individual characteristics, such as individual cognitive and non-cognitive abilities, that are considered to be central to explaining life outcomes but that previous studies have not been able to include. Second, we provide empirical evidence on the relationship between intergenerational social mobility and skin color. In the study of this relationship, we also include measures of stress and parenting style at the home of origin that prior studies in psychology and economics have found essential in the developing skills of children (Hart and Risley 1995; Putnam 2015). In the following section, we describe in greater detail each of our variables as well as their association with life outcomes and social mobility.

### **3. Data and Descriptive Statistics**

Data for this analysis come from the Survey of Social Mobility in Mexico 2015 (SMS-2015), for which the first author of this study directed the design and implementation.<sup>6</sup> The survey is representative at the urban level<sup>7</sup> in Mexico and consists of 2,616 households in 23 states and 86 municipalities in

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<sup>6</sup> In Spanish, this survey is known as the *Encuesta de Movilidad Social 2015* and is publicly available at <http://movilidadsocial.colmex.mx/index.php/encuesta>. For a detailed guide to the survey, see Campos-Vazquez (2016).

<sup>7</sup> Urban is defined as a community of 100,000 inhabitants or more. By this definition, the urban population of Mexico is close to 50% of the total.

Mexico. In each household, one parent and one adolescent aged 12-18 were interviewed.<sup>8</sup> The adult sample is thus restricted to households inhabited by at least one teenager aged 12-18.<sup>9</sup>

The main objective behind the social mobility survey is to understand the underlying factors that affect social mobility in Mexico. To meet this objective, the 2015 survey includes detailed and innovative information for research on intergenerational social mobility. The adult sample includes educational and demographic data for all household members, information on employment status, income, and occupation for the interviewee, and data on household assets. In addition, the questionnaire solicits retrospective information on respondents' parental homes when they were 14 years old, including household assets, parental educational attainment, and home environment.

Another innovative aspect of the survey is its inclusion of measures of cognitive and non-cognitive abilities, as well as information on stress and parenting style at interviewees' parental homes. Cognitive skills are measured with tasks such as remembering the names of animals after 30 seconds, a digit span test (5 questions), and 10 questions from the Raven test. Non-cognitive abilities are assessed using the Big-Five Trait Taxonomy (10 questions), a Locus of Control test (10 questions), and a Grit test (8 questions). Stress and parenting styles are measured through retrospective questions about parenting characteristics such as time spent with children, shouting and insults, and presence of consistent rules when respondents were 14 years old.

A key aspect of the survey is that it includes data on the skin color for each individual surveyed, for the first time in a survey of its size in Mexico. The survey employs the scale used by the Project on Ethnicity and Race in Latin America (PERLA, Telles 2014), which has been used to analyze a wide range

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<sup>8</sup> During the survey, 31,402 houses were visited. In 93% of these, contact with a household member was established, implying a 7% non-response rate. Among these households 2,899 were identified as being integrated by at least the father or mother of the family, as well as children between the ages of 12 and 18. Full interviews were conducted for 2,616 of these households.

<sup>9</sup> The social mobility survey consists of two separate questionnaires especially designed for adults and teenagers. To avoid interference in answers, parents and children were interviewed separately. In this paper we analyze only the adult responses.



of ethnic and racial issues in Latin-America. It is based on a color scale from 1 to 11, with 1 representing the lightest skin color and 11 the darkest.<sup>10</sup>

### 3.1 Skin Color

The social mobility survey uses the PERLA color palette described in Telles (2014), in order to build a strong representation of skin color. Each interviewer received detailed training in rating respondents' skin color according to the palette of eleven skin tones (1 = lightest, 11 = darkest) and was instructed not to take into account any other factor in doing so. Interviewers discreetly registered respondents' PERLA classification while they were solving the Raven matrices, approximately 25 minutes after the interview had begun.<sup>11</sup> Other studies relating phenotypic features to socioeconomic outcomes have relied on interviewer-based classifications using color palettes (Trejo and Altamirano 2016; Flores and Telles 2012; Gullickson 2005; Massey and Sánchez 2010; Telles and Bailey 2013; Telles and Lim 1998; Telles et al. 2015). The survey's skin tone data are presented in Figure (Fig.) 1.<sup>12</sup>

[Figure 1 about here]

Figure 1 shows the percentage of the sample in each of the eleven palette's categories. There is a high concentration in the middle of the scale (4-6), and there are few individuals at the extremes. The average skin tone is 4.94,<sup>13</sup> with a small difference between men (5.16) and women (4.77). Given the composition of the sample, we formed five categories to facilitate analysis: White (PERLA 1-3), Light

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<sup>10</sup> The PERLA color palette is the result of an arduous labor of identification and classification of the phenotypes of Latin America, conducted by Edward Telles (2014). More information can be found at <https://perla.princeton.edu/perla-color-palette>.

<sup>11</sup> One potential concern of using an interviewer-based measure is that respondents' socioeconomic status could bias interviewer evaluations of skin color. In other words, social class may change ethnoracial perception as in a "money whitening effect," where wealth could drive interviewers' classifications into whiter categories (Telles et al. 2015). The survey sought to minimize such effects through the use of a color palette and by thoroughly training the evaluators. A further concern is that interviewers' classifications may be influenced by factors such as their own education or gender. However, previous studies have found that neither the sex nor the educational attainment of interviewers is a significant predictor of their color ratings in Mexico (Telles et al. 2015; Villarreal 2010).

<sup>12</sup> The supplementary material includes a table with descriptive statistics.

<sup>13</sup> This figure is close to the value of 4.5 (s.d. 1.41) reported for Mexico in Telles et al. (2015).

Brown (PERLA 4), Medium Brown (PERLA 5), Brown (PERLA 6), and Dark Brown (PERLA 7-11). These groups account for 7.8%, 24.2%, 38.8%, 22.3%, and 9% of the sample, respectively. In the regression analysis we standardize the measure of skin tone to facilitate interpretation.

### 3.2 Socioeconomic Characteristics

The study of intergenerational mobility focuses on the association between parents' and adult children's socioeconomic standing: a closer association means less mobility. We calculate intergenerational mobility using an approach similar to that of Torche (2015), with self-reported household-level information at the time of the interview (current household) and retrospective information for when the respondent was 14 years old (parental household). This information serves as a proxy for family socioeconomic status. To compare levels of socioeconomic status, we construct two indices of economic well-being, one for the parental and the other for the current household, using a primarily asset-based approach and principal component analysis (PCA), a common methodology in mobility research (CEEY 2013; McKenzie 2005; Torche 2015).<sup>14</sup>

Family living standards for the current and parental households are evaluated with direct questions. For the parental index, dummy variables for asset ownership are used for the following: shower, washing machine, gas or electric stove, refrigerator, landline telephone, water heater, television, automobile, indoor bathroom, and domestic workers employed. We also include information on parental ethnoracial background (indigenous or not), parental education (elementary school or not), number of bedrooms per household member, and whether the household was in a rural or urban area. For the current wealth index we compute the PCA over dummy variables for asset ownership of the following: shower, washing

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<sup>14</sup> This methodology involves reducing a set of correlated variables into a group of uncorrelated components. As these components are independent, every component explains a fraction of the correlation between every variable.

machine, gas or electric stove, refrigerator, landline telephone, water heater, internet, cable television, and the number of television sets, cell phones, automobiles, personal computers, complete bathrooms, and domestic workers employed. Three other household characteristics are included: number of rooms and light bulbs per household member, and a dummy variable for dirt floor. Both indices are standardized to facilitate interpretation of results.

As for socioeconomic characteristics of the sample, the average age of respondents is 42.7 years and 69.3% are currently working. Parental educational attainment is defined as the educational level of the mother or father, whichever is highest, and respondents' education is their self-reported level. Among parents, 67% have only elementary schooling or less, and only 6.3% of obtained a college education. Respondents have an average of 10 years of schooling, and 11.8% finished college. We identify respondents' ethnicity by asking whether their father or mother speaks an indigenous language.<sup>15</sup> Only 8.9% of respondents answered affirmatively.

### **3.3 Cognitive and Non-Cognitive Skills**

Previous studies have strongly established that cognitive and non-cognitive skills are good predictors of various economic outcomes, including employment, education, and income, and may in turn be important determinants of social mobility (Almlund et al. 2011; Heckman and Kautz 2012; Nisbett 2009; Richardson et al. 2012). The social mobility survey 2015 includes three basic measures of cognitive skill commonly used in general intelligence tests. The first is a short 10-item Raven's Progressive Matrices test, one of the modules of the WAIS-IV (2008), a widely-used intelligence test (Jensen 1998). The Raven's test is commonly used to measure fluid intelligence, which includes general reasoning ability and

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<sup>15</sup> Respondents were asked to indicate the ethnracial background of their parents. We identified whether one or both parents spoke an indigenous language (yes=1, no=0).

the ability to detect patterns and solve previously unknown problems. The respondent must complete a geometric design with a missing element, choosing from a set of possible options; the score is the number of correct answers. The second test of cognitive skill is an animal-naming task, commonly used to measure crystallized intelligence, the ability to solve problems using previous experience and knowledge. The respondent must name as many different animals as possible in half a minute; the score is the number of animals remembered. This test has been used in other surveys, including the German Socioeconomic Panel (GSOEP) and has been proven to be highly correlated with other measures of crystallized intelligence (Schipolowski et al. 2014). Finally, a short digit-span test (five questions) is used to measure working memory. The respondent listens to a series of digits and is then asked to recall them. The number of correctly recalled digits in five different series is the measure of working memory. This test is one of the most widely used for short-term memory in clinical diagnosis and psychological and economic research (Ostrosky-Solís and Lozano 2006; Richardson 2007; Schurer et al. 2015). Our measure of general cognitive skills is constructed using a principal component analysis for the standardized scores from these three tests, and the general cognitive score is standardized to allow comparability and interpretation.

