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Being white is a full time job? Explaining skin tone gradients in income in Mexico

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ABSTRACT

While scholarship on wage discrimination has confirmed that ‘racism’ is persistent, recent insights indicate that ‘colorism’ – the idea that lighter skin tones are rewarded more compared to darker ones, all else equal – is often more relevant in some societies where race or ethnicity are less salient markers. In this article, the following underlying theoretical mechanisms are discussed and are subjected to an empirical test: differential investment in human capital, i.e. education; variation in occupational status, i.e. being employed in indoor white-collar vs outdoor blue-collar jobs; and concentration in richer vs poorer regions. Mexico, known as a country where race and ethnicity generally are less salient categories for social stratification while skin tone is more important, is used as a case. Based on regression analyses on the most recent 2017 wave of the National Survey on Discrimination in Mexico, we show that there is an effect of skin tone on income that is explained by differences in education, occupational status and, to a lesser extent, regional concentration. Triangulating the findings with data from 2010 indicate that if colorism is at work, it are the lightest tones that are privileged, not the darkest ones that are penalised.

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1. Introduction

In an ever-diversifying social world, the unequal treatment of minorities, and in particular racial and ethnic minorities, is of paramount interest of social science research and policy makers. For wage inequalities, the argument is that employers either have a ‘taste for discrimination’ (Becker 1957), i.e. discrimination rooted in prejudice towards minorities, or apply ‘statistical discrimination’ where individual unobservable productivity characteristics such as skill levels are inferred from observable markers or ‘signals’ (Phelps 1972; Arrow 1973). The result of both forms of discrimination is that minorities generally report lower incomes, all else equal (Waters and Eschbach 1995).

When studying minorities, a focus on race and ethnicity might conceal the importance of the so-called colour line (cf. Darling-Hammond 2004). Indeed, the study of gradients in

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income has mostly focused on rather arbitrary US census categories¹ (Waters and Eschbach 1995, 421), or on country of origin in scholarship across the Atlantic (Adsera and Chiswick 2006) or the Pacific (McDonald and Worswick 1999). Such studies implicitly take for granted that either race or ethnicity are salient markers; however, in some societies, these social categories are of subordinate importance, because stratification occurs more along skin complexion. Skin tone might by itself even vary greatly within racial or ethnic categories (Keith and Herring 1991; Branigan et al. 2013), serving independently as a criterion for discrimination. The aim of this manuscript is to study differences in incomes along the colour line in a country in which skin tone is of high relevance: Mexico. Selecting this case allows for a deeper understanding of the *process* of discrimination based on ‘colorism’ (cf. Hunter 2007) that extends the literature on racial or ethnic discrimination.

At first glance, skin tone might be an excellent case to inquire taste-based ‘colorism’ discrimination, i.e. employers, all else equal, might invest less in people with skin tones that society perceives as lowest in the hierarchy.² However, such assumption vastly overlooks the complexity of skin tone, which tends to downplay mechanisms of statistical discrimination. By itself, statistical discrimination assumes that variation in skin tones marks unobservable characteristics relevant for specific jobs (Arrow 1998), most prominently human capital investment (Altonji and Blank 1999). Skin tone might also relate to skill qualifications,³ as darker tones could result from lower-status outdoor-jobs with lower wages while lighter skin tones reflect higher-status indoor-jobs with higher salaries (Hersch 2008). Lastly, geography might matter, too, as skin tones lighten in regions that are more distant from the equator (Webb 2006), making lighter tones more concentrated in the affluent north.⁴ The aim of this article is to put these arguments to an empirical test, assessing whether income differences along the colour line exist after accounting for explanations aligning to arguments of statistical discrimination.

Research into social stratification along the colour line is limited but growing (Hall 2013; Dixon and Telles 2017), and becoming more increasingly complex by incorporating the interaction with race (Villarreal and Bailey 2019). Yet, earlier studies on ‘colorism’ insufficiently focused on income disparities and the underlying stratification mechanisms, often because of data limitations. US outcomes show that among blacks, those with lighter skin tones have historically been associated with more prestige (Keith and Herring 1991), making that African Americans with darker complexion are penalised in the labour market (Goldsmith, Hamilton, and Darity 2006; see also Hersch 2011 and Hunter 2007). In Mexico, ‘colorism’ has been widely addressed for several outcomes, including poverty risk and affluence (Villarreal 2010; Campos-Vazquez and Medina-Cortina 2019), but a thorough study across the whole income distribution is absent. While Villarreal (2010) found that darker skin tones have a higher poverty risk and are less likely to be affluent, it is not fully clear what processes drive these findings. In a more recent study, Campos-Vazquez and Medina-Cortina (2019) show that light-skinned Mexicans’ salary is 53 percent higher compared with their dark-skinned compatriots. Although they argue that the gap is not greatly affected by including detailed controls, detailed information on how skin tone could influence wages is missing. By studying the ENADIS 2017 National Survey on Discrimination in Mexico (INEGI 2018) – aiming to be representative of households in Mexico⁵ – we aim to complement these studies by providing a more comprehensive view on how skin complexion affects incomes.

In order to study the relationship between skin tone and income, we first review the literature in the second section of the article, introducing the concept of wage discrimination, distinguishing between taste-based and statistical discrimination, and highlighting the relevance of skin tone as a marker. We then introduce the Mexican case, central in this study. In the third section, we present the data, which differ from Villarreal's pioneering work (2010) and Flores and Telles' response (2012), as well as are different from recent findings (Campos-Vazquez and Medina-Cortina 2019). The fourth section shows the findings, distinguishing between bivariate and multivariate statistics, as well as a robustness check using earlier data. Although our study supports the idea that there is a skin tone gradient in wages, they largely reflect educational inequalities; results suggests that while the lightest-skinned respondents are clearly rewarded, the darkest groups are not necessarily the most penalised. In the final section, conclusions for the study of discrimination based on skin tone are drawn.

2. Literature review

2.1. *On taste-based and statistical discrimination*

Discrimination in income presupposes that for equal qualifications, some individuals are rewarded more than others. Gary Becker (1957) coined that some employers simply have a 'taste for discrimination' – employers, based on prejudices, prefer to invest their assets in job candidates they like; put differently, they 'would pay to maintain social or psychological distance from members of a particular group' (Figart and Mutari 2005, 476). With equal qualifications, workers from less preferred groups have two options: either they are more productive for the same wage, or they receive a lower pay for similar productivity.

Recent scholarship has turned their attention to correspondence tests to study the taste-based discrimination: relevant vacancies are being responded by fictitious individuals who are identical in their qualifications but randomly vary in their phenotypic and physiological attributes, e.g. race (Bertrand and Mullainathan 2004), age (Bendick, Brown, and Wall 1999) or sex (Neumark, Bank, and VanNort 1996). Bertrand and Mullainathan's (2004) seminal study shows that job applicants with white-sounding names have a fifty percent higher chance to get a callback than similar applicants with African-American names. Also European studies confirm that employers generally are less likely to hire job applicants of minority origin, as for instance well-documented in a special issue in this journal (Lancee 2019; see also Carlsson and Rooth 2007; Wood et al. 2009; Kaas and Manger 2012).

The increase in popularity of correspondence tests responds to weaknesses in traditional studies on wage discrimination. According to the more subtle form of statistical discrimination (Phelps 1972; Arrow 1973), employers are risk-averse in their hiring decisions; because job applicants are often not known to them, they suffer from omitted information relevant for the job, which they complement by inferring from observable characteristics to unobservable qualities. Employers often have specific ideas about productivity of the group that the applicant is member of: they either rely on stereotypes about labour-market qualifications of the group, or they rely on detailed information on the qualifications of the group the job applicant belongs to. Discrimination, then, is

the result of differences between majority and minority groups that cannot be explained by qualities relevant for the job (Duncan 1969), like for instance levels of education. Yet, such conclusions are criticised, too, often because of the problem of omitted variables that are not present in traditional surveys (Heckman 1998), particularly if such characteristics differ across the attribute of interest. Such criticism informs us that the study of discrimination should thoughtfully consider frequently neglected variables, such as skin tone, which is central to our study.

2.2. Income discrimination along colour lines

Following the logic of taste-based discrimination, there would be a general preference that puts lighter tones on top of the skin tone hierarchy while darker tones are at the bottom. A first strand in the literature explains the existence of such hierarchies because they are socially constructed based on ‘cultural beliefs about civility, modernity, sophistication, backwardness, beauty, and virtue’ (Hunter 2007, 243–144). During US slavery, being Black but of a lighter tone resulted in a more privileged treatment than having a darker skin complexion (Bodenhorn and Ruebeck 2007; Monk 2014). Also, colonialism enforced the idea that lighter skin tones were associated with higher status (Murguia and Telles 1996; Rondilla and Spickard 2007; in Hunter 2007). As elaborated further, these processes not only occurred in the US, but were present in other contexts, too, including Mexico. One of the consequences is the ‘bleaching syndrome’ (Hall 1995) that may lead to psychological distress and even physical modifications to resemble the European white ideal type.

There are, however, possibilities that lower incomes based on skin colour result from the fact that variations in skin tones conceal unobserved differences in qualifications necessary for the labour market. If we depart from the hypothesis that skin tone gradients in income are a reflection of differential investment in human capital, then schools should be considered as a sorting mechanism. Hunter (2007) argues that skin tone hierarchies are reproduced in the classroom, as teachers place higher traits (e.g. hard-working and professional) on light-skinned than on dark-skinned pupils (e.g. lazy and unsuccessful), ultimately devoting more time and attention to students with a lighter skin tone (Murguia and Telles 1996; in Hunter 2007; see also Rosenbloom and Way 2004). The reproduction of such hierarchy continues to take place throughout the school, as teachers also treat parents differently according to skin tone, and student counselors might also stimulate students higher on the colour hierarchy to pursue higher education (Oakes 1985; in Hunter 2007). Citing Hunter (2007, 244), the ‘lighter kids benefit and the darker kids pay the price’. Because of the well-described returns-to-education effects (Hout 2012), it is plausible that higher wages are more common among those with a lighter skin tone.

A second argument why darker skin tones would have lower incomes is because a relationship exists with occupational status, which reflects job autonomy and skill complexity (Breen 2005). The argument is twofold. On the one hand, hierarchies in skin tones might exist during hiring processes, sorting light-skinned applicants in higher status jobs with higher incomes, and dark-toned applicants in lower status jobs with lower incomes (cf. Villarreal 2010). A different argument is coined by Hersch (2008), namely that a dark skin complexion can be the result of lower status jobs, which often involve outdoor work. Continuous exposure to sunlight darkens the skin. As such, the

relationship between skin tone and income might be spurious to occupational status, precisely because jobs higher on the occupational ladder lead to higher incomes (Hout 1984).

A third mechanism that might explain gradients in income along skin tone reflects geographical disparities. This idea aligns with dependency theories (Wallerstein 1974) that divide the world into core or 'rich' countries that benefited most from capitalism and are characterised by technological innovation and high investment, and 'poor' peripheries that supplied the resources to the core. Presently, the distinction between core and peripheral countries collapses to a large extent with the north–south divide (Reuveny and Thompson 2007), with semi-periphery countries, e.g. BRICs-countries,⁶ falling in between both extremes. In a biological redux, one might follow a similar logic to skin tone and geographical concentration: darker skin colours are more concentrated in the peripheral south, while lighter skin colours are more concentrated in the core north (Webb 2006). The concentration of certain skin tones in different regions with different economies would then reflect in variation in individual earnings.

Evidently, these factors do not operate independently from each other. For instance, in poor regions, job opportunities, particularly in higher-status professions, might be grim, making that parents and teachers may persuade young people, particularly of dark skin colour, to not invest fully in higher education. Also, the review makes clear that skin tone is not necessarily an exogenous factor that explains several socioeconomic outcomes, but can be endogenous to them, too. This necessitates the use of not only advanced analysis techniques, but also for a good empirical case.

2.3. The Mexican case

The case we put under investigation is Mexico, which is a popular case for the study of colorism (see Dixon and Telles 2017). More than two centuries after its independence, Mexico is still facing the consequences of having inherited a highly stratified society from its colonial past (see Villarreal [2010], but also Chavez-Dueñas, Adames, and Organista [2013], and Castellano Guerrero, Gómez Izquierdo, and Pineda [2009] for a detailed review). Undoubtedly, skin tone largely albeit not solely reflects genetic variation (Moreno-Estrada et al. 2014). The significant genetic heterogeneity and corresponding large variation in skin tones across Mexico reflects pre-Hispanic times (Moreno-Estrada et al. 2014), but was 'transformed by the Spanish conquest and colonisation, the nationalist processes of the nineteenth and twentieth centuries and the historical internal and external immigrations' (Castellano Guerrero, Gómez Izquierdo, and Pineda 2009, 217). Mexico's subjection under Spanish rule did not only brought Europeans to Mexico, but also introduced enslaved Africans into the country's racial mix.

During the Spanish rule, a *casta* system was imposed, determining a person's social importance, with the *criollo* (born of pure Europeans in America) and the *mestizaje* (mixture of indigenous with the Spanish) on top of the hierarchy (Chavez-Dueñas, Adames, and Organista 2013). At the end of Spanish dominance (1821), the largest group still was the indigenous group; the enslaved African started to mix into the *mestizo* group, while also the white upper class was large. Historically, the *mestizaje* is strongly recognised in Mexico and even became a cultural category instead of a racial one, embracing the idea being that racial mixture is a dominant model that has made racial purity irrelevant (Wade 1993). Precisely because of its complex racial makeup,

genetic studies have been introduced recently to trace long historical legacies (Moreno-Estrada et al. 2014). Although, the *mestizo* society was, as Castellano Guerrero, Gómez Izquierdo, and Pineda (2009, 218) claim, “‘free’ of racism by definition’, at present day, race is not irrelevant in Mexico. Recently, a government-led campaign encouraged embracing Afro-Mexican self-identification (Villarreal and Bailey 2019).

