

ABSTRACT This paper considers the extent to which the geneticization of 'race' and ethnicity is the prevailing outcome of genetic testing for genealogical purposes. The decoding of the human genome precipitated a change of paradigms in genetics research, from an emphasis on genetic similarity to a focus on molecular-level differences among individuals and groups. This shift from lumping to splitting spurred ongoing disagreements among scholars about the significance of 'race' and ethnicity in the genetics era. I characterize these divergent perspectives as 'pragmatism' and 'naturalism'. Drawing upon ethnographic fieldwork and interviews, I argue that neither position fully accounts for how understandings of 'race' and ethnicity are being transformed with genetic genealogy testing. While there is some acquiescence to genetic thinking about ancestry, and by implication, 'race', among African-American and black British consumers of genetic genealogy testing, test-takers also adjudicate between sources of genealogical information and from these construct meaningful biographical narratives. Consumers engage in highly situated 'objective' and 'affiliative' self-fashioning, interpreting genetic test results in the context of their 'genealogical aspirations'. I conclude that issues of site, scale, and subjectification must be attended to if scholars are to understand whether and to what extent social identities are being transformed by recent developments in genetic science.

Keywords ethnicity, genealogical aspiration, genealogical disorientation, genealogy, genetics, race, self-fashioning

Bio Science:

Genetic Genealogy Testing and the Pursuit of African Ancestry

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[O]ur biographies are written, at least in part, in terms of structural chemistry. (Lock, 2005¹)

The decoding of the human genome precipitated a change of paradigms in genetics research, from an emphasis on what then president Bill Clinton, in his announcement of this scientific achievement, described as 'our common humanity' (White House, 2000) to a concern with molecular-level differences among individuals and groups. This shift in research focus from lumping to splitting spurred ongoing disagreements among scholars in the

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social and biological sciences about whether genetic markers can and should be used to distinguish human groups. One fulcrum on which this debate has hinged is the question of the epistemological status of 'race'.

These divergent perspectives on the definition and meaning of 'race' can be generally characterized as pragmatism and 'naturalism' (Hacking, 2005).² I define 'race' pragmatists as those scholars who emphasize the practical outcomes for lived experience of the historically contingent processes of racialization (Omi & Winant, 1994). For them, 'race' is not a biological fact, but a social invention, better understood as an index of power – one that structures access to resources including healthcare, education, and housing – than as a register of inherent human difference (Goldberg, 1990; Smedley, 1998; Schwartz, 2001; American Sociological Association, 2002). The pragmatist position was succinctly articulated in a 2001 editorial in the *New England Journal of Medicine* that stated that '[r]ace is a social construct, not a scientific classification' (Schwartz, 2001: 1392). Pragmatists bolster their arguments by citing human population geneticists' findings that humans are 99.9% alike and that intra-group genetic differences vary far more than inter-group ones (American Anthropological Association, 1998; Lewontin, 1982).

In contrast, the contemporary 'race' naturalist position can be summarised as '[n]ature makes differences between individuals. These differences are real, not constructed' (Hacking, 2005: 103).³ Extending this logic, contemporary 'race' naturalists contend that humans can be classified into groupings that confirm the biological reality of 'race' (Sarich & Miele, 2004). These claims are based on novel techniques that allow scientists to locate genetic variants shared *across* human groups, but differently distributed *among* them, and to subsequently ascribe racial and ethnic distinctions to this statistical spectrum. Two recent, influential papers, for example, argue that genetic markers can be used to predict an individual's geographic origins, with the concepts of 'population', 'origin', and 'geography' serving as a proxy for 'race' (Rosenberg et al., 2002; Bamshad et al., 2003).

The stakes of the pragmatist–naturalist debate are high. Naturalists underscore the urgency of their position with the argument that pressing healthcare concerns oblige researchers to use racial and ethnic categories as 'starting points' for genetic research (Burchard et al., 2003: 1174). Pragmatists conversely and aptly point to the intertwined history of science, medicine, and 'race' that is punctuated with instances in which scientific theories of human difference are used to justify forms of discrimination from chattel slavery to segregation (Baker, 1998). They contend that the new splitting techniques in genetics threaten to sustain and compound this deplorable legacy (Duster, 2003 [1990]).

Yet, both naturalist and pragmatist conceptions of 'race' have drawbacks. Invoking scientific objectivity, naturalists may abjure responsibility for participation in research programs that presume inherent human difference and for how subsequent findings are socially reified (Cooper et al., 2003: 1169). For example, Risch et al. (2002: 11) attempt to dissociate genetic research into group differences from both its social origins and

social effects when they write that '[t]he notion of superiority is not scientific, only political, and can only be used for political purposes'. On the other side, while pragmatists attend to past injuries and the potential risks of scientific racism when they consider recent developments in genetics research, some do not fully appreciate how 'race' can be a non-deterministic biological 'discourse about the body'.⁴ Condit's (1999) research on the public understanding of genetics is instructive on this point. In a study of the connotations of the word 'blueprint' as a descriptor of genes, Condit found that respondents used the word to evoke both schematic and schema, that is, an immutable infrastructure of human nature as well as a malleable constellation of constitutive facets of identity. This research shows that there is considerable variance in how the influence of genes is construed by the public that bears consideration in contemporary investigations of 'race' and ethnicity. Rejecting a reductive understanding of 'race' as genetic fact should not preclude investigations into the ways in which biological discourses contribute to racial formation processes beyond the lab and the clinic. Indeed, 'race' and ethnicity have never been the products of a single domain of knowledge or influence, for example, of the biosciences or the social sciences exclusively.⁵ Rather, their significance has always been constituted, simultaneously 'socially' and 'naturally', through an assemblage of discourses, concepts, ideologies, and practices enacted at various social locations (Omi & Winant, 1994; Gilroy, 2000; Fausto-Sterling, 2004: 2–4). Accordingly, investigations of 'race' and ethnicity in the genomics era should be pursued from many perspectives and on many scales. In this paper, I endeavor to triangulate the naturalist–pragmatist 'binary trap' (Ossorio & Duster, 2005: 115) through an examination of the consumption⁶ of genetic genealogy testing – the use of DNA analysis for the purpose of inferring ethnic or racial background and aiding with family history research.⁷

Knowledge derived from genetic science has increasingly been used to explain ever-growing aspects of the social world. The proliferation of genetic genealogy testing – DNA analysis which purveyors claim provides scientific substantiation of an individual's ancestral origins based on the comparison of his or her DNA against a database of genetic samples from a statistically constituted social group – appears to be one example of this increasing 'geneticization' (Lippman, 1991, 1998). The questions I pose are whether and how these technologies come to 'geneticize' racial and ethnic identities. The decision to employ genetic testing for genealogical purposes could be viewed as a sign that test-takers are confident about the underlying assumptions of this form of genetic analysis as well as in naturalist conceptions of human difference. However, as I describe below, while the geneticization of 'race' and ethnicity may be the basic logic of genetic genealogy testing, it is not necessarily its inexorable outcome (Rose, 2007: 176–77). My research shows that, to the contrary, the scientific data supplied through genetic genealogy are not always accepted as definitive proof of identity; test results are valuable to 'root-seekers' to the extent that they can be deployed in the construction of their individual and collective

biographies. Root-seekers align *bios* (life) and bios (life narratives, life histories) in ways that are meaningful to them.⁸ These users of genetic genealogy interpret and employ their test results in the context of personal experience and the historically shaped politics of identity (Lock, 2005; Wailoo & Pemberton, 2006). They actively draw together and evaluate many sources of genealogical information (genetic and otherwise) and from these weave their own ancestry narratives.

