Race and intelligence part 4

Hi, I'm Jim, I'm Erik, and I'm Jo and this is Speaking of Race.

Jo: Hey, guys, James Watson has been in the news lately.

Erik: James Watson, co-discoverer of the double helix structure of DNA in the 1950s with Rosalind Franklin and Francis Crick, you mean?!

Jo: Yup.

Erik: Oh cool, what's he discovering these days?

Jo: Well, nothing. But WE are discovering that he is remarkably (and very publicly) racist and eugenicist in his views.

Erik: What?!

Jim: We're not just now discovering it! Watson's been talking about genetic differences in intelligence between Africans and non-Africans for a long time, but publicly since at least 2007, when he said in an interview that he wished everyone were equal but that anyone who has dealt with black employees knows otherwise. And it just got worse from there.

Erik: But that was over ten years ago. What happened this week?

Jim: Watson, who's now in his 90s (not that age is an excuse, as I can attest), was interviewed for another PBS documentary that just came out after the new year. It dealt specifically with his controversial views on race. In the film, they asked him if his views had changed at all, and here is what he said:

Jo: "I would like for them to have changed. There would [have to be] new knowledge, which says that your nurture is much more important than nature. But I haven't seen any knowledge. And there's a difference on the average between blacks and whites on IQ tests. I would say the difference is ... it's genetic." (Click here to read about it)

Jim: It made the news this week because the lab Watson headed for much of his career, which, by the way, is the same lab that housed the Eugenics Record Office of Charles Davenport, has FINALLY publicly rejected him and removed his honorary status as a retired lab member after he said this. They censured him all the way back in 2007, but they had not completely severed ties till last week.

Erik: Whoa

Jo: Isn't that crazy? I mean, here we have a Nobel-prize-winning scientist--one so famous we've all learned about him in our high school textbooks--and here he is, promoting this non-scientifically-supported personal viewpoint that race and intelligence are linked. It baffled his longtime colleagues when he first came out with this stuff in the early 2000s because it seems to be so much more linked to personal opinion than the kind of rigorous science he was known for.

Jim: Yep… that's a really important distinction. He's saying he THINKS it's genetic--but let's be clear here, he isn't actually drawing on any science to support that claim. It's just sort of like, 'Well, black people score lower on IQ tests, and I THINK genetics is really cool, and I suspect, personally, that there's a link there.'

Jo: It's scary because it is an entirely unscientific personal viewpoint that poses the danger of looking very science-y because--for Pete's sake--it's JAMES WATSON who's saying it.

Jim: And it's a great way to kick off our episode because our goal today is to talk about the contemporary incarnations of the race and intelligence debate.

Jo: Well, thanks, Watson, for the great segue into the topic.

Erik: Jim, you're the expert on this stuff, so we should just ask you to carry this episode by yourself. What do you think Jo?

Jo: I mean, he already looks kind of omniscient god-like, with that white flowing beard and all. Or maybe Dumbledore like. Erudite, anyway. So, you're on.

Jim: Nice synonyms for old…gee, thanks guys.

Erik: Alright, Jim, so last time we ended with *The Bell Curve*, that best selling 1994 book by Richard Herrnstein and Charles Murray. This is the one that repeated the old notion that each racial group had a defined intelligence factor, '*g'* --

Jim: -- Lil' G! --

Erik: --and that the range of that intelligence for members of each race was limited, so that, on average Asians had a higher intelligence than "Whites" who were higher than "Blacks." And this was a matter of genetics.

Jo: So, I think we should start today by grilling Jim about the book's reception because there was a lot of support for it, but also a lot of backlash, right?

Jim: It was a big deal in both directions. The *Bell Curve* sold almost half a million copies within just a few months of publication. It continued to be read and cited through the 1990s. Even today a few pop-science people look to it as an authoritative text. But that's not necessarily because the book was recognized as good SCIENCE.

Erik: it was crap science! But it sure seemed to look scientific to the media.

Jim: Ya, do you know the backstory there?

Erik: No, what?

Jim: Just after the book went on sale, Pioneer Fund-supported psychologist Linda Gottfredson wrote a high-profile supportive review of the book for *The Wall Street Journal* (Gottfredson, 1994). She got 51 other professors -- "all experts in intelligence and allied fields" to sign the statement. So it was a carefully engineered media plug.