The survey also includes multiple measures of non-cognitive skill. We obtain our aggregated measure of non-cognitive skill using a principal components analysis for three measures. The first is a 10-item locus of control scale. The locus of control is defined as an individual's perceived control over life events. This short test is a modified version of the original Rotter locus scale (1966), which is included in the GSOEP (2006) and has been used in numerous studies (Caliendo et al. 2015; Heineck and Anger 2010; Piatek and Pinger 2010; Rammstedt 2007). Respondents assess their agreement with a statement on a scale from 1 to 10, where 1 means "totally disagree" and 10 means "totally agree." Five of the items represent internal control (e.g., "You have to work hard to succeed.") and the other five external control (e.g., "I frequently feel that others have control over my life."). The measure of locus of control is the average of

the 10 responses, with external control responses scored inversely: a higher score on the scale reflects a high internal perception of control.

The second test of non-cognitive skills assesses the Big Five personality traits (10 questions, Rammstedt and John 2007). The Big Five is the most widely-used personality taxonomy (Cervone and Pervin 2013) and includes openness to experience (creative thinking), conscientiousness (scrupulous behavior), extraversion (outgoing behavior), agreeableness (cooperation skills), and neuroticism (emotional instability). A third test is for grit which refers to the ability to commit to and meet long-term goals. The survey includes the 8-item Short Grit Scale developed by Duckworth and Quinn (2009). Each item consists of a statement reflecting grit-related attitudes (e.g., “I have difficulty maintaining my focus on projects that take more than a few months to complete.”). Respondents rate each item on a scale of 1 to 5, where 1 means “Very much like me” and 5 means “Not like me at all.”

### **3.4 Measures of Parenting Style and Stress in the Parental Home**

Parenting and home environment are important factors in children's development. Research has been consistent in showing the importance of positive parenting for the development of both cognitive and non-cognitive abilities and the development of prosocial behavior. Children whose parents who are actively involved in their education develop more positive behavior and show better performance (Avvisati et al. 2014; Castro et al. 2015). Yet these factors are also related to the socioeconomic status of the household. Parents at higher socioeconomic levels foster negotiation and self-sufficiency skills in their children, while children in poorer households have less supervision, lower levels of autonomy, and fewer school-related activities. Poorer households also have higher levels of stress, which affects parental investment and children's development (Evans et al. 2012; Nisbett 2009; Putnam 2015). Hart and Risley

(1995) show that low-income children hear far fewer words than their higher-income counterparts, and that the quality of words is greater.

It is clear, then, that parenting style affects life outcomes, and it may be that skin color affects life outcomes indirectly through parenting style. We therefore include measures of home environment and parenting style in our analysis to control for omitted variable bias between the outcome variables (schooling, earnings, and social mobility) and skin color. The social mobility survey allows us to construct indices of parenting style and of stress in the parental home (when interviewees were 14 years of age) using data obtained through retrospective questions. For the stress measure these data included: 1) the frequency of insults, shouts, and threats in the parental home, 2) the frequency with which respondents felt emotionally close to other household members, and 3) the frequency of fears and concerns within the household. Respondents rate each item on a scale of 1 to 4, where 1 means “Always” and 4 means “Never.” For the parenting style measure they included: 1) the closeness of respondents' emotional relationships with their fathers and mothers, 2) the degree to which respondents' parents understood their concerns and problems, 3) the number of school activities respondents did with their parents, 4) the amount of spare time respondents spent with their fathers and mothers, and 5) the consistency of their parents' rules. Respondents rate each item on a scale of 1 to 4, where 1 means “A lot” and 4 means “Not at all.” We followed the principal component analysis for each measure and normalized the indices to means of zero.

#### **4. Skin Color and Life Outcomes**

The main question of this study is whether there is evidence that skin color affects intergenerational social mobility. We begin by analyzing the relationship between skin color and school attainment and between skin color and hourly wages in order to corroborate existing results.

[Figure 2 about here]

Figure 2 includes two panels. Panel A shows the descriptive relationship between the average years of schooling and skin color, and panel B the relationship between average hourly wage and skin color. For simplicity, the five skin tone groups described in Table 1 (PERLA 1-3, 4, 5, 6, 7-11) are used. In general, there is an unambiguous negative and decreasing relationship between skin color and life outcomes, hereafter the negative color gradient hypothesis. It is noteworthy that years of schooling decrease as color darkens, from an average of 11.5 years in the White category, to 9 years for the Dark Brown group. A similar trend can be seen in hourly earnings, from the White group, where average hourly wages are approximately 78 MXN (\$9.2USD in PPP), to the Dark Brown group, where they are approximately 40 MXN (\$4.9USD in PPP), a 49% difference.

The SMS-2015 dataset's information on labor, education, family environment, personality characteristics, and cognitive skills allows us to control for a number of factors not previously included in the literature that could bias estimation. We carry out a regression analysis of school attainment (years of schooling) or individual earnings (log hourly wages) on skin color (standardized score and PERLA groups) and a vector of individual productivity-enhancing characteristics. Several specifications of this reduced-form relationship are estimated, and the results for years of schooling and (log) individual hourly earnings are reported in Tables 1 and 2, respectively.<sup>16</sup>

[Table 1 about here]

Table 1 shows the regression analysis of the effect of skin color on years of schooling. Column 1 shows the baseline estimation on standardized skin color, including only a basic set of individual characteristics: sex, age, ethnicity, and geographical region dummies, as is common in the literature

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<sup>16</sup> Specifically, we estimated  $y_i = \alpha_0 + \delta * Skin_{tone} + \beta * X_i + \varepsilon$ , where  $y_i$  is either years of schooling or log (individual earnings) for individual  $i$ ,  $X_i$  is a vector of individual characteristics, and  $Skin_{tone}$  corresponds to the standardized PERLA skin tone classification. The color scale runs from 1 to 11, with 1 the lightest color and 11 the darkest. We also defined five skin tone groups (White [PERLA 1-3], Light Brown [4], Medium Brown [5], Brown [6], and Dark Brown [7-11]) and estimated  $y_i = \alpha_0 + \delta_i * \sum_{i=2}^5 Skin_{group} + \beta * X_i + \varepsilon$  in order to compare life outcomes for each group relative to the lightest.

(Flores and Telles 2012; Villarreal 2010). With other variables held constant, a one standard deviation increase in skin color decreases the average expected education attainment by 0.75 years. This result is consistent with the negative association between skin color and educational attainment in Mexico described in previous studies. Villarreal (2010) estimates the conditional probability of having a college education for given skin colors (white, light brown, and dark brown), and finds that the probability is 29.5% lower for respondents who are light brown and 57.6% less for dark brown than for those who are white. Flores and Telles (2012), using the PERLA skin tone classification, also describe a color gradient: for those with light brown skin the probability is 29.8% less and for those with dark brown skin, it is 50.7% less than for those with light skin.<sup>17</sup> A negative skin-color effect on education has also been shown for Mexican-Americans: Murguía and Telles (1996) found that lighter-skinned Mexican-Americans complete more years of schooling than their darker-skinned counterparts, even when their family backgrounds are similar.

Column 2 of Table 1 also includes the measure of cognitive and non-cognitive skills described in Section 2. Including these factors reduces the effect of skin color on years of education by approximately 36%. Column 3 includes two other factors in the parental household that are relevant to educational attainment: parental education and parental wealth. The data in column 3 shows that a one standard deviation increase in skin tone translates into an average of 0.32 fewer years of education. This effect is smaller than that reported in other studies, but it includes a much richer set of individual characteristics in the estimation.

In order to examine additional evidence for the hypothesis of a negative skin color gradient on education we formed five skin tone groups: White (PERLA 1-3), Light Brown (PERLA 4), Medium

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<sup>17</sup> Because our dependent variable is years of education rather than a dummy variable identifying undergraduate education or higher, the results in Table 2 cannot be directly compared with the existing literature. We thus also estimated the conditional probability of attaining a college education for a given skin color, using the social mobility survey 2015. For reasons of space, we have not included this comparison in the text. The results are similar, however, and can be found in Table 6 of the supplementary material.



Brown (PERLA 5), Brown (PERLA 6), and Dark Brown (PERLA 7-11). We then estimated the specifications described (columns 1-3), but with a dummy variable identifying the skin tone group for each individual as the main regressor. Column 4 reports the baseline estimation, column 5 includes the measures of cognitive and non-cognitive skills, and column 6 includes family characteristics, with skin color coefficients relative to White, which is omitted. Overall, the results are consistent with previous studies: individuals in the darkest group (Dark Brown) have an average of 1.4 fewer years of education than those in the White category. A similar result can be found in Trejo and Altamirano (2016), who showed that Mexicans with median skin color have a year less education and those with the darkest have three fewer years than their counterparts with the lightest skin.

Controlling for parental wealth and schooling, while the evidence does show a negative gradient, it is not statistically significant, suggesting that the differences are only palpable at the extremes. The variables of ethnicity (indigenous parents) and parental education are remarkably similar to those found in Flores and Telles (2012). The indigenous ethnicity variable we employ has no effect on education, but parental schooling and presumably class origins are strongly related to educational attainment and their inclusion diminishes the effect of skin color. Column 5 shows a significant negative color gradient without parental schooling variables, but when the latter are added, as shown in column 6, the effect of skin color vanishes. People with darker skin attain significantly less education than those with lighter skin. However, adjustment for characteristics such as cognitive and non-cognitive skills and parents' education and wealth lessens the magnitude of the disparity. Those with the darkest skin have 1.4 fewer years of education than those with the lightest.

[Table 2 about here]

Table 2 shows an estimation similar to that in Table 1, but considering the log of hourly wage rather than years of education as the dependent variable. Columns 1-3 use the standardized skin tone as

the main regressor. Column 1 reports the baseline estimation and includes sex, years of schooling, age, age squared, and ethnicity as controls. A one standard deviation increase in skin tone translates to an average reduction in wages of 12%, with other variables held constant. Introducing the cognitive and non-cognitive variables into the estimation (column 2) does not change the effect of skin color. We also find no evidence that parental wealth, parental schooling, or social environment in the household of origin affects the relationship between skin color and earnings. We thus conclude that previous estimates of the effect of skin color on earnings do not suffer from biases if these skills and parental wealth are unobserved.

Using the skin tone groups previously described (PERLA 1-3, 4, 5, 6, 7-11), we find strong evidence for the negative color gradient hypothesis. The results in column 4 show that people in the Light Brown, Medium Brown, Brown and Dark Brown categories earn an average of 37%, 42%, 56% and 54% less in hourly wages, respectively, those in the White group. These estimations suffer practically no change with the inclusion of cognitive and non-cognitive skills and parental education. Finally, our results are consistent with a color gradient relationship found in previous studies in Mexico (Altamirano and Trejo 2016; Arceo-Gomez and Campos-Vazquez 2014) and in studies of African-Americans in the United States (Espino and Franz 2002; Hersch 2006; Hill 2000; Telles and Murguia 1990). Thus, previous studies and the results presented here show that skin-color stratification cannot be explained with other variables such as class, family background, or cognitive or non-cognitive skills, and that color continues to define a stratification system in Mexico, with great differences in wages between darker and lighter people who are otherwise similar.

## **5. Skin Color and Social Mobility**

We begin this section by measuring intergenerational mobility using a rank-rank specification (Chetty et al. 2014), which ranks the percentile of each individual relative to others in the sample based

on the indices of parental and current wealth described in Section 3. We then examine the relationship between social mobility and skin color.

[Figure 3 about here]

Figure 3 shows the parental (panel A) and current (panel B) wealth index distribution by skin tone group (White, Light Brown, Medium Brown, Brown and Dark Brown). The data show the degree of difference in wealth distribution associated with differences in skin color. In both Panels A and B, lighter skin color of a decile is associated with wealthier households. For parental households (Panel A), the percentage of persons in the White group is approximately 7% up to the 7th decile, but in current households there is a clear gradient across deciles (the greater the household wealth, the higher the percentage in the White group). This suggests that there are advantages associated with light skin color that begin in the parental home and continue through adulthood, with corresponding disadvantages for the darkest skin color. In our data, 52% of individuals in the White category move upwards, as compared with only 43% of those in the Brown and Dark Brown groups.

[Figure 4 about here]

We formalize the previous result using a regression framework. Figure 4 shows the resulting OLS estimates of the relationship between the percentile wealth ranking of adults (y-axis) and the percentile ranking of their parents (x-axis) for three skin tone groups: White (PERLA 1-3), Light and Medium Brown (PERLA 4-5) and Brown and Dark Brown (PERLA 6-11).<sup>18</sup> That is, we establish the relationship between current and parental wealth by skin color. The first notable result is the positive influence of wealth of origin on future attainment, implying persistence in socioeconomic status. The slopes for the White, Brown, and Dark Brown groups are 0.36 (s.e. 0.05), 0.43 (0.02), and 0.39 (0.03), respectively. Although

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<sup>18</sup> That is, we estimated  $y_i = \alpha_0 + \beta * Parent_i + \varepsilon$ , where  $y_i$  is the individual's current wealth, expressed as an index, and  $Parent_i$  corresponds to the calculated parental wealth index. We estimated this regression separately for the subsamples White (PERLA 1-3), Brown (PERLA 4-5), and Dark Brown (PERLA 6-11) and plotted the prediction from the regression.

the difference in slopes is not statistically significant, we show below that there is a great deal of heterogeneity. Second, it is clear that with the same level of parental wealth, the lighter a person's skin color, the higher is their current rank (implying that white individuals show higher upward mobility than their brown or dark brown counterparts). The people in the White group who were poorest when they were 14 years old are on average currently better off than the people in the Brown and Dark Brown groups who were poorest at that age.

[Figure 5 about here]

The estimation in Fig. 4 does not show the heterogeneity in the relationship of current and parental wealth. However, we can see this heterogeneity with a quantile unconditional regression formulation. We estimate the intergenerational association at several conditional percentiles (20th, 40th, 50th, 60th, and 80th) of individuals' parental wealth for the three groups separately: White, Light and Medium Brown, and Dark Brown. Quantile regression coefficients are plotted in Fig. 5. The graph provides an assessment of the dispersion of children's income around the central tendency at different levels of parents' income, by skin color. By plotting regression lines for different quantiles, the variance of the distribution of current wealth across levels of parental advantage becomes obvious. This analysis complements that of Fig. 4 by focusing on the predicted dispersion in addition to the predicted mean of individual outcomes at different levels of parental advantage. The skin tone group with wider variability around the mean can be seen as having higher mobility at that level of parental wealth. For the lowest quantile of every group, Fig. 5 describes a situation where individuals in the White group at the lower end of the parental distribution will be better off than their counterparts in the Brown and Dark Brown groups. On the other hand, at the top of the parental distribution, dispersion is lower for those in the White group than for those in the Dark Brown group. That is, those in the White group show higher upward mobility at the bottom and lower downward mobility at the top than those in the Brown and Dark Brown groups.

[Table 3 about here]

Table 3 shows calculations of the social mobility matrices associated with each of the three groups considered. For each matrix, element  $(i, j)$  indicates the proportion of individuals whose current wealth falls within quintile  $j$  and whose parents' wealth falls within quintile  $i$ . A useful way to interpret Table 3 is to recall the perfect mobility case, in which parental wealth has no influence on an individual's current wealth. This would require the same proportion of individuals in all cells (20%). Another benchmark is the zero mobility scenario, in which the transition matrix would have 100% along the main diagonal and zeros elsewhere.

Perhaps the most striking fact is the intergenerational persistence in the wealthiest quintiles (q4 and q5). In the White group, the proportion of individuals who started and stayed at the top of the distribution (q4 and q5) is almost 90%, while in the Brown group the figure is 67% and in the Dark Brown group it is 57%. At the lower extreme of the distribution, individuals starting in the bottom quintile (q1) who manage to move into the higher quintiles (q4 and q5) are mostly lighter-skinned: 51% of individuals in the White group, but only 23% and 15% of the Brown and Dark Brown groups, respectively.

[Table 4 about here]

Table 4 presents our OLS estimation of the effect of skin color on intergenerational mobility. Panel A shows the results using the standardized skin color and panel B the results for skin color groups as in previous tables. Columns 1 and 2 include sex (female), age, and age squared as regressors, and Columns 3 and 4 additionally include indicator variables for parental ethnicity and both parents present in the household of origin, as well as the variables of parenting style and stress in the household of origin. Columns 1 and 3 show calculations of the direct effect of skin color on current wealth, conditional on parental wealth. Columns 2 and 4 include an interaction between parental wealth and skin color in order to calculate differential effects on mobility. The results depict stratification in current wealth associated

with skin color. Column 1 in panel A indicates that a one standard deviation increase in skin color on the PERLA scale, with constant sex, age, and parental wealth, translates into a lowering of the current wealth rank by 5.5 percentile places. The rest of the columns in Panel A show similar results. Social mobility is relatively low in Mexico: columns 1 and 2 show that a one-unit increase in the parental wealth rank distribution increases the current wealth distribution by 0.43 units (on average and holding everything else constant). Columns 2 and 4 do not show differences in mobility (in the mean) across skin color categories.

Panel B includes the results by skin color group, which support the negative color gradient hypothesis that darker skin color is associated with lesser life outcomes. Column 1 shows that the Dark Brown group is 20 percentile places below the White group in current wealth, even after controlling for parental wealth, and the other columns show qualitatively similar results. As in Panel A, columns 2 and 4 show no differences in mobility (in the mean) across skin color. Figure 5 and Table 3 do, however, indicate heterogeneity of mobility by parental wealth.

To formally quantify the effect of skin color on mobility, we estimate conditional quantile regressions of current against parental percentile rank of wealth, sex, age, and age squared. Regressions are estimated separately for the White (PERLA 1-3), Light and Medium Brown (PERLA 4-5), and Brown and Dark Brown (PERLA 6-11) groups. We plot the coefficient for parental wealth and its 90% confidence interval for each skin color group in Fig. 6. The results are heterogeneous. Although the confidence intervals for the White group are wide, individuals in the Dark group show lower coefficients for parental wealth for quantiles 20 to 40. The coefficients for those in the Light Brown group show a pattern very similar to that of the White group. The Dark group also shows lower coefficients for parental wealth than the Light Brown for quantiles 10 to 60. Lower coefficients for the Dark Brown group indicate that greater parental wealth has a lesser effect on current wealth. It is as if parental wealth provides less insurance

against very bad outcomes for those in the Dark Brown group. Simply put, the Dark Brown group experiences higher rates of downward mobility than other groups.<sup>19</sup>

[Figure 6 about here]

Why do individuals in the White group achieve better outcomes than those in the Dark Brown group? A conclusive answer to this question will require future research. Here we provide some possible explanations. Previous studies show lesser life outcomes among darker-skinned individuals in Mexico (Trejo and Altamirano 2016; Flores and Telles 2012; Telles 2014; Telles and Bailey 2013; Telles and Sue 2009; Telles et al. 2015; Villarreal 2010). There is also compelling evidence of discrimination based on physical appearance in the Mexican labor market. Darker-skinned individuals are employed in less-skilled occupations, including domestic workers, manual workers, drivers, and security guards (Arceo-Gomez and Campos-Vazquez 2014; Villarreal 2010). Undoubtedly, discrimination is a channel that leaves darker-skinned people without the same opportunities for mobility as their lighter-skinned counterparts.