This paper draws upon interviews with, and ethnographic fieldwork among, persons of African descent who have made use of one or more categories of genetic genealogy testing. Since 2003, I have observed events and conferences at which genetic genealogy testing was discussed or offered, including meetings at churches, libraries, and universities in England and the US.⁹ In Britain, my research has centered on the London metropolitan area where I attended a gathering of subjects in the research project and BBC documentary, *Motherland: A Genetic Journey*; I also interviewed several study participants and the program's producers. At sites throughout the US, I attended gatherings of 'conventional' genealogists – amateur researchers who employ archives and oral history, among other sources, to reconstruct family history. Because of their demonstrated interest in ancestry tracing, conventional genealogists are targeted by purveyors of genetic testing services. In this process, I also have become a genealogist and my own research subject. I am currently conducting research on my family's history that traverses the southern US and Jamaica. I am a member of the Afro-American Historical and Genealogical Society (AAHGS) and of a local AAHGS chapter in New York City. I intend to purchase at least one genetic genealogy test after I have completed more family history research.

In addition to archival excavation, the practice of genealogy now involves considerable technical mediation: Family Tree Maker and other computer software programs that assist genealogists to construct pedigree charts and to rationalize the large amounts of information the activity requires; email listservs dedicated to discussion of the technical aspects of genetic genealogy testing; and websites at which test-takers can compare DNA results in order to establish degrees of relation. Since contemporary genealogical research is a substantially technological pursuit, my research necessarily involved 'virtual' ethnography (Hine, 2000; Miller & Slater, 2001; Helmreich, 2003; also Heath et al., 1999). Specifically, I observed and participated in a virtual community whose members share an interest in tracing African ancestry. Community discussions encompassed varied topics related to the practice of genealogy. One forum is dedicated to discussions of DNA testing. In virtual genealogical settings, members also dialogue about the science behind genetic ancestry tracing; display expertise through their command of jargon and recent genetics research or developed through prior experience with one or more testing companies; circulate topical scientific papers and newspaper articles; and share genetic genealogy test results and their feelings about them. As a participant observer of genealogical settings, my involvement in this online community primarily consisted of discussions with genealogists, both on the public

listserv and ‘off channel’ – that is, in private online conversations. There were ‘nodes’ (Heath et al., 1999) of overlap and continuity between the on-line and off-line communities I inhabited and, as I describe below, I came to know several members of this virtual community personally through interviews and at genealogical gatherings.

In what follows, I discuss these African American and black British consumers of genetic genealogy testing whose accounts provide a window to this emerging practice of using genetic and socio-historical resources to constitute their identities and thereby also to constitute ‘race’ and ethnicity in the age of genomics.¹⁰ I trace the historical and cultural precedents of black root-seeking, and then discuss three categories of genetic genealogy testing and the information each provides. Turning to the experiences of test-takers, I consider whether and how genetic genealogy test results are incorporated into individual and collective biographies. Extending the concept of ‘objective self-fashioning’ (Dumit, 2003b: 44) to ‘*affiliative* self-fashioning’, I argue that genetic genealogists exercise some control over the interpretation of their test results, despite the presumption of their conclusiveness. Among other factors, test-takers’ negotiation of test outcomes may be generated by a disjuncture between genetic and other types of evidence about ancestry that can elicit an affect I term ‘genealogical disorientation’. Genetic genealogy testing may thus amplify possibilities for subject-formation and ancestral affiliation, rather than simply reducing them to genetic determinants. I conclude that, contrary to both naturalist and pragmatist arguments, genetic genealogy testing provides a locus at which ‘race’ and ethnicity are constituted at the nexus of genetic science, kinship aspirations, and strategic self-making.

Genetic Root-Seeking and the Usable Past

Until recently, for persons of African descent and others, pursuing one’s family history has typically entailed genealogical excavation of the type depicted in Alex Haley’s (1976) best-selling book *Roots: The Saga of an American Family* – a novelized account of Haley’s efforts to trace his ancestral lineage back to the African continent. As is widely acknowledged, Haley’s project – the book and the award-winning television mini-series adapted from it – prompted an international conversation on racial slavery and its consequences. Less recognized, but equally important, Haley’s narrative established an expectation, among a generation of readers and viewers in the US and abroad, that recovering ancestral roots was not only desirable, but also possible.¹¹

Genealogists of African descent frequently reference *Roots* when describing how their interest in family history research was piqued. Elisabeth’s (a pseudonym)¹² experience is typical of the genealogists with whom I spoke – typically aged 40 years or older, college educated, and predominantly female – who as teenagers or young adults were inspired by Haley’s example.¹³ I first encountered Elisabeth, a computer scientist in her late forties, in an online community of black genealogists to which we both

belong and I interviewed her at her home in the north-western US in 2004. To the rhythm of her placing and removing from the oven the cookies she was baking for her pre-teen son, she described the chain of events that had led her to become a genealogist and, some decades later, a genetic genealogist. In particular, she waxed nostalgic about a presentation by Alex Haley at her Midwestern high school that had stimulated her interest in genealogy:

Haley came to my high school in 1970. This was before *Roots* came out. He had a *Reader's Digest* article about it out and he was on the road just telling everyone about how he traced Kunte Kinte. And, I was in 9th grade and I just sat there mesmerized Actually, I have a copy of the tape [of Haley's presentation]. I got in contact with my old high school civics teacher, out of the blue, last year. And, he says, 'You know, I was going through stuff and I found this old Alex Haley tape. I didn't know what to do with it – would you like it?' Of course! And it's phenomenal! ... It was just a fascinating talk; it really was. That's when I got bit by the genealogy bug.

Elisabeth's friend, Marla, expressed similar sentiment about Haley's influence when I met with her. Although she made a start at genealogical research in the 1960s, following the death of the eldest member of her extended family, it was not until a decade later, when she attended a lecture by the author at a local community college, that her interest was galvanized. This encounter impressed upon her that a non-specialist researcher could employ insurance records, land deeds, slave-ship manifests, and family history libraries to trace her roots to Africa.¹⁴ As she explained to me,

it was interesting to hear him talk about ... going to the Mormon temple and going to Lloyd's of London and all of that. I never figured that I would have access to those kinds of records ... I never ever thought that the average person could have accessed it. So, I never anticipated being able to ... go back to slavery.

