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# What do I look like? Narratives of origin, heredity and identity inscribed in appearance

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ABSTRACT
Genetic anthropology studies offer evolutionary and migratory narratives to characterize individuals and human groups based on genetic traits. From the analysis of genetic information, these studies construct genealogies that connect body characteristics with geographies and stories of origin. In recent years, an international group of researchers worked in a project focusaed on Latin American populations. In this paper, we present the results of our ethnographic work and interviews with participants in this project. Based on this material, we show that Mexican participants tend to use their physical appearance, typological ideas of human difference, family stories and family names to give meaning to scientific terms such as genetic ancestry. Participants rely on shared visual habits to interpret their own and others' appearance and to negotiate their belonging to racial, ethnic and family groups.

KEY WORDS
Physical appearance, genetic ancestry, visual habit, hereditary phenomena, genetic anthropology.

## ¿DE QUÉ ME VES CARA?: NARRATIVAS DE HERENCIA, GENÉTICA E IDENTIDAD INSCRITAS EN LA APARIENCIA

RESUMEN
Los proyectos de antropología genética ofrecen explicar la historia evolutiva y migratoria de los grupos humanos y los individuos con base en sus características genéticas. Suelen dibujar genealogías que se narran en términos genéticos y que vinculan rasgos físicos con geografías e historias de origen. En este artículo presentamos los resultados del trabajo etnográfico y entrevistas realizadas a los participantes de un proyecto de antropología genética enfocado en poblaciones latinoamericanas. Mostramos que los participantes del contexto mexicano recurren a la apariencia, a ideas tipológicas sobre la diferencia humana, historias familiares y los apellidos para dar sentido a términos científicos como *ancestría genética*. Los participantes ejercitan el hábito visual racial para interpretar su apariencia y negociar su pertenencia a grupos raciales, étnicos y familiares, que son traducidos a términos genéticos en el contexto de estos estudios.

PALABRAS CLAVE
Apariencia, ancestría genética, hábito visual, fenómenos de la herencia, antropología genética.

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## Introduction

With the launch of the Human Genome Project in 1990, a "geneticization" or genetic and molecular perspective of life was popularized, which imposed new parameters to understand the body, health, identity and origin of the human being (Kay, 1993; Lippman, 1991; Nelkin and Lindee, 2004). As part of this trend, during the first decade of the 2000s and until now, numerous projects of genetic anthropology and personalized genomics have appeared that seek to narrate the migratory and evolutionary history of individuals and groups in genetic terms. In general, these projects have aimed to unveil the components of personal ancestry based on genetic characteristics, which, they claim, can also explain aspects of one's physical appearance, personality or identity.

This article focuses on an international project — which we will call project LATINA[1] — for the study of genetic diversity in the Latin American population, which started in 2011. Based on our ethnographic work, which consisted of participant observation in the LATINA laboratory for nine months and interviews with project participants, we found that the participants give new meanings to the technical concept of "genetic ancestry". They do so by drawing from oral, visual, private and shared evidence that is interpreted through what we call "hereditary phenomena", a set of characteristics shared by families that include both bodily and cultural traits (López-Beltrán, 1992). From this set of phenomena, the project participants give meaning to the scientific terms that are used in the questions that are posed to them and, in making these terms their own through this reinterpretation, they respond to the questions which interpellate them.

1. All the references to the project have been anonymized.

Several studies from the humanities and social sciences have been concerned with locating, discovering and analyzing the spaces where genomics has led to a transformation of conceptions of the body, heredity, identity and origin (for example, García, Oliveira Rufino, Bergese, Agüero, Cuevas, Díaz-Rousseau, Pauro, Nores, Garita-Onandía, Tavella and Demarchi, 2016; Nelson, 2008; Schwartz-Marín and Wade, 2015), and the effect of this transformation (Gibbon, Santos and Sans, 2011). Similarly, in recent years, there has been growing interest in the coordinates that demarcate race, mixture, skin color and class in different Latin American contexts, and how these axes shape discrimination and race relations (Telles and Flores, 2013; Telles and Paschel, 2014; Villarreal, 2010). This article contributes to this discussion by linking these two problems and offering a diagnosis of the intersections between the context of genomic sciences in Mexico and Latin America, physical appearance and identity. It shows that the observable differences in bodies encode semantic records related to the family in terms of kinship and memory, but also with a set of specific racial types that are shared as referents to establish the terms of belonging and difference. At the same time, this text contributes to the general discussion on the public perception of science, especially the reception of the studies of genetics and human genomics in Latin America.

## Genetic ancestry and the great human family

Genetic anthropology projects such as the Proyecto Diversidad del Genoma Humano or the LATINA project (the case explored here) focus on understanding the diversity of human populations in genetic terms. Commercial projects from the direct-to-consumer (DTC) genetic testing industry such as the Genographic Project or, more recently, The DNA Journey (related to the Momondo travel site), offer answers about the origin of individuals and groups in terms of human migrations through the analysis of personal genetic information (ASHG, 2008; Momondo, 2016; Wells, 2016). In general, these studies assume that human groups are related and that it is possible to trace their common origin. This argument is linked to anti-racist commitments, in promoting the idea that the human "race" is a single "human family", so that "in a way we are all kind of cousins" (Momondo, 2016). These studies also tend to assume that some "isolated" populations have remained more or less unchanged for at least the last 500 years (the Yoruba in West Africa, for example), thus constituting reservoirs of useful information to understand our evolutionary history. The degree of "purity" of certain lineages is established

based on specific DNA markers that are thought to characterize the population, while the combination of these markers is taken as an indication of "mixture" (admixture). Finally, these projects assume that individuals currently living in a given region are more likely to be related to the original population of that place, so contemporary indigenous populations are taken as representatives of ancestral populations (Weiss, Kidd and Kidd, 1992; Wells, 2016).