However, there are other factors related to discrimination that have not been explored, such as differences in personal aspirations and social identity associated with phenotypic differences. These considerations provide an alternative perspective that may help to disentangle the differences in life outcomes as well as the mechanisms through which they are reproduced. Recent research, for example, has stressed the existence of an "implicit bias"—subconscious stereotypes that guide social interaction—on children's education. Gilliam et al. (2016) reveal that preschool teachers spend more time focused on black students, especially black boys, expecting bad behavior. By itself, this fact does not explain differences in life outcomes, but taken together with the fact that black children in the United States are 3.6 times more likely to be suspended from preschool than white children, it is significant. A similar

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<sup>19</sup> We estimate a similar regression but using the standardized skin color measure and its interaction with parental wealth. Results are similar to those presented by skin color group. The interaction coefficient shows a significant negative effect for quantiles 10 to 60; it is shown in the supplementary material.

phenomenon could be occurring in Mexico. The role of implicit biases is pervasive across people and institutions and may impact decision-making processes. Implicit biases create a vicious cycle exacerbating inequalities over time (Jones et al. 2012).

A complementary explanation of the results may relate to the nature of social identity and social norms that affect aspirations and performance. When people think and act, they generally use concepts and stereotypes drawn from their communities. Many mental models are useful; others contribute to the intergenerational transmission of poverty (World Bank 2015). People's mental models shape their understanding of what is possible in life. As a result, people from disadvantaged groups tend to underestimate their abilities and perform worse in social situations when they are reminded of their distinctive characteristics (Hoff and Pandey 2014). This may be the case with skin color in Mexico. Social identity and implicit biases in early ages in addition to discrimination may explain the higher persistence in economic outcomes for darker-skinned individuals.

## **6. Conclusions**

The main question of this study is whether skin color affects social mobility in Mexico. Overall, taking together our results and the conclusions of previous studies of Mexico, we conclude that skin color is a key variable in social inequality and intergenerational mobility.

We begin the analysis by corroborating existing evidence of the relationship between life outcomes (wages and educational attainment) and individual skin color, but using additional information and a richer set of individual characteristics that previous works have not been able to include: a measure of cognitive and non-cognitive skills, the economic situation of the parental household, and other sociodemographic characteristics. We then make a contribution to the literature of racial stratification by analyzing the effect of skin color on social mobility. We are able to do so by employing the 2015 Survey of Social Mobility



in Mexico (SMS-2015), whose general objective is to understand the underlying factors of social mobility in Mexico.

Our results are in line with previous studies and provide empirical evidence of profound social stratification by skin color. Mexicans with darker skin color attain significantly less education than their lighter-skinned counterparts. However, controlling for characteristics such as cognitive and non-cognitive skills and parents' education and wealth lessens the magnitude of the disparity. Those with the darkest skin color average 1.4 fewer years of education than those with the lightest. This relationship also holds for hourly earnings: the lightest-skinned receive 53% more hourly earnings than their darkest counterparts.

We also make a contribution to the literature of racial stratification by studying the relationship between intergenerational social mobility and skin color. Given the design of the survey, we were able to test the effect of individuals' skin color on their economic position, controlling for the socioeconomic position of their parental home and other determinants of economic outcomes, such as ethnicity, years of schooling, schooling of parents, and information about their home environment while they were growing up. People with lighter skin show more upward social mobility, independent of their starting wealth. Those with darker skin are 20 percentile ranks lower in the current wealth distribution than their lighter-skinned counterparts with the same level of parental wealth. Individuals with the darkest skin color also show higher downward mobility than other groups. We find that stratification by skin color persists in Mexico, and provide evidence of its importance to life outcomes. Future research is needed to explore the importance of factors besides labor-market discrimination to explain such difference.

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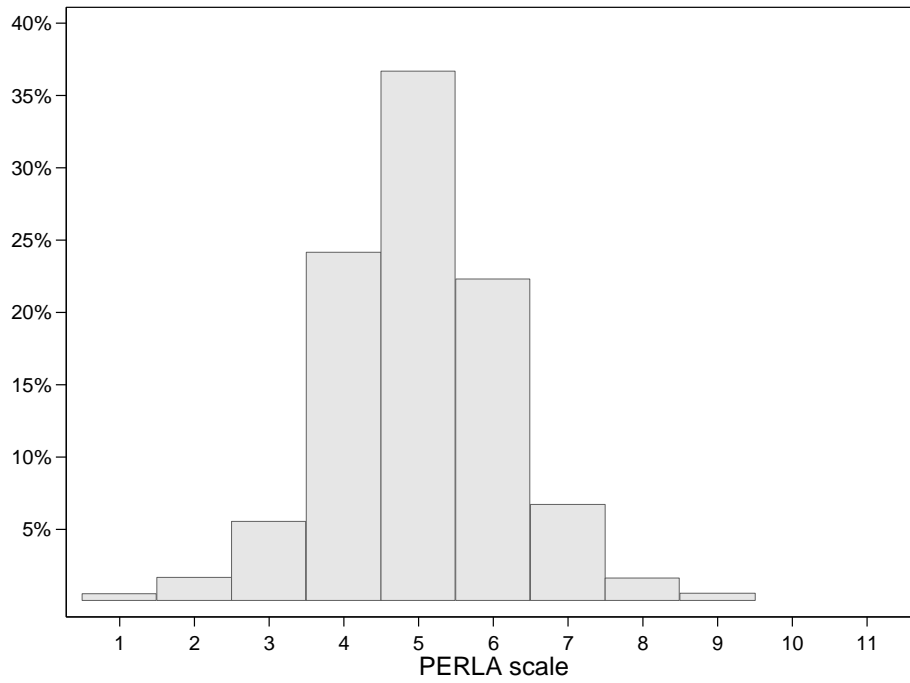
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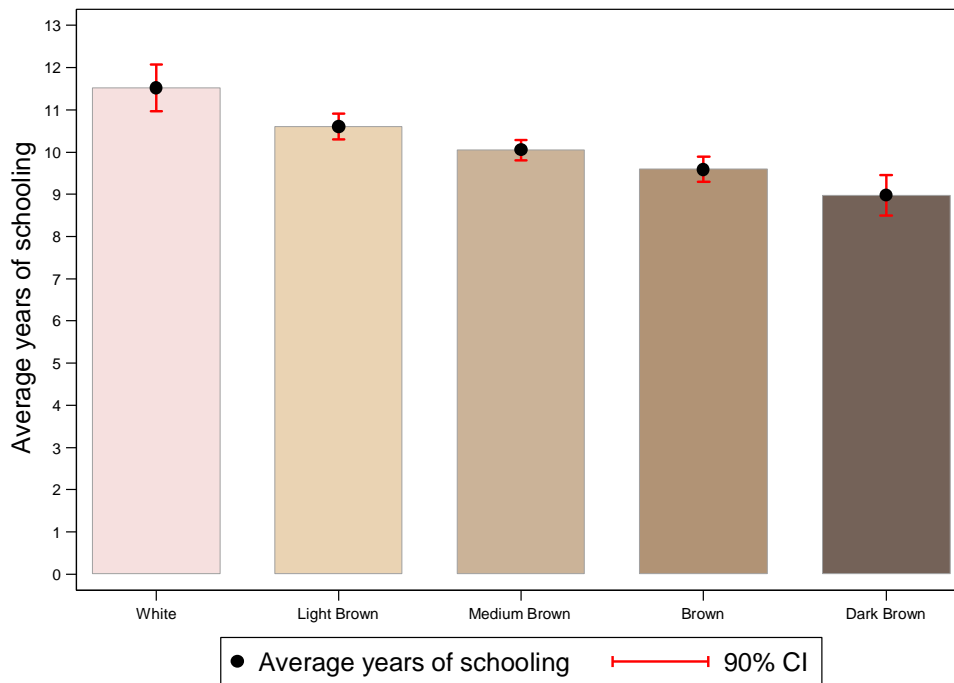
**Figure 1. Sample Composition (PERLA Palette)**



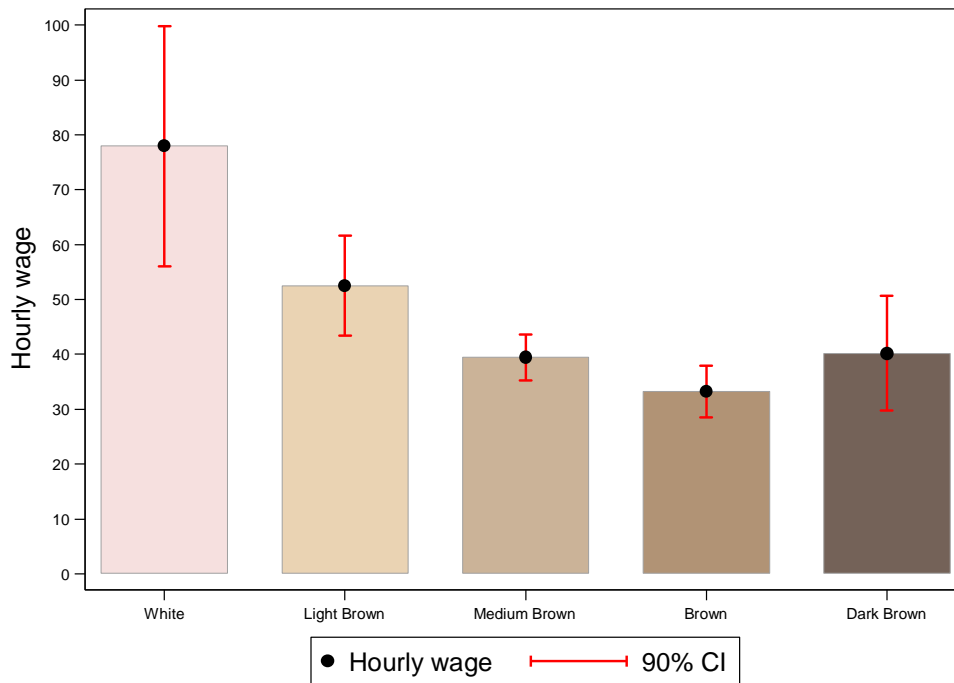
**Fig. 1** shows the PERLA composition of the EMOVI-2015 sample. The color scale runs from 1 to 11 with 1 the lightest and 11 the darkest. PERLA 1-3 (White) totals 7.8% and PERLA 7-11 (Dark Brown) 9.1%. For more information on the PERLA palette visit <https://perla.princeton.edu>. **Source:** Figure prepared by the authors using the SMS-2015 dataset.