Across the Atlantic Ocean, the 'Roots' mini-series elicited feelings of 'deep shame and embarrassment' (McCalla, 2005) in a teen-aged Beaula McCalla who, as an adult, endeavored to cope with these emotions by organizing African-centered programming in Bristol, England, and, eventually, by participating in a television documentary (*Motherland: A Genetic Journey*).

In notable contrast to the ubiquity of what might be called the 'Roots moment' among root-seekers, very few of my informants have been able to complete their familial lineages using standard genealogical methods like those Haley used.¹⁵ Persons wishing to trace their African ancestry beyond the 19th century face many hurdles to the achievement of this goal – genealogists speak of coming up against a 'brick wall' – principally, the scarcity of written records from the era of the slave trade. Consequently, DNA analysis appeals especially to root-seekers whose prior efforts have failed to yield information sufficient for extensive genealogical reconstruction.

Genetic genealogy testing emerged from techniques developed in molecular genetics, human population genetics, and biological anthropology (Cavalli-Sforza et al., 1994; Hammer, 1995; Jobling & Tyler-Smith, 1995; Skorecki et al., 1997). Three principal tests are offered by the growing number of companies that sell DNA analysis for genealogical purposes. Rather than taking up the companies' technical or brand descriptions, I categorize the tests according to the type of information each imparts, because as I discuss below, the forms of social orientation that the test outcomes suggest are of primary importance to root-seekers. My informants purchased particular genetic tests in order to fulfill distinct 'genealogical aspirations'; for instance, corroboration of a multicultural background or assignment to an ethnic community. With this in mind, I classify these tests as ethnic lineage, racio-ethnic composite, and spatio-temporal.

Ethnic lineage testing draws on the unique features of *Y-chromosome* DNA (Y-DNA) and *mitochondrial* DNA (mtDNA) to infer ancestral links to contemporary nation-states or cultural groups. Y-DNA is passed virtually unchanged from fathers to sons and can be used to trace a direct line of male ancestors; mtDNA, the energy catalyst of cells, is inherited by male and female children exclusively from their mothers, and contains 'hyper-variable' segments that are conducive to comparison and thus useful for uncovering matrilineage. Using both forms of ethnic lineage testing, a consumer's DNA is searched against a testing company's reference database of genetic samples. If the sample and the reference DNA match at a set number of genetic markers (typically eight or more), an individual can be said to have shared a distant maternal or paternal ancestor with the person who was the source of the matching sample in the reference population. Several companies offer this type of testing, including African Ancestry (<africanancestry.com>) and Family Tree DNA (<ftdna.com>). A typical ethnic lineage result may inform a test-taker, for example, that her mtDNA traced to the Mende people of contemporary southern Sierra Leone.

With spatio-temporal testing, a consumer's DNA sample is classified into a haplogroup (sets of single nucleotide polymorphisms [SNPs] or gene sequence variants that are inherited together) from which ancestral and geographical origins at some point in the distant past can be inferred. This form of analysis was made possible by the ambitious Y-DNA and mtDNA mapping research that resulted in theories about the times and places at which various human populations arose (Cann et al., 1987; Cavalli-Sforza et al., 1994). Family Tree DNA supplies customers with haplogroup information, as does National Geographic's Genographic Project. Based on a match with the mtDNA-derived L1 haplogroup, a customer employing this test can receive a result indicating that her ancestors lived in Africa approximately 100,000 years ago.

Racio-ethnic composite testing involves the study of nuclear DNA – which is unique to each person (identical twins excepted, although this is now being debated) and consists of the full complement of genetic information inherited from parents – for the purpose of making claims about one's ancestry. A DNA sample is compared with panels of proprietary

SNPs that are deemed to be 'informative' of ancestry. Algorithms and computational mathematics are used to analyze the samples and infer the individual's 'admixture' of three of four statistically constituted categories – African, Native American, East Asian, and European – according to the presence and frequency of specific genetic markers said to be predominate among, but importantly, not distinctive to, each of the 'original' populations.¹⁶ This form of analysis was developed and is principally offered by the Ancestry by DNA division of DNAPrint Genomics as well as by other companies that use its techniques, such as the Genetic Testing Laboratories in New Mexico and UK-based International Biosciences. A hypothetical customer might learn his composite to be 80% African, 12% European and 8% Native American.

Each of these tests thus offers a different window into the past, and root-seekers demonstrate different interests and preferences based on their genealogical aspirations. Racio-ethnic composite testing has proved unsatisfactory to some root-seekers who want to re-create Alex Haley's *Roots* journey in their own lives. Although composite testing analyzes an individual's full genome (rather than a section of it, as is the case with ethnic lineage and spatio-temporal testing), its results nevertheless lack specificity and usefulness for some users.¹⁷ Cecily was one of them. We met at the 2005 annual meeting of the AAHGS. As we sat near the display booth of the African Ancestry company from which she had previously purchased an ethnic lineage test, I asked whether she planned also to pursue racio-ethnic composite testing. In response, she declared, 'I don't need to take that test. We're all mixed up. We know that already.' Somewhat similarly, spatio-temporal testing results may be deemed too remote by some root-seekers. Marla, who in addition to the genealogy chapter she leads with Elisabeth, also moderates an internet forum dedicated to discussion of DNA testing for genealogical purposes, has purchased several tests. An mtDNA test purchased from African Ancestry matched her with the Tikar people of Cameroon. As I have found is frequently the case, Marla's initial testing experience stimulated further curiosity about her ancestry, rather than satisfying it fully. She then purchased a composite test for herself and also paid for three family members to have ethnic lineage testing from Trace Genetics (a testing company known for its large database of Native American reference samples, which was purchased by DNAPrint Genomics, in 2006). For a fourth round of testing, Marla sought to find out more about the maternal line of her deceased father. As a seasoned genealogist, she knew that this information could be accessed if she had a paternal second cousin's DNA analyzed. In an email exchange between Marla and I that followed from a conversation at her home, she detailed Family Tree DNA's spatio-temporal analysis of her cousin's genetic sample:

The mtDNA of my 1st cousin's daughter (paternal grandmother's line) traced to 'Ethiopia' and $\pm 50,000$ years ago. It is Haplogroup L3 which [according to the information provided by the company] 'is widespread throughout Africa and may be more than 50,000 years old'. Her [the cousin's] particular sequence 'is widespread throughout Africa' and has its 'highest frequency in West Africa'.

Marla expressed that the results were ‘deeper’ than she had wanted and referred to ancestry ‘far before the time that I am interested in’. She continued, expressing frustration that these genetic genealogy test results did not provide her with more information than she might have surmised on her own:

Huh???? Ethiopia? West Africa? Didn’t just about everybody outside Africa come through the Ethiopia area 50,000 years ago? Maybe I’m off by a few thousand years. ... These kinds of results are meaningful for those tracking the worldwide movement of people (like the National Geographic study), but not really meaningful to me in my much narrower focus.