Nevertheless, in spite of the pride for racial mixture, there still is a strive for phenotypical whiteness (Van den Berghe 1967; Sue 2009). Villarreal (2010) exemplifies this well using a quote from Friedlander’s study (1975, 77) on Hueyapan: ‘Villagers openly expressed their preference for light skin, blue eyes, curly and/or blond hair’. In everyday practices, the social hierarchy of skin tone with a preference for whiteness is being reproduced. A clear example are Mexican soap operas *telenovelas*, like *Teresa*,⁷ as Hunter (2007, 240) diagnoses that ‘almost all of the actors look white, unless they are the maids and are then light brown’. Also advertisement carries out the ideal of a white skin, by prioritising lighter-toned models and by marketing products that lighten the skin tone (Winders, Jones, and Higgins 2005). This culturally shared norm that lighter skin tones are on top of the skin tone hierarchy is therefore also the basis of our hypothesis in this analysis, as it implies that *lighter skin tones have higher incomes than darker skin tones* (H1).

Thorough empirical research on the relationship between skin tone and income in Mexico has been limited because both variables are rarely measured concurrently. Yet, Villarreal (2010) and Campos-Vazquez and Medina-Cortina (2019) indicate that lighter skin tones are rewarded more; the underlying mechanisms why this is the case is less well discussed. Recent outcomes shed more nuance, as Villarreal and Bailey (2019) show that at the descriptive level, those who identify as black report no lower income than those who do not self-identify their race as Black. As their study thickens, more advanced instrumental variables techniques reveal a negative effect. The authors’ explanation for this interesting finding is that ‘the earnings advantage of Afro-Mexicans (...) may indeed be attributed to a greater tendency for Mexicans with greater earnings potential to embrace a black identity’ (Villarreal and Bailey 2019, 19).

To prevent that the skin tone hierarchy affects social outcomes, the Mexican Constitution prohibits discrimination on various grounds, including ethnic or national origin. In 2003, the Federal Law to Prevent and Eliminate Discrimination in Mexico created the National Council to Prevent Discrimination to recognise and embrace the diverse composition of Mexico and to further understand how discrimination is experienced and differences between people are perceived. Among the first acts of this National Council was to set up surveys to have a clear understanding of discrimination among vulnerable groups. In tandem with the Project on Ethnicity and Race in Latin America (PERLA), it has been traced what the social consequences of variation in skin tones actually are (for a review, see Trejo and Altamirano 2016). Based on four different skin tones, Villarreal (2010, 665) shows that darker tones have a lower educational attainment, which hints about the idea that *the positive effect of lighter skin tones on income can be explained by higher levels of education* (Hypothesis 2).

Another socioeconomic mechanism that is central in our study is occupational status. Also here, it is confirmed that there is a relationship between skin tone and status; Villarreal (2010, 666–7) reports that among the group of manual workers, only 9.4 percent consider themselves as white, whereas this is 28.4 percent among the professional category.

This evidence suggests that *higher reported incomes by Mexicans with a lighter skin tone can be explained by occupying jobs with higher status* (Hypothesis 3).

In final, theoretical reasoning flowing from dependency theories (Wallerstein 1974) assumes that regional divides also explain the relationship between skin tone and income. The application to Mexico is rather complex, as in comparative studies, this country is recognised as a semi-peripheral country (Chase-Dunn, Kawano, and Brewer 2000). Also geopolitically, the IMF (2019) confirms that while Mexico is the fifteenth largest economy of the world, the northern states are adjacent to the first economy of the world, i.e. the US, while the southern states border to Guatemala (#66) and Belize (#166). Such observation departs from methodological nationalism, neglecting variation within the country. As economic indicators show, strong regional variation exists, with the most affluent state being Mexico City with an equalized disposable household income slightly higher than 10,000 US dollar, while also Nueva Leon, Sonora, Baja California, Baja California Sur, and Coahuila – all in the north – higher than 8,000 US dollar; on the other hand in the South and South-West, with Chiapas, Oaxaca, Guerrero, Puebla, and Tlaxcala disposable incomes are below 5,000 US dollar (OECD 2015). Additional rankings based on the Human Development Index confirm this north–south divide (UNDP 2015). The complexity is that the north–south divide in skin tone also reflects the colonial past, with African descendants being particularly concentrated in southern states like Oaxaca, Guerrero and Veracruz (Villarreal 2010). Combined we propose that *lighter skin tones have higher incomes because they are concentrated in the affluent north of the country* (Hypothesis 4).

3. Data and methods

The data used in this manuscript come from the 2017 National Survey on Discrimination in Mexico, carried out by the National Institute of Statistics and Geography (INEGI 2018). The data are freely accessible.⁸ The sampling design is probabilistic, aiming for generalisation to the Mexican population. A random sample of households was selected based on a multi-staged stratified sample frame; primary sample units were selected proportionally to their weight in the population. Households were selected from all 31 states and Mexico City. The fieldwork took place from 21 August to 13 October 2017. In this period, 39,101 households were visited with multiple household members being interviewed face-to-face, leading to a data set with more than 100,000 respondents.

Important to note is that the setup of the survey contains several modules, with different respondents being offered different modules. Our key question on skin tone is part of the module ‘Questionnaire about Opinions and Experiences’, which was only offered to 35,242 respondents.⁹ In addition, because our research question deals with skin tone gradients in reported income we can only include respondents that make money from work, we delineate based on the occupational status question. This already reflects in the gender distribution of the sample, as more men (57 percent) than women (43 percent) have salaried work. Last, we limit the sample to the active population of 18 to 65 years old; although youth employment and elderly work are common, we do not want these processes influence our results. After listwise deletion, 15,188 respondents remain.

Table 1. Descriptive statistics of the continuous variables of interest.

Variable	Min	Max	Mean	Std Dev
Reported monthly income	640	60,000	6,369.780	5,794.757
Logged reported monthly income	6.461	11.002	8.487	0.724
Skin tone	1	11	6.634	1.433
Age	18	65	39.180	11.770

Source: INEGI (2018). $N = 15,188$, unweighted data

While the study aimed at being representative and generalisable for the Mexican population, unweighted descriptives (see [Tables 1](#) and [2](#)) indicate some biased patterns, with for instance relatively low response in the *Centrosur* region (which hosts capital Mexico City). To correct for this, INEGI has included a weight variable (factor) to calculate population weights. To calculate these weight coefficients, the factor-variable needs to be multiplied by the total number of cases (134,591) and divided by the Mexican population size (estimated to be 123,150,000 for 2017). A description of the weight coefficients leads to a distribution ranging from 0.007 to 59.294, with a mean of 1.002 and a standard deviation of 2.167. In spite of weighing the data, the survey seems to suffer from an underrepresentation of lighter skin tones.¹⁰

Pioneering studies on social stratification based on skin tone in Mexico have not engaged with the recent ENADIS-survey. Villarreal (2010) has looked at the 2006 MIT Mexican Panel Study, a survey representative of all Mexicans in which both interviewer and interviewee were asked to rate the respondent's skin tone on a four point-scale. Villarreal's (2010) study did not excessively focus on income differences but rather on poverty risk and the likelihood of affluence. Second, Flores and Telles' (2012) response focused on a different survey, namely the Mexican part of the America's Barometer (LAPOP 2010), with the argument that the four point-scale highlighted by Villarreal (2010) did not

Table 2. Descriptive statistics of the categorical variables of interest, 2017.

Variable	Category	N	Pct
Education	Lower	3,404	22.412
	Middle	8,409	55.361
	Higher	3,375	22.221
Occupational status	Elementary	3,142	20.687
	Plant and machine operators	1,639	10.791
	Craft and related trades work	2,038	13.418
	Skilled agriculture and fishery	457	3.009
	Service work, shop and market sales	1,576	10.377
	Clerks	2,027	13.346
	Technicians and associate professionals	1,078	7.098
	Professionals	2,588	17.040
	Managers, senior officials and legislators	643	4.234
	Region	Noroeste (North-West)	2,610
Noreste (North-East)		1,226	8.072
Occidente (West)		1,752	11.535
Oriente (East)		2,654	17.474
Centronorte (Central-North)		2,638	17.369
Centrosur (Central-South)		1,133	7.460
Suroeste (South-West)		1,283	8.447
Sureste (South-East)		1,892	12.457
Gender		Man	8,690
	Woman	6,498	42.784

Source: INEGI (2018). $N = 15,188$, unweighted data.

fully untangle the vast variation in skin tones; LAPOP asked the interviewer to rank the respondent's skin tone on a 1–11 scale. Unfortunately, Flores and Telles' response (2012) did not highlight income as an outcome variable. More recently, Campos-Vazquez and Medina-Cortina (2019) analysed the Survey of Social Mobility in Mexico, fielded among 2,616 adults. The reason why we analyse the ENADIS-data is first the fact that it aims to be representative of all Mexican households, guaranteed by the fact that it has been carried out by INEGI; second, the sample size is rather high, allowing for refined analyses of underlying processes; third, the survey has been designed and used in policy-oriented studies on discrimination, making it one of the most relevant Mexican surveys to study wage inequalities.

3.1. Dependent variable

The dependent variable is constructed based on two questions, namely first how much the respondent made for its work or activity [*¿Cuánto gana por su trabajo o actividad?*], which was an open question, truncated to 98,000 pesos or more (equivalent to 5,404 USD or 4,729 EUR at July 2017 exchange rates). The second question asked for the reference period, namely (a) per week [*a la semana*], (b) bi-monthly [*a la quincena*], (c) monthly [*al mes*], (d) yearly [*al año*]. Wages have been recoded to reflect monthly income. Descriptives indicate a reported monthly income ranging from 640 MXN (or 35.29 USD or 30.89 EUR) to 60,000 MXN (or 3,308.65 USD or 2,895.57 EUR).

After calculating the monthly income, we take its natural logarithm for two reasons. First, because incomes are skewed, taking the natural logarithm of disposable income reflects a normal distribution more. Second, the interpretation of the regression outcomes is more intuitive: an increase of one unit in the independent variables translates with an increase of the regression coefficient in percentage monthly income. Figure 1 shows the income distribution before (left) and after (right) calculating its natural log.

3.2. Independent variable

Respondents were offered the palette of 11 skin tones, widely used in the PERLA-studies, ranging from 1 (darkest skin tone) to 11 (lightest). Figure 2 represents the darkest and

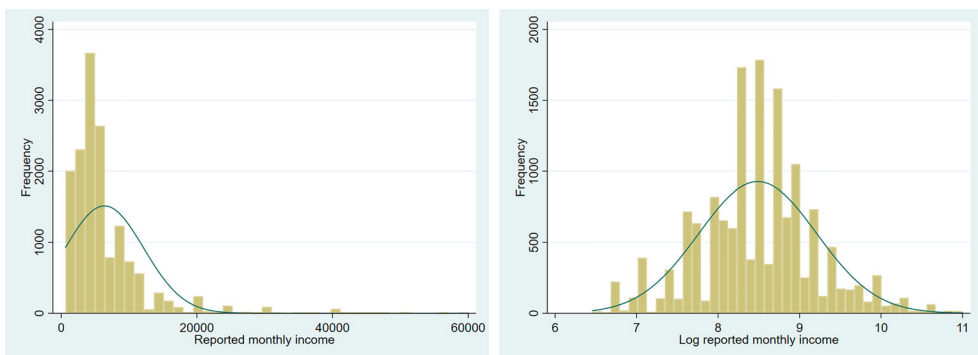


Figure 1. The distribution of income in ENADIS 2017.

Note: $N = 15,188$; unweighted data.

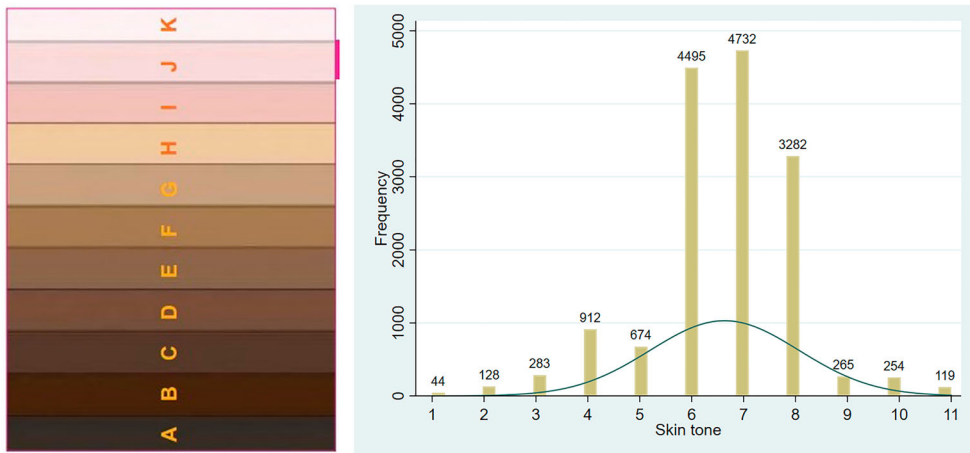


Figure 2. Measuring skin tone in ENADIS 2017 and its distribution.

Note: $N = 15,188$; unweighted data.

lightest skin tones in the questionnaire, with their accompanying survey letter. While the LAPOP-survey instructed interviewers to rate the skin tone, which might lead to biased assessments (e.g. interviewers who question dark-skinned respondents of high social class might perceive their skin tone as lighter as it objectively is), also self-assessed skin tone, as central in this article, are not undisputed. As Villarreal (2010) using self-assessed measures warns, there might be biased responses in skin tone, particularly because light skins are on top of the social hierarchy. This warning has been demonstrated in recent American findings that self-rated skin tone correlates with perceived discrimination (Monk 2015), and that among US Hispanics, interviewer-assessed skin tones are more normally distributed compared to self-assessed skin complexion (Uzogara 2019). Nevertheless, in spite of Villarreal's (2010) own warnings, he also discovered high reliability in self-assessed skin tones. In combination with other discussed advantages of ENADIS 2017, we can proceed with the empirical analyses; results should nonetheless be interpreted with care, because descriptives indicate that the seventh darkest category attracts the lion's share of the respondents clump around category 6, 7 or 8, with the mode being 7. Our data also confirms that women have a lighter (6.852, $sd = 0.016$) skin tone than men (6.470, $sd = 0.016$).¹¹

3.3. Intervening variables

In this study, we highlight three variables that can explain a positive relationship between skin tone and income. First, we explore the role of education, which was surveyed using the question 'What grade did you pass at school?' [*¿Hasta qué grado aprobó en la escuela?*]. 'None' [*ninguno*], 'preschool' [*preescolar*] and 'primary' [*primaria*] are recoded as 'lower education' (reference category). Subsequently we created the category 'middle education' using the responses 'secondary' [*secundaria*], 'normal basic' [*normal básica*], 'technical training with completed secondary' [*carrera técnica con secundaria terminada*], high school or baccalaureate [*preparatoria o bachillerato*], and 'technical training with completed high school' [*carrera técnica con preparatoria terminada*]. Lastly 'academic or

professional bachelor' [*licenciatura o profesional*], and 'master or doctorate' [*maestría o doctorado*] are recoded as 'higher education'.

Secondly, occupational status is considered, which is derived from a general question of occupation – *¿Cuál es la ocupación principal?* – which reflects the Mexican system to classify occupations and can be grouped into nine categories based on the ISCO-88-classification (ILO 2016). We distinguish between 'elementary occupations', i.e. the lowest skill complexity which therefore serves as reference category. The second category is 'plant and machine operators'. 'Craft and related trade workers' is the third category. Fourth, there is the group of 'skilled agricultural and fishery workers'. The fifth category distinguished is 'service and sales workers'. The sixth category is 'office clerks' while the seventh category is composed out of 'technicians and associate professionals'. The eighth and ninth category, in final, consist of respectively 'professionals', and 'legislators, senior officials and managers'.

Thirdly, area of residence is considered, which in the survey was obtained from the administrative information regarding the federal state the respondent was interviewed. These states have been post-coded into the eight regions North-West [*Noroeste*] (Baja California, Baja California Sur, Chihuahua, Durango, Sinaloa, and Sonora), North-East [*Noreste*] (Coahuila, Nueva León, and Tamaulipas), West [*Occidente*] (Colima, Jalisco, Michoacán, and Nayarit), East [*Oriente*] (Hidalgo, Puebla, Tlaxcala, and Veracruz), Central-North [*Centronorte*] (Aguascalientes, Guanajuato, Querétaro, San Luis Potosi, and Zacatecas), Central-South [*Centrosur*] (Mexico City, México, and Morelos), South-West [*Suroeste*] (Chiapas, Guerrero, and Oaxaca), and South-East [*Sureste*] (Campeche, Quintana Roo, Tabasco and Yucatán). Based on official statistics, we expect the South-West to be the poorest region with lowest reported incomes, serving as our reference category, while *Centrosur* (containing the capital city) as well as the northern regions are expected to have the highest reported incomes. Tables 1 and 2 present descriptives of the relevant variables.

3.4. Control variables

The analyses control for age, surveyed by the question 'How old are you?' [*¿Cuántos años cumplidos tiene?*]. As aforementioned, the analyses are limited to respondents aged 18–65. Because we expect that income reflects experience and therefore age, the hypothesis is that elderly report a higher salary than the younger respondents. We also control for gender, distinguishing between 'man' [*hombre*] and 'woman' [*mujer*]; 'man' serves as reference category in the analysis. We expect that men report a higher income than women.

4. Results

4.1. Bivariate analysis

In Figure 3, we graphically represent the association between skin tone and the logarithm of reported income, as well as the respective associations between education, occupational status and region on the one hand, and reported monthly income on the other hand. Pane A shows a positive association between skin tone and monthly income: the lighter the skin tone, the higher the income. There is one notable exception, as the darkest skin tone report approximately the same income as the lightest skin tones.¹²

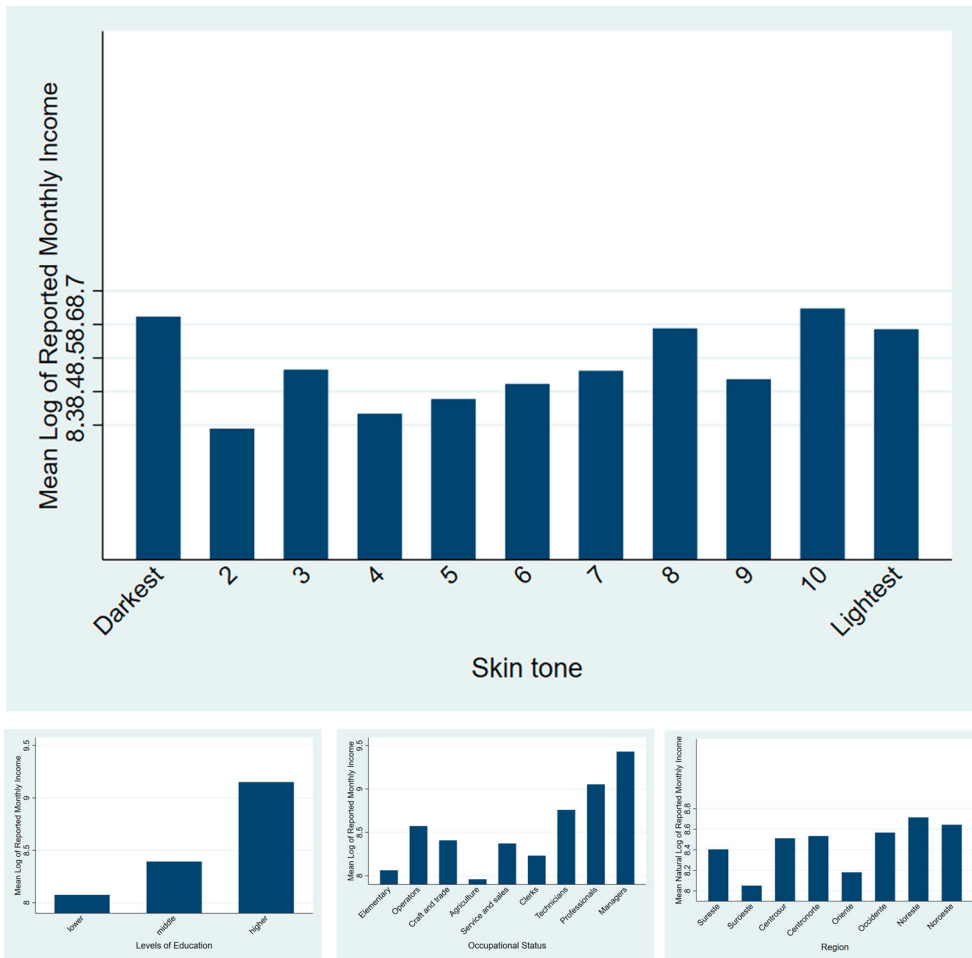


Figure 3. The relationship between reported monthly income, skin tone, and the relevant mediating variables.

The bivariate exploration clearly shows a positive association between education and income, as reported in Pane B: respondents with a higher level of education (academic or professional bachelor, and master level or higher) make significantly more than the middle and lower educated. Concerning occupational status (Pane C), generally a positive trend can be diagnosed: being employed in a higher status corresponds with a higher income, with particularly the highest group (managers, senior officials and legislators) standing out. Respondents employed as skilled agricultural or fishery workers actually report incomes lower than the expected ‘elementary’ professions. As for the regions (Pane D), three regions stand out in terms of highest household incomes, namely North-East [*Noroeste*], North-West [*Noroeste*], and West [*Occidental*]; not surprisingly, these regions are closest to the US border. Lowest household incomes are reported in South-West [*Suroeste*] and the East [*Oriente*], the two regions most distant from the US.

Additional bivariate explorations indicate a positive association between skin tone and education ($F = 160.45$; $p < 0.001$). The higher educated have a significantly lighter skin

colour (7.005; $sd = 0.046$) than the middle (6.717; $sd = 0.036$) and the lower educated (6.393; $sd = 0.062$). Significant differences also exist for occupational status ($F = 37.34$; $p < 0.001$), with the lower occupational stratum having a darker skin tone (6.598; $sd = 0.071$), while managers have the lightest skin tone (7.064; $sd = 0.097$). Those working in agriculture and fishery, and who are therefore more exposed to sunlight, have the darkest skin tone (6.292; $sd = 0.098$). Additionally, a positive association between skin tone and region ($F = 20.45$; $p < 0.001$) exists, with as expected darkest skin tones reported in the South-West (6.341, $sd = 0.062$) with the lightest skin tones reported in the capital region of Central-South. However, a clear north–south divide is less present in the data. Combined, this exploratory analysis indicates the necessity of multivariate analyses.

4.2. Regression analysis

Turning to the multivariate analysis, Model 1 of Table 3 shows the regression coefficient of skin tone controlling for age and gender.¹³ Holding constant for these covariates shows that income on average increases with 5.8 percent when being one shade lighter in skin colour, which confirms our starting Hypothesis 1. Put differently, there is an income difference of approximately 60 percent between the lightest and darkest skin tones, confirming Campos-Vazquez and Medina-Cortina (2019).

In Models 2a, 2b and 2c, we test whether this skin tone gradient in the natural log of reported income is attributable to the respondent's level of education, occupational status, or region of residence. The analysis indicates that this is partially true: the regression coefficient of skin tone (Model 2a) decreases by 59 percent (from 0.058 to 0.024) when levels of education are added to the model; in this multivariate model, the bivariate finding that the higher educated have a higher income is confirmed; the analysis therefore also confirms Hypothesis 2. Instead of levels of education, the occupational status is added in Model 2b. The analysis shows some moderate mediation,¹⁴ as the coefficient drops from 0.058 to 0.028. The analysis shows that there is a linear trend to higher incomes along status lines. As such, Hypothesis 3 is confirmed. Model 2c shows that the region of residence weakly affects the skin colour regression coefficient, namely by 17 percent (from 0.058 to 0.048). Compared to the South-West region, we do see that the region comprising Mexico City (*Centro-sur*), as well as the more northern regions, report higher incomes, giving some confirmation for Hypothesis 4.

Adding the three theoretically relevant intervening variables – education, occupational status and region – to the model simultaneously, Model 3 shows that the regression parameters of skin tone are even more reduced, rendering it to nonsignificance. Almost 80 percent of the bivariate skin tone effect of Model 1 is explained by the combination of all relevant variables in the model, raising the explained variance to slightly more than 40 percent.

Figure 4 summarises the results of the subsequent regression models by plotting the regression parameters (and their confidence intervals) of the models. As the upper coefficient shows, the bivariate effect of skin tone on reported income (under control for age and gender) is rather sizeable. The three subsequent parameters display the effect of skin tone explained by respectively education, occupational skills, and region, and shows that there is some mediation taking place, albeit in varying degree. The lowest coefficient shows that

Table 3. Log of reported monthly income regressed on skin tone and relevant variables.

	Model 1: Controls	Model 2a: Education	Model 2b: Skills	Model 2c: Region	Model 3: Full
Intercept	8.292*** (0.074)	7.893*** (0.073)	8.033*** (0.062)	7.952*** (0.077)	7.581*** (0.067)
Skin tone	0.058*** (0.010)	0.024** (0.009)	0.028** (0.008)	0.048*** (0.009)	0.012 (0.008)
Education (Ref: Primary)					
Secondary		0.354*** (0.028)			0.205*** (0.025)
Tertiary		1.110*** (0.035)			0.695*** (0.037)
Occup. (Ref: Elementary)					
Operators			0.423*** (0.032)		0.310*** (0.030)
Craft and trade			0.276*** (0.047)		0.236*** (0.042)
Agriculture and fishery			-0.216*** (0.057)		-0.139** (0.053)
Service and sales			0.336*** (0.046)		0.247*** (0.048)
Clerks			0.197*** (0.047)		0.092* (0.044)
Technicians			0.735*** (0.048)		0.517*** (0.050)
Professionals			0.955*** (0.036)		0.565*** (0.038)
Managers			1.306*** (0.067)		0.837*** (0.064)
Region (Ref: <i>Suroeste</i>)					
<i>Sureste</i>				0.332*** (0.045)	0.285*** (0.037)
<i>Centrosur</i>				0.423*** (0.066)	0.308*** (0.052)
<i>Centronorte</i>				0.453*** (0.043)	0.380*** (0.034)
<i>Oriente</i>				0.121* (0.047)	0.123** (0.039)
<i>Occidente</i>				0.497*** (0.052)	0.452*** (0.041)
<i>Noreste</i>				0.634*** (0.045)	0.499*** (0.038)
<i>Noroeste</i>				0.566*** (0.042)	0.474*** (0.034)
R^2	0.057	0.294	0.317	0.122	0.418

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Entries represent regression parameters (with robust standard errors between brackets). Models are controlled for age and gender. $N = 15,188$. Population weights apply. Source: INEGI (2018).

in the full model, the regression parameter of skin tone on reported income is rendered nonsignificant, as the confidence intervals overlap with zero.

As Figure 2 shows, the distribution of skin tone is not normally distributed, with respondents clustered around skin tones 6, 7 and 8 (on the PERLA-scale from 1 to 11). To detect whether the results hold for respondents at the extremes, subsequent regression models presented in Table 3 have been performed on a limited set of respondents, as we estimate the difference between the three lightest skin tones (1,241 respondents) and the five darkest skin tones (3,451 respondents). Results represented in Figure 5 indicate first that coefficients are particularly smaller: if skin tone is treated as continuous (Table 3 and Figure 4), the *estimated* income of the lightest tones is 60 percent higher than incomes of the darkest tones; if the extremes are dichotomised (Figure 5), the difference

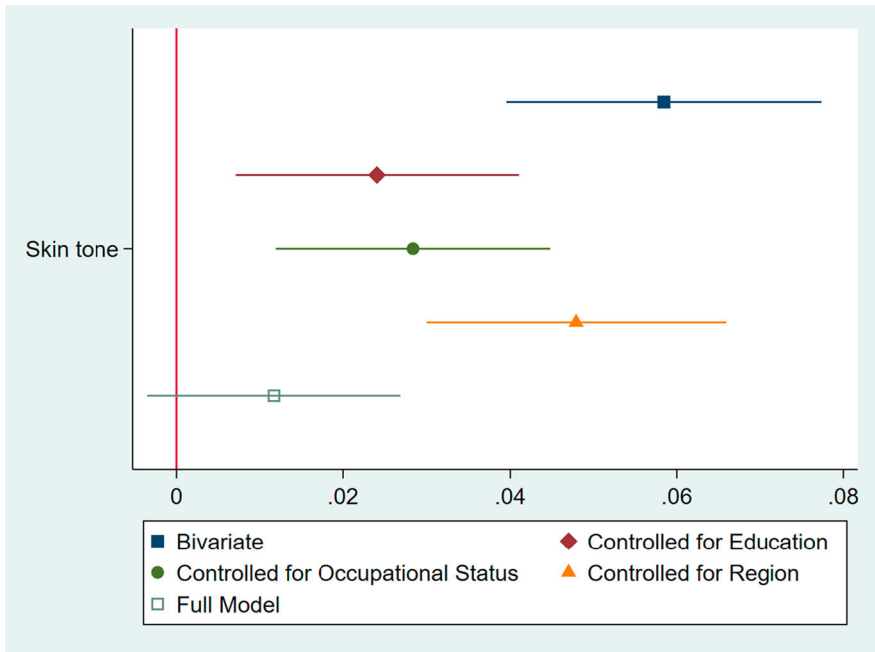


Figure 4. The impact of education, occupational status and region on the regression coefficient of skin tone on reported monthly income.

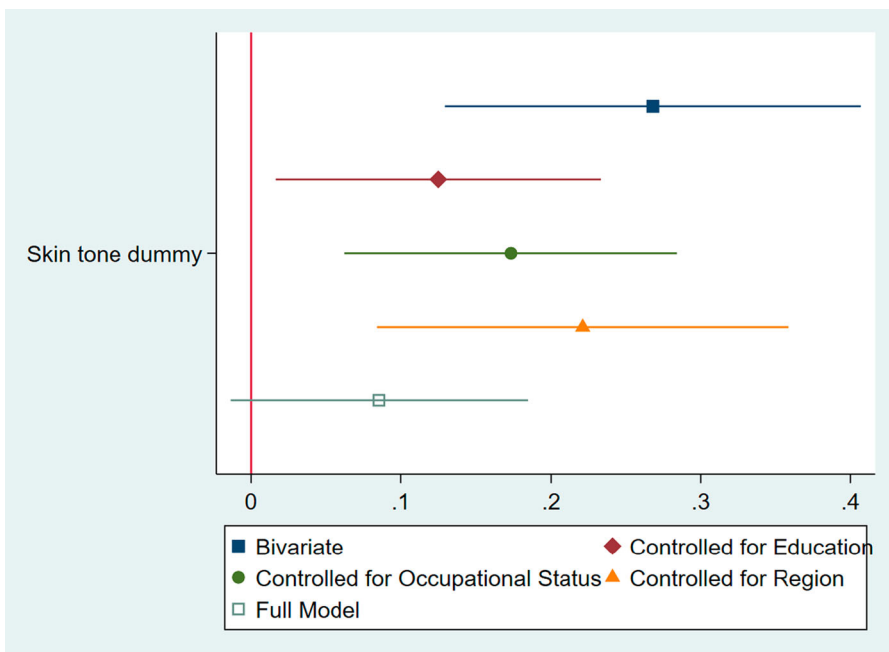


Figure 5. The impact of education, occupational status and region on the regression coefficient of skin tone dichotomized on reported monthly income, reduced dataset.

is almost 30 percent. Second, the explanations of education, occupational status, and region have a similar impact on the skin tone gradient in income as when the whole skin tone distribution is analysed. Importantly, when all variables are added simultaneously, the skin tone effect disappears.

4.3. Robustness check: analysing ENADIS 2010

As a robustness check, we have redone the analysis for the ENADIS 2010 survey.¹⁵ There are two crucial differences between ENADIS 2010 and ENADIS 2017 that puts limitations on the 2010-version. On the one hand, income in the first survey is measured by household income, which might suffer from reporting bias. To account for household size, we calculated the (logarithm of) equivalized household income as a measure of disposable income, akin to the OECD-modified scale (OECD 2013). To

Table 4. Log of equivalized HH income regressed on skin tone and relevant variables.

	Model 1: Controls	Model 2a: Education	Model 2b: Skills	Model 2c: Region	Model 3: Full
Intercept	7.657*** (0.066)	6.937*** (0.077)	7.096*** (0.088)	7.338*** (0.079)	6.443*** (0.094)
Skin tone	0.054*** (0.007)	0.031*** (0.006)	0.041*** (0.007)	0.041*** (0.007)	0.017** (0.006)
Education (Ref: Primary)					
Secondary		0.536*** (0.037)			0.419*** (0.034)
Tertiary		1.221*** (0.054)			0.974*** (0.054)
Occ. status (Ref: Element)					
Industrial & Skilled			0.640*** (0.070)		0.394*** (0.066)
Service and sales			0.591*** (0.063)		0.410*** (0.053)
Technicians and associate professionals			1.033*** (0.084)		0.630*** (0.073)
Professionals			1.339*** (0.098)		0.593*** (0.096)
Managers			0.508*** (0.073)		0.371*** (0.063)
Item nonresponse			0.380*** (0.063)		0.205*** (0.053)
Region (Ref: <i>Suroeste</i>)					
<i>Sureste</i>				0.318*** (0.072)	0.313*** (0.063)
<i>Centrosur</i>				0.564*** (0.068)	0.461*** (0.059)
<i>Centronorte</i>				0.257*** (0.070)	0.278*** (0.060)
<i>Oriente</i>				0.054 (0.071)	0.102 (0.060)
<i>Occidente</i>				0.549*** (0.066)	0.567*** (0.057)
<i>Noreste</i>				0.713*** (0.065)	0.636*** (0.056)
<i>Noroeste</i>				0.628*** (0.066)	0.581** (0.057)
R^2	0.032	0.211	0.151	0.119	0.308

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Entries represent regression parameters (with robust standard errors between brackets). Models are controlled for age and gender. $N = 9,876$. Population weights apply. Source: CONAPRED (2011).

do so, we divided the reported total household income by the so-called equivalized household size. In this calculation, the first adult counts for one, each additional adult or person aged 14 and over counts as 0.5, and each child below 14 counts as 0.3. For instance, a single adult counts as 1, while a household with two adults and two children below 14 count as 2.1.

Second, also the measurement for skin tone differed largely. Respondents, according to their gender, were offered a set of nine different pictures of people (eyes blurred for reasons of anonymity) with varying skin tones, ordered randomly. One problem might be that the skin tone overlaps with ethnic phenotypes, meaning that some respondents were more attracted to the phenotypes in the picture than to the skin tone. Nevertheless, each picture had an accompanying letter ranging from A to G, which was also the response to the skin tone question. Responses have been coded from darkest (code '1') to lightest (code '9') to facilitate the interpretation of the analysis.

In our robustness check, we arrived at models largely identical to the ones presented in Table 3. As the results of Table 4 indicate, we see large parallels to the results on the 2017-data for all variables involved. The results indicate that there are significant bivariate differences in the natural log of the reported equivalized household income, with lighter skin tones reporting higher incomes. A small but nonetheless significant effect of skin tone on the log of equivalized household income remains after accounting for education, skills complexity, region within Mexico, respectively, and even in a full-blown model, mostly confirming the analyses presented in Table 3. There is only one exception: although the regression parameter of skin tone on equivalized household income in 2017 reflects the 2010 coefficient and is rather small, it is significant at a 99% confidence level. Further analyses entering skin tone as eight different dummies into the model shows that no skin tone differs significantly from the darkest reference category, implying that the significant coefficient originates from an overall general pattern underlying the effect.

5. Conclusion

Studies on inequalities based on skin tone are growing, particularly in Mexico (Villarreal 2010; Campos-Vazquez and Medina-Cortina 2019). This is not surprising, as skin complexion is more salient than race in Mexico; by contrast, the US and Europe emphasize respectively race and ethnicity (Hunter 2007). The aim of this article was to complement existing studies on the Mexican case by providing comprehensive insights into *how* skin tones are related to individual wages by analysing the most recent ENADIS 2017-data, and therefore to engage with debates on taste-based versus statistical discrimination. By doing so, we provide insights and heuristics that can be applied to other contexts, not less so in the US and Europe.

While a number of studies argue that across Mexico, dark skin colours negatively affect life chances, the results of our study are more complex. On the one hand, the analysis indicates that there is an income gradient along the colour line. While the regression analyses point to a linear pattern, descriptives show an extraordinary position of the darkest skin tones. Moreover, triangulation with the 2010 data shows that it is not dark-skinned Mexicans that are penalised; rather, we found that wages are particularly high among the two lightest skin tones, all else equal. As such, our study aligns with Campos-Vazquez and

Medina-Cortina (2019), and in particular to Villarreal and Bailey (2019) who at the onset demonstrate that identifying as black does not relate to a lower reported income, yet further argue that higher reported incomes might stimulate black self-identification. Given the absence of racial self-identification, the authors' claim could not be empirically verified in our study, giving fuel to continued research efforts.

In addition, when controlling for theoretically relevant factors of education, skill qualification, and region, there are no observable differences in incomes across skin tones anymore, which nuances existing findings. The combination of education and skill qualification, as well as the fact that the 2010 data, which nonetheless have their limitations, show that the lightest skin tones are rewarded more, allows us to draw the cautious conclusion that the *direct* impact of skin tone on incomes is probably exaggerated but runs through several sorting mechanisms. These mechanisms make that people of darker skin tones end up with lower educational and skills qualifications, which ultimately result in lower paid professions. Public policy could therefore invest more to make access to and treatment of minorities in schools more equal (cf. Rosenbloom and Way 2004). Research found that school personnel respond differently to students depending on their phenotype or physical traits (e.g. Hunter 2007), making that this is not only important for further study, but also a point of emphasis for school professionals.

There is more than this interpretation. Ultimately, it should not be forgotten that in Mexico, the majority of people are *mestizo* – neither white nor black but a mix, reflecting the historical mix between the indigenous and the Spanish. Yet, the dominant idea is that white skin tones are high up on the social ladder, which is culturally reinforced through popular culture (Hunter 2007), for instance in popular *telenovelas* and through advertising. While incomes might become less a reflection of skin tone, educational outcomes and access to the best jobs favour the lightest skin tones. Combined, reducing disparities based on skin tone might be quite hard, precisely because of the fact that Mexican culture values white skin tones excessively, and cultural representations are quite persistent and difficult to change.

The aim of this study was to provide some cues for future studies on wage inequality based on the colour line in contexts other than Mexico. While in the US, stratification based on race is highly relevant, research nevertheless shows that also within racial categories, skin tone variation not only exists, but also have social and economic consequences (Keith and Herring 1991). Similarly, studies on inequalities based on foreign origin are widespread across the European continent. Recent research strategies have opened opportunities to study the independent effect of skin complexion (Lancee 2019). Given the results herein, it would not be surprising if such effects would largely overlap with ethnicity or country of origin.

Evidently, our study suffers from some drawbacks we would like to articulate. First, from a causal argument, Telles (2004) warns that in Brazil, higher income groups rank themselves as whiter than they actually are, invoking the idea that 'money whitens' (see also Monk 2015). Also recently, Villarreal and Bailey (2019) indicate that some with higher incomes identify easier as Afro Mexicans. Although such reversed causality would bias our findings, as skin tone effects would be smaller, we cannot completely rule out this possibility. Second, for a clearer understanding of income discrimination along the colour line, we focused on the target's perspective (i.e. the employee), rather

than the perspective or how employers unfairly judge people of particular phenotypes. Recently, correspondence tests distinguishing between three skin tones have been done in Mexico, showing that the darkest complexion is disadvantaged (Arceo-Gomez and Campos-Vazquez 2014); yet, findings with a larger range of skin tones are missing. Nevertheless, the fact that the expression ‘being blonde is a full time job’ (Kardashian 2015) has penetrated Mexican society in the variant of ‘being white is a full time job,’ albeit in complex ways, is demonstrated in this study.

Notes

1. Vivid debates exist on Asian-Americans, as they are often portrayed as ‘model minorities’ (Waters and Eschbach 1995); evidence nevertheless suggests that this is a myth for the reason that higher earnings among these groups are reported because of overcompensation in education (Zeng and Xie 2004).
2. American research for instance discovered public support for the ‘bad is black’-heuristic that sees black people as more likely to be perceived of having committed immoral acts (Alter et al. 2016).
3. Hence, skin tone is not *per se* exogenous; in this argument, skin tone is endogenous to occupational status.
4. The mechanism is that in people living more remote from the equator, lighter skin pigmentation allows for a better synthesis of vitamin D from ultraviolet radiation through weak sunlight (Webb 2006).
5. One noted shortcoming is that the share of people identifying as relatively lightly toned on the PERLA scale is relatively low.
6. One can consider BRICs countries (Brazil, Russia, India and China) as examples of the semi-periphery. In world systems theory, these countries are in political, economic and social terms not considered as part of the industrialized ‘north’, neither are they considered to be part of the poor ‘south’. Mexico is also considered to be a semi-periphery country.
7. For a more recent and international example, check Alfonso Cuarón’s Academy Award-winning movie *Roma*.
8. The data can be retrieved online from the INGENI-website: <https://en.www.inegi.org.mx/programas/enadis/2017/>
9. To test whether these respondents are representative for the whole sample, a nonresponse analyses was performed explaining participation in the reduced questionnaire (code 1) vs non-participation (code 0). The analyses (available upon request) shows that older respondents, the higher educated, and respondents from the North-West [*Noroeste*] are overrepresented ($p < 0.01$) in the ‘Questionnaire about Opinions and Experiences’.
10. Although it is unclear why this is the case, one might speculate about the role of response behaviour with respondents inclined to report less extreme skin tones.
11. While scientific evidence shows that women have a lighter skin tone than men (Jablonski and Chaplin 2000), Villarreal (2010) claims that there is a reporting bias involved, too.
12. It needs to be added that only 44 respondents report the lightest skin tone, making that also the standard error (0.22) is rather high compared to other skin tones (e.g. second darkest skin tone has a standard error of 0.11). Also, only when the analyses are weighted, this extraordinary value appears.
13. Income declines with age; yet, subsequent models show that this has to do with the on average lower levels of education of the elderly. We see a narrow gender gap: women report lower household income than men. Controlling for education largely mediates the gender gap.
14. Language-wise, it needs to be remembered that skin tone is also endogenous to occupational status.
15. A full report can be obtained from the authors.

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