**Figure 2. Relationship between Skin Color and Socioeconomic Results**

A. Years of Schooling



B. Hourly Wage

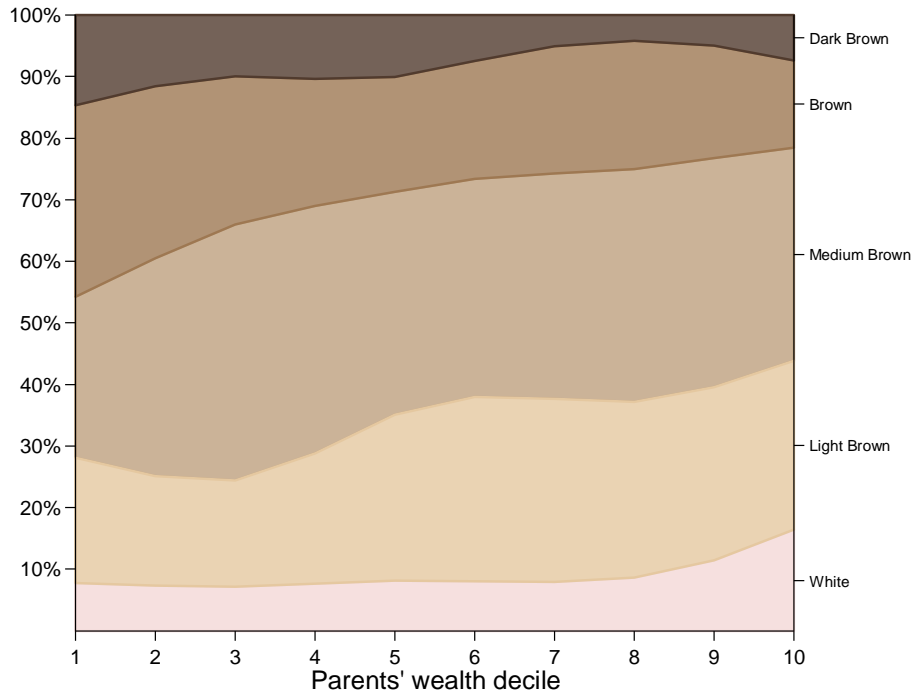


**Fig. 2** includes two panels. Panel A shows the descriptive relationship between the average years of schooling and skin color, and panel B the relationship between average hourly wage and skin color. White (PERLA 1-3), Light Brown (PERLA 4), Medium Brown (PERLA 5), Brown (PERLA 6), and Dark Brown (PERLA 7-11). **Source:** Figure prepared by the authors using the SMS-2015 dataset.

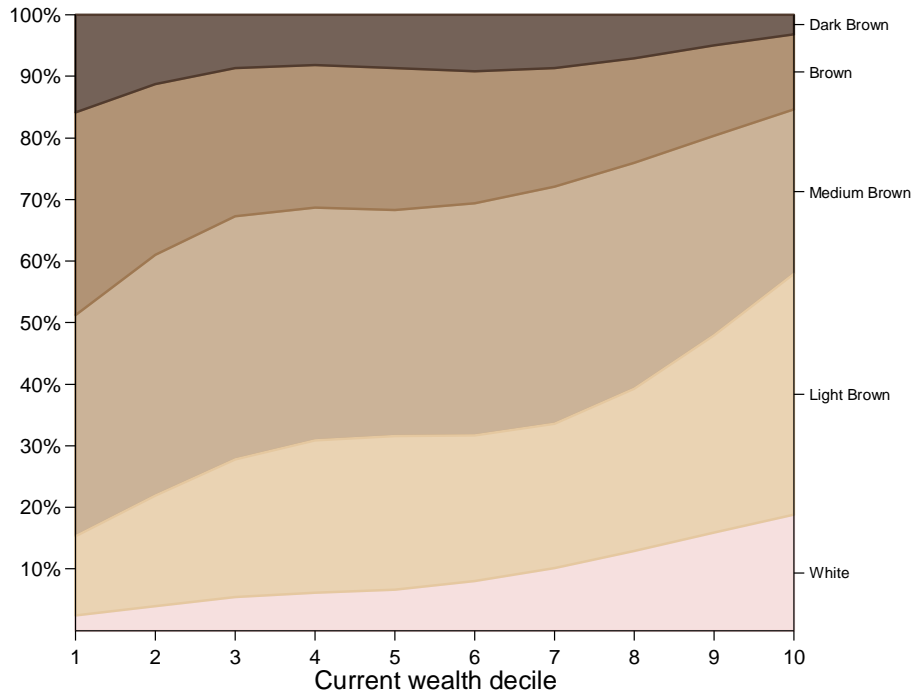


**Figure 3: Percentage of Adults in the Sample by Skin Color and Wealth Decile**

**A. By Parents' Wealth Decile**

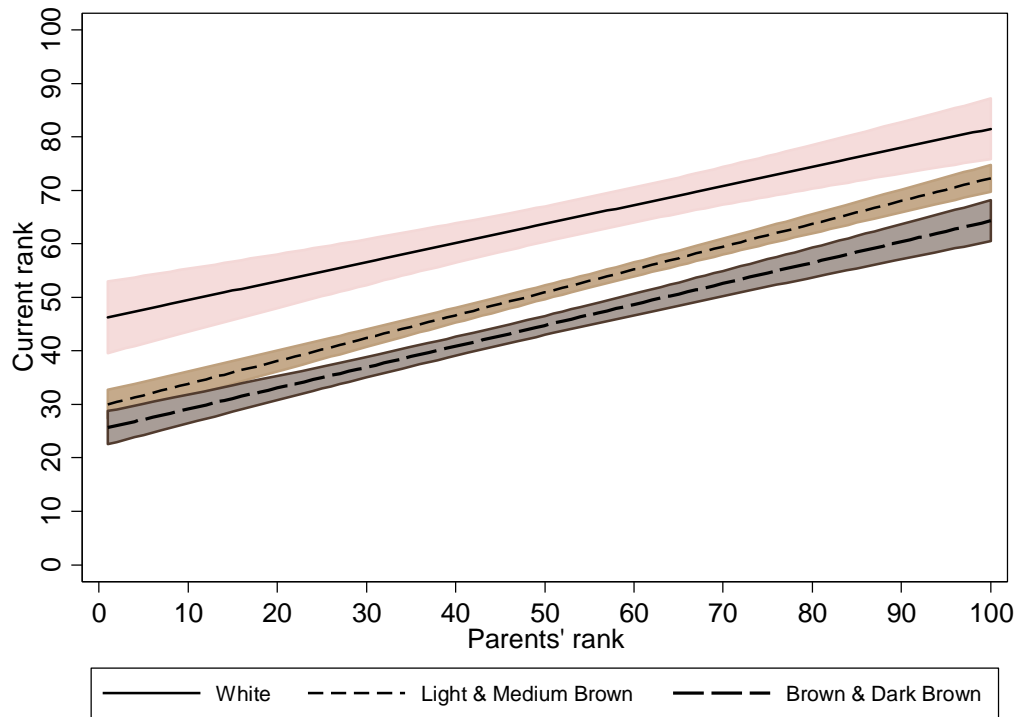


**B. By Current Wealth Decile**



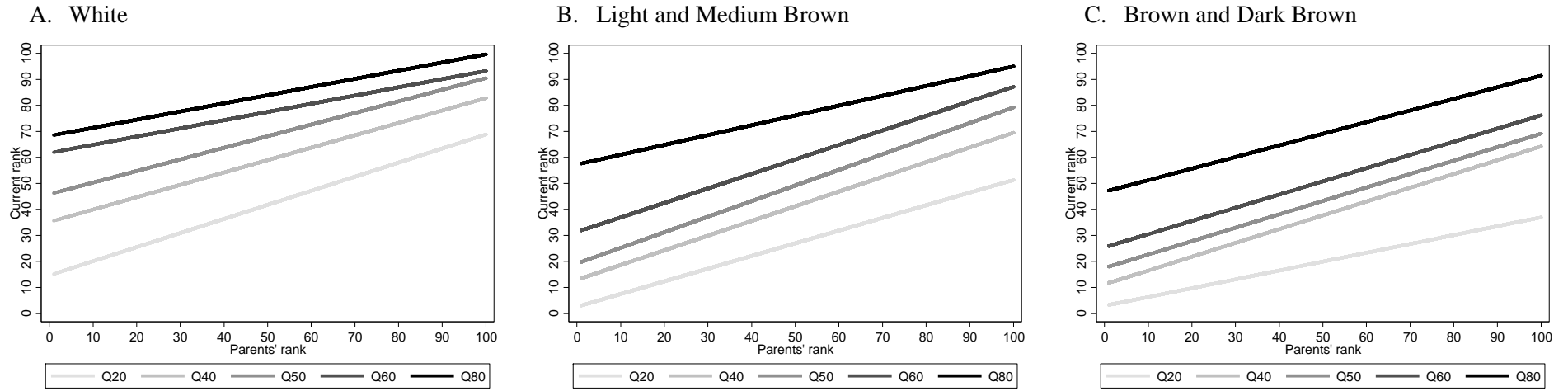
**Fig. 3** shows the percentage of adults in the sample within each wealth quintile by skin color. **Source:** Figure prepared by the authors using the SMS-2015 dataset.

**Figure 4: Relationship between Current and Parents' Household Wealth by Skin Color**



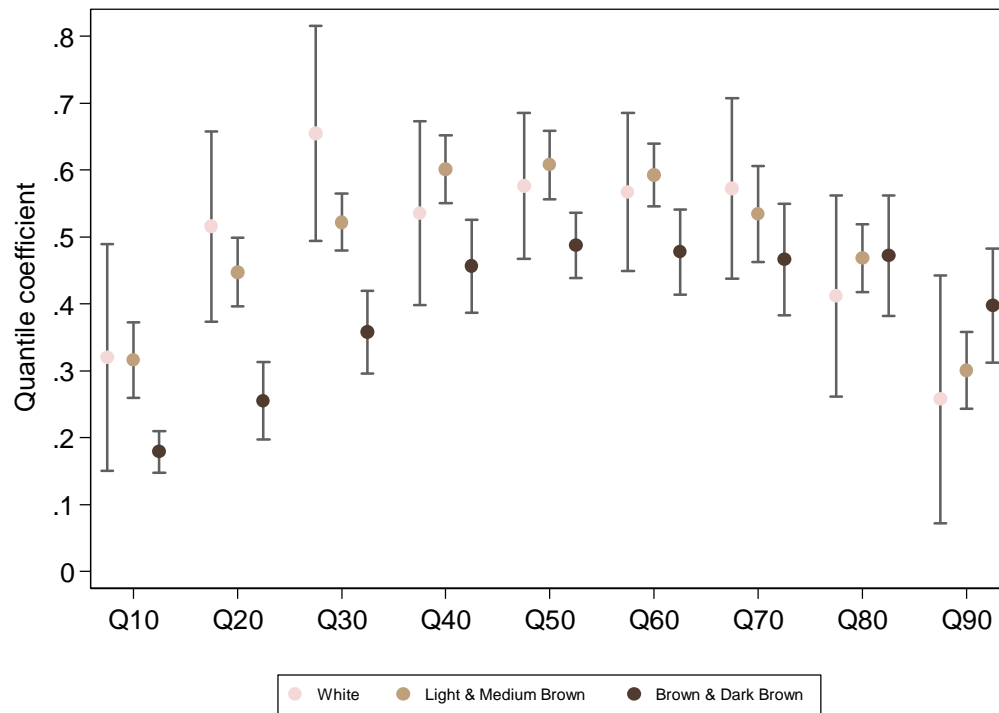
**Fig. 4** shows the resulting OLS estimates of the relationship between the percentile wealth ranking of adults (y-axis) and the percentile ranking of their parents (x-axis) for three skin tone groups. Based on the regression analysis, we formed three groups with similar results: White (PERLA 1-3), Light & Medium Brown (PERLA 4-5), and Dark Brown (PERLA 6-11). Estimates from OLS regressions are reported for each group. Confidence intervals at the 90% level. The slopes for the White, Brown, and Dark Brown groups are 0.36 (s.e. 0.05), 0.43 (0.02), and 0.39 (0.03), respectively.

**Figure 5: Rank-Rank Unconditional Quantile Intergenerational Association by Skin Color**



**Fig. 5** provides a quantile regression assessment of the dispersion of children's income around the central tendency at different levels of parents' income by skin color. Based on the regression analysis, we formed three groups with similar results: White (PERLA 1-3), Light and Medium Brown (PERLA 4-5), and Brown and Dark Brown (PERLA 6-11).

**Figure 6. Intergenerational Mobility and Skin Color using Quantile Regression**



**Fig. 6** shows the coefficients resulted of conditional quantile regressions of current against parental percentile rank of wealth, sex, age, and age squared. Each dot is the coefficient of a conditional quantile regression of current versus parental wealth percentile rank by skin color. We formed three groups with similar results: White (PERLA 1-3), Light & Medium Brown (PERLA 4-5), and Dark Brown (PERLA 6-11). Confidence intervals at the 90% level presented in black.

**Table 1. Effect of Skin Color on Years of Schooling**

	(1)	(2)	(3)	(4)	(5)	(6)
Skin tone (std.)	-0.75*** [0.147]	-0.48*** [0.134]	-0.32* [0.147]			
Light Brown				-1.03 <sup>†</sup> [0.611]	-0.80 [0.553]	-0.83 [0.583]
Medium Brown				-1.66** [0.581]	-1.22* [0.513]	-0.97 <sup>†</sup> [0.548]
Brown				-2.20*** [0.640]	-1.45* [0.566]	-1.10 <sup>†</sup> [0.607]
Dark Brown				-2.89*** [0.682]	-1.95** [0.600]	-1.40* [0.633]
Female	-0.53* [0.252]	-0.27 [0.235]	-0.17 [0.230]	-0.51* [0.250]	-0.25 [0.232]	-0.15 [0.224]
Age	0.60*** [0.094]	0.55*** [0.084]	0.53*** [0.075]	0.60*** [0.095]	0.55*** [0.084]	0.53*** [0.075]
Age squared	-0.01*** [0.001]	-0.01*** [0.001]	-0.01*** [0.001]	-0.01*** [0.001]	-0.01*** [0.001]	-0.01*** [0.001]
Indigenous parents	-0.72 [0.565]	-0.20 [0.507]	0.61 [0.583]	-0.70 [0.576]	-0.21 [0.508]	0.61 [0.576]
Cognitive		1.16*** [0.123]	0.72*** [0.125]		1.16*** [0.124]	0.73*** [0.125]
Non-cognitive		0.66*** [0.101]	0.55*** [0.100]		0.66*** [0.102]	0.54*** [0.100]
Parents' wealth percentile rank			0.03*** [0.005]			0.03*** [0.005]
Parents' education (completed elementary school)			0.75** [0.276]			0.76** [0.278]
Parents' education (middle school)			0.94** [0.343]			0.94** [0.345]
Parents' education (high school)			1.75*** [0.455]			1.77*** [0.456]
Parents' education (college)			3.01*** [0.557]			3.02*** [0.557]
Parenting Style			0.26* [0.111]			0.27* [0.112]
Stress at parental home			-0.02 [0.113]			-0.02 [0.110]
Both parents			0.24 [0.247]			0.24 [0.248]
Observations	2,611	2,611	2,516	2,611	2,611	2,516
R-squared	0.070	0.193	0.316	0.068	0.193	0.316

**Notes:** Robust standard errors in brackets. <sup>†</sup>p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001. The White group (PERLA 1- 3) is excluded; coefficients for Light Brown (PERLA 4), Medium Brown (PERLA 5), Brown (PERLA 6), and Dark Brown 5 (PERLA 7-11) should thus be interpreted as relative to it. For every specification we also include geographical dummy variables as follows: Northeast: Coahuila, Chihuahua, Durango, Nuevo León, and Tamaulipas. Northwest: Baja California, Baja California Sur, Sinaloa, and Sonora. West-Center: Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit, Querétaro, San Luis Potosí, and Zacatecas. Center: Hidalgo, Estado de Mexico, Morelos, Puebla, Mexico City, and Tlaxcala. Southeast: Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán.

**Table 2. Effect of Skin Color on Hourly Wage**

	(1)	(2)	(3)	(4)	(5)	(6)
Skin tone (std.)	-0.12**	-0.12**	-0.12**			
	[0.037]	[0.037]	[0.039]			
Light Brown				-0.37*	-0.35*	-0.37*
				[0.150]	[0.149]	[0.152]
Medium Brown				-0.42**	-0.39**	-0.37**
				[0.132]	[0.132]	[0.134]
Brown				-0.56***	-0.53***	-0.54***
				[0.142]	[0.141]	[0.143]
Dark Brown				-0.54**	-0.53**	-0.53**
				[0.168]	[0.170]	[0.170]
Female	-0.20**	-0.19*	-0.23**	-0.20**	-0.19*	-0.22**
	[0.076]	[0.076]	[0.078]	[0.074]	[0.075]	[0.076]
Age	0.02	0.02	0.04	0.02	0.02	0.04
	[0.041]	[0.042]	[0.037]	[0.043]	[0.043]	[0.038]
Age squared	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Indigenous parents	-0.03	-0.01	0.05	-0.04	-0.02	0.05
	[0.122]	[0.123]	[0.135]	[0.116]	[0.118]	[0.127]
Years of schooling	0.07***	0.07***	0.06***	0.07***	0.07***	0.06***
	[0.011]	[0.011]	[0.012]	[0.011]	[0.011]	[0.012]
Cognitive		0.01	-0.01		0.01	-0.01
		[0.036]	[0.037]		[0.036]	[0.037]
Non-cognitive		0.06 <sup>†</sup>	0.05		0.05	0.04
		[0.034]	[0.035]		[0.035]	[0.035]
Parents' wealth percentile rank			0.00*			0.00*
			[0.002]			[0.002]
Parents' education (completed elementary school)			-0.03			-0.03
			[0.177]			[0.174]
Parents' education (middle school)			0.04			0.05
			[0.192]			[0.192]
Parents' education (high school)			0.11			0.10
			[0.232]			[0.232]
Parents' education (college)			0.18			0.18
			[0.257]			[0.255]
Parenting Style			-0.00			0.00
			[0.048]			[0.047]
Stress at parental home			-0.06 <sup>†</sup>			-0.05
			[0.036]			[0.037]
Both parents			-0.16			-0.17
			[0.113]			[0.112]
Observations	1,301	1,301	1,267	1,301	1,301	1,267
R-squared	0.177	0.182	0.209	0.185	0.189	0.217

**Notes:** Robust standard errors in brackets. <sup>†</sup>p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001. The White group (PERLA 1- 3) is excluded; coefficients for Light Brown (PERLA 4), Medium Brown (PERLA 5), Brown (PERLA 6), and Dark Brown 5 (PERLA 7-11) should thus be interpreted as relative to it. EMOVI-2015 includes information for 2,616 adult individuals of whom 1,821 reported they were working at the time of the interview. Of the working individuals, 1,310 reported a positive income and 9 reported an invalid number of per-month working hours. For every specification we also included geographical dummy variables as follows: Northeast: Coahuila, Chihuahua, Durango, Nuevo León, and Tamaulipas. Northwest: Baja California, Baja California Sur, Sinaloa, and Sonora. West-Center: Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit, Querétaro, San Luis Potosí, and Zacatecas. Center: Hidalgo, Estado de Mexico, Morelos, Puebla, Mexico City, and Tlaxcala. Southeast: Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán.

**Table 3. Socioeconomic Transition Matrix by Skin Color (Quintiles)**

		White				
		Current wealth				
		Q1	Q2	Q3	Q4	Q5
Parents' wealth	Q1	12.4	19.5	17.4	45.9	4.7
	Q2	16.5	16.6	22.3	22.6	22.0
	Q3	5.8	25.2	11.0	21.6	36.5
	Q4	1.9	21.2	12.7	28.7	35.6
	Q5	1.0	2.8	8.7	28.5	59.9

		Light and Medium Brown				
		Current wealth				
		Q1	Q2	Q3	Q4	Q5
Parents' wealth	Q1	35.2	24.8	17.4	12.2	10.5
	Q2	29.2	23.9	22.4	15.9	8.6
	Q3	16.1	24.5	24.8	18.2	16.4
	Q4	6.1	14.9	25.3	25.0	28.7
	Q5	7.0	10.8	14.8	24.4	43.0

		Brown and Dark Brown				
		Current wealth				
		Q1	Q2	Q3	Q4	Q5
Parents' wealth	Q1	47.8	25.1	11.7	10.8	4.7
	Q2	25.2	30.0	23.8	17.3	3.6
	Q3	27.6	23.9	15.9	22.6	10.1
	Q4	22.0	14.4	30.5	19.7	13.5
	Q5	6.9	13.4	23.1	26.4	30.4

**Notes:** Based on the regression analysis, we formed three groups with similar results: White (PERLA 1-3), Brown (PERLA 4-5), and Dark Brown (PERLA 6-11). Table 5 shows the percentage of respondents in each quintile of current wealth, according to parents' wealth and skin color.

**Table 4. Intergenerational Mobility and Skin Color**

	(1)	(2)	(3)	(4)
A. Using standardized skin tone				
Skin tone (std.)	-5.48***	-5.26***	-5.51***	-5.56***
	[0.795]	[1.588]	[0.773]	[1.499]
Parents' wealth percentile rank	0.43***	0.43***	0.40***	0.40***
	[0.025]	[0.025]	[0.026]	[0.026]
Parents' wealth*Skin tone		-0.00		0.00
		[0.024]		[0.023]
Observations	2,616	2,616	2,521	2,521
R-squared	0.304	0.304	0.304	0.304
B. Using skin tone groups				
Light Brown	-7.37**	-8.11	-7.53**	-8.46
	[2.839]	[7.256]	[2.748]	[6.665]
Medium Brown	-15.01***	-18.58**	-15.23***	-19.29**
	[2.749]	[6.903]	[2.628]	[6.198]
Brown	-18.11***	-17.40*	-18.41***	-18.04**
	[2.987]	[7.066]	[2.886]	[6.437]
Dark Brown	-19.94***	-22.52**	-19.51***	-23.05***
	[3.456]	[7.432]	[3.378]	[6.923]
Parents' wealth percentile rank	0.43***	0.40***	0.40***	0.37***
	[0.025]	[0.089]	[0.026]	[0.079]
(Parents' wealth*Light Brown)		0.01		0.02
		[0.102]		[0.094]
(Parents' wealth*Medium Brown)		0.07		0.08
		[0.098]		[0.089]
(Parents' wealth*Brown)		-0.02		-0.02
		[0.103]		[0.096]
(Parents' wealth*Dark Brown)		0.05		0.07
		[0.113]		[0.108]
Observations	2,616	2,616	2,521	2,521
R-squared	0.309	0.310	0.310	0.311

**Notes:** Robust standard errors in brackets. †p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001. Columns 1 and 2 include sex (female), age, and age squared. Columns 3 and 4 additionally include an indicator variable for indigenous parents, parenting style in household of origin, stress at parental home, and whether both parents lived in the household of origin. Panel A includes standardized skin color. Panel B includes skin color groups: White (PERLA 1-3), Light Brown (PERLA 4), Medium Brown (PERLA 5), Brown (PERLA 6), and Dark Brown 5 (PERLA 7-11). As the White group is excluded, the others should be interpreted as relative to it.



## Supplementary Material

### Table 5. Descriptive Statistics

	All	s.d.	Female	s.d.	Male	s.d.
N (no sample weights)	2,616	-	1,846	-	770	-
PERLA scale skin tone (average)	4.94	[1.23]	4.77	[1.18]	5.16	[1.26]
PERLA scale skin tone standardized	0	[1.00]	-0.14	[0.96]	0.17	[1.02]
Age (years)	42.7	[7.65]	41.7	[7.31]	43.9	[7.88]
% working	69.3%		61.4%		88.3%	
Hourly wage (MXN)	44.8	[66.1]	44.4	[70.6]	44.9	[63.52]
Years of Schooling	10.1	[3.86]	9.9	[3.96]	10.3	[3.77]
% College	11.8%		8.1%		19.4%	
% Primary School or less	19.5%		20.6%		18.2%	
% Indigenous language spoken by Parents	8.9%		10.4%		8.3%	
% Parents' College	6.3%		6.9%		5.4%	
% Parents' Elementary School or less	65.1%		64.3%		66.3%	

**Notes:** The EMOVI-2015 includes information for 2,616 adult individuals, of whom 1,821 reported they were working at the time of the interview. Of the working individuals, 1,310 reported a positive income and 9 reported an invalid number of per-month working hours. Hourly wage is restricted to individuals with positive income and is defined as monthly labor income over weekly hours of work times 4.33. Primary school or less refers to a maximum of 8 years of schooling. **Source:** Figure prepared by the authors using the SMS-2015 dataset.

**Table 6: Skin Color and the Linear Probability of Obtaining College Education**

	(1) Change in probability	(2) Change in probability	(3) Change in probability	(4) Change in probability
Light Brown	-0.11 [0.076]	-0.09 [0.072]	-0.08 [0.080]	-0.09 [0.079]
Medium Brown	-0.16* [0.075]	-0.13 <sup>†</sup> [0.070]	-0.11 [0.079]	-0.12 [0.078]
Brown	-0.20** [0.077]	-0.15* [0.072]	-0.11 [0.081]	-0.12 [0.080]
Dark Brown	-0.24** [0.078]	-0.17* [0.073]	-0.14 [0.084]	-0.14 [0.083]
Female	-0.04 [0.026]	-0.02 [0.026]	-0.02 [0.026]	0.10 [0.105]
Age	0.04*** [0.008]	0.04*** [0.008]	0.04*** [0.007]	0.04*** [0.008]
Age squared	-0.00*** [0.000]	-0.00*** [0.000]	-0.00*** [0.000]	-0.00*** [0.000]
Cognitive		0.08*** [0.012]	0.06*** [0.013]	0.06*** [0.013]
Non-cognitive		0.05*** [0.012]	0.04*** [0.011]	0.04*** [0.012]
Parents' wealth percentile rank			0.00* [0.001]	0.00 <sup>†</sup> [0.001]
Parents' education (completed elementary school)			0.04 [0.024]	0.03 [0.024]
Parents' education (middle school)			0.04 [0.035]	0.03 [0.036]
Parents' education (high school)			0.16*** [0.047]	0.15** [0.048]
Parents' education (college)			0.33*** [0.072]	0.33*** [0.073]
Female*age				-0.00 [0.003]
Parenting style				0.01 [0.012]
Stress at parental home				-0.01 [0.012]
Both parents				0.02 [0.027]
Observations	2,616	2,616	2,616	2,521
R-squared	0.054	0.123	0.185	0.193