Marla concluded our exchange by informing me of her plan to send these results to the African Ancestry company for reinterpretation and comparison against its ethnic lineage database. Washington, DC-based African Ancestry was founded by geneticist Rick Kittles and his business partner Gina Paige in 2003. The company sells two genetic genealogy tests, MatriClan and PatriClan, which analyze mtDNA- and Y-DNA-linked genetic information, respectively, in order to associate customers with present-day African ethnic groups based on matches with its proprietary biobank, the African Lineage Database (ADL). As I described, African Ancestry’s services are popular among root-seekers of African descent because they approximate Haley’s *Roots* journey and because the company claims to hold the largest collection of ‘African DNA’.

Cecily and Marla’s comments indicate that effectual test outcomes are those that offer test-takers a *usable* past. For Cecily, composite testing would merely confirm the ancestral hybridity (resulting from racial slavery) of which she was already convinced; to her mind, this form of scientific genealogical analysis provided information that was neither novel nor useful. Given Marla’s aim to derive ethnic lineage from spatio-temporal results, the ‘much narrower focus’ that would be ‘really meaningful’ to her would apparently take the form of a genetic genealogy that affiliated her with an African ethnic group and possibly a present-day nation, thus fulfilling the genealogical aspiration that was established when she attended the Alex Haley presentation three decades earlier. Taken together, Cecily’s indifference toward racio-ethnic composite testing and Marla’s preference for ethnic lineage testing, suggest that not just any scientific evidence of ancestry will do. Rather, consumers come to genetic genealogy testing with particular questions to be answered, with mysteries to solve, with personal and familial narratives to complete and seek ‘the right tools for the job’ (Clarke & Fujimura, 1992). Genetic genealogy test results may challenge not only prior expectations but also other evidentiary bases of self-perception and social coherence. As Marla’s response to the spatio-temporal result implies, as I elaborate below, genetic genealogists are judicious not only about the types of genetic genealogy tests they purchase, but also about the significance of the test results. The negotiation of test results throws into relief the inadequacy of the ‘race’ naturalist–race pragmatist contest. For, through their efforts

to align *bios* with bios, root-seekers selectively imbricate discrete epistemologies of 'race' and ethnicity.

Genealogical Disorientation: 'We Still Technically Don't Know Who We Are'

I attended a symposium on 'race' and genetics at a large public urban university in the Midwest in the fall of 2003. It was a small, interdisciplinary gathering of scholars and included presentations by social scientists, geneticists, and bioethicists, among others. The audience consisted mostly of symposium presenters, but also included interested faculty affiliated with the university and members of the public, who sat in on discussions for short periods of time throughout the day. A smattering of non-academics was on hand for an afternoon presentation by Rick Kittles, African Ancestry's chief science officer and, at the time, also a director at the National Human Genome Center at Howard University. In a manner that blended erudition and affability, Kittles discussed the scientific research and socio-cultural assumptions behind the ethnic lineage analysis his company had begun offering several months prior.¹⁸ During the presentation, I sat next to a middle-aged African American woman, whose cotton navy jacket emblazoned with Teamsters Union patches and steel-toed work boots placed her in a somewhat different genealogy of interest in the topic at hand than the academics in attendance, who, like me, were dressed in business casual and hunched over our notebooks. While Kittles continued his dynamic performance, the woman nodded enthusiastically in assent and, from time to time, looked over to me seeking mutual appreciation of the geneticist's presentation. I smiled and nodded in return. This silent call-and-response went on for several minutes when at one point she leaned in and whispered to me that she had 'taken his test'.

At the conclusion of Kittles' presentation, the woman (Pat) and I continued our discussion of her experience with African Ancestry's genetic genealogy service as she strode with me through the labyrinthine campus – less confusing to her as a university employee – to the public transport stop from which I would travel to the airport. As we walked and talked, she spoke of her interest in conventional genealogy and of recent events that had prompted her to use DNA analysis to trace her African roots. Pat told me that she is a longstanding member of the AAHGS and of two other genealogical societies. For almost 30 years she had assembled archival materials, reminiscences, oral history, and linguistic clues from family members. This evidence led her to deduce that her family's maternal line may have descended, in her words, from 'the Hottentots' (or the Khoisan of southern Africa). Despite some success with her genealogical research by traditional means, Pat has not been able to locate a slave-ship manifest or definitive documentation of her African ancestry. She told me that, as a result, 'some missing links' remained to be uncovered for her.¹⁹

Prior to Pat's employment at the university, she processed forensic evidence for a police department crime lab in the same city. This work

experience bolstered her confidence in African Ancestry's product. As she explained to me, 'I've seen people let off jail sentences based on DNA ... I'm not question[ing] about DNA ... given my experiences [working in the lab], there is no reason to doubt the technology.' Pat's resolute belief in genetic analysis was paralleled by her faith in the company's black chief scientist. At our initial meeting, she unequivocally said, 'I trust Dr. Kittles.' Because of a legacy of racially segregated healthcare and experimental exploitation, such as the notorious Tuskegee syphilis study, some African Americans are mistrustful of bioscientific research. This mistrust has been shown to negatively impact contemporary health-seeking behavior and to create a disincentive for African Americans to participate in clinical trials (Corbie-Smith, 1999; Gamble, 2000). In contrast, the growing popularity of African Ancestry's services demonstrates that this long-held skepticism may be overcome by the trustworthy persona of a researcher-entrepreneur combined with a passion for root-seeking (Rotimi, 2003), and in Pat's case, in particular, familiarity with genetic analysis and its usefulness in exonerating wrongly incarcerated persons.²⁰

Pat purchased an mt-DNA test from African Ancestry following a persuasive pitch by Kittles at one of the three genealogy club meetings she regularly attends. Asked to recall her feelings as she awaited her genealogy test results, she responded, 'I didn't know what to expect ... it's like rolling a lottery thing, okay this is where it landed.' By this, Pat meant that she came to the testing with prior information but not necessarily preconceptions about her ethnic 'match'. A comparison of Pat's DNA with the ADL did not place her maternal line in southern Africa. Instead, she was associated with the Akan, a large ethnic group of Ghana and south-eastern Côte D'Ivoire that includes the Asante, the Fante, and the Twi, among others. Pat's results included 'my genotype' printed out on paper, 'a letter of authenticity from the lab', and 'a certificate saying I was Akan'. However, these authoritative artifacts did not leave Pat feeling settled about her ancestry. She recollected, 'I felt numb, blank. [I've] been doing genealogy since 1977. I grew up with knowledge of Hottentot ... all these years later, I find out it's Ghana.' She added, after a pause, 'What if it's true?'

Pat's uncertainty about her results increased several weeks later, when she learned that other members of her genealogy club reported receiving the same ethnic match from African Ancestry as she did – Akan. These results may be accurate in the statistical universe of gene sequence variants, especially in light of substantial historical research showing that current-day Ghana and other western African countries were key nodes in the trans-Atlantic slave trade. Nevertheless, the preponderance of similar ethnic lineage findings among her genealogist colleagues, and the inconsistency of her genetic result with the family genealogy she had laboriously assembled by conventional means, led Pat to conclude that 'we still technically don't know who we are'.

Pat's use of the word 'technically' in her estimation that 'we still ... don't know who we are' is of signal interest. It indicates that although she had expected that genetic genealogy testing would provide her with a

family of origin in Africa, the results did not fully convince her. She harbors some doubt about the reliability of the techniques used. However, given her prior positive assessment of genetic testing, her reference to technical uncertainty also seems to indicate discomfort with conceptualizing family history as a technical matter. On one level, her uncertainty might be interpreted as an instantiation of the 'genealogical dis-ease' (Rapp et al., 2001) that may result from the collision of kinship concepts and genetic science. Yet, her words intimated that the genetic genealogy testing experience produced something else as well, a lack of orientation, and more particularly, 'genealogical disorientation' as an affect ('I felt numb') and as an effect of her misgivings about its reliability ('What if it's true?'). Pat also feels 'blank'. In her search for family, she has lost the familiar. It was not evident during this conversation if the personal reinscription that these feelings of 'blankness' might necessitate would produce a deepened investment in how she perceived of herself prior to the testing experience, would catalyze a new inscription of genetic deterministic thinking about her racio-ethnic identity, or produce some combination of these.²¹ For Pat and others with whom I have spoken, the receipt of genetic facts about ancestry opened up new questions about identity and belonging, rather than settling them absolutely (Elliot & Brodwin, 2002). The test results did impart a topographical orientation to Pat in the form of an abstract matrilineal link to the Akan that consequently associated her with a country in Africa. But the DNA analysis failed to orient her in a more phenomenological sense. It did not orient her *towards* the social world in a particular manner, nor did it give her bearings *in relation to* other persons or collectivities.

Since receiving her test results, Pat has endeavored to fashion this second, phenomenological sense of orientation for herself. She established a friendship with a Ghanaian neighbor and has embarked on research into the history and culture of the Akan. More recently, Pat has begun to explore the possibility of having roots in West Africa. Yet her DNA test has taken on deeper significance, not because of increased confidence in mt-DNA analysis, but because of her own efforts to resolve her genealogical disorientation. The growing appeal of Pat's Akan-ness was powerfully illustrated in the following account she shared with me: at a community Kwanzaa fair, Pat was faced with a purchasing decision that revealed her vacillating racio-ethnic identity. Coming upon an African immigrant flag-vendor as she strolled through the fair, Pat was confronted with two symbols of her ancestral roots and putative nationality. She inquired about the significance of a flag with three fields of red, black, and green. The vendor replied that it was a 'general flag' indicating that it was a pan-African flag that symbolized the African diaspora rather than a specific nationality or ethnicity. Pat responded, 'My DNA said I came back as Ghanaian. I don't need the red, black, and green.' The woman replied, 'Now you know, so you don't need just a plain flag anymore.' She summed up that 'if anything has changed [about how I perceive myself], it's that I bought my first Ghanaian flag last year'. In this exchange, Pat's testing experience emboldened her to invoke her *soma* ('my DNA said I came back as Ghanaian')

when offered an undifferentiated symbol of Africa by the vendor. She then asserts that she may not ‘need’ the pan-African flag. However, it is the African vendor’s not disinterested response, ‘Now you know’, that endorses and authenticates Pat’s claim to Ghana, leading to the purchase of a symbol of her possible ‘home’.²² Although this social interaction encounter authorized Pat’s genetic affiliation with the Akan, her opinion of her family origins nevertheless remains in flux. Now, when asked by others about the outcome of her root-seeking pursuits, Pat admits to answering ‘Akan’ and ‘Hottentot’ interchangeably.

Reckoning African Ancestry: Affiliative Self-Fashioning and Genetic Kinship

In *Picturing Personhood*, anthropologist Joseph Dumit explores the interplay between technologies that make the inner-workings of the brain visible and ‘biomedical identity’ (2003a). Brain images and genetic genealogy tests are very different inscriptions of scientific knowledge, but they are similarly metonymic. Both are artifacts of bioscience that circulate beyond the laboratory and the clinic. Brain scan images and certificates announcing genetically derived ‘race’ or ethnicity are ‘received-facts’ that can be incorporated into a process of subject formation that Dumit calls ‘objective self-fashioning’. He defines this as ‘an ongoing process of social accounting to oneself and others in particular situations in which received-facts function as particularly powerful resources because they bear the objective authority of science’ (Dumit, 2003b: 44). Applied to the geneticization of ‘race’ and ethnicity, the concept of objective self-fashioning elucidates how individual and collective identities are constituted through both extant frameworks (for example, historical knowledge, collective memory, conventional genealogy, and alternative genetic kinship accounts) and novel techniques (also see Wailoo & Pemberton, 2006; Wailoo, 1997). But as Pat’s experience illustrates, and as I detail below, with genetic genealogy testing, test-takers enact a course of deliberate and strategic negotiation in an effort to create kinship orientation that is not taken account of in Dumit’s analysis. Therefore, extending Dumit’s analysis, I term this process ‘affiliative self-fashioning’.²³ Whereas objective self-fashioning highlights the epistemological authority of received-facts that become resources for self-making at specific ‘location[s] of social accounting’ (Dumit, 2003b: 44) such as the lab or the courtroom, affiliative self-fashioning attends as well to the weight of individual desires for relatedness, for ‘communities of obligation’ (Rose 2007: 177) and how this priority shapes evaluations of the reliability and usability of scientific data. In the process, received-facts are also reconciled with a complex of alternative identificatory resources.

I attended a symposium on ‘race’ and genetics at the London School of Economics in 2004. Neil Cameron, one of the producers of the 2003 BBC documentary, *Motherland: A Genetic Journey* also took part in this 2-day meeting. At the conclusion of the first day’s discussions, he invited me to a gathering of participants in the study on which the documentary was

based and I eagerly accepted his invitation. I arrived at the venue, the Museum of London, to find about a dozen men and women assembled in a small seminar room. This was a gathering of the Motherland Group, black Britons who participated in a study commissioned for the documentary for which they had volunteered DNA samples in exchange for the opportunity to have their ancestral links to Africa scientifically established. The Motherland Group first convened in March 2003, shortly after the premiere of the documentary and at the request of a few study participants. According to Arthur Torrington, a participant in the study and leader of the Motherland Group, members came together to stimulate discussions that would make the 'pros and cons of the testing clear' because, as he expressed it, the test results were but 'the beginning of a journey; there is much more to this thing'. Producer Neil Cameron, who manages the study's data protection registry, contacted participants. He and his production partner, Archie Baron, subsequently arranged presentations to the group by genetics experts. As Cameron explained to me, group members 'wanted to be able to talk to each other about the experience and learn more about the science behind the study'.