The personal information provided by this type of projects is called genetic ancestry, a term adopted from English, and already widely used in Spanish-speaking countries. Ancestry tests are statistical approximations of genetic similarity or difference with respect to reference populations. These tests are used to establish the genetic origin of a person in terms of ancestral populations linked to a specific geographic location (ASHG, 2008).

In 2008, the American Society of Human Genetics (ASHG) published a statement on ancestry testing in recreational (DTC companies), anthropological and medical contexts. In this statement, the ASHG warns that genetic tests are less accurate and determining than is generally advertised. The results provided by these tests are essentially statistical and the selection of the reference population as well as the data gathering methodology used in the tests affect their results. Therefore, scientists or result suppliers should make explicit the influence of these factors when offering an interpretation.

Several authors from the humanities have criticized the studies of genetic ancestry (for example, Bolnick, Fullwiley, Duster, Cooper, Kahn, Kaufman, Marks, Morning, Nelson, Ossorio, Reardon, Reverby and TallBear, 2007; Reardon, 2009). These works focus on different aspects of personalized genomics and genetic anthropology projects, ranging from the ontological assumptions of the sampled populations as pure "foundational lineages" (TallBear, 2007), practices associated with the construction of reference populations (M'charek, 2000; Nash, 2015) or the use of the concept of "race" (Reardon, 2009), to discussions about the influence of the results on the individual or collective perception of identity (Nordgren, 2010; Pálsson, 2012; Wailoo, 2012) and the political implications of such results for certain human groups (ASHG, 2008; Kent and Wade, 2015; TallBear, 2013). It has also been pointed out that the alleged anti-racist power of assuming that we are all related and form a large human family depends on a primitivistic perspective on indigenous groups (Nash, 2012), which restores typical dichotomies of racist discourses. Thus, rather than promoting the elimination of racial classification as a scientific and social convention, genomics naturalizes such differences by

"revealing" the hidden elements of biological origin that explain and stabilize social arrangements such as racial distinction (Palmié, 2007: 210).

The link between genetic ancestry tests and one's belonging to ethnic or racial groups, populations or geographic regions, has led scholars to note that the use of genomics fosters a reductionist perspective of human difference or a "molecularization of race" (Duster, 2005; Fullwiley, 2007; Koeniig, Lee and Richardson, 2008), and that the latter has replaced other registers of difference, such as physical appearance. However, a closer look at the logic behind the studies of genetic anthropology and their objectives shows that appearance is still an important source of information in relation to the perception and evaluation of personal identity and group belonging.

In fact, appearance plays a fundamental role in the practice of the genomic determination of origin through the analysis of genetic components. For example, it has been documented that physical appearance, along with the inferences drawn from it, affects the acceptance, rejection or surprise at genetic ancestry results (Kent and Wade, 2015). In a similar vein, studies from the field of medical genomics have evaluated the degree of coincidence between lay participants' self-ascription to a genetic ancestry and the result of the genetic ancestry test. These studies affirm that the lay public's self-evaluations of ancestry (especially in populations that are assumed to have a *mestizo* (mixed) constitution, such as Latino ones) are generally "incorrect," since they do not reflect the genomic "reality" which can be known through the tests (Lee, Teitelbaum, Wolff, Wetmur and Chen, 2010; Mersha and Abebe, 2015).

In general, these studies, as well as those of genetic anthropology mentioned above, invite the participant to link the evidence that is visible on the body with an inner truth (Guterl, 2013). That is, to establish a relationship between the surface and the depth, and to look for traces in what is visible that can help infer or make sense of a genomic result. The logic that links the surface with a deeper truth is not exclusive to the relationship between phenotype and genotype. While it has motivated the search for "relevant" human differences — the subject of study of classical physical anthropology and racial studies — this logic also lies behind the daily judgements with which we establish difference, similarity and belonging. As Guterl points out, the history of race is not only constructed from the scientific, political and social context or public discourse, but *«it is also the story of the everyday assessment, or scan, of the body as a text, and the culturally informed interpretation of the signs and symbols seen in the profile, the posture, and the comportment of a person's carriage.*

[…] *It is, too, the story of visual habits, sightlines that allow* […] *to prescribe common sight"* (Guterl, 2013: 3).

The visual habit, informed by what appearance, resemblance and difference suggest, feeds the "genealogical imagination" of the public and helps them establish links between what they see in their bodies and what they know about their family (Palmié, 2007). Thus, the criteria of belonging and exclusion to a lineage are established, or what Wade has called "race-kinship congruity", a term that refers to the idea that it should be possible to explain the appearance of family members based on genealogy (2012). Mónica Moreno Figueroa has underlined the importance of "likeness" as a source of evidence in the negotiation of belonging. Within her analysis, focused on the Mexican context, the negotiation that occurs at the family level is interwoven with a series of norms in which family expectations are combined with the national ideology of *mestizaje* (Moreno Figueroa, 2008).