Jo: Huh.

Jim: Wanna hear something funny? I KNEW someone on that list! It was my undergrad professor, Vince Sarich, who taught my human variation course at Berkeley.

Jo: That's crazy! Who were the other, y'know, 50?

Jim: Well, for starters, there was your buddy from two episodes ago, Jo--Raymond Cattell.

Jo: Ah, yes. Cattell was the famous social psychologist who popularized the idea that dumb people were outbreeding smart people, leading to the inevitable decline of American intelligence. The one I knew because of his work in psychometric methods. He was a pretty well respected guy in his time -- were these mainstream scientists?

Jim: Um, it depends on who you ask. But here's a hint: some of the signatories included twin studies researcher Thomas Bouchard Jr., Cyril Burt's student Hans Eysenck who supervised Arthur Jensen's (also a signatory) postdoc, Richard Lynn, Jean Philippe Rushton, Robert Plomin ...

Jo: --Oh, wait. I didn't recognize all of those names, but some of those are people we just talked about in the last several episodes.

Jim: Exactly -- many of them were directly supported by the Pioneer Fund --

Jo: -- that shadowy organization behind many of the race science studies in the twentieth century from our last episode. I smell what you're cooking.

Erik: And it smells like the Pioneer Fund special! A dash of racism with a little eugenic spice thrown in!

Jim: Yeah, so for instance, Thomas Bouchard, Jr. (Bouchard Jr, 1998) is a psychologist and geneticist who's still living today. By the 1990s he was conducting a major Pioneer-Funded U.S. study of identical twins reared apart. He was one of the signatories.

Jo: This must be following in the long tradition of trying to use twin studies to try to figure out which aspects of human intelligence were inherited, and which were environmental.

Erik: -- Cyril Burt --

Jim: Bouchard's was called The Minnesota Study of Twins Reared Apart, or MISTRA. If you've ever heard anything about the freaky findings of twin studies, like two identical twins separated at birth who grew up to drive the same car and vacation at the very same Florida beach every year--it was probably from this study, or one like it.

Jo: Wait, so I'm genetically destined to drive a seafoam green vespa with a sidecar?!

Jim: I'm afraid it's in your genes, Jo. Bouchard's Minnesota study was dedicated to finding a genetic basis for general intelligence, which others then used to support a genetic basis for the difference in intelligence between Blacks and Whites.

Erik: -- Cyril Burt and C. D. Darlington --

Jim: And what about Robert Plomin, have you heard of him? He was on the *Wall Street Journal* piece, too.

Jo: Not before you mentioned him a second ago. Was he another twin-studies guy?

Jim: Sort of. In the mid-1990s, Plomin was lead author on a study looking for associations between DNA markers and IQ (Plomin et al., 1995). The team investigated 100 DNA markers using a relatively new technique at the time, the same one used the OJ Simpson trial--and found a handful were statistically associated with low versus high IQ among white kids. They made no statements about race, but, of course, we know that this was just a beginning.

Jo: what do you mean, that was just a beginning?

Jim: Hang on till the end of the episode and you'll find out!

Jo: ooh, a cliffhanger! Plomin: To Be Continued….

Erik: You also mentioned Jean Philippe Rushton among that list of *Bell Curve* supporters. That name rings a bell.

Jim: It's probably because you once had a copy of his 1996 Pioneer Fund-supported book *Race, Evolution, and Behavior* that argued Whites and East Asians have wider hips than Blacks because they give birth to larger brained babies (Rushton, 1996).

Erik: What?! Why would I have bought a book like that?

Jim: You didn't! You were a member of the American Anthropological Association once, right?

Erik: Yeah, back in the 1990s.

Jo: and I was just a child.

Jim: Well, the Pioneer Fund loved Rushton's book so much that they paid to have copies mailed to everyone on the AAA's mailing list in 1999. I received two copies, one through the AAA mailing list in 1999 and another one through the American Association of Physical Anthropologists mailing list in 2000 (Rushton, 1999, 2000)!

Jo: That ain't right! Jeez, I mean, remember Jim when we were trying to just get email addresses for AAA members so we could do a study? They have that stuff under lock and key! Who was this magical guy who managed to get access to all the AAA's secrets?

Jim: Rushton was a psychologist at the University of Western Ontario whose work was all about trying to make an evolutionary argument for racial differences. He believed that "Negroids" (his term) were evolutionarily specialized for physical endowment, leading to greater athletic prowess and also greater criminal activity. "Mongoloids" specialized in mental achievement. "Caucasoids" were somewhere in between--but closer to Mongoloids. He relied on an evolutionary ecological idea called r and K selection.

Erik: For listeners who haven't heard those terms before, biologists in the 1960s came up with the idea that there are two broad kinds of reproductive strategies we can observe between different species in the natural world -- one of those biological binaries that hangs on even when

there is lots of disconfirming evidence. r-selection is a strategy that an organism will have lots and lots of babies but not invest very much time or energy into raising any of them. Like in *Finding Nemo* -- lots of baby fish eggs will be food but just enough will survive. r-selected organisms grow fast and have smaller brains --

Jo: --like hamsters. When I was a kid I had this hamster and, you know, it turned out, she was pregnant ...

Erik: Yes, yes, ANYWAY, that's r-selected. The other is K selected. This strategy involves having very few babies but investing tons of time and resources into them so every one has a much higher likelihood of survival. These tend to grow slowly and have big brains -- elephants, for instance.

Jim: And as a species, *all* humans are K-selected. But Rushton suggested that wasn't true--that some human groups were r-selected for small brain sizes and many children. Guess who he thought fit into that group?

Jo: Um, ok, lemme guess, Negroids? And Mongoloids and Caucasoids are K-selected…? UGH. Even his terms seem pulled from another century.

Jim: It's funny that you say that. If you're sensing a throw-back to almost 200 year old cranial capacity measurements, you're exactly right! He was using cranial capacity measurements --

Jo: Oh, you're KIDDING.

Jim: Nope.

Jo: The very same measurement that Samuel George Morton used in the first half of the 19th century?!

Jim: Yup. Keep in mind, too, that Rushton did no primary research with his extensive funding from the Pioneer Fund. He selectively aggregated a bunch of unrelated studies, categorized results into one of his three races, then he used the funding to print up abridged editions of the book to mail them out to many of us.

Jo: They didn't hold any water if you looked closely, though.

Jim: Nope. As Erik said a second ago: these works were not persuasive because they were recognized as good <u>science</u>. They were rhetorically persuasive. That rhetoric kept the argument going.

Jo: Whew, so there's no doubt that *Bell Curve* and Rushton's book reached a lot of people. But let's talk about the backlash now because the Bell Curve was, of course, highly controversial.

Erik: The backlash was pretty stiff this time around.

Jim: -- not, you know, tear-gas and shotguns stiff --

Erik: -- more like concerned academics holding symposia stiff --

Erik: Still, I recall a big backlash. Stephen Jay Gould reissued his attack on the long history of race science, *Mismeasure of Man* (Gould, 1996). They founded of the Institute for the Study of Academic Racism. There were articles in *Time* and *Newsweek*. The Southern Poverty Law Center weighed in. Critics who called out the Pioneer Fund and the individual scientists got actual airtime... (See, for example, Alland Jr et al., 1996; Lieberman et al., 2001). Charles Murray, one of the *Bell Curve* authors, kind of crawled back into the shadows.

Jo: So can we can say that the scientific argument connecting race and intelligence was completely discredited by the early-2000s, thanks to all this pushback against the Bell Curve?

Erik: Yeah, I mean when the single largest biological survey ever conducted -- the Human Genome Project -- was completed, the President of the United States got up and said there was no genetic basis for races. That had to finally kill that old biological determinism that linked intelligence to racial groups. So, yay! They did it! Podcast high fives!

Jim: Ok, ok, stop me if you've heard this one before!

Jo: ooh, are you about to tell a joke in celebration of our podcast's--and HISTORY's--final victory over biological determinism?

Jim: Yeah, right! So, a group of people walks into a building and takes an IQ test, then has their DNA sequenced. The so-called scientists in charge find that the white folks average about 12½ points higher on the IQ test then the black folks. Then they look at the DNA and find that there are a few dozen single nucleotide polymorphisms that very between the two groups and are correlated with the IQ scores. When they look at all of the SNPs they find that they are correlated with a little less than a 10th of a point of IQ. About six weeks before their paper is published the headlines read, "Scientists find genetic basis of inferior black IQ!" Sound familiar?

Jo; Um, wait, that wasn't a joke. That is horribly misrepresented scientific findings.

Erik: Are you talking about stuff that happened after the Human Genome Project?

Jim: Yes--I'm referring to the trope of genetic studies of intelligence--or whatever passes for that in a given study--from the past 25 years.

Jo: Oooooooo. So we didn't actually win over biological determinism…?

Erik: After the discrediting of early 20th century intelligence studies; after the seeming death of intelligence and race stuff in the 1960s; after the wave of books and studies and documentaries discrediting *The Bell Curve* … ?

Jim: It hasn't gone away--

Jo: --Sigh--

Jim: --It has changed though. Let me talk about some more of these more recent studies and see if you can figure out how. There's been tons of stuff, but I think we only have time to talk about a few of the developments.

Jo: Okay?...

Jim: I want to start with one of my favorites. In 2004, a young geneticist at the University of Chicago named Bruce Lahn decided to try to look at human evolution by examining genes that might have influenced increasing brain size in our species. His lab identified variants in two genes that were previously associated with a pathological brain condition known as microcephaly, like with the recent Zika scare.

Jo: But … I don't get it, how would that play into the evolution of our large brains?

Jim: They found that these genes associated with microcephaly appeared to have been under strong selection in the relatively recent past, with one having a likely age of ~37,000 years and the other ~5800 years! (Evans et al., 2004)

Jo: Ok, so that's really recent across the whole span of human history. But what did that tell them?

Jim: That's where things really start to get interesting. They found that the mutations that they assumed selected for bigger brains and, therefore, greater intelligence were more common outside of Africa. They went on to speculate cautiously in *Science* that the older variants may have been associated with the peopling of Europe (~40,000 years ago), while the more recent one may have been associated with the "emergence and spread of domestication from the Middle East ~10,000 years ago and…the development of cities and written language 5000 to 6000 years ago."

Erik: Uh oh. I think I can see where this is going.

Jim: Yeah, so that study was referenced in a 2005 article in the *National Review*. The author, John Derbyshire, read the Lahn lab study as saying … Erik …?

Erik: It's going to be bad, isn't it?

Jim: Just read...

Erik: "If different human groups, of different common ancestry, have different frequencies of genes influencing things like, for goodness' sake, brain development, then our cherished national dream of a well-mixed and harmonious meritocracy with all groups equally represented in all niches, at all levels, may be unattainable" (Derbyshire, 2005, p. 42).

Jim: And, surprise, surprise -- Derbyshire at the *National Review* didn't offer a follow-up when Lahn's Chicago lab and some other labs (including even a piece with Rushton collaborating!) found that these genes have no association with variation in normal brain size. And they don't have any association with with IQ scores! (Mekel-Bobrov et al., 2007; Regalado, 2006)

Jo: Okay, so there's the brain size study. What else is really significant in this world of race and intelligence over the last decade? I'm still trying to divine what the differences are from the pre-Human Genome Project stuff.

Jim: There are the GWASes.

Jo: What are those?

Erik: ROUS's?!

Jo: Inconceivable! Pregnant hamsters?

Jim: Um, guys. No. G-W-A-S stands for Genome-Wide Association Study. As you remember from our Human Genome Project episode, all humans are overwhelming the same genetically, varying by just a small fraction of a percent in our DNA.

Jo: Right, the four letters A,C,G, and T stand for the building blocks of our DNA and you're saying that we have exactly the same letters in almost all the same positions throughout our 3 billion pairs of nucleotides.

Jim: Right, but in a small number of places, I may have an A for Adenine where Erik has a G for Guanine. That's called a Single Nucleotide Polymorphism or SNiP, and a GWAS is looking for these SNPs throughout the genome in a large number of people and adding up what they had or didn't have to produce what's called a 'polygenic' score for each individual. The ASSOCIATION part comes in when the geneticists try to find SNPs that are statistically associated with various outcomes like diabetes, or schizophrenia, or brain size, or some measure of intelligence.

Erik: So we're back to trying to show a relationship between a biological variable and IQ scores?

Jim: For the most part, no. The outcome measure that has been settled on in most of these studies over the past half decade has been "educational attainment" (can you feel my air quotes?). Because these large databases of sequence information (like 23andMe) also tend to have information on how much school a person has had, that's become the analyzed variable.

Jo: So, they take the years of education and interpret that as a proxy for how successful someone is?! That's possibly an EVEN WORSE measure of mental ability than actual intelligence testing!

Jim: The most recent one of these reports came out just last summer (July 2018) in Nature Genetics (Lee et al., 2018) saying that they had identified 1,271 SNPs that were associated with years of education among 1.1 million "European-descent individuals." The polygenic score of statistically "predicts" 11-13% of the variation in years of education.

Erik: So 87-89% of the variation isn't accounted for by over a thousand genetic markers? And only for white people?

Jo: That's what it sounds like, right Jim?

Erik: So why all the fuss?

Jim: Because the New York Times, of all outlets, carried two relatively favorable pieces the week this study came out that made it sound like we had found some definitive association between genes and education (Harden, 2018; Zimmer, 2018)...BUT, there are NO genes associated with years of education! The SNPs are merely genetic markers, not genes! And each SNP accounts for about one one-hundredth of a percent of variation in "years of education" (airquotes again because of all the manipulation that has to be done to even come up with this number of years from the different studies). ANNNNDDDDD we have several mountains of data about environmental effects on educational success! This stuff drives me absolutely bat-shit crazy!

Jo: Yea, I'm familiar with the literature documenting the strong effects that safe, secure, healthy settings with supportive caregivers have on educational success. We don't need to look at someone's DNA for that--nor will it tell us anything nearly as powerful as will the environmental work....but wait. How does race figure in to this GWAS if all of the subjects were "European-descent"?

Jim: Well…the polygenic score didn't work at all well for African-Americans, and even within the European subjects, the GWAS appears to have different effects, varying from country to country. But remember, the twin studies were all within population studies and they provided all the fuel Jensen needed to ignite his racist fire in 1969!

Erik: But it's fair to say that there are no Arthur Jensen's anymore, right? I mean there are specialized GWASs, but this stuff is way too complex for the general public to even have heard of … right?

Jim: Sadly, that's not completely true. You probably heard of the work of Noah Rosenberg's lab.

Erik: Ah, yeah -- he's the evolutionary geneticist who published the cluster studies of human genetic variation in 2002 that essentialists claimed as evidence for biological race (Rosenberg et al., 2002).

Jim: Right, and if folks want to learn more about that they should go to our episode "Race and the Human Genome Project." So Rosenberg's work was amplified by a *New York Times* science writer named Nicholas Wade. Wade wrote a book just a few years ago called *A Troublesome Inheritance* (Wade, 2014).

Jo: I remember it made a big splash.

Jim: Something like that. Using Rosenberg's cluster results -- that was basically it, he had no other research to go on -- Wade made the argument that differing natural selection processes have driven the disparity between the three main human groups today (guess what those are).

Jo: ooh ooh I know, Asian, White, and Black?

Jim: Ka-ching! So Wade's big argument is that complex behaviors—such as tendencies toward aggression, or willingness to submit to law or authority—might differ GENETICALLY between these three major groups, and that that difference layered on top of culture explains not only why white people colonized the rest of the world, but also why, for instance, we continue to have higher rates of crime among African Americans in the US. It's a bold and really awful misrepresentation of the data; we have no evidence whatsoever of the kinds of genetic predictions of behaviors that he is suggesting.

Erik: So kind of like the genetic version of Jared Diamond's "Guns, Germs and Steel" (Diamond, 1997)?

Jim: Yes, exactly.

Erik: But it also sounds like the older things we've been talking about for these last few episodes.

Jo: But the backlash to Wade's book was **really** severe -- even louder than the backlash to the *Bell Curve*.

Jim: BUUUUUT! Making controversial claims that science supports a biological concept of race and the superiority of one race sells books in this political environment. That brings us to…

Jo: yaaaaaa?.....

Jim: so, remember, Robert Plomin, one of the signatories on the *Wall Street Journal* piece supporting the *Bell Curve* that I mentioned back at the start of this episode, several hours ago.

Jo: Cliffhanger resolved!

Jim: Like many of the people we've discussed in this episode, he was trained as a psychologist but spent his career doing behavioral genetics. In 2002, Plomin was ranked among the 100 most eminent psychologists in the history of science (71st). He's continued to publish on twin study stuff since the 1970s. Just last month he wrote a *Scientific American* blog called, "In the Nature–Nurture War, Nature Wins" (Plomin, 2018b).

Erik: That's not subtle.

Jim: Nope. It was a promotion for his new book: *Blueprint: How DNA Dictates Who We Are* (Plomin, 2018a).

Erik: That's maybe, also, even less subtle.

Jo: If I were trying to make up two sentence fragments that would succinctly describe genetic determinism, I couldn't have done better than those two titles.

Jim: In all fairness, Plomin IS a true believer--he even collaborated with the big Chinese project on the genetics of genius run by the world's leading genome sequencing firm BGI. They're looking to genetically engineer future geniuses! Plomin continues to make the case that we have many genetic influences on intelligence--something that is almost certainly true--and that these genetic influences significantly outweigh the environmental influences--something that is certainly *not* true. There's already a severe critique of the book by a historian of science--

Erik: Woohoo!

Jim: --Nathaniel Comfort situates Plomin's new book right in line with Wade's *Troublesome Inheritance*, Charles Murray's *Bell Curve* and even Jensen's work (Comfort, 2018).

Erik: See, we're good at that.

Jo: What's that?

Erik: "situating" we're good at situating things.

Jo: So, back to Plomin. Given that we've now got all this evidence that it's way more complicated than the simple genetic determinism story, how does he make his argument?

Jim: His main point is that we will soon have the complete DNA blueprint for every child. And that DNA blueprint will help us design individual learning plans for kid so they will get the best education possible. All kids are special needs kids, he says.

Jo: That's kind of nice --

Erik: --Sounds like *GATTACA* --

Jo: So, what's wrong with this book? It doesn't sound like Wade or Jensen…

Jim: But it is, in so many ways! First, the book suffers from Maslow's hammer syndrome. In this case, the hammers are GWAS and polygenic scores and the nails are basically all personality variables including intelligence.

Jo: You mean, he's just taking the GWAS scores and kind of indiscriminately trying to use them to predict all kinds of things they aren't necessarily related to?

Jim: Exactly. We've already pointed out some of the issues with GWASes, and Plomin doesn't talk about race at all in the book (maybe because the polygenic scores are almost as population specific as the concept of heritability was in Jensen's work). But at the end of the day, Plomin comes up with the same kind of non-solutions that Jensen did and Herrnstein and Murray did, saying that our genes are our fate and all we can do is muck about the edges by trying to improve living and educational conditions.

Jo: OK, guys, so we have now done four episodes on the history of race and IQ testing. We've gotten right up to the present with this stuff. What have we learned?

Jim: That it's like Groundhog Day. The "scientists" keep trying new technologies, but unlike the movie, there's no rom-com happy ending to this saga.

Erik: You're right, Jim, but it also seems like, when we take the long arc of history, there are some patterns that are worth pointing out.

Jo: So the question is, what has and has not changed over the material we've been looking at in these four episodes, right? The most obvious thing seems to be that despite actual *centuries* of research, we still have not found any evidence that race and intelligence are biologically linked. That feels almost TOO obvious to need to point out, but then there are the James Watsons or the Charles Murrays or even the Plomins of the world who keep suggesting that maybe we just haven't found it yet--so we have to start there.

Erik: Yes, that hasn't changed. There is no scientific evidence that demonstrates a hard link between the category we call "race" and the complex behaviors that we identify as "intelligence." But there are some other things that HAVE changed.

Jo: Listening to Jim, I think I've figured it out--what has changed in the more recent race/intelligence work. It's pretty obvious if you think about it. With all the money invested in modern genomics, these new studies are all making similar claims about race and intelligence, but they're using the language of genomics rather than the looser biological claims made prior to the Human Genome Project.

Erik: Yeah, the biological determinism that we've seen from Galton onward is now hardened genomic determinism like what we see with Plomin's brand-new book about DNA as our "blueprint". We're convinced that everything reduces to genes. So there MUST be a polygenic score-for race and a polygenic score-for intelligence. Those genes MUST have been parceled out at different times in the evolution of humankind. So we have Africans with one set of SNPs, Asians with another, Europeans with another, and so on.

Jim: For the most part, it's like everything else we've documented in this series. Whatever is the hot new technique is what the racial "realists" use to divide us up. Now, it's the language of genomics and GWASes, Polygenic scores and CRISPR gene editing (btw, there's an 8 week course from Harvard available online that teaches CRISPR!), that's really all that has changed.

Jo: But that makes it sound like this isn't anything but a rhetorical shift. It's all still built upon the same nature-beats-nurture framework that we've seen through the entire 20th century. In fact, even Watson himself used that language in the PBS interview he just did--he literally states in that quote we read at the start of the episode today that he believes nature trumps nurture. Just like Plomin in that *Scientific American* blog last month.

Erik: Maybe it would help us pull this all together to take a look at how we get to this conclusion. So let's lay out the whole mess: how did scientists get to the point where they said that race and intelligence are connected--nature beats nurture, to oversimplify it--and why do we think that is wrong?

Jim: First, scientists assumed that differences in performance on some test signifies differences in a thing called general intelligence. Of course, what we're counting as intelligence reflects the tester's cultural and personal values -- we rank things more highly that <u>we</u> consider more important, and there's a lot of variation in that across time and culture.

Erik: This, I think where history provides a powerful corrective that geneticists, for instance, conveniently ignore. There are cultural, economic, dietary, linguistic, educational, climate-based, political, even microbial differences between people groups have accumulated over centuries. We de-emphasize these innumerable historical contingencies that end up feeding into differences on tests. We chalk difference up to nature, just like Watson.

Jo: I think the problem of that viewpoint is that it's remarkably oversimplified. When we say that traits like intelligence are determined by one's polygenic score for intelligence, we wave away the significance of these historical and cultural factors. We've learned that biologists and psychologists like Cattell, Jensen, Rushton, Flynn, and Plomin really aren't the best authorities on intelligence and race; this stuff has to be looked at from a more holistic perspective that takes history and culture into account.

Jim: You're right, cultural anthropologist. And while we're each throwing in our perspective from our home disciplines here, let me add the human biology part. What's crazy is that the science is beginning to demonstrate that these cultural and historical factors impact biology itself.

Erik: Right -- one of the unintended consequences of the Human Genome Project was that it demonstrated we have *far* fewer genes than we previously believed -- fewer than 20,000. Even organisms like rice have more genes. In the absence of gene material to actually create complex traits like intelligence, researchers began to resurrect a concept from much earlier in the 20th century called "epigenetics." Epigenetic research has demonstrated that the effects of

"nurture" actually transforms the "nature" part of the equation. So genetic determinism could itself have non-genetic determinants.

Jo: One of the reasons genetic determinism holds on is because of the stature of some of its long-time promoters. LIke Watson, but also the others we have mentioned in this episode.

Jim: See, like I said, never going away.

Jo: So, aside from being inaccurate and promoting racism--those are pretty bad consequences--are there other implications we should be worried about here?

Erik: One of the biggest for me is that a belief in genetics and intelligence very easily slips us right back into the old consequences of determinism -- a desire to eliminate individuals and groups who don't meet some predetermined standards. That might sound like a leap, but just listen to a quote from Watson when he was on an older PBS documentary in 2007:

James Watson: "If you really are stupid, I would call that disease. Stupidity is disease of the brain. The lower 10 percent, who really have difficulty even in elementary school--well, what's the cause of it? A lot of people would like to say it's poverty and things like that, but it probably isn't. And so, I'd like to get rid of--y'know, help--that lower ten percent."

Jo: That's the documentary where he then he goes on to talk about how great it would be if we used genetic modification to make all women pretty, isn't it?

Erik: YUP

Jim: I think we've finally got to wrap all of this up.

Jo: Jim -- you did a good job. There's so much going on.

Jim: And we only hit the tip of the iceberg. You have no idea how far down this thing goes.

Erik: I bet we can do a revisited episode in a year where we see what else has emerged, especially when we see what the reaction to the Plomin book is...

Jo: I hate to say this, but it's time to stop talking. If there are any listeners left out there, thank you so much for listening to our series on Race and Intelligence. Please, we'd love to have comments on our facebook, twitter, instagram accounts.

Erik: Where are we going next time, guys?

Jo: Thug heads?!?

You've been listening to Speaking of Race. I'm Jim, the physical anthropologist, I'm Jo, the cultural anthropologist, and I'm Erik, the historian of science.

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