This meeting served as a forum for the co-production of biological and social identities, for the making of what Paul Rabinow (1996) has called 'biosociality'. However, participants did not gather on the basis of what have now become canonical examples of biosociality – shared medical conditions, genetic predisposition to disease or disability (see Rapp et al. [2001] on achondroplasia; Petryua, [2002]; Rose & Novas [2005] on biological citizenship; and Gibbons & Novas [2007]). As both Cameron's and Torrington's comments about the purpose of the Motherland group suggest, rather than on the basis of accepted or determined biological identities, members assembled to explore what biosociality might result from their testing experience. This was *bios* put to the task of creating a very particular kind of sociality: the possibility of kinship based on ethnic lineage and ethno-racial composite DNA analysis. It was a venue for the constitution of individual and collective identities through both objective and affiliative self-fashioning.

Although DNA samples from 229 persons were analyzed for the Motherland study, the documentary featured just three participants, chosen by the producers for their telegenic appeal and for the dramatic potential of their narratives. Cameras accompanied Jacqueline Harriot as she traveled to Jamaica to explore her more recent Caribbean heritage and await the results of her racio-ethnic composite analysis.²⁴ *Motherland* viewers also traveled with Mark Anderson and Beaula McCalla as they were transported to their supposed, respective pre-slave trade 'motherlands' of Niger and Bioko Island (an island of Equatorial Guinea) for a dramatic 'reunion' with their lost kin.

Beaula was in attendance at this meeting of the Motherland Group, which featured human evolutionary geneticist, Martin Richards, a specialist from the University of Leeds in African migration, as the day's speaker. His presentation outlined the theoretical and technical assumptions on

which the study participants' genetic genealogy results rested, and cautioned attendees about the limitations of mtDNA and Y-chromosome analyses for the purposes of determining ancestry. Specifically, Richards warned attendees that genetic genealogy does not link a consumer to ancestors at a specific place and time. He stressed as well that the proprietary DNA databases on which genetic genealogical tests rely are incomplete, because they contain too few samples from too few sites in Africa to make robust claims about any given individual's ancestry (also see Rotimi, 2003; Ely et al., 2006).

On these points, Richards was repeating arguments first aired in an editorial critique of the Motherland study that he published in the *Guardian* newspaper of London one year earlier (Richards, 2003). Entitled 'Beware the Gene Genies', his opinion piece revealed that the genetic marker used by Cambridge University geneticist Peter Forester to link Beaula with the current-day Bubi people of Bioko Island, Equatorial Guinea – called a 'rare marker' in the documentary – was also found thousands of miles away. Richards (2003) wrote that 'a glance at the published mitochondrial database shows that Beaula's variant is also found in Mozambique'. He continued, noting that 'a huge area of central and southern Africa that provided more than a third of all victims of the slave trade is still unsampled. Beaula's maternal lineage could have come from anywhere in that region.' I was later told by producer Cameron that Motherland Group members were familiar with Richards' editorial. Nonetheless, Richards' repeated criticisms of the project on this day supplied a moment of quiet tension in the room – expressed through hushed 'tsk-tsks' and sheepish glances. I initially attributed this tension to the fact that Beaula (who I recognized from the documentary) was present as the geneticist delineated the two possible, but possibly conflicting, accounts of her ancestry. However, at the conclusion of Richards' talk, it became clear that Beaula was not the only person in the room who might be experiencing genealogical disorientation.

During the question-and-answer period, a self-described 'Grenadian-born British' woman, who appeared to be in her late fifties and who I will call Delores, announced that in addition to herself, '12 or 15 women came up Bubi in the [Motherland] study' and concluded that the test 'does not give a complete blueprint of who I am'. Delores' evaluative rhetorical posture established her role as the interpreter of her genetic genealogy test results and underscored the process of affiliative self-fashioning in which she was engaged at this gathering. Her use of the word 'blueprint' may reflect some degree of accord with a geneticized conception of her ancestry (Lippman, 1991). Like Pat's use of the word 'technically', however, the qualifier 'complete' here seemed to express a conviction that the genetic genealogy test offered only a partial account of her identity. Delores' knowledge of the '12 or 15' other 'Bubis' in the study also undermined her sense of individuality – her desire for 'a complete blueprint of who I am', as she put it. The genetic findings did not seem to satisfy her criteria for either genetic or social exclusivity.

Many who attended the Motherland gathering stayed after Richards' presentation to ask additional questions and socialize over tea and cookies. After hearing Delores voice her concerns, I was curious about Beaula's opinion of the second possible interpretation of her genetic genealogy test. Did she, like Delores, question the test's reliability because of the presence of the 'rare' Bubi marker in several other Motherland study participants? Which result, if any, did she accept after learning that her ancestry might also be traced to south-eastern Africa? On what basis did she decide between the alternative accounts of her maternal lineage? I introduced myself to Beaula and we began a conversation about her experience as a participant in the *Motherland* documentary project. Before she could fully respond to my queries, a man who had been sitting next to her at the meeting joined us. She introduced him to me: 'This is my brother, Juan. He doesn't speak English. He speaks Spanish [an official language of Equatorial Guinea].' 'Your biological brother?', I asked. 'My brother from Equatorial Guinea', she responded. From this point on, the discussion continued between the three of us, with me alternating between elementary Spanish with Juan, and English with Beaula (who spoke even less Spanish than me), but drifted from the topic of Beaula's genetic ancestry tracing, to the purpose of my visit to London and Juan's impressions of England. As a consequence, I was not able to inquire further about Beaula's brief, but suggestive, statement of affiliation with Juan on that day. Nevertheless, because I was subsequently in contact with Beaula and Juan by email, I can make a few provisional observations about this exchange and what it suggests about which ancestry association Beaula finds most compelling.

When posing the question, 'Your biological brother?', I wanted to know how she defined her relationship with Juan. Although she is depicted in *Motherland* as living an Afro-centric lifestyle in Bristol, England, her classification of Juan suggested to me a relationship that was more significant than the vernacular term 'brother' used by some blacks to refer to others of African descent. Moreover, in an email, Juan informed me that 'Beaula esta ayudando a encontrar a mi madre [Beaula is helping me find my mother]' – a mother with whom he had lost contact many years ago, and who may have migrated from Equatorial Guinea to Europe. This statement suggested that Beaula and Juan did not share a mother, nor was it likely that they were members of the same nuclear family.²⁵ If Beaula did not regard Juan as a relation in either of these two senses, perhaps 'my brother from Equatorial Guinea' described what Catherine Nash (2004) terms 'genetic kinship', affiliations fashioned from the facts of DNA analysis, the particulars of which are both unspecified and ahistorical.²⁶ What was certain was that there was something that linked Beaula to Juan and, moreover, obligated her to assist him with his own familial search.²⁷ Sponsorship of an orphanage and school on Bioko Island and the cultivation of a growing number of Equatoguinean acquaintances both in Africa and Europe also indicated Beaula's chosen affinity. Her assertion of a familial and ethnic tie to Juan confirmed that, whatever her feelings about the genetic link to Mozambique, she was committed to the ancestry designation she received

as a participant in the Motherland study. Similar to Pat's experience, Beaula's genetic genealogy result amassed traction through social ties (Schneider, 1968).