As will be seen in our ethnographic material, project LATINA participants use this visual habit to negotiate their belonging to or difference from certain groups and to answer the questions that they are faced with during the project. They interpret their own appearance and juxtapose it with that of others to answer the questions that scientists ask about genetic ancestry and self-description. Based on the signs and symbols of the body, participants can establish narratives that agree with other hereditary phenomena, such as family histories, but can also find points of contention.

## Project LATINA

Project LATINA was conceived by a group of Latin American researchers as an effort to genetically characterize the Latin American population in terms of genetic admixture and, at the same time, to observe the reception of concepts and enactments linked to identity, race and physical appearance in that context. It sought to offer genetic estimates of individual ancestry and to characterize, in the same terms, physical features such as facial shapes, skin, hair and eye color, as well as male pattern baldness and gray hair (LATINA, 2011). That is, it sought to establish a link between genes, appearance and origin. In addition, it aimed to explore this population's perception of its own ancestry, as well as ideas about race and the effects of genetics on identity (LATINA, 2011). Project LATINA emerged from an academic context seeking to contribute to the studies of human evolution and population genomics using genetic anthropology techniques. Its academic focus distinguishes it from other projects with main-

ly commercial or recreational objectives (DTC). Despite this difference, both the DTC and LATINA projects, and in general the genomics projects that aim to describe Latin American populations, characterize them as mixed populations (for example, Fuentes, Pulgar, Gallo, Bortolini, Canizales-Quinteros, Bedoya, Gonzalez-José, Ruiz-Linares and Rothhammer, 2014; Silva-Zolezzi, Hidalgo-Miranda, Estrada-Gil, Fernandez-Lopez, Uribe-Figueroa, Contreras, Balam-Ortiz, del Bosque-Plata, Velazquez-Fernandez, Lara, Goya, Hernandez-Lemus, Davila, Barrientos, March and Jimenez-Sanchez, 2009), that is, as a result of the mixture among natives of the American continent, European conquerors and African slaves. This idea of mixing is both inspired and justified by the common historical narratives of conquest and immigration.

The LATINA team installed sampling centers in Mexico, Colombia, Peru, Chile and Brazil. In these countries, blood samples and anthropometric measurements were taken from voluntary participants, who were also asked to fill out individual questionnaires to record socioeconomic information. In addition, as part of the sampling, volunteers were asked to answer questions concerning ideas about race, ethnicity, origin, identity and racism.

The genetic analysis of populations considered to be *mestizo* is carried out by means of an *admixture analysis* to discriminate between the genetic variants in terms of ancestral composition. In project LATINA 40 genetic variants (SNPs) were examined that are assumed to have very different frequencies in samples from populations from Southern Europe (Spanish), West Africa (Yoruba) and Native Americans (from the entire continent). The reference populations, that were used to determine the percentages, were comprised of 299 individuals from Southern Europe who represented the European ancestors, 408 individuals from America who represented the Native Americans, and 169 individuals from Africa who represented the African ancestral component. The presence of these variants was determined in the samples of the participants, and the frequency with which they appeared was estimated using statistical methods. Finally, based on these results, ancestry percentages were estimated.

We visited the LATINA laboratory regularly at its location in Mexico between August 2011 and May 2012, and we were also participants. During this period, we observed and recorded the different phases of the sampling process, as well as the reactions and comments of the participants. The sampling began with an introductory talk given by the researchers, in which basic concepts of the research, along with its objectives, were explained. Subsequently, the researchers delivered a questionnaire to each participant which included socioeconomic ques-

tions, as well as questions about race, self-perception, racism and family history. While the volunteers answered the questionnaire, they were called one by one to take a blood sample. In the case of Mexico, it was important to take the blood sample at the beginning of the process, since the volunteers were asked to fast before attending in order to be able to provide them with a blood chemistry profile. Once the questionnaire was filled out, the participants moved through the different anthropometric measurement stations. At the end, five photographs of the face were taken, which would later be used for the geometric morphometric analysis to determine facial variability. This was the last phase of the sampling. At the end, the participants received a sheet with their "volunteer code number" and were informed that they would receive their results in the following months.

In addition to the observation of the sampling we carried out in the LATINA laboratory, we conducted 120 exit interviews with the volunteers. This method allowed us to identify the moments and concepts that elicited reactions in the participants. The group of LATINA participants was quite heterogeneous. It was composed of young undergraduate students from the institution where the sampling was done, as well as acquaintances and relatives of some of the researchers associated with LATINA. Another group of participants attended because they were interested in obtaining the free blood chemistry profile. A smaller number participated due to a prior interest in their genealogy. The age of participants ranged from 18 to 65 years and most of the participants were from Mexico City.

When the participants received the sheet with their volunteer code number, we would approach them. We explained that we were not part of LATINA and that we were interested in hearing about their experience as participants in this project. If a volunteer accepted, the exit interview was conducted outside the laboratory, without recording any of the interviewee's personal data. We asked them about their main reasons for attending the sampling, what they expected to know when the results were delivered and about the resources they had used to answer some of the questions on the questionnaire.

We designed a semi-structured interview with 10 open-ended questions (Kvale and Brinkmann, 2009) to learn how they had found out about the project, what they had found most difficult to answer and what they had understood by terms such as "ancestry" and *"mestizo"*. We were interested in tracking the dynamics and the set of attitudes of the participants in relation to the project and to the questions. We were also interested in determining through what resources the participants related to

the objectives of the LATINA project and to the terms used in it to refer to origin, personal description and the belonging to a national, racial and family group. During our visits to the laboratory, we observed dozens of participants answering the questionnaire, which allowed us to identify their reactions to certain questions. Based on the qualitative analysis of the interviews and the observation in the laboratory, we were able to observe that the volunteers found two questions particularly difficult. These were question 25, which asked respondents to choose a category by way of self-description, and question 28, which asked the volunteers to calculate what percentage of Native American, black and European ancestry they thought they had.

The responses and reactions of the participants show that there is a common set of resources that allows them to understand the questions posed by the project. In general, the participants thought about their appearance, their family histories and their surnames. These three elements are part of what we define above as "hereditary phenomena", and are used to "negotiate" (Moreno Figueroa, 2008) one's belonging to a certain group when selecting a self-description category (question 25), or the fractioning of one's personal genetic composition when calculating the percentages of ancestry (question 28). In both cases, we identified that this negotiation process sometimes does not occur in isolation. On the contrary, as we explain below, it depends on the approval of the other. In this sense, it is a reciprocal evaluation of physical appearance and of the inferences that can be drawn from it.

## Do you consider yourself…

The questionnaire provided by LATINA consisted of 28 questions. Of these, the first 9 collected personal information (age, education, native language, place of origin of the individual and of parents and grandparents). The following 10 questions dealt with personal concerns in relation to ancestry, ancestors, genetics and its relation to ancestry, as well as to the relationship between origin and ancestry. The next 5 questions asked about a possible link between genetic studies and racism. The first 24 questions were answered almost automatically, but as soon as the participants reached question 25 (Fig. 1), in most cases, the rhythm of response was interrupted. Faced with this question, in which the participants were asked to choose one or more categories that describe them, we observed two types of reactions. The first is characterized by the need to socialize and certify the selection of a self-description category in front of others.

| ***Do you consider yourself:*** | | |
|---|---|---|
| Black _____ | Mulatto _____ | Indian _____ |
| Moreno (brown) _____ | Coppery _____ | Mestizo _____ |
| White _____ | Pardo (brown) _____ | European _____ |
| Other (use your own words to describe) _____ | | |

**Figure 1.** Approximate reproduction of question 25 on the LATINA questionnaire. The authors have modified the format of the question to preserve the anonymity of the project, without modifying the content.

In the laboratory, sitting at a long table, three young people were answering the questionnaire. One of them, when trying to answer question 25, consulted with the participant next to him: *"What do I look like to you: black, coppery?"* She replied: *"Answer how you see yourself"*. A third participant added: *"It depends on what you think you look like"*, underlining the instruction to self-describe, to which the first participant replied: *"but it has to do with how you see me"* (LATINA participants, ethnographic observation, Report 2012a: 6). As can be seen, the question of self-description was often answered relationally; one can have an idea about one's own appearance, but it must be certified by someone else. As if, when in doubt, consulting with someone else could confirm or correct what one thinks of oneself. This was suggested by a woman during the exit interview: *"Well, many times we don't even know how to describe ourselves because there are many who say,* 'I consider myself güero'[2]*, but we see him, and he's not"* (LATINA participants, interview transcript, Report 2012a: 59). In both cases, in the gesture of consulting someone else before choosing a category, there is an implicit idea that among the possible inferences that can be drawn from physical appearance there are some that are correct and others that are not. In the process of choosing a category to self-describe, the other, the one who sees us, has the ability to verify or correct what we have chosen based on what they see. As Telles states regarding ethno-racial self-description in the context of the application of national censuses, *"ethnicity can be self-evident, but it is also regularly defined by others. Race and ethnicity are not simply a matter of identity or consciousness. They also involve the gaze of other"* (2017: 2343). There is a tacit agreement within the visual habit which participants use to evaluate their body and that of others. The discussion and agreement regarding what should be answered, which category should be

2 *Güero/a* in Mexico refers to a person with blond hair and light skin.

chosen, has to do with the fact that these categories evoke the same within a specific context: these categories refer to a body type that is not made explicit and that is assumed to be the same among the members of a group. For instance, some participants reported a certain degree of confusion when faced with descriptors such as "*pardo* (brown)" and "coppery", unknown in the Mexican context. However, most of the time, their perplexity before the variety of possible answers was a very personal reaction of ambivalence: *"I don't have any idea what to answer… I don't know; what am I? Indian, mulatto, coppery, pardo (brown),* mestizo… *I'm a pardo (brown)* mestizo" (LATINA participants, ethnographic observation, Report 2012a: 7). This question made it necessary for participants to evaluate and describe themselves in the words offered, that is, to exercise on themselves the visual habit described by Guterl (2013), which is deeply linked to a racial and typological way of understanding human difference.

The reactions of ambivalence to question 25 are also a reflection of the Mexican public's lack of experience with the exercise of self-description. In contrast to openly racial contexts such as that of the United States, most Latin American countries have officially dispensed with racial categories and with self-ascription to these categories in population censuses and official government institution forms (Loveman, 2014). These countries have sought to build a homogenous national population based on the idea of mixture and the *mestizo* as the "norm", in contrast to the indigenous and Afro-descendant inhabitants, which are considered subaltern and eccentric identities (Loveman, 2014; Saldívar and Walsh, 2014; Wade, 2013). Membership in the *mestizo* category is not chosen, since it is assumed that the population as a whole belongs to this group. Among the minority categories, the national censuses in the Mexican context have only made the indigenous identity visible, which has been defined based on various descriptors (biological, linguistic and cultural) but which has, in general, been understood as the counterpart of the alleged *mestizo* majority (Saldívar and Walsh, 2014).

The categories of question 25, chosen from different registers (ethnic, continental, racial), were offered as options that were intended to be meaningful to the participants of the different Latin American countries participating in the project. This set of categories, however, usually makes racial discourse present by combining traditional descriptors of physical difference, such as color — *moreno* (brown), *pardo* (brown), white, black, coppery — with traditional classifications of race in colonial terms (European, Indian, mestizo). In this sense, the set of categories used made the issue of race present, although the explicit mention of this discourse

was avoided. This is the "absent presence" of race in genomic research labs in Latin America (Wade, García-Deister, Kent, Olarte Sierra and Díaz del Castillo Hernández, 2014).

The second reaction to question 25 that we observed involves the use of typological ideas. The possibility of socializing, evaluating and comparing the answers depends on shared ways of imagining the appearance described by the presented categories. Among those who discuss their answers, there is a tacit agreement about what an Indian, a European and a black person look like. It is not said, but it is shared. The participants have a prior idea, and then they reflect on the degree of similarity they have with this ideal. The tacit presence of this agreement is evident in comments such as the following. In an exit interview, a participant speaks, or rather evaluates, the response of a friend who has also participated in the project: *"He says he's Indian… with those traits, no one will believe that!"* (LATINA participants, interview transcript, Report 2012b: 13). The speaker does not approve the friend's choice to self-describe as Indian and claims that "no one" would agree with this classification, since the friend's features do not match those of an indigenous person. Without saying what those features are or why there is such discrepancy, the speaker's comment shows that there are shared expectations about what an indigenous person looks like.

Something similar happens with the European category. During the exit interview, a man offers a characterization of what it means to look European, using his family history: *"I don't know exactly what the descent* [sic] *of my father's family is, beyond my grandparents* […] *they are white, with light eyes and all that* […]*"* (LATINA participants, interview transcript, Report 2012b: 11). It is not necessary to identify the place of origin of his ancestors (great-grandparents, great-great-grandparents), to consider them of "European descent". It is enough to say, *"they are white, with light eyes and all that"*, to conclude that they have a European aspect. The tacit agreement of what it means to "look European" is indicated by the fact that the white skin color and the light eyes are associated with "all that", which is left implicit and yet understood, traits that are accurate indicators of a specific ancestry. Assuming that certain physical features are obviously correlated with a group of unspoken characteristics that indicate European origin, speaks of a shared idea of what this category means. Another participant, when describing a sister's traits, uses similar resources: "[…] *my sister, I don't look anything like her because she's blonde and white and all* […]*"* (LATINA participants, interview transcript, Report 2012b: 23), where "blonde, white and all" imply the same degree of correlation and obviousness from which European descent

can be inferred. As Pálsson and Helgason point out, in the European narratives of heredity and race, the blond phenotype (blond hair, light skin and eyes) is considered a characteristic that represents the essence of European identity (2003: 162).

The last two examples, in addition to showing that there is an implicit idea of the typical appearance of the people belonging to each category, show that appearance is understood as an epiphenomenon of genealogy. This means that, generally, participants understand appearance as a result of their genealogical history. Family history gives meaning to the physical characteristics, similarities and differences with respect to which membership is "negotiated". For this reason, appearance and what it symbolizes may come into conflict with personal history when there is no clear link between these two registers. At the same time, the joining of family histories with appearance strengthens the stereotypical ideas that guide visual habit. This set of family histories and bodily similarities is what we call "hereditary phenomena".

In the case of the Mexican context, we found that a frequent response to question 25 was that of *mestizo*. As mentioned before, *mestizo* is a relevant category in the construction of the Mexican national identity and in the country's nation-building project (Kent, García-Deister, López-Beltrán, Santos, Schwartz-Marín and Wade, 2015; Saldívar and Walsh, 2014). In the course of the last century, this category has been studied in biomedicine and anthropology, disciplines that have sought to present the particularities of this mixture (López-Beltrán and García-Deister, 2013). During the exit interviews, when participants stated that they had chosen the term *mestizo* to describe themselves, we asked them if they could define it. Based on the answers we received, we were able to identify the different motifs that the "Mexican mestizo" evoked in the participants. The *mestizo* was commonly imagined through the idea of the mixture between two or more groups or races. When only two groups were mentioned, the body of the *mestizo* was imagined as an intermediate between the European and the Indian, with characteristics of both, although with enough variability to make it impossible to describe in a single way.

Several responses indicated that the *mestizo* was understood as a "middle ground" between the skin color *"of a very dark brown* [moreno] *of the Indian"* and *"the white of the Spanish"* (LATINA participants, interview transcript, Report 2012b: 15), where the racial mixture is traced back to the moment of the Conquest and the subsequent biological process of *mestizaje*. The idea of the *intermediate* also serves to imagine the rest of the facial and bodily features:

> A round nose but not very sharp or very wide, round, round face, not very sharp, round cheekbones, black hair, but the hair type can vary between straight and wavy, the height depends on how much European component one has […], medium complexion, […] brown eyes between light brown and dark brown, […] hair color usually black, although it may have some brown tones (LATINA participants, interview transcript, Report, 2012a: 83).

As this passage shows, the physical characteristics of the *mestizo* are imagined between two extremes: sharp/wide, straight/wavy, medium complexion, light/dark brown, black/brown hair. Both in our research and in cases described by other authors, the mix and the contrast that it generates are thought of in terms of a binomial *mestizaje* between Europeans (Spanish) and indigenous populations (Moreno Figueroa, 2008). In this sense, the national ideology of *mestizaje* functions as part of the hereditary phenomena that come into play when the project participants self-describe.

The *mestizo* was also defined by participants as a "mix of physical characteristics", generally recognizable in other family members and in other "races": *"I have my maternal grandfather's curly hair but my paternal grandfather's color, even though my maternal grandmother was very white, with light color eye even. But I do see my characteristics in all races, so I consider myself* mestizo*"* (LATINA participants, interview transcript, Report 2012a: 126). Thus, being *mestizo* means being a combination of the contrasting characteristics of one's own family, which are instances of the physical traits typical of different "races".

Above all, the *mestizo* evokes a gradient of possibilities that the visual habit knows how to recognize. Although the precise characteristics of the *mestizo* are, for some, difficult to describe, there is something in common: *"That they are dark, of short stature, with certain features on their faces. Most people in the Valley of Mexico are* mestizo […] *I think we can identify each other"* (LATINA participants, interview transcript, Report 2012b: 15). It is this possibility of "identifying" each other, as Mexican *mestizos* or as foreigners, which helps volunteers describe themselves and evaluate the descriptions that others make of themselves. Although Mexico City is made up of millions of people, the interviewee states that "most" of its inhabitants share the characteristics that he describes as typical of the *mestizo*. Other participants expressed a similar opinion. There seems to be a homogeneity, at least an imagined one, among the inhabitants of Mexico City. In this sense, the possibility of "identifying" ourselves and each other is not situated in the face of the other, but rather in the eye that looks, in the common visual habit. It is

common for nation-states to imagine their inhabitants both as an "imagined political community", sovereign and limited (Anderson, 2006: 6-7), and as a community that shares an origin connected with a geography, as well as a collective and cultural identity derived from biological inheritance (Nash, 2015). It is the association with a certain national ethno-racial identity that motivates individuals to recognize themselves in these same terms (Loveman, 2014: 18). In Latin America, national identities are spaces of intersection between notions of "race" and "nation" (Wade et al., 2014). And although race has been described as a "present absence", both in social life and in genomic research in Latin America (Wade et al., 2014: 500), it is a factor that promotes and justifies that the nation be considered a relevant investigation unit. In this sense, projects such as LATINA — even when seeking to make place for diversity — strengthen the ideas of community, similarity and biological homogeneity within the nation. Even in the design of the sampling, with five laboratories in five different countries, project LATINA promotes the idea that there are traceable and relevant differences among the selected countries. LATINA's results reinforce and renew this idea. The countries of Latin America are imagined as different entities when thought of in terms of their specific foundational myths. Integrating these narratives of origin in genomic research represents an exercise of validation and authority that Palmié describes as the simultaneous interpolation of ontologies of population genetics and unproven constructions of the past, which results in the legitimization of the latter in the form of allelic frequencies (2007: 211).

The second question that caused the greatest difficulty when answering the questionnaire was number 28, a question that asked the participants to express their ancestral composition in quantitative terms (percentages). The following section analyzes the resources that volunteers used to answer this question.

## What do you think your ancestry is?

The LATINA researchers used various resources to explain to the participants what the objectives of the project were, as well as what they could obtain by participating. Part of the explanation included presenting certain relevant terms, such as *genetic ancestry* and *genes*. At various times, the notion of *genetic ancestry* was explained using terms such as inheritance. In addition, at least two documents were distributed with the objective of recruiting potential donors. One of them consisted of a paper printed in black and white that read: *"Are you interested in knowing more*

*about your ancestors and your genes?"* Although the concept of *genetic ancestry* refers to the statistical calculation of similarity to certain reference populations, the different resources and the questionnaire failed to make this clarification. In fact, the multiple resources and the links that these drew between "genetic ancestry" and "ancestors", "genes", "heredity" and "appearance", more than explaining, established a logic of racial gaze in which genes, ancestors, heredity, race, origin and appearance were mixed to give meaning to genetic ancestry. These connections were strengthened by certain questions in the questionnaire. For example, question 28 (Fig. 2) read: *"What do you think your ancestry is? That is, the approximate percentage of your ancestors who were of Indian, black or European origin?"* This question was accompanied by an explanation that made one think of one's ancestors and their origin in racial, ethnic, color and geographical terms (as in question 25).

What do you think your ancestry is? That is, the approximate percentage of your ancestors who were of Amerindian, black or European origin?

Mark with an X the percentage range of each ancestry that you consider to have. If you think you do not have an ancestry choose 0-20%

| ***Amerindian ancestry*** | | ***Black ancestry*** | | ***European ancestry*** | |
|---|---|---|---|---|---|
| 0-20% none or very low | | 0-20% none or very low | | 0-20% none or very low | |
| 20-40% low | | 20-40% low | | 20-40% low | |
| 60-80% high | | 60-80% high | | 60-80% high | |
| 80-100% very high or total | | 80-100% very high or total | | 80-100% very high or total | |

If you think you poses other types of ancestry (ancestors of other races), please specify which:

**Figure 2.** Approximate reproduction of question 28 on the LATINA questionnaire. The authors have modified the format of the question to preserve the anonymity of the project, without modifying the content.

In addition to using categories of different registers to provide content to the concept of *ancestry*, at the end of the question the volunteer is invited to add *"other types of ancestry* (*ancestors of other races*)*"*. The question written in this way makes explicit the racial content of the research and its amalgamation with the calculation of genetic ancestry percentages. The aforementioned absence becomes present and visible.

Consistent with what the brochure and question 28 suggest, the volunteers mobilized a series of resources from their personal history to an-

swer this question. In addition, as they did when answering question 25, they resorted to the characteristics of their appearance to give meaning to their narratives and translate the relationships they were able to establish between their appearance and their history into genetic terms. We found three common ways of answering this question. The first has to do with appearance and is related to question 25 and the shared way of imagining a clear and demarcated typology to negotiate belonging. The second is linked to the use of anecdotes and family histories, and the third is related to surnames. These elements function as evidence that allows participants to imagine what percentages of the ancestral groups coexist in their personal history. This is how genetic information is intertwined with the other "markers" of origin and identity, exemplified in the following description of the way in which question 28 was answered:

> Well, I calculated it because first of all, since my parents are of indigenous origin, I said: "*Well, therefore I must have some majority in that*". And then, European, well, I don't think, I don't seriously think I have much European. I also don't have features so you can say, "*Oh, how European you look*", and African, well yes, because you come from there, so then you must have more of that percentage (LATINA participants, interview transcript, Report 2012a: 72).

In her response, anecdotes and family histories — *"my parents are of indigenous origin"* — are combined as a resource to infer that she has a "majority" component of that ancestry. In addition, European ancestry is ruled out based on evidence that is extracted from the appearance: *"I also don't have features so you can say* 'oh, how European you look'*"*. As in the previous cases, the volunteer assumes that there is a set of European features that she cannot recognize in her appearance. In addition, she exposes the relational nature of this visual habit by asserting *"so you can say* 'oh, how European you look'*"* to emphasize that neither she, nor anyone else can say that these traits can be seen on her face. There is a tacit agreement regarding the referent of each category, which is also understood in typological terms.

The last element of the volunteer's comment refers to African ancestry, which in this case is understood in relation to the history and origin shared by all human beings, who come from Africa. The Mexican imaginary of mixing has underestimated the contribution of the black population to the genetic composition of the national *mestizo*; its inclusion and recognition are quite recent phenomena (Moreno Figueroa and Saldívar, 2005). However, some of the participants indicated having an African

percentage based on three reasons. The first one is related to the origin and evolution of the human species and its migration from Africa, as in the case of the comment presented above. In this case, the African component is detached from the personal genealogical line. The second reason is having personal anecdotes that include a family member of African origin. For example, a LATINA volunteer, when trying to make sense of the phenotypic variety in her family, which she describes as *"half white, half morena (brown)"*, recalls that her maternal grandmother's father, who is from Veracruz, *"was of those who were brought from Africa as slaves"* (LATINA participants, interview transcript, Report 2012b: 23). This comment, in contrast with the previous one, recognizes the African component as part of the personal lineage and of the "hereditary phenomena", which explain the set of similarities and differences in her family. A final reason for recognizing a "black" ancestral component (as described in question 28) is the recognition of a "third root" as a formative element of the national population. However, this comment appeared only once during our fieldwork. While a few LATINA volunteers in Mexico acknowledged one of these reasons when calculating their ancestry percentages, the "black" component was generally considered irrelevant or minimal. This is exemplified in the following answer, which as in previous cases, is based on appearance and resemblance: *"I looked at myself and I looked at my family and compared traits, but I can't tell, I couldn't tell. Not European, black I think it would be very low; I think it's more like Indian"* (LATINA participants, interview transcript, Report 2012a: 67). This result echoes other studies conducted in Mexico that report a low level of identification with an African origin (Martínez, Saldívar, Flores and Sue, 2014).