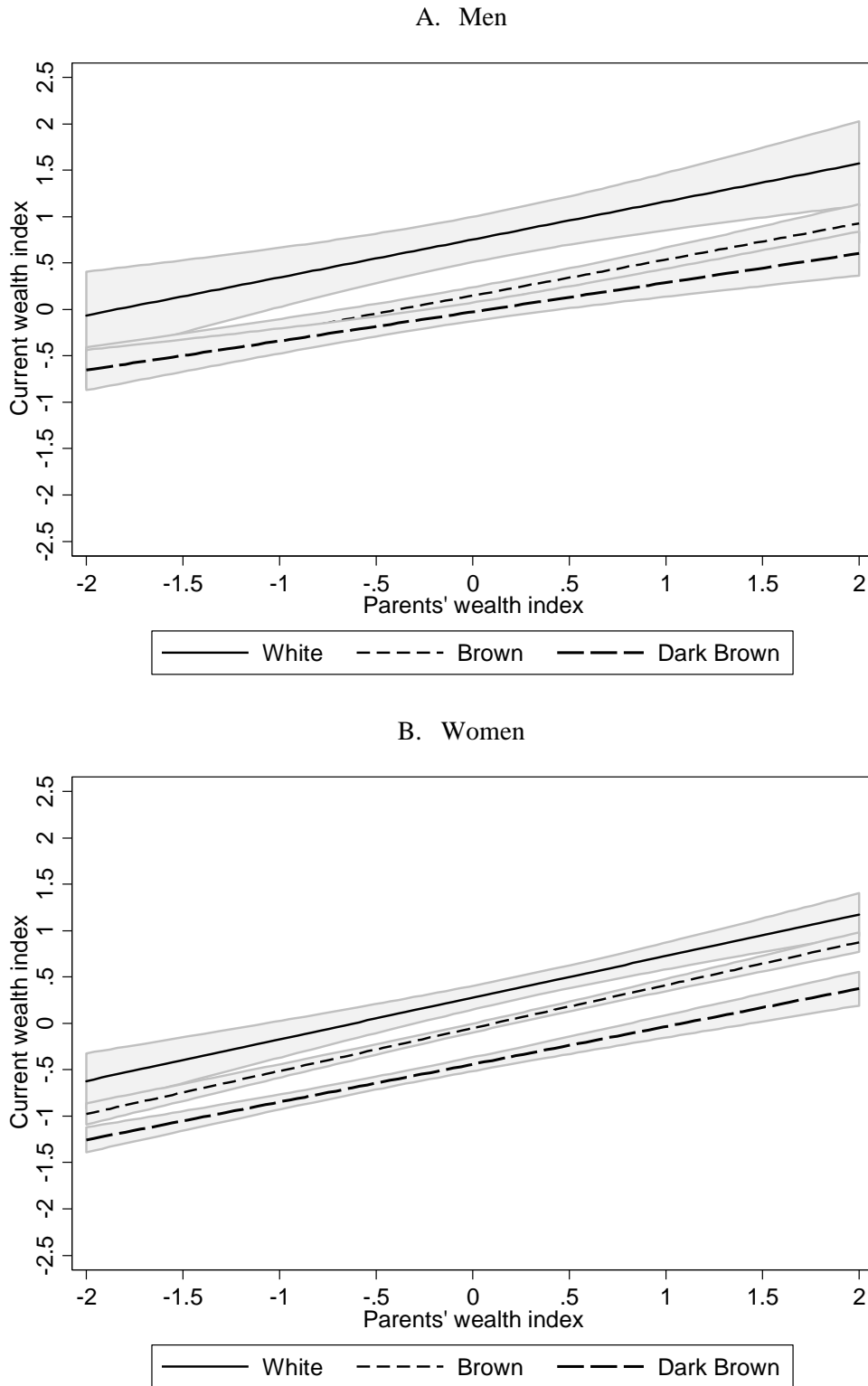
**Notes:** Robust standard errors in brackets. <sup>†</sup>p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001. Pr(College | White) = 0.17. Coefficients for the skin tone categories represent the discrete change in the probability of attaining college education due to skin color (as a dummy variable, from 0 to 1) and should be interpreted as relative to the White group (PERLA 1-3). In column 4 we include standardized measures of stress at the parental home and parenting style. The variables of interest are dummy identifiers of each subject's skin color as follows: White group (PERLA 1- 3), Light Brown (PERLA 4), Medium Brown (PERLA 5), Brown (PERLA 6), and Dark Brown 5 (PERLA 7-11). Coefficients are estimated using a linear probability model with a dummy identifier of college education as dependent variable.

**Table 7: Robustness, Economic Outcomes and Skin Color by Gender**

	(1) Years of schooling Male	(2) Years of schooling Female	(3) Log (Hourly wage) Male	(4) Log (Hourly wage) Female	(5) Current wealth rank Male	(6) Current wealth rank Female
Skin tone (std.)	-0.19 [0.274]	-0.44*** [0.115]	-0.11* [0.048]	-0.10 [0.069]	-4.54*** [1.241]	-6.10*** [0.800]
Age	0.68*** [0.142]	0.44*** [0.076]	0.06 [0.049]	-0.03 [0.056]	5.03*** [0.936]	2.21*** [0.594]
Age squared	-0.01*** [0.002]	-0.00*** [0.001]	-0.00 [0.001]	0.00 [0.001]	-0.04*** [0.010]	-0.02* [0.007]
Cognitive	0.68*** [0.204]	0.73*** [0.145]	0.02 [0.047]	-0.09 [0.057]		
Non-cognitive	0.49** [0.171]	0.61*** [0.114]	0.03 [0.046]	0.11 <sup>†</sup> [0.060]		
Years of schooling			0.06*** [0.014]	0.07** [0.021]		
Indigenous parents					5.95 [4.450]	-2.49 [3.166]
Parents' wealth percentile rank	0.03*** [0.009]	0.03*** [0.005]	0.00* [0.002]	0.00 [0.003]	0.36*** [0.046]	0.43*** [0.028]
Parents' education (completed elementary school)	0.50 [0.508]	0.91*** [0.273]	-0.13 [0.207]	0.19 [0.268]		
Parents' education (middle school)	1.36* [0.613]	0.51 [0.344]	-0.03 [0.232]	0.17 [0.297]		
Parents' education (high school)	1.57 <sup>†</sup> [0.824]	1.83*** [0.448]	0.05 [0.279]	0.32 [0.354]		
Parents' education (college)	2.66** [1.011]	3.09*** [0.643]	0.16 [0.364]	0.23 [0.366]		
Parenting style	0.37 [0.236]	0.20 <sup>†</sup> [0.109]	-0.02 [0.074]	0.01 [0.057]	1.28 [1.759]	0.40 [0.875]
Stress at parental home	0.06 [0.229]	-0.05 [0.108]	-0.10* [0.050]	-0.02 [0.053]	-0.09 [1.648]	-1.40 [0.865]
Both parents	0.25 [0.490]	0.39 [0.273]	-0.20 [0.168]	-0.07 [0.141]	4.87 [3.559]	1.06 [2.106]
Observations	735	1,781	441	826	737	1,784
R-squared	0.276	0.375	0.218	0.230	0.242	0.353

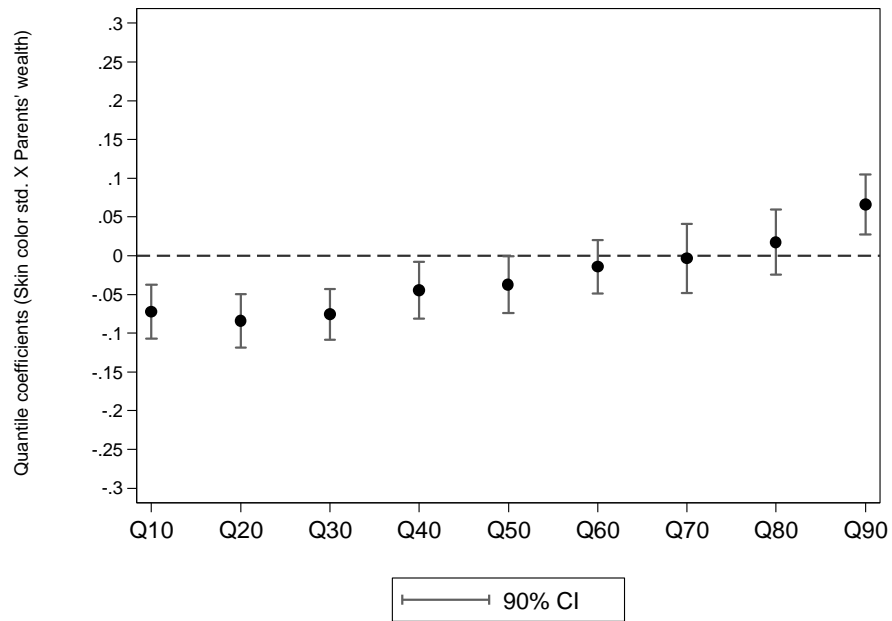
**Notes:** Robust standard errors in brackets. <sup>†</sup>p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001. Columns 1-2 present the effect of skin color on years of schooling as shown in Table 2. Columns 3-4 present the effect of skin color on hourly wages as shown in Table 3. Columns 5-6 present the relationship between intergenerational mobility and skin color. Results are shown separately for men and women.

**Figure 7: Robustness, Relationship Between Current and Parents' Household Wealth by Skin Color and Sex**



**Fig. 7** shows the relationship between the percentile wealth rank of adult children (y-axis) and that of their parents (x-axis) by skin color and sex. Estimates from OLS regressions on the binned data are reported for each group. Based on the regression analysis, we formed three groups with similar results: White (PERLA 1-3), Brown (PERLA 4-5), and Dark Brown (PERLA 6-11). Confidence intervals at the 90% level are presented in light gray.

**Figure 8. Intergenerational Mobility and Skin Color**



**Fig. 8** presents the interaction coefficient (Skin color std. x Parent's wealth) of a conditional quantile regression (controlling for gender, age and age squared) of current versus parental wealth percentile rank. Confidence intervals at the 90% level presented in black.