UNITED STATES DEPARTMENT OF LABOR

OFFICE OF ADMINISTRATIVE LAW JUDGES

In the Matter of:	)	
	)	
OFFICE OF FEDERAL CONTRACT COMPLIANCE PROGRAMS, U.S. DEPARTMENT OF LABOR,	)	Case No. 2017-OFC-00006
	)	
Plaintiff,	)	
	)	
vs.	)	
	)	
ORACLE AMERICA, INC.,	)	
	)	
Defendant.	)	
	)	

VOLUME IV

Wednesday,
December 11, 2019

Office of OALJ
90 Seventh Street
San Francisco, CA

The above-entitled matter came on for hearing, pursuant to notice, at 9:00 o'clock a.m.

BEFORE: THE HONORABLE RICHARD M. CLARK,
Administrative Law Judge

APPEARANCES:

On behalf of the Plaintiff:

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I N D E X

P R O C E E D I N G S

(9:00 o'clock a.m.)

JUDGE CLARK: Okay. Good morning. We are on the record in the matter of OFCCP vs Oracle American, Incorporated, 2017-OFC-00006. Today is December 11th, 2019, this is day four of our hearing. We're in OFCCP's case in chief.

There's a housekeeping matter that I needed to put on the record from yesterday. And, I think, Mr. Parker cited the cases, or put the case names when we talked about Mr. Ratliff's testimony, the cases that I read, I just want to put them on the record with the citations in case they didn't make it into the record yesterday. And William I have a copy of the case names for you.

So the first one was Industrial Engineering and Development Incorporated, et all versus Static Control Components, 2014 West law 4983912, District Court of Florida from October 6th of 2018.

Second case, Cooley versus Lincoln Electric Company, 693F.2d 767, District Court of Ohio, March 10th, 2010.

And Stryker Corporation versus Ridgeway, 2016 West law 6585007, District Court of Michigan February 1st, 2016.

Those are the three cases that I read prior to allowing Mr. Ratliff to testify and give limited testimony

yesterday.

Ready to call a witness, Ms. Bremmer?

MS. BREMMER: Yes, Your Honor. OFCCP calls Dr. Madden to the stand and Janet Herold will be conducting the examination.

JUDGE CLARK: Okay. Good morning. And I asked this question off the record, but I should ask it again -- hold on Ms. Herold -- was there anything we need to take up before we begin testimony this morning, Ms. Bremmer?

MS. BREMMER: No, Your Honor.

JUDGE CLARK: And Ms. Connell?

MS. CONNELL: No, Your Honor.

JUDGE CLARK: Okay.

Come on up this way, yes. Good morning.

DR. MADDEN: Good morning, Judge.

JUDGE CLARK: Go ahead and set your stuff down and get situated. If you would raise your right hand.

Whereupon,

JANICE MADDEN,

having been first duly sworn by the Administrative Law Judge, was examined and testified as follows:

JUDGE CLARK: Have a seat, please.

And, Doctor, if you would state your name and spell it for our record, please?

THE WITNESS: Janice Fanning Madden. J-A-N-I-C-E

F-A-N-N-I-N-G M-A-D-D-E-N.

JUDGE CLARK: Okay. And, Dr. Madden, I know you've given depositions before, and I know you did in this case as well, the only thing that's different here is that we're actually recording what's said, there's not a court reporter actually typing. So be sure to let the lawyers ask the complete question and they'll let you give a complete answer, because we can't record two people at once. All right?

THE WITNESS: Thank you. I'll do my best.

JUDGE CLARK: Okay. And if one of the lawyers makes an objection, you just -- if you're giving an answer, just go ahead and stop talking and I'll let you know whether to continue, okay?

THE WITNESS: Thank you. Yes.

JUDGE CLARK: Ms. Herold.

DIRECT EXAMINATION

BY MS. HEROLD:

Q Good morning, Professor Madden.

A Good morning.

Q What is your current employment?

A I am currently a Professor of Regional Science, Sociology, and Real Estate at the University of Pennsylvania.

Q And what does that mean?

A It means that I teach courses and conduct research at the university in those areas -- in those areas.

Q And what is regional science?

A Regional science is basically economic geography. I got involved with that with thinking about the relationship between labor markets -- between labor market job sites and where people live and the demographic effects of that. Basically, how race effects access to jobs and gender is effected by access to jobs.

Q And the sociology part of your title?

A The sociology, I basically, teach economics to the sociologists. Penn is kind of a unique place in that we require economics courses of our PhD students, and I teach those courses. There are four economists in the sociology department and I teach labor economics in that vein, as well.

Q And finally real estate?

A In real estate, I have not taught ever in real estate, that's my research. And I basically am in that program and I don't teach courses, I teach executives in that program. I teach our, our, our angels, our sponsors at the Wharton school, who are interested in how demographics affect real estate markets. And, basically, the role of an aging population, immigrants, racial differences, and women's changing work roles how that affects how cities operate and demand for various kinds of real estate.

Q And what do you teach?

A The courses I teach -- I teach the under -- for 47

years I've taught the economics of discrimination to our undergraduates, I have taught micro-economic theory to graduate students, I have taught courses on the analysis of labor markets for women: statistical, economic, and sociological to graduate students. And I have taught courses on regional economic development.

Q And you mentioned that you've taught both undergraduates and future -- and graduate students including a Wharton, did you ever get any feedback about your classes?

A Yes. Over 47 years, I've seen my students become very successful. I've been very -- I mean, Penn is a pretty prominent university, I think we're ranked fifth or sixth these days -- and I've had several students, to my amazement because of the tough competition, tell me I had taught the best course they ever took at the university. That is a very nice thing to have said to you.

And one of my former students, actually not too long ago, maybe 10 years ago is now the city solicitor in Philadelphia. And has come to me to help him now as a result of having taken my discrimination course on some of his role in the city solicitor's office.

Q How long have you been a professor at Penn?

A I've been a professor at Penn since 1972 when I joined the Wharton School immediately after getting my doctorate in economics from Duke University.

Q Okay. So let me just back up there. Before you got your PhD at Duke can you give me the earlier part of your educational history?

A Yes. I did my undergraduate work -- I'm a fifth generation Coloradoan (phonetic). I did my undergraduate work at the University of Denver in economics and mathematics. And then went to Duke University for the PhD and Masters I got on the way to the PhD in economics. I got my undergraduate degree in '69 and my doctorate three years later in 1972.

Q So you joined Penn in 1972, can you walk me through your career progression at Penn?

A Yes. I've basically moved through the ranks at the University of Pennsylvania. I was promoted from assistant professor to associate professor, and then from associate professor to full professor in 1988. I, at that time, then became director of the Alice Paul Institute for Research on Women at Penn.

And then in 1990 I was promoted to -- no. I'm sorry, 1988 I was full professor -- and then in 1990, '91, I was given a chair which is sort of endowed special research funds for full -- that some full professors get at that point. And then I went on in 1991 to become Vice Provos for Graduate Education, which is Penn language for Dean of the Graduate School. I basically ran doctoral education for all

of the 12 schools at the University of Pennsylvania. And I stepped down from that in 2000 and went back to the faculty.

And then I ran various programs on -- we needed, I became a utility administrator I guess. I ran the doctoral program in demography, which is population studies, and I also ran the Masters of Public Administration program and the Fels Institute for Government at the University of Pennsylvania for a few years after being vice provost.

Q And in your academic career has your research had a theme or a focus?

A Yeah. Well my research has always focused on the demographics and labor markets in cities would say. I've been fascinated with the connections between them. I have been fascinated with how one's demographic characteristics -- age, race, ethnicity, national origins -- affect outcomes in labor markets, affect where you choose to live, affect where you can live, affect the difference between where you work and where you live, affect what kind of jobs you can have access to.

I have been interested in how labor market institutions affect opportunities by people by their demographic characteristics. That has been the link through all of the various departments and programs I've been involved in. I also have an appointment -- I guess, maybe

it's not even on vitae -- in the city and regional planning program. So the urban programs, the sociology programs, the economic and business programs at Wharton have all been interested in me, but for that same strain of research.

Q And has your work been published?

A Yes.

Q Can you describe to me -- remembering that I am uninitiated into academia -- the quantity and nature of the work you've published?

A I have published five books, and I think about five -- five -- about fifty articles in refereed academic journals in economics, sociology, and urban studies.

Q And what does refereed mean?

A Refereed means that colleagues at comparable universities to mine, before the research is published, review that research, decide it's accurate, and also decide it's important before it's published. Referee -- the typical journals I've published my work in, publish less than 20 percent of the submissions based on those referee reports.

Q And is refereed the same as peer reviewed?

A Yes. Yes. It is.

Q And does the fact that a journal is refereed or peer reviewed matter, either to you as a scientist or when you're looking at someone else's work, as to the prestige of a journal?

A Well it matters to prestige, but I think it also matters to how you weigh it. I do not typically use in my courses any material that has not been referred, including my own. Occasionally, I use some things that are recent and haven't been refereed, but I warn the students about that. I said:

"You should never take seriously academic research that has not gone through the peer review process. And it's to be weighed more heavily when it's the peer reviewed process of one of the more prestigious journals."

Q Have you served as a peer reviewer?

A I have served as a peer reviewer and I've also served as journal editor.

Q Okay. Has you research and scholarship received recognition?

A Yes. I was elected to be a fellow of the Regional Science Association International, which is an international organization, basically, of people who work on economics and space. Space not being astrospace, but space being spacial structures of the world, of the US -- of the United States and other economies.

Q Have there been other recognitions?

A Yes. I was also, I was also elected president of

the North American Regional Science Association. And I served -- I don't know, the exact years are on my vitae -- but I served as a member of the Governing Board of the American Academy of Political and Social Sciences. And, for about five or six years, I have served as chairman of the board of that academy which is the oldest -- I believe it's the oldest social science professional association in the United States. And it's mission is to secure the correct and appropriate use of social science and government in the judicial, legislative, and executive branches.

Q Have you served on any committees related to collecting pay information?

A Yes. The National Academy of Sciences -- which is the most prestigious academic organization in the country -- appointed me to the panel, that they created in 2013 I believe, to advise the government on the best ways to collect compensation data to measure race and gender differences in the labor market.

Q Okay. And have you served on any chairs relating to measuring data regarding scientific or engineering enterprises?

A Yes. Again, the same National Academy of Science has appointed me to chair their committee, which I believe was probably about 20 years ago, their committee in which we talked about how you measure the performance of the United

States science and technology workforce. And we published a volume on that, that committee did, which I was heavily involved in writing. I also was asked by the National Research Counsel to serve when I was graduate dean on their committee which was set up to try and foster recruitment of people into science and technology jobs.

Q Okay. And how was your research funded?

A My research has been funded by the two most competitive organizations to provide -- to fund academic research, the National Institute of Health and the National Science Foundation. I've also been funded by the Department of Labor -- in a competitive process not your division -- and I have been funded by the Brookings Institution, I've been funded by the Spencer Foundation, and there's probably various others. Oh, the Pew Foundation has funded me, as well.

Q So let's shift a moment to talk about your consulting work. Have you done any work in the area of employment discrimination or affirmative action for organizations that was not related to litigation?

A Yes. I have.

Q What was that?

A Well I actually prepared the first affirmative action plan for the New York City Board of Education. That was probably 25, 30 years ago, sometime ago where I did that.

I have also been retained by firms to, basically, review their hiring practices and their compensation practices for race and gender differences. These include very large financial institutions, they include manufacturing institutions, they include a variety of institutions.

Q And that's all outside of a litigation consulting?

A Yes. And I've also been hired by several universities to evaluate their training programs including the University of Virginia, Emery University, the Government of Ontario, the Canadian province, hired me to review graduate education at all of their universities. I've also worked for Carnegie Melon and for Duke University.

Q Okay. So now I want to talk about your experience, research or consulting work, related to the science and technology industry.

A Okay.

Q How much work do you feel you've done involving science or technology employees?

A Well I've been involved in several litigation areas that involved scientific organizations, including Eastman Kodak, Los Alamos Labs, Livermore Labs, Knolls Atomic Propulsion Lab, that's what comes to mind.

Q And did you have any interaction as to science or technology, the industry, or it's employees in your work related to the Dean of the graduate school?

A Well, yes. I can assure you that every employee of Oracle that got a PhD or a master's research degree from the University of Pennsylvania in the 1990's has my signature on the degree. I was responsible for our engineering PhD and masters programs as well as our mathematics and science degrees and supervising the production of that training.

Q So your consulting business you do through Econsult, is that right?

A Yes. Correct.

Q How many times have you provided expert testimony on economics and employment -- economics and employment discrimination? I'm so sorry.

A Well courtroom, probably a dozen times, but including depositions I would say 50 to 60 times.

Q And have those -- have you provided testimony in federal court or state court or both?

A To my knowledge it's all been federal court.

Q Okay. Of the cases and --

A Federal and Department of Labor and EOC administrative courts, but those are federal courts.

Q Those aren't state courts.

A Right.

Q Of the cases on which you have been retained, what percentage is plaintiff, and what percentage is for the defendant?

A I would say about 15, 1 5, percent has been for defendants and about 85 percent has been for plaintiffs.

Q And how many cases have you provided testimony regarding compensation discrimination?

A I would say probably about 20.

Q Okay. And does that number differ if I ask the question about being retained as opposed to providing testimony?

A Yeah. There would be more about retention.

Q Okay. How familiar are you with evaluating statistical evidence in federal courts or by federal courts?

A Well I'm quite familiar with it. I mean that's why the judicial -- Federal Judicial Center which the Supreme Court runs to train federal judges -- asked me to lecture federal judges on a few occasions as to the use of statistics and discrimination cases. And the Federal Reserve Bank, similarly retained me to train federal judges in the use of statistics and economics in the courtroom.

Q And has your consulting work and your research ever overlapped?

A Yes. I have a -- I mean one of the things that consulting gives me access to is data that in academe you don't normally get access to. So, for example, the work I did in a series of cases, stock-broker cases, of stock broker -- where allegations were made of class action discrimination

by gender and by race in stock-broker cases, the reports I prepared in those cases actually got published in fairly prestigious journals. The gender work got published in the premier gender and sociology journal, *Gender and Society*. And the racial work got published in the journal *Industrial Relations*, which is a premier labor economics journal.

Q Okay. Anything else other than the stock broker cases?

A Well, yeah, it's not -- it wasn't litigation but many years ago, Mr. Johnnie Cochran asked me if I would work with him to think how we could do something about racial disparities in NFL coaches in the amount of NFL coaches that were African American. And we put together a database -- well Mr. Cochran put together the database, and then I did an analysis of it. And that started, actually, a series of publications that came out in the *Journal of Sports Economics* on looking at how to evaluate whether there were race disparities, and it actually motivated the NFL to adopt the Rooney rule.

And the year before the Rooney rule there were three black coaches among the thirty-two in the NFL, and two years afterwards there were eight. And that's what actually the succeeding publications were looking at what changed, what procedures changed that changed that racial composition. But that was from consulting as opposed to for my normal

research at the university.

Q Has your consulting work concerned predominantly employers who -- I'm sorry -- predominantly employees who are engaged in blue collar or manual labor positions or more complex or highly educated work?

A Most of my work has been really fairly complex like the stock brokers, like universities, university faculty, the Eastman Kodak which is a heavily scientific based firm. I can only think of a few cases that have been blue collar. Almost all of it has been white collar and fairly sophisticated.

Q Okay.

MS. HEROLD: Your Honor, if I could approach to show the witness an exhibit?

JUDGE CLARK: Yes. Have you shown it to counsel?

MS. HEROLD: I will right now.

This is Plaintiff's Exhibit or attachment to Plaintiff's Exhibit 1.

I'll say that for the Court so you can hear it. This is Plaintiff's Exhibit 1, the attachment to Plaintiff's Exhibit 1, which is her initial July 2019 report and this is her CV.

JUDGE CLARK: I actually don't need it. Is there some reason you didn't bring it up on the screen?

MS. HEROLD: Actually, it is, you can’t see more

than one or two pages together, (Indiscernible 9:22:08)

JUDGE CLARK: Okay. I'll take a copy then.

MS. HEROLD: Sorry. I did try.

JUDGE CLARK: Okay.

BY MS. HEROLD:

Q Okay. Professor Madden, do you recognize this?

A Yes.

Q What is it?

A It is my curriculum vitae, or for non-academics a resume, from June 2019.

Q Is it missing anything? Is it up to date?

A I have had one publication since then and that is a -- there was a publication coming forth -- I think it's coming forth -- in urban studies, which is not on here, which is on the extent to which the migration history of a city, whether it's a traditional migration site, a new migration site, or doesn't get much migration, affects immigrant outcomes.

Q Okay. And anything relating to employment discrimination that's not on the vitae?

A Sometimes I think that article does, but no, nothing else.

Q Okay. And anything else that you think we didn't cover from your CV that is related to your credentials here?

A I think we've covered -- I mean, the one thing I

would point out is that, in the courses I've taught, I've taught the statistics and econometrics that are relevant to the measurement issues of the subjects I studied, so that the courses also teach statistics and econometrics.

Q Okay.

MS. HEROLD: So, Your Honor, if I could just have a moment to bring up the demonstrative, I just need to master the technology for a second.

JUDGE CLARK: Okay.

Has Counsel seen this prior to today?

MS. HEROLD: Yeah. We exchanged last night.

JUDGE CLARK: Okay.

MS. HEROLD: Pursuant to the parties agreement, we exchanged demonstratives the night before.

JUDGE CLARK: So, Counsel, you appear to be showing this on the big screen, I thought we had agreed at the prehearing conference that -- so don't put anything up on the big screen, yet.

MS. HEROLD: Okay.

JUDGE CLARK: I thought we had agreed that nothing would go up on -- be published except on the internal screen monitors.

Ms. Connell, or I don't know who's got this witness here?

MS. CONNELL: I do.

JUDGE CLARK: Do you have any objection to this? You've seen the exhibit I guess.

MS. CONNELL: We've seen the exhibit, we don't have any objection to the screen. I think the screen's are sufficient.

JUDGE CLARK: And you have no objection to the demonstrative exhibit?

MS. CONNELL: Yeah. I mean we would prefer that it just be on the screen, but if they're going to display it, it's --

JUDGE CLARK: So, Ms. Herold, my understanding was we weren't going to put stuff up, I understand there's no objection. Why is it that you're putting it up on the big screen instead of just on the internal screens?

MS. HEROLD: Well two reasons. One is that -- can I first address that, that was not consistent with our understanding and we had discussed that with opposing counsel, so I just want to reflect that, that wasn't our understanding.

JUDGE CLARK: What wasn't your understanding?

MS. HEROLD: That things would only be shown on the screens. We had came to the courtroom ahead of time to talk through the technology so there may be a mis-communication but that was not our understanding.

JUDGE CLARK: Okay.

MS. HEROLD: And the second issue is, we carefully went through the demonstrative to ensure that there is no PII or no concern regarding any of the confidential information we had discussed. And then, third, the reason that we are putting it there in addition to the screens so Professor Madden can walk us through various parts of it and it's just easier to see visually. That's the reason.

JUDGE CLARK: Okay.

And there's no objection?

MS. CONNELL: I mean, again, we would prefer that it be on the screen. We do have some confidentiality concerns regarding the exhibit, so I think it's more appropriate that it be on the screen than up on the projector, particularly because Your Honor has ruled that, that would be the case.

JUDGE CLARK: