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# Knowing something versus feeling different:The effects and non-effects of genetic ancestry on racial identity

**Janet K. Shim, PhD, MPP**,

Department of Social and Behavioral Sciences, Box 0612, University of California, San Francisco, 3333 California Street, Suite 455, San Francisco, CA, USA 94143-0612

**Sonia Rab Alam, PhD, MPH**,

Facebook, Inc., Menlo Park, CA, USA

**Bradley E. Aouizerat, PhD**

Department of Oral and Maxillofacial Surgery, College of Dentistry, New York University, Dental Center, 421 First Avenue, New York, NY, USA 10010

## Abstract

Since the completion of the Human Genome Project, there have been pitched debates about its implications and the research it enables. One prominent thread of concern focuses on the role of post-genomic science on technically enabling and generating interest in genetic ancestry testing (GAT). Critical analyses of GAT have pointed to multiple issues, raising the alarm on consumers' experiences with such technologies. This paper describes the results of a pilot study in which we tracked women's experiences receiving their genetic ancestry results, and their understandings of, reactions to, and valuing of this information over time. Overwhelmingly, our participants reported a curious combination of anticipation and satisfaction yet no discernable impact on their sense of self or racial identity. We elaborate on the effects and non-effects of GAT for the women in our study, and how we make sense of their simultaneous experiences of 'knowing something' but not 'feeling different.'

### Keywords

genetic ancestry; racial identity; return of results

That race and racial identity are socially constructed is a basic sociological fact. Ideas about oneself in relation to others, perceptions of how others see oneself, one's treatment by others, are all the product of processual, cumulative, lived, and indelibly *social* experiences from which individuals conceive of their racial identity (e.g., Golash-Boza and Darity 2008; Hitlin, Brown, and Elder 2007; Phillips et al. 2007; Saperstein, Penner, and Light 2013; Waters 1990, 1999).

(corresponding author) Janet.Shim@ucsf.edu.

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The turn of the 21st century has brought another possible ingredient to the forging of racial identity: genetic ancestry. Genetic ancestry may have distinct effects because it is often perceived to be relatively, even self-evidently, *non-social*. Genome science claims to be able to estimate admixture — the proportion of one's genetic ancestry originating from different continental regions — using ancestry informative markers (AIMs), a set of genetic variations for a particular DNA sequence that appear in different frequencies in populations from different regions of the world. Some genetic ancestry tests compare an individual's variations at these AIMs with previously analyzed genomic reference sets from people whose ancestral history is purportedly fairly well known.[1] Genetic ancestry tests have subsequently spawned multiple consumer-facing, for-profit companies such as 23andme, Inc., Ancestry.com LLC, and African Ancestry, Inc.

Given this, we wondered what the effects of information about one's genetic ancestry are on racial identity. One possibility is that if multiple kinds of information are thought to contribute to racial identity, then genetic information may be simply one of many factors that shape how people identify racially. However, racial classifications have always been tied to social hierarchy, and thus it may be that one's current racial identity is closely tied to their social experiences and exposures within a particular racial order. In that case, those cumulative social experiences and the racial identities tied to them may trump information about genetic ancestry. And finally, a third possibility is that the perceived *non-social* nature of genetic ancestry might give it more weight than social factors in shaping one's racial identity, because it may be seen as referring to one's origins that are, in some sense, immutable and 'real.'

This paper investigates these possibilities by leveraging a serendipitous opportunity to study the experience of receiving genetic ancestry information. In 2011, research participants serving on the National Community Advisory Board of the Women's Interagency HIV Study (WIHS) requested to receive their ancestry admixture estimates; these estimates were already being calculated for the purposes of inclusion as co-variates in genomic studies. WIHS is a longitudinal cohort study of women with HIV, and a risk-set matched control group. The women enrolled are primarily African American and Latina, with a smaller number of Asian and Caucasian non-Hispanic women. We conducted a qualitative pilot study to describe participants' expectations of and desires for their genetic ancestry estimates and their experiences receiving those estimates.

Our participants drew a fairly firm distinction between their genetic ancestry information — which they saw as occasionally meaningful but yet still "just information" — and their selfidentity. *All* of the women in our study reported that their ancestry results had *no effect* on how they conceived of who they were, or the communities and peoples with whom they affiliated. At the same time however, some also told us that the results *did* have some impact, that they did "feel different," but not in ways that displaced their existing ideas about their racial identities. Our results therefore comport with other research on racial identification,

[1]There are multiple types of genetic ancestry tests that use different sources of genetic information to infer ancestry; some, for example, examine Y chromosomal and mitochondrial DNA, while others analyze various combinations of AIMs. Moreover, there is a good deal of controversy over whether AIMs (or any genomic information) from current, selected human populations can plausibly stand in for those of their ancestral, wider populations (see, for example, Duster 2015; Fullwiley 2008; Lee et al. 2009).

that what individuals "know about their ancestry, how they incorporate it into their sense of self, how they negotiate experiences of perceived discrimination, and whether they feel their identity is validated by others" (Saperstein, Penner, and Light 2013, 366) all influence one another, in complex ways that are difficult to parse, but that are not eclipsed by new information about genetic ancestry.

## The social construction of race in genomics and genetic ancestry testing

Despite widespread perceptions that genetic knowledge arises out of incontrovertible biological facts, critical analyses of genomic research clearly demonstrate otherwise. "Normal," "workaday genomics" (Benjamin 2015) incorporates into its very infrastructure procedures that embody claims about human differences. Ethnographic work on such research practices show in detail how classificatory assumptions and processes enter into genomic research on population differences (e.g., Bliss 2012; Fujimura and Rajagopalan 2011; Fullwiley 2011; Lee 2006, 2008; Reardon 2005; Shim, Ackerman, et al. 2014; Shim, Darling, et al. 2014). Fullwiley (2014, 8056), for example, shows that social and political labels of groups get imported into genetic research as it "combines ideas about human biological difference that draw on measures of physical characteristics and human biological material that are both *race* and *population* based."

Accordingly, analyses of genetic ancestry testing (GAT) have raised multiple potential concerns. Royal and colleagues (2010) detailed several factors that can lead to uncertainties and inaccuracies in estimates of genetic ancestry derived from AIMs, and to caveats around the interpretation of such results. Compounding this confusion is the significant variation in the terms used in GAT (Lee et al. 2009; Royal et al. 2010), and more specifically, the frequent interchanging of a language of "continental ancestry" and "populations" with terms referring to "race" and "ethnicity" (Greely 2008; Lee 2013). Duster (2015) argues that such lexical sleight-of-hand can contribute to the molecular reinscription of race. The spreading use of AIMs sustains the idea that they 'measure' fractional ancestry, an idea that is illusory given that continental ancestry was always already admixed to begin with. The replacement of "race" with "continental ancestry" does not, then, undermine notions of the biological basis of race, but in fact contributes to the "molecular reification of racial categories" (2015, 1). Claims about genetic admixture and proportionate ancestry are combined with a well-intentioned but misguided assumption that using genetic ancestry in health research (even if combined with consideration of environmental determinants) can contribute to explaining health disparities. What then results is the molecular reinscription of race. Indeed, as Benjamin (2015) points out, in multiple locations in both the global north and south, the allure of genomics and its objectivity has led to its use in 'verifying' identity and settling citizenship debates.

These kinds of confusions about the precise nature of genetic ancestry, and conflations of genetic ancestry with race, have raised the alarm on consumers' experiences with GAT. Multiple scholars identify concerns with the psychological, social, legal, political, and ethical implications of ancestry inference, and the actual and potential consequences of individuals learning of their results (Bolnick et al. 2007; Lee et al. 2009; Nelson 2008a, 2008b; Nordgren and Jeungst 2009; Royal et al. 2010). We were able to identify just a few

published studies that empirically examine the experience of receiving GAT information (Hirschman and Panther-Yates 2008; Lee 2013; Nelson 2008a, 2008b, 2013, 2016; Scully et al. 2016). As described below, these few empirical studies suggest that genetic ancestry test takers do not necessarily buy into the relatively simplistic language of "ancestry," "race," "origins," and "identity" in unreflective ways.

Lee (2013) found that some consumers of 23andMe tests were disappointed that their ancestry results did not provide them with, for example, "their 'family village'" that they had desired and perhaps had been led to expect. However, most were circumspect about their ancestry results. Like Lee's (2013) participants, Scully and colleagues' (2016) test takers were searching for knowledge useful to constructing a narrative about a personalized past. They were recruited to participate in an ongoing genomics project in Northern England, and were residents of a region that has strong cultural narratives about Viking origins. They found that GAT did not provide ready-made information about their pasts, but rather required work to make sense of its meanings (see also Nash 2015). Some did indeed come to view their results as representing a "past-in-the-present" (Scully et al. 2016, 169) where they could see an imagined genetic community stretching back in time; others only found this to be a "confusing picture of a remote and ill-defined past" (2016, 174). And still others fit their results into pre-existing beliefs and feelings about who they were and where they came from, and saw them as "potential accreditation" (2016, 170) and "vindication of a long-held belief' (2016, 175) about their already assumed identity.

Finally, in Nelson's (2008a, 2008b, 2013, 2016) study of Black American and Black British users of traditional genealogy and genetic ancestry tests, she found that they did not always accept GAT results as definitive proof of their ancestry. Instead, they "interpret and employ their test results in the context of personal experience and the historically shaped politics of identity" (2008a, 762). Some found their results stimulated further curiosity in their ancestry, rather than being wholly satisfied them. For many, the results were either not specific enough (about aspects of their roots that they had expected to discover), or too distant (referring only to long-ago population encounters) to allow their full, as-is integration into their ideas about their past. In sum, Nelson's participants "actively draw together and evaluate many sources of genealogical information (genetic and otherwise) and from these weave their own ancestry narratives" (2008a, 762). Nelson therefore speculates that "genetic genealogy testing may thus amplify possibilities for subject-formation and ancestral affiliation, rather than simply reducing them to genetic determinants" (2008a, 762).

In this paper, we address this question in a different context: Among women participating in a research study unrelated to genetic ancestry, are GAT results taken up in their thinking about their racial identity, and if so, how? Is it just one of many potential contributors to racial identity, or a particular one due to its widely perceived nature as uniquely scientific information? Or is genetic ancestry relatively insignificant in the face of lifelong biographical and social experiences? Here we describe how participants' experiences receiving their genetic ancestry estimates were overwhelmingly characterized by a curious combination of anticipation and satisfaction yet no discernable impact on their sense of self or racial identity. Our participants reported that their genetic ancestry results had *no* effect on their sense of self, their understandings of who they were, and the communities and

peoples with whom they affiliated. Yet for a few participants, their results did have some impact, but not in ways that shifted their extant ideas about who they were. In either case, however, GAT results were seen as both informational as well as emotional: participants' sense-making and interpretation of ancestry estimates inevitably perfused ancestry admixture percentages with feelings about their meaning and significance — *even when* individuals concluded ultimately that test results had little effect on how they thought and felt about their identity. In what follows, we elaborate on the effects and non-effects of genetic ancestry estimates for the women in our study, and how we make sense of the simultaneity of their experiences of "knowing something" versus "feeling different."

## Methods

This paper is based on 63 in-depth interviews conducted with 21 participants (three interviews per participant). From 2013-2014, we recruited members of several Community Advisory Boards (CABs) of the WIHS to participate in our study. WIHS, and therefore our study, include only women. Self-identified race and ethnicity were as follows: of 21 total participants, 14 (67%) were African American; 4 (19%) Hispanic; 1 (5%) Asian American/Pacific Islander; 1 (5%) Native American/Alaskan Native; and 1 (5%) other (total exceeds 100% due to rounding).[2]

Using AIMs, estimates of individuals' ancestry that purportedly come from Europe, Africa, and Asia were calculated. Genetic ancestry was therefore reported at the continental level. Asian ancestry was also understood to potentially stand in for Native American ancestry: many population geneticists assume that patterns of AIMs frequencies that distinguish Asian ancestry are also found in Native American ancestry due to the migration of Asians to North and South America.[3]

To capture women's experiences with GAT over time, we conducted three, in-depth interviews with each participant: once prior to receiving their ancestry estimates, another immediately following the return of ancestry estimates, and a third interview 3-6 months after receiving their results. The first interview covered topics such as participants' desires for and expectations of their ancestry estimates, understandings of AIMs and GAT, and how ancestry estimates might affect self-identity and community affiliation. Just prior to the second interview, participants received their genetic ancestry estimates. The second interview covered some of the same topics as the first, but asked participants to reflect on their understandings of their ancestry information[4] in comparison to what they expected to receive, and to characterize the effects if any of GAT on self-identity or community affiliations. Finally, the third interview explored any changes in participants' self-conceptions, how they used and shared their ancestry information, and how those experiences affected them over time. Interviews lasted from 45 minutes to 2 hours and were conducted mostly in person but in a few instances by phone. Human subjects approval was

[2]We did not collect data on socioeconomic status or other demographic information, and therefore cannot comment on the potential effects of those characteristics on participants' experiences with GAT, as we can with self-identified race and ethnicity.
[3]We note, following TallBear (2013), that this claim is much contested by many Native Americans.
[4]We want to emphasize that whether people actually understand genetic ancestry *as* ancestry is an open empirical question; more broadly, *how* they understand the kinds of information genetic ancestry tests reveal and the meanings they assign to them are part of what this paper explores.

granted by the University of California, San Francisco and the two health care institutions where interviews were conducted.

During our interviews, we deliberately left terms such as “race,” “identity,” “ancestry,” “community,” and so on undefined. Our project was intended to capture whether and how these terms — however participants *themselves* defined them — were related to and affected by their genetic ancestry estimates. Thus we did not intend for this study to describe how participants defined race and racial identity per se, but rather to discern whether receiving GAT information affected their sense of self, their racial identity (however they defined it), and their understandings of the terms of group membership for themselves.

All interviews were audio-recorded, transcribed, and uploaded into ATLAS.ti software. We undertook a collaborative analysis of a sub-set of interviews to generate the initial codes inductively. Through successive waves of independent and joint coding, and comparison of our coding, we finalized a codebook of approximately 100 codes distributed among about 12 categories. The ATLAS.ti query tool was used to extract data tagged with particular codes. We wrote and circulated memos on these queries in order to generate the findings described in this paper. We also generated queries of specific codes for each participant to better track and analyze each individual’s experiences from the first interview through the third.

Given that this paper is about identity, we reflect on our own identities and the possible implications they might have on this research.[5] JKS identifies as an Asian American, cisgendered woman; SRA as a Bangladeshi American, cisgendered, queer woman; and BEA as a Caucasian, non-Hispanic male. Given that JKS and SRA conducted all the interviews, our participants may have perceived that we share with them an identity as women of color. SRA is brown-skinned and often mistaken for being Latina (in fact, one Latina participant wanted to know if they shared that background). However, given that Asian and South Asian Americans are sometimes seen to occupy a liminal position relative to other communities of color and to whites, it is also possible that they did not see or presume or experience a shared status or identity with us. It is impossible to know fully the effects our gender and race played in our interactions; however, we did not sense that the vast majority of participants were less than fully engaged with us and our questions. Moreover, there were multiple times in which interviewees intimated or indicated to us in tacit ways that they sensed some shared understanding of marginality: for instance, participants often would end their reflections with phrases like “you know?” (see Ochieng 2010), some spoke at length about colonialism and oppression, and there were frequent references to interactions with “white people” and experiences of racism as if these were mutually understood experiences.

[5]There is a vast literature on reflexivity in qualitative methods and the potential effects of researcher identities, interactions, and behaviors on qualitative data collection and interpretation (see, e.g., Altheide and Johnson 2011; Bhopal 2010; Casper 1997, 1998; Charmaz 2014; Clarke et al. 2018; DeVault 2018; Fine 1994; Mruck and Mey 2007; Ochieng 2010; Way et al. 2015). Guided by this literature, and motivated by JKS’ and SRA’s orientations as feminist qualitative researchers, we continually recorded and tried to surface, through memos and discussions among the research team, when we discerned such interviewer effects (or not) and why, and our methodological-political decisions regarding either managing those effects or accepting them as reasonable tradeoffs for other commitments we had. We present what we believe are the most significant reflections along these lines in the Methods and Discussion sections.

We believe another relevant dimension of reflexivity is our disciplinary affiliations and epistemological commitments. JKS and SRA identify as qualitative researchers who do feminist science, technology, and medicine studies and health research, and BEA is a molecular epidemiologist. Because of JKS' and SRA's disciplinary training and their familiarity with the literature reviewed above, and because BEA, by virtue of his background in genetics, understood the assumptions built into the use of AIMs, all three of us had some ambivalence about the use of GAT, particularly within the context of an ongoing research study. We were also highly attuned to ensuring participants understood the limitations of the technologies being used to generate those results, and countering the potential conflation of ancestry estimates with racial identity. These concerns manifested in our process of returning results to participants (described below), and in turn, likely had some effect on their experiences (discussed in the last section of this paper).

## Returning genetic ancestry estimates to participants

After consultation with CAB members, we first sought to ensure that participants would have repeated opportunities to basic information about the GAT process. BEA attended CAB meetings to give members a basic primer on genetics and ancestry testing, after which those in attendance could indicate their interest in participating in the study. JKS and SRA reiterated this information in our first interviews with participants, using a standard script, and confirmed their wish to proceed. At the second interview, just prior to giving participants their results, we played a short, narrated slide show we created to repeat information on how genetic ancestry estimates are generated, what the estimates might look like, why they are estimates and not precise measures of an individual's ancestry, and ended with an acknowledgment that there exists a wide range of perspectives on the significance of GAT.

For each participant's genetic ancestry estimates, we created a four-page hard copy report. Each report included a first page reiterating why the test results offer only estimates of genetic ancestry. This was followed by a second page depicting the individual's ancestry estimates in both pie and bar graph forms, with purple, magenta, and pink colors representing estimates of African, Asian/Native American, and European ancestry, respectively. The third page of the report showed how the individual's results compared to those of other WIHS participants with the same self-identified race and ethnicity. That page also included a representation of all WIHS participants' genetic ancestry estimates, stacked side by side, but categorized by self-identified race and ethnicity (see Figure 1). The final page of the report again showed how the individual's results compared to the ancestry estimates of other WIHS participants, but this time not grouped by self-identified race and ethnicity (see Figure 2). We elected to include these last two visuals to demonstrate that genetic ancestry is not clearly defined or categorical, and that genetic ancestry estimates do not map onto self-identified race and ethnicity categories in any clear way. In both the hard-copy report and our verbal presentation of their reports to the participants, we took pains to emphasize that genetic ancestry was far more of a continuum rather than categorically defined populations.

## Knowing something: Genetic ancestry estimates as “just information”

Turning to our findings, the vast majority of our participants perceived their experiences of receiving their genetic ancestry as getting “just information.” That is, even though many awaited their results with varying degrees of anticipation, on balance all of the participants reported their results as having little to no effect on their sense of self or racial identity.

The markedly muted impressions that GAT made on our participants were captured in one interview after another. For example, Desiree[6] expressed some positive feelings about her results (indicating a very small fraction of African ancestry and much larger proportions of Asian/Native American and European ancestry), but they did not seem particularly consequential to her: when asked if her results meant anything in particular to her, she replied, “Really not much.” Nikki also talked about her results (mostly a mix of African and European ancestry) as just being “good to know” and that it’s “more information,” but that they really did not influence how she feels about herself or how she identifies. Participants expressed their general lack of sentiment around the results using phrases like “I’m fine,” “I have no problem whatsoever,” and “It’s just all the same to me.” We identified two main reasons for such non-effects: that genetic ancestry was seen as only incidental and distant information, and as replicating what was already known.

### Knowing what is in me, not what is me: Genetic ancestry as the incidental and distant past

Many of our participants understood their genetic ancestry estimates as “just information” that was incidental and remote, not particularly relevant to their present. A common refrain was that the results described something that was “in me” but not “is me,” an artifact from the very distant past. For example, Edwina told us that her results (approximately equal percentages of African and European ancestry) are “not going to change me or nothing … I got this in me now … [But] no, it’s not going to change me. Not one bit … I’m the same person.” As she explains, the results describe something that is “in” her but that do not change the person that she is.

For many of our participants, this sensation was compounded by their understanding of GAT as depicting a very distant past. For example, Ana carefully parsed her interpretation of her results (showing a relatively high proportion of European ancestry) as revealing something that is far back in her past, that does not have anything to do with her present:

> I connect to, as far as a racial-ethnic group, is Latino, period … That’s my identity … I don’t find this [genetic ancestry] to be separate … because of the connection through blood lines. But I do believe I’m far removed … I don’t think of myself in any way, shape, or form could be related to any European blood line … But then you find out that … the footprints that led you here, the way before, you were of a race that you have no clue about, never been, never known, never understood, never wanted to be or want to be … All it is, is footprints … You had nothing to do with [it] whatsoever … To me personally, as long as I see it that way then I don’t take it

[6]All names are pseudonyms. Additionally, participants’ genetic ancestry test results are described to provide some context to their reflections about them. However, complete and precise percentages are not provided for two reasons: to preserve anonymity, and also to avoid reinforcing the controversial claim that genetic ancestry can be measured in such precise, fractional ways.

> to heart like, 'Oh wow, I'm partly European!' No, I'm not partly European. I'm Puerto Rican, even more *[chuckle]* who's Latina, and just doesn't think of 700 years ago [as] part of me! Not at all.

With the "footprints" metaphor, Ana seems to be gesturing to the sense of this distant past as far behind her, where she came from but certainly not *who* she is now. She acknowledges that the origins and circumstances of her mixed ancestry are part of herself, but they have very little to do with her and her present and how she knows herself.

In fact, for some of our participants, this sense of human migration and patterns of contact over the very distant past is what helps them to make any sense of their ancestry estimates. For example, Adina had not considered the possibility of having mixed ancestry, but upon seeing her admixed estimates (roughly equal Asian/Native American and European ancestry with a small fraction of African ancestry), she could only understand them in the context of human migration flows:

> Well it's interesting to know … If you think of the way that civilization or man traveled, it would make sense, right? … I identify with being Mexican American but I don't identify with the numbers that are there. Because that's just a process of man developing; it's history … You can't change history … Can't change the facts, can't change what's in your DNA.

Echoing other participants' refrain of "what's in me, not is me," Adina concedes that this admixture is "in your DNA" but that this is "history … the facts" that occurred in the past and that cannot be changed. Thus she does not "identify with the numbers" on her ancestry results nor is her identity influenced by the lives of such distant ancestors. Instead she identifies "with being Mexican American," the identity that she has constructed and lived with in *her* lifetime, that has constituted her *own* past and shapes her present and future. This explains her sense of distance and detachment from her genetic ancestry results.

**Knowing who I am already: Replicating the already known—**The most common reason invoked for the relative non-significance of genetic ancestry is that they already know and accept who they are. Age, experience, and a lifetime of constructing and living with a particular sense of themselves trumped any effects genetic ancestry results may have; or, GAT simply confirmed things that they already knew or suspected about themselves. As Esther explains, after learning that her results indicate a very small percent of Asian/Native American and some European ancestry in addition to African ancestry, "It's no big deal. I mean, I love who I am. I'm African American … After 45 years, girl, please. I'm not worried about changing nothing." Edwina told us that even if her results turned out to be unexpected, this would not unsettle her: "If I don't have it [results indicating any particular genetic ancestry], I don't have it. I'm 56 years; I've lived half my life."

Desiree concurred with these sentiments; even though she was somewhat surprised by her GAT results (mostly European and Asian/Native American ancestry), she stated that "It just clarifies what I thought … It affirmed something that I knew already." When we asked whether her results change who she feels she is, she demurred, "No, I don't think so … I'm

51 now and I've always associated myself with Native Americans and that's what I will always be … I'm not trying to look for who I am; I've pretty much established who I am."

Ana (whose results indicated more than half European ancestry as well as significant African ancestry) also agreed: "I identify as a Latina, Puerto Rican ancestry … That's all I know … No it [GAT] doesn't affect my identity … because that's all I've ever known … So I'm well established in that." Ana also attributes her equanimity in the face of new information about her genetic ancestry to her age, saying, "I think because I'm older I have a better grasp of it." But at the end of the day, Ana rejects the notion that her ancestry changes how she sees herself; instead, she stresses that her admixture

> really doesn't have anything to … do with [my identity] … I can't relate to them that way — to change anything I am now … Because I've always been brought up and known as Latina and that's all I've ever known … So to change over or change something, that wouldn't happen.

And for Jeanette, she also rejects the notion that learning her ancestry estimates (indicating a significant proportion of European and somewhat higher proportion of African ancestry) changes how she's viewed herself for her almost 59 years of life:

> I still feel like the same African American black female as always *[laughter]* … No big news and no big trauma here … I have had this identity for 59 years. So I think it's a little bit late in the game to kind of be changing, you know? *[laughter]* … I'm settled in who I am and what I am … It just solidified everything I already knew about myself.

For some participants, GAT offered them "just a little bit more" information than they had before, but even this additional knowledge did not impact their racial identity. Gabrielle, for example, told us that while she plans to put her results (mostly African and some Asian/Native American ancestry) in her "book of memoirs" and they gave her "new info," it was "just a little bit more, knowing more about me." And Esther — who, as described above, found out that she had mostly African but also some European ancestry — allowed that her genetic ancestry "is a good thing to know. To me it makes sense and it's good for me to know different things, especially when it comes to my family 'cause I don't know everything about my entire family." But even so, she concluded that "I know a little more than I knew before," but "like I said earlier, I don't feel any different about myself."

Finally, Layla underscored what others described about the stability of living with a certain sense of oneself, but offered a somewhat different wrinkle on the durability of this racial identity and the subsequent non-significance of GAT. As she explained, her genetic ancestry estimates (which showed a small proportion of European ancestry and mostly African ancestry) have relatively little impact on her because

> I'm going to look in the mirror and I'm still going to be black … It's not like it will affect how anybody else feels I am so that's why it doesn't affect how I feel, because I'm still going to be treated the same. Unfortunately America has always been that way … To the world, we're still black … At the end of the day as far as the way I'm treated by the world in general, they will still see dark brown skin and

> they will still see nappy hair … I think that a lot of people wouldn't care. They're already committed to what they see as being their life experience within the race that they identify with, the fact that you almost have to identify by the way that you're seen.

For Layla, racial identity is indelibly shaped by how others see and treat her, as "something that's been imposed on me," as she puts it. Thus the continued significance of ascribed race attenuates any effect that knowing her estimated genetic ancestry has on her racial identity.[7]

## Feeling different: Genetic ancestry as vindication and proof

On the other hand, several of our participants perceived their genetic ancestry as making a difference in how they felt about themselves, *including* some participants who reported above that GAT had little to no effect on their racial identity. For example, Cleo had said that her ancestry results (indicating mostly African and some European ancestry) had no significant or material effect on her; but at the same time, she also told us:

> It [GAT] is very important … because it'll give me the whole sense of my worth … You know your ancestries, you know I defined myself as a person of my birthright … So, I feel like an important part of me as a person, my individuality.

Similarly, Ana is another participant who did not feel that her genetic ancestry (estimated as being over half European ancestry) would substantially affect how she felt about her own identity. But at the same time, she awaited her GAT results with keen anticipation:

> Well, it won't change the fact that I'm Latina, period. I'm brown and I'm Latina; that won't change. But it will give me a better perspective of sort of what my lineage might be and a better understanding of where my family is from … So I just want this for me and it would definitely make a big difference in my life … I really can't wait until I see what the percentage is and all that kind of stuff because I know they can't tell me what my family is, but they can tell me what the percentage is … Because then I have an idea of what more I'm made up of … I can't wait!

After receiving her results and living with them for several months, Ana reaffirmed the meaningfulness of her results to her:

> It just attaches to a window that I've never … seen through before … Attaching to something that is a part of me from hundreds and hundreds of years ago … And it's neat to know that that part of me existed.

Thus on the one hand, all of our participants profess to varying degrees that their genetic ancestry — though interesting or illuminating — was "just information." And yet on the other hand, they were also undeniably meaningful to some of those very same participants. How to make sense of this seeming paradox?

[7]It may be that those coming of age during Jim Crow, hyper segregation, the Civil Rights era, and before the increase in interracial marriage and biracial children, as many of our participants did, may have markedly different views about their racial identification possibilities than young adults at the turn of the 21st century who may see their racial and multiracial options as less constrained (e.g., Brunsma and Rockquemore 2001).

These participants explained that the deep significance they accorded to their genetic ancestry estimates stemmed from their confirming something they *already* knew about themselves. Thus, the experience of receiving results that replicate "what I knew already" could lead some to conclude *both* that genetic ancestry had *no* effect, as well as *some* effect, on their sense of themselves. In distinction to those above who felt the estimates gave them little to no new information, the women we profile here placed a great deal of weight in having "confirmation" and "proof." The consequentiality of the GAT experience lay squarely, not in receiving a *different* sense of self as a result of the estimates, but in ratifying their *extant* sense of self. It was this sense of "vindication," a legitimation of their convictions of who they are, that made them "feel different."

Among our participants, Kea was perhaps the most obvious example of this kind of experience. For her, a crucial consequence of receiving genetic ancestry estimates centered around having a small proportion of her genetic ancestry estimated to come from Africa (along with mostly European and Asian/Native American ancestry). This, she said, "made me feel really good … Yeah, it really did. I was like, yay!" Kea's delight in these results stemmed from her long-held conviction that she was part black, a belief that was supported by others: as she said her African-American husband told her, "'I always knew you were Black … I always knew you had Black in you.'"

Throughout her life, Kea had always, in her words, "played" with her racial ambiguity; but now with her GAT results in hand, she feels more legitimacy to do so. She described how different people saw her differently: some thought she looked Mexican, others saw her as Asian American, and still others perceived her to be black. Kea liked the interactional flexibility that this afforded her, that she could "sit with" and "hang out with" different kinds of folks. She even described her racial/ethnic identity diversely, sometimes saying that she was "Creole," or Pacific Islander, or simply letting others ascribe her race/ethnicity in various ways. "I always felt legit saying it," she told us, but now,

> I have the proof … I actually carry my other copy [of the GAT results] in my binder … Every day it's followed me since the first time I got it … I'm totally vindicated. I love the fact that I have proof. If anyone tries to question it I carry the proof around.

Having mixed ancestry, and in particular, having African ancestry, was *always* how Kea felt about herself, and how she represented herself to others. But her experience of this sense of self is qualitatively different now that she has "proof."

And yet, at the end of the day, Kea still maintains that her genetic ancestry does not significantly change how she sees herself:

**Interviewer:** Does it [the estimates] affect your identity at all, like your personal identity, self-identity?

**Kea:** No.

**Interviewer:** And if you like if you had a form right now to fill out your racial identity would that change for you based on these results?

**Kea:** No, because … I always relate on forms to "Pacific Islander." If they don't have that then I just say "Other."

**Interviewer:** Right. So … nothing would change for you?

**Kea:** No.

Kea was by no means the only participant who felt that her ancestry estimates authenticated beliefs she had always held about herself. Sherice (whose estimates indicated mostly African but also very small fractions of European and Asian/Native American ancestry) also had lived with a certain sense of herself, of her inclinations towards things that she sees as being "Asian": "Trust me, my other spirit is Asian. I don't care what you say, how you say it, how you wrap it up … that's how I feel." Therefore, when she received results that she understood indicated a very small fraction (less than 4%) of her ancestry originated from Asia, Sherice says that this information "just makes me feel much better." When asked how this information changes things for her, she explained:

> It's your background. And for me I can express that now. It's not a piece of the luggage that is left unopened. At least I know where I come from now … That is truly the bottom line: knowing where I come from … I look at the whole scope of everything, of the history of my line … how important it is to know where you come from … A person is beyond a name. They have an ethnic background and just all of the information that leads up to what brings your life to its full effect. Just knowing was just – it was good, it was really good.

For Sherice the results represent true and full knowledge about where she comes from, something tangible and reliable that she can share with others. And while they confirm what she already knows about herself, they nonetheless make her "feel much better."

## Discussion and conclusion

Across the board, the women in our study reported varying degrees of satisfaction to pleasure at being able to receive their genetic ancestry estimates (especially at no financial cost). They treated their results as interesting, even important and meaningful: some accorded great significance to their results, requesting additional copies to share with family, and carefully storing them with other important papers in memory books or a safe. However, participants juxtaposed their genetic ancestry as "meaning a lot" and "a good thing to know," with being something they "already knew," or comprising just "a little bit more" knowledge that is "informational" and "doesn't tell me much." Genetic ancestry did not change how participants saw themselves, how they felt about their past and background, or their communities and affiliations. Instead, it seemed that our participants' racial identities emanated from their cumulative, personal, familial and social life experiences — and therefore as discrete from information they received from a singular source (their genetics) at one point in time. In these senses, our findings echo those of Lee (2013), Scully and colleagues (2016), and Nelson (2008a, 2008b, 2013, 2016). As in their studies, ours found that test takers were quite circumspect about their GAT results, in part because they were non-specific, and/or because they provided a window into a remote past that was interesting

but nonetheless often not much more than a curiosity. In the end, GAT did not provide new or usable information for many individuals; even if they were viewed as "received-facts" (Dumit 2003), ancestry estimates had to be "reconciled with a complex of alternative identificatory resources" (Nelson 2008, 771).

On the other hand, several of our participants reported that their results did make some difference: GAT authenticated beliefs they had always held about themselves. This newfound sense of legitimacy, "proof," and validation in what they *already* knew — rather than an *altered* sense of identity — was how our participants described the felt difference that having their genetic ancestry estimates gave them. Thus, while the women in our study actively engaged with, processed, and interpreted their results, they did so in ways that were largely *not* taken up in their racial identity, even for the several participants who "felt different." Consequently, we saw some women with very small fractions of some continental ancestry (for example, on the order of 1-3%) drawing a strong, confirmatory sense from such results, while others whose results indicate larger proportions of some ancestry (e.g., 15-45%) dismissing any impact on their already well-developed sense of who they are and how the world views them. That is, despite GAT providing our participants with seemingly precise estimates of fractional ancestry, the magnitude of the numbers themselves appeared to have little influence on the magnitude of the meanings made of them. For some, small percentages were very significant; for others, much larger percentages were deemed trivial.

This experience of "proof" stands in apparent contrast to the few of Lee's (2013) participants who saw the patchwork of continental origins of their DNA as eye-opening, revelatory information; those individuals experienced their test results as self-discovery, as knowing something new about themselves. Our several participants' experiences of legitimation also appear distinct from those of Nelson's (2008a, 2008b, 2013, 2016) test takers, who seemed to weigh the import of new genetic information and actively stitch them into their own ideas about their past. But they did have something in common with Scully and colleagues' (2016, 170, 175) participants who were delighted by the "accreditation" and "vindication" their results conferred. In a larger sense, though, all four sets of participants share the experience of coming to genetic ancestry testing with "emotions of longing and personal fulfillment encouraged by cultural ideas of roots, identity, and personal discovery" (Oikkonen 2015, 766), and with "genealogical aspirations: with particular questions to be answered; with mysteries to solve; with autobiographical narratives they want to complete" (Nelson 2016, 77). Those emotions, aspirations, and narratives then provide the context, the backdrop, and the touchstone against which GAT results are assessed, balanced, and interpreted.

Interestingly, the relative non-effects of GAT on our participants' racial identity do not seem to stem from reservations about the science of genetic ancestry: many variously and sometimes simultaneously referred to their results as a "guess" and as "just an estimate," but also "a fact," something that "is true about myself," that "clinched" who they are, that "can't be changed" and about which there is "no doubt." That is, some of our participants saw GAT as expressive of 'facts,' others did not, and still others seemed to oscillate between these two views. But even for those who believed in the veracity of their genetic ancestry estimates, that information seemed to hold relatively insignificant weight in the face of lifelong

biographical, social experiences as members of communities and social groups. Indeed, quite a few participants brought up their age as a means to express the near-absurdity that their racial identity, accumulated and negotiated over their lifetime, would be influenced by genetic ancestry.

For all of these reasons — because they already knew who they are, because the results tell them only about their distant past, or about what they already knew, or just a little bit more than they knew before — our participants experience their ancestry estimates as "just information." They allow that the estimates give them knowledge, but this knowledge has little to almost no discernable impact on their sense of self or their identity. By virtue of going through the genetic ancestry testing process, they now "know something," but this knowledge does not make them "feel different."

At the same time, we posit that the frequent invocation of age and the process of racial identity construction as something that one "comes to terms with," as a participant put it, says something about the nature of racial identity in the U.S. For people of color, whose appearance, behaviors, social status and so on are seen as different and stigmatized, the construction and acceptance of one's identity can be a supremely fraught process. Thus one's position within a social hierarchy shapes the extent to which racial identity construction is seen as something that one 'works on' and must 'come to accept,' as opposed to who one simply 'is.' That so many of our participants spoke about age in the context of the non-effects of GAT reveals the underground workings of exclusion and inequality: Racial identity was anchored to our participants' lifelong experiences of social relations and social realities, built out of "my actual life experience," in the words of one participant, of affiliative and communal practices as well as hierarchical and marginalizing encounters. Such identities were hard won for many of the women of color in our study, and consequently, relatively unchanged by the addition of genetic ancestry information.

The ambivalence some participants expressed about the 'fact-ness' of ancestry admixture, the aspirations and yearning for discovering roots, and the weight accorded to life experiences, also indicate that genetic ancestry estimates were seen as conveying both informational *and* emotional content. There could be no grasp of genetic ancestry as knowledge without some affective experience and interpretative understanding of what its import was. Our participants point to the paired nature of genetic knowledge and sentiment. The women in our study exhibited wide-ranging and even fluid emotions — disappointment, disorientation, anger, elation, mild curiosity, satisfaction — and this range was mirrored in others' reports of test takers' experiences with GAT (Lee 2013; Scully et al. 2016; Nelson 2008a, 2008b, 2013, 2016). Even our participants who saw their ancestry estimates as "just information" felt this way only after processing their results and interpreting their significance through their emotional responses to them. These reactions demonstrate the ambivalence of genomics, that it is both "statistical and yet emotional, informational and yet embodied, significant and yet insignificant" (Oikkonen 2015, 747). Thus "knowing something" appeared to be no less an emotion-inflected experience than "feeling different," and "feeling different" was certainly no less an informational experience than "knowing something." Given that GAT invoked for many test takers understandings of self and racial identity, and given that racial identity and experiences have been so fraught for so long in the

U.S., it is little wonder that GAT carries and constitutes both knowledge and emotion (see also Oikkonen 2015).

We do not wish to downplay ethical concerns that GAT results may have unexpected, and even potentially upsetting or disturbing, effects on individuals' racial identity, their selfconcept, or their sense of belonging to various communities.[8] However, we did not find this to be true in our participants' experiences. Of course, this claim is offered with caution given that ours is a pilot study based on a relatively small sample. On the other hand, we feel our longitudinal design, with interviews before, during, and after receipt of results, allow us to robustly characterize participants' perspectives and experiences over time.

Several other factors may also provide further context for the consequences of GAT for identity that we found. First, because so many of our participants (20 of 21 total) were women of color, many of whom seemed to expect that their ancestry would be admixed, it stands to reason that receiving genetic ancestry estimates to this effect would not come as a surprise. Second, because our GAT results provided estimated ancestry at the continental rather than regional level, this more general information may not have been perceived as being particularly revealing or startling, especially when many participants expected mixed ancestry already.

Third, we considered the potential impact of HIV on discussions of ancestry or racial identity. HIV is a racialized and stigmatized condition, but one that is likely *not* geneticized because it is an infectious disease.[9] Our participants were all part of this study by virtue of their inclusion in WIHS, a HIV case-control study — though it is important to note that our participants were probably a mix of those diagnosed with HIV (cases) and those with similar demographic profiles who do not have HIV (controls). Many of them did connect their participation in our study to their participation in WIHS, and thus there was a health-related inflection to some of their rationales for undergoing GAT; however, the links they made between race, biology, ancestry, and HIV were extremely loose and variable. Multiple women told us in general terms that part of what makes "ancestry," broadly speaking, meaningful and valuable to know is because of its potential relevance for health. Some participants had incomplete family histories, and talked about any additional information as being important to pursue if there was even a remote possibility that it might help to fill in the gaps. However, none mentioned the racialized aspects of HIV prevalence, or its infectious transmission, as reasons for downplaying the salience of genetic ancestry for their racial identities. Indeed, as described above, some believed in the veracity and 'fact-ness' of GAT science. Thus it did not appear that their involvement with a study examining a non-genetically transmitted disease led them to think about health, ancestry, and identity in relatively non-geneticized ways. Rather, it seemed that there was no discernible pattern between what their GAT results showed and the impacts those had on racial identity.

[8]And indeed, this is something that many of our participants spent time explaining to us, that while they themselves felt comfortable (for some, this occurred only eventually, over a period of time) with their genetic ancestry estimates, that they anticipated this would not be the same for others receiving their estimates. While outside of the scope of this paper (and the focus of another), we do want to acknowledge here that many women cautioned that people might have strong reactions to their results, and that therefore the process of obtaining genetic ancestry estimates should be undertaken with caution.

[9]Our thanks go to an anonymous reviewer for bringing up this point.

Finally, our participants were receiving their genetic ancestry estimates in face-to-face interactions, during which highly contextualized information was delivered in careful, lengthy, and multi-media formats, and they had ample opportunities to ask questions and seek clarification. In contrast to consumers who purchase DTC ancestry testing where results are delivered electronically and/or by mailed printed reports, our participants may have received more information about the limitations of genetic ancestry estimation and certainly had more opportunities to explore the various interpretations of their results with staff who understood the GAT process. As a research team implementing the return of genetic ancestry results, that was certainly our intent: we were committed to being as clear as possible that test results could only provide estimates of genetic ancestry, that the information that those estimates were based on did not comport to more well-known racial-ethnic categories, and that continental genetic ancestry was far more of a continuum than categorically defined populations. Consequently, our participants' experiences may well be distinct from those of DTC test takers.

In conclusion, despite legitimate concerns about the ethical and social implications of genetic ancestry testing, our participants did not tell us that finding out their genetic ancestry had undue emotional, psychological effects on their identities and sense of self. Instead, our findings align with scholarship on the formation of racial, ethnic, and other identities (e.g., Frank, Akresh and Lu 2010; Golash-Boza and Darity 2008; Saperstein and Penner 2012; Wimmer 2008), that they are constructed in interaction with others, over lifelong experiences, shaped by the social circumstances they encounter and intersubjective interpretation and negotiation. Our participants thus exemplify that while racial identification may be fluid and complex, genetic ancestry — rather than fundamentally disturbing or countering these accumulations of self-knowledge — is sometimes flexibly and variably folded into individuals' extant understandings of themselves, and at other times seemingly incidental to lifelong, cumulative, and socially mediated and constituted experiences.

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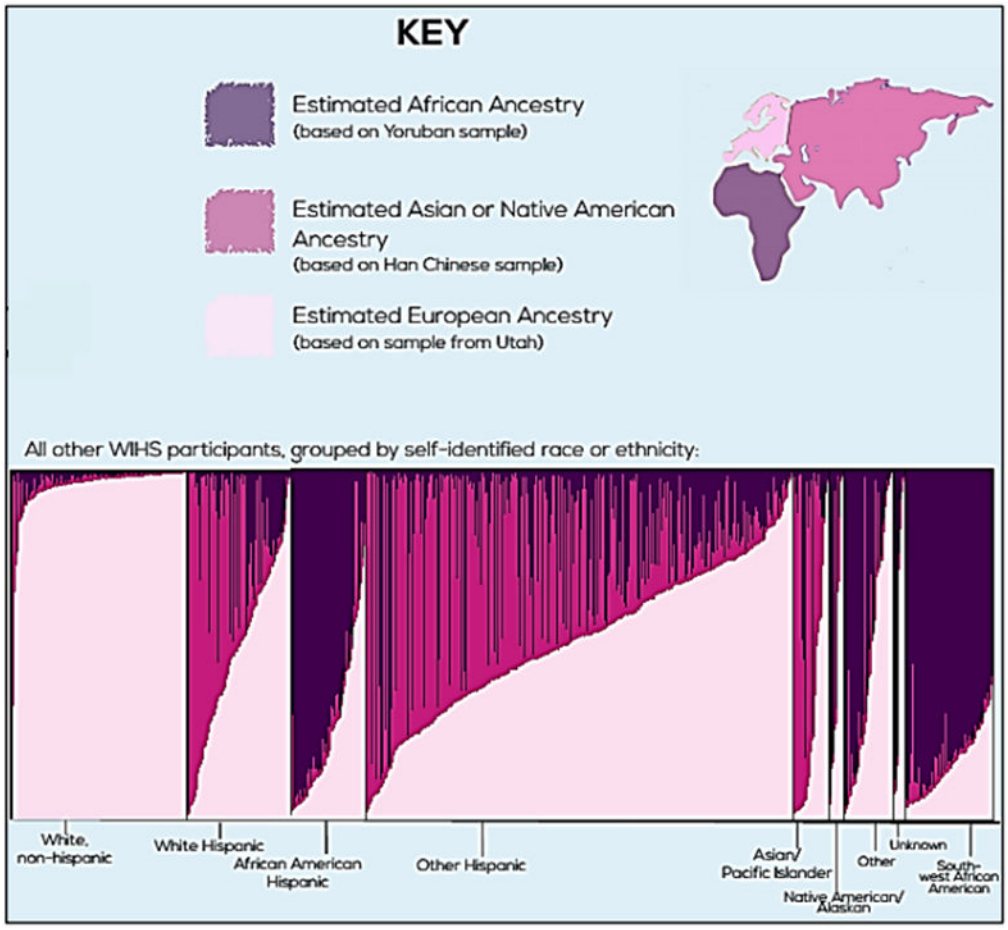


**Figure 1.**
Genetic ancestry estimates of all WIHS participants, by self-identified race and ethnicity

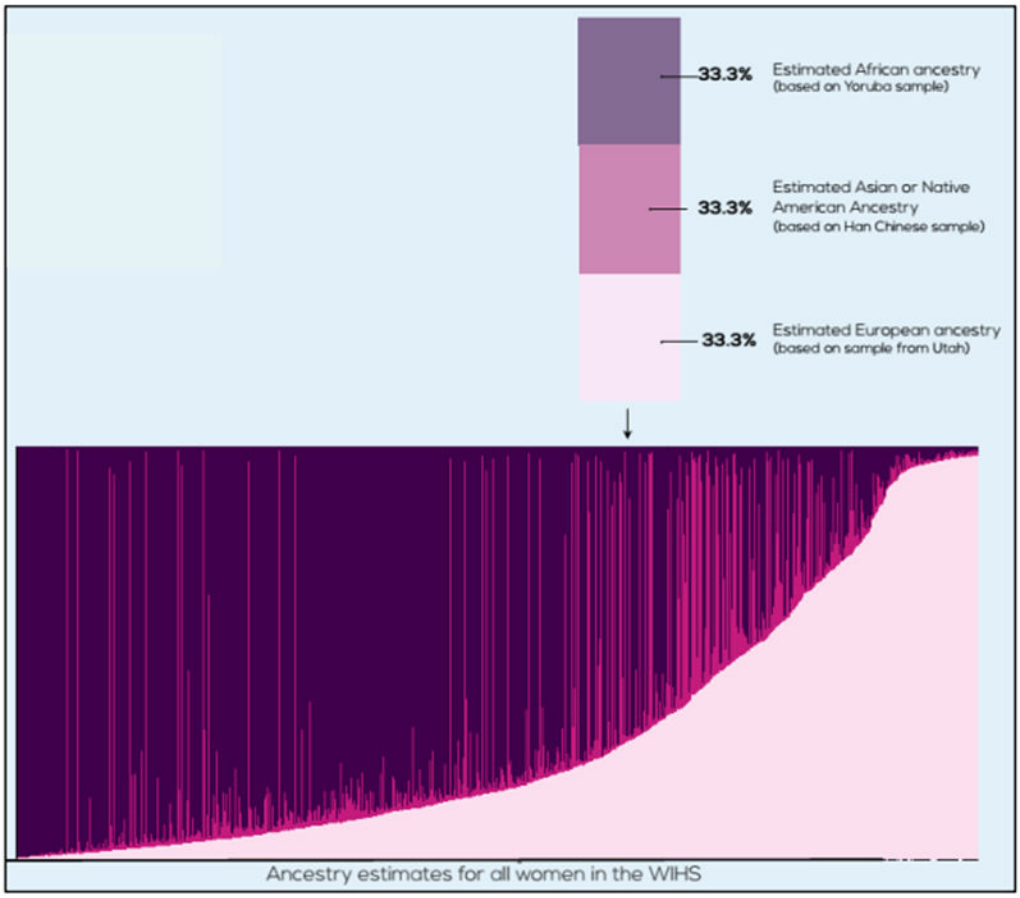


**Figure 2.**
Genetic ancestry estimates of a fictional individual, compared to all WIHS participants