In addition to personal appearance, family resemblance and family history, volunteers used surnames as a third type of evidence. This can be seen in the following response: *"at some point my brother and I, because of one of the surnames we have* […] *had investigated that surname. So, then we discovered that it is a group of Asian origin that lived in some islands of the South Pacific that came to America"* (LATINA participants, interview transcript, Report 2012a: 77). Names, like other "technologies of belonging," are useful for situating and connecting people in different groups such as families, ethnic groups, nations, lineages, etc. The patrilineal system of naming used in modern Western nation states was developed in Europe during the Middle Ages. This system was used to record time, the succession of power and alliances, as well as inheritance (Pálsson, 2014). In a way, surnames and the pre-biological notion of inheritance share the function of indicating what is transmitted, be it material goods

or bodily conditions (López-Beltrán, 1992). Traditionally, before genealogy was explored with genetic resources, surnames were the main evidence of the construction of lineages and family trees. What is striking about the use that participants make of this resource is its combination with the other characteristics of the body and family histories. For example, the following case: *"*[…] *probably because of my parents* […] *I am European. My surname is* […] *we are probably fifth generation Lebanese immigrants. It is not so noticeable on me, but my sisters do have more curly hair,*[3] *more akin features"* (LATINA participants, interview transcript, Report 2012a: 80). For this participant, his surname, along with the traits that appear in his family, which in him are "not so noticeable" (in case our visual habit was not well practiced), are clues that suggest that they are part of the Lebanese migration to Mexico. Within a unilineal kinship system, it is possible to create an imaginary account of the ancestors and eliminate, from among these, those who do not correspond to the phenotypic expectations that guide the construction of the lineage. The set of assumptions that inform the visual habit we use to see similarity (or not) in others and that guides the "genealogical imagination" becomes naturalized (Palmié, 2007). The participants who had previous ideas about their lineage or their origin, as these last two cases, thought that the result of the genetic test could confirm the information that had been obtained by other means (traditional genealogy, family histories) or answer questions or solve cases that are difficult to explain.

In an analysis of the audiences that participated in project LATINA, but in the sampling conducted in Colombia, Schwartz Marín and Wade (2015) state that the attitudes and receptions of the ancestry results vary in relation to the type of audience and their education within the natural or the social sciences. They affirm, in addition, that both types of audiences attribute a greater degree of authority to genetics when referring to a collective level, in contrast to the use of genetics as an influential factor at the individual level. We, in contrast, did not detect a correlation between types of audiences and a type of reception or associated reaction. This may be due in part to the fact that our sampling was conducted in the LATINA laboratory and not with focus groups, as these authors did. In our case, the variety of ages, educational and socioeconomic level was greater, and although we recorded the age and occupation of the volunteer in each interview, this information did not seem to have a significant relationship with the type of answers to our questions in the exit interview.

3. The interviewee refers to "cabello chino", which in Mexico means *curly hair*.

## Conclusion

In this article, we showed that genetic anthropology projects motivate an exercise in the public to link physical appearance and personal histories with genetics. Through the visual habit, with which we interpret our body and that of the other, we are able to locate and determine ties of belonging and difference to ethnic, racial and family groups.

Personal appearance provides clues that, linked to family histories, give content to the concept of *genetic ancestry*. Consequently, the term *genetic ancestry* lacks a fixed and stable meaning. We resort to the notion of "hereditary phenomena" to refer to the set of signs that participants use to negotiate their belonging to one group or another. This belonging is constituted by the exercise of evaluating oneself and the other in terms of similarity and difference: Do I look like it or not? Do you look like it or not? Am I different or similar? an exercise that takes place in a context where the conventional narrative has marked clear differences among members of different population groups, countries and continents.

Through the interviews, we were also able to identify that there is a tacit agreement regarding the aspect associated with the categories of *mestizo*, Indian, European, black, *moreno* (brown), etc. This agreement has to do with typological racial ideas that have been conserved and recreated in the collective imagination. The racial classifications produced by physical anthropology and geography throughout the 19th century and part of the 20th century were constructed based on continental lines of differentiation. Europe, Asia, Africa and America were conceived of as territories that housed populations of a specific racial type, that is, Caucasoids, Mongoloids, Negroids and Americans. The fact that the studies of genetic anthropology describe the Latin American population with categories that follow these same lines of classification makes it easier for participants to be guided by old stereotypes. The idea that appearance contains information about origin feeds on essentialist notions of human variation in which simple traits are associated with specific identities. Blond and white are associated with European; brown and dark hair, with Indian; dark skin and dark curly hair, with black. This is how genetic anthropology projects, such as the one analyzed here, invite the public to establish a link between this typological way of understanding human difference (and similarity) and the genomic descriptions of such difference (such as the presence of certain genetic variants or a certain percentage of European, African and American ancestry). By tying these together, national myths and ontologies are naturalized and validated. At the same

time, the nation is validated as a relevant unit of analysis in the study of biological diversity.

Lastly, this article shows that explanations of origin, identity and belonging produced by research in genetics and human genomics do not replace other types of resources used by lay publics to understand their appearance, personal history or heredity. Instead, this set of "hereditary phenomena" is mobilized to give meaning to the scientific terms. Interestingly, it is the explanatory resources provided by the researchers themselves that suggest that there is a connection between scientific concepts such as *ancestry* and family histories, appearance and ancestors. In this sense, the projects of genetic anthropology are a space where traditional notions of belonging, similarity and difference give meaning to new genomic narratives, where old racial stereotypes are lined with genetic reality.

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