Racial and Ethnic Projects: Site, Scale, and Subjectification

Almost weekly, it seems that media outlets in the US and the UK publish dramatic accounts of genealogical disorientation experienced by persons whose genetic analyses reveal new or surprising information about their ancestry. Among this genre of unexpected and unsettling kinship narratives are stories of persons whose presumed racial and ethnic identities are overturned by genetic testing, including the University of Miami professor who was said to be related to Genghis Kahn based on Y-DNA analysis (Wade, 2006), several persons in Yorkshire, England, who were found to share a Y-chromosome haplotype uncommon in Europe that ancestrally linked them to Africa (BBC, 2007), and a black-identified civil rights advocate in California whose DNA was said to exhibit no trace of sub-Saharan African ancestry (Kaplan, 2003). On the other end of the affective spectrum are published reports of African Americans who, following the use of genetic genealogy testing, claim finally to know who they are. These roots narratives follow a now predictable arc: DNA testing, feelings of completion, and the assumption of the subject's unwavering confidence in the genetic test outcome. Press accounts such as these leave little doubt that genetic truth of identity and kinship will out, that social categories such as 'race' and ethnicity are being made anew from the whole cloth of As, Cs, Gs and Ts.

Away from the glare of the media, however, test-takers can exercise latitude in determining the import of genetic ancestry analysis. To be sure, root-seekers come to genetic genealogy with the expectation that it will supply definitive information about their family histories. But a genetic 'match' is just the beginning of a process of identification, rather than its conclusion. After test results are rendered, root-seekers endeavor to translate them from the biological to the biographical, from a pedigree of origins to a satisfying life story. They attempt to meaningfully align *bios* with bios.

The efforts to reconcile 'nature' and 'culture' into identity that commence following the use of genetic genealogy testing call into question 'race' naturalist and 'race' pragmatist polemics. More analytic purchase can be gained by conceiving of contests over the 'reality' of 'race' as contrasting, but ultimately interlinked, 'racial projects': social ventures through which 'race' and ethnicity are fashioned, interpreted, represented, and institutionalized (Omi & Winant, 1994). From this perspective, naturalism and pragmatism come into view as but two of many historical and coeval projects. Attentiveness to this multi-layered process should redirect scholarly focus away from zero-sum definitional boundaries and toward issues of *scale, site, and subjectification*.

'Race' is constituted in the law, the media, bioscience, and from seemingly small acts that occur at 'the level of everyday life' as well (Omi &

Winant, 1994: 56). Racial projects are thus scalar; they take form at the interplay of macro-, meso-, and micro-level processes. As the experiences of genetic genealogy test-takers reveal, the constitution of 'race' and ethnicity may fluctuate by scale – the codification of social categories in commercial laboratories, for example, is not always or easily translated into the geneticization of identity. Accordingly, analyses should traverse levels of scale from the microscopic, byte-sized 'molecularizaion' of 'race' (Rose, 2007; Fullwiley, 2007), through the individual and collective lived experience of social identity, and to large-scale racialization and ethnicization (Epstein, 2004, 2007).

It is also important for scholars to take notice of the *specificity* of scale, or site. In drawing attention to site, I seek to highlight the significance of where – in what social and physical situations – 'race' and ethnicity may be constituted for the robustness of scholarly claims. Although some generalizations can be made about the pervasiveness of geneticization, there are distinctions that are also worth noting. In the domain of genetic testing, similar forms of DNA analysis produce evidence at specific locations that differently permit or constrain identification. For example, mtDNA analysis is used not only in genealogy testing, but also in medical genetics (for example, research into type 2 diabetes [Ballinger et al., 1992]) and forensic science (when there is a small sample of biological evidence). However, as I have described, commercial mtDNA analysis for genealogical purposes supplies racio-ethnic lineage information may permit consumer interpretation, while mtDNA testing in a criminal justice setting, in which the genetic 'matching' criteria is narrowly delimited and backed by state authority, leaves little space for negotiation. Taking account of site variance such as this can yield richer insights about both racialization and geneticization.

Subjectification – subjects making themselves and being made by forces beyond themselves – is related to site and is also important to discussions of 'race' and genetics. Genetic genealogy testing opens up 'ethnic options' (Waters 1990, 2001) to blacks in the US and the UK that may have been previously unavailable. However, the affiliative self-fashioning it may spur is enacted from within what might be understood as the 'iron cage' of the genome.²⁸ The testing promises to reveal elusive knowledge, yet the particular longings that root-seekers of African descent seem to feel when they resort to it are shaped by distinct histories of slavery and the continuing realities of racial oppression. Root-seekers' sense of autonomy and empowerment may come at the cost of acquiescence to a classificatory logic of human types that compounds, rather than challenges, social inequality. The affiliative self-fashioning described here is then a limited type of agency, unfolding from within less mutable social structures.

Examining genetics and 'race' from the perspectives of scale, site, and subjectification alerts us to the intricacies of the 'genome-in-practice' (Goodman, et al., 2003). The decoding of the human genome does not and cannot verify the validity of 'race' because many epistemologies and ontologies contribute to its meaning and significance. It is too early to assess what long-term effects genetic genealogy testing may have on social

norms or political affiliations. Yet, it is apparent that the practice of crafting racial and ethnic subjects through genetic genealogical designation – what has been cavalierly described as ‘recreational’ genomics – displays complexity that warrants notice and further investigation.

Notes

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1. Here Lock is paraphrasing chemist H.E. Armstrong.
2. These concepts are, of course, generalizations of a range of perspectives about the meaning and significance of ‘race’. Nonetheless, I think they serve as a useful analytic for describing debates about ‘race’ and genetics – which have not abided disciplinary boundaries – without reducing them to a contest between natural scientists and social scientists, and thus, for showing the imbrication of naturalist and pragmatist positions. Both Haraway (1997) and Reardon (2005), for example, have demonstrated that racial pragmatists include social and natural scientists who invoke findings from the natural sciences to support their argument that ‘race’ is a biological fallacy.
3. ‘Contemporary’ is used here to mark a difference between 18th- and 19th-century arguments about racial taxonomies and assertions about innate human difference, and current naturalist positions articulated by scholars who are typically aware of the history of scientific racism and who disavow it, even as they maintain their commitment to the reality of human types. Naturalists conceive of their position as distinct from the legacy of scientific racism, while pragmatists consider the naturalist position to be an extension of this conceptual trajectory.
4. I borrow the phrase ‘discourse about the body’ from Haraway (1997). Following Haraway (1991), I seek to highlight how ‘bodies are made’ in scientific and other practices.
5. See Baker (1998) on the history of anthropology; Gilroy (2000) on ‘raciology’ and humanism; Goldberg (1990) on the socio-historical contexts of racism; Jacobson (1998) on ethnicity and whiteness in the US; Lopez (1996) on citizenship law; Omi & Winant (1994) on racial formation theory.
6. The ethnographic data for this paper are drawn from my interactions with persons who have *purchased* genetic genealogy testing as well as individuals who participated in a study in which such testing was employed, but for which they *paid no fees*. Accordingly, the word ‘consumption’ here is meant to broadly connote ‘use’. ‘Consumer’ is used only in reference to people who have purchased test kits. When referring to both groups of informants, and to avoid confusion, I use the terms ‘test-taker’ and ‘root-seeker’.
7. Here, I echo Ossorio and Duster (2005) in stressing the need for debates about ‘race’ and genetics to move beyond currently entrenched perspectives, and encourage scholars to truly understand the risks and possibilities presented by new racial (in)formation processes. As they contend, this debate has produced more heat than light: it fails to illuminate ‘the complex interplay between biological and social aspects

of human taxonomies' and the 'social processes that can create biological feedbacks' (p. 116). In this paper, I seek also to understand how ideas and techniques from genetic science in turn create social feedback that can be selectively incorporated into individual and group identity formation.

8. My thanks to Stefan Helmreich for suggesting this phrasing. Root-seekers' alignment of *bios* and bios is similar to the process of 'categorical alignment' described by Steven Epstein (2007).
9. In the larger project that produced this paper, in addition to following the experiences of test-takers, I also track other 'reconciliation projects', ways in which how genetic genealogy testing is put to the purpose of responding to a variety of social issues related to the legacy of racial slavery. Thus, in addition to investigating the experiences of test-takers in the US and the UK, I explore the development of genetic genealogy testing for African Ancestry in the African Burial Ground research project, in which investigators examined human remains uncovered at a long-forgotten African cemetery in downtown Manhattan in 1991. I follow the use of these tests as possible evidence in an ongoing class action suit for reparations for slavery in the US. I also am interested in how these tests are used for purposes of commemoration, such as in the case of the former Connecticut slave Venture Smith and his wife Margaret 'Meg' Smith, who were exhumed in 2006 in the hopes of discerning their African ethnicity and completing the historical record.
10. I use the term 'constitute' rather than 'construct' because the former evokes the processes of racialization and ethnicization *as well as* debates about the constitutive elements or the 'stuff' of which 'race' and ethnicity is made (for example, gene variants, cultural practices, social contexts, power relations, and so on).
11. Genetic genealogy testing is employed by other diasporic social groups whose historical experiences of migration, dispersal, and persecution have made it difficult to document genealogical information, including Irish (Nash, 2004) and Jewish (Abu El-Haj, 2004) communities. These services are also widely used for religious reasons. For example, genealogy is an important part of the after-life cosmology of the Church of Jesus Christ of Latter Day Saints.
12. My informants reveal sensitive and personal information about issues of identity, community, and belonging, and so I use pseudonyms in order to protect their privacy. I do, however, use the actual names of the three participants in the *Motherland* documentary who, by participating in the film, have chosen to make their accounts public, and of the documentary producers whose roles are also public knowledge. I also use the name of the leader of the Motherland Group with his permission. The names of all other members of that group are pseudonyms.
13. The predominance of women among my informants and, in genealogical communities more generally, is consistent with the literature on 'kinkeeping', the term used by Rosenthal (1985) to describe the gendered work of maintaining family ties, through activities such as fostering communication between members or providing emotional and financial aid to them. With genealogical practices, kinkeeping involves the work of connecting *past* and *present* kin.
14. Marla also felt a special connection to Haley's mission because his father had been a professor at her college.
15. Haley's research is controversial. He was charged with plagiarizing from the novel *The African* – a matter that he settled out of court – and was also accused of fictionalizing much of his account of his ancestors' lives.
16. For a detailed discussion of racio-ethnic composite or 'AIMS' analysis, see Fullwiley (2008).
17. To be sure, the usefulness of test results depends on the test-taker and the particular questions he or she seeks to answer through genetic genealogy testing. Here, I am highlighting how test preferences are shaped by the problems to which they are applied. It should be also be noted, however, that many of the test-takers I encountered used more than one type of genetic genealogy analysis, typically to compare results received from different companies or to obtain new information from a

- company from which services were purchased previously (for example, when a company releases a more robust form of test that employs more markers or has added a significantly larger number of samples to its database).
18. In addition to the fact that African Ancestry supplies genetic genealogists with the particular tools required to re-trace their own versions of Alex Haley's roots journey, its success and popularity among blacks is owed also to Kittles' 'authentic expertise' as an African American and a geneticist (see Nelson, 2008).
 19. Pat's phrase 'missing links' suggests that she feels that integral knowledge about her ancestral background remains unknown, but also calls to mind discourses of human evolution.
 20. Indeed, many of the most highly publicized cases of wrongly accused persons being exonerated by DNA analysis have involved African Americans. The emancipation of blacks in these instances may mitigate the negative legacy of the Tuskegee study. In the UK, many of the black Britons who participated in the Motherland study were apprehensive about providing their DNA because of concerns about privacy (interview with Arthur Torrington, 20 November 2005).
 21. In my analysis of Pat's experience, reinscription is distinct from the 'molecular reinscription of race', Duster's (2006: 427) description of the use of 'patterns in DNA for "predicting" ethnic and racial membership' in pharmacogenetics and forensic science. However, reinscription is not unrelated re-writings. Pat's 'blankness' was prompted by the molecular or genetic logic to which Duster refers.
 22. To be sure, Pat and other test-takers exercise consumer choice in the interpretation of their genetic test results. On the one hand, the particular freedom to choose links her purchase of ethnic lineage testing to her purchase of the Ghanaian flag. On the other, her exchange with the vendor suggests that her choice is somewhat constrained by the African woman's cultural authority, just as it is by African Ancestry's authenticating but limited biobank. For discussions of the consumption of technology, see Oudshoorn & Pinch (2005) and Nelson & Tu (2001).
 23. 'Self-fashioning' was first elaborated by Greenblatt (1980) with reference to Renaissance aesthetics. I am not the first to suggest other genres of self-fashioning: in addition to Dumit (2003a,b), see also Abu El-Haj (2002) on 'territorial self-fashioning' in the Middle East.
 24. Harriot's test determined her racio-ethnic composite result to be 28% European and 72% sub-Saharan African.
 25. It is worth noting here that Juan has 'lost his mother' to paraphrase Hartman's (2007) poignant exploration of African American root-seeking and its psychoanalytic implications. In this regard, he was a root-seeker like Beaula and the others discussed in this paper.
 26. Genealogists also use the phrase 'DNA cousin' to characterize persons who might share a set of genetic genealogy test markers but whose relationship to one another remains unspecified. In this instance, 'DNA' marks filial ambiguity and scientific precision, see Nelson (2008).
 27. As I discuss in another paper (Nelson, 2008), the generation of responsibilities and rights and forms of exchange across the Africa diaspora is a common end-result of genetic genealogy testing. In this way, genetic genealogy testing facilitates the formation of a spatial, interactional diasporic network (Ma, 2003).
 28. However, as Fujimura (2006) rightly suggests, the 'iron cage' is not intractable. Root-seekers' perspectives give them potential, and possibly powerful, agency in the process of translating, contesting, and transforming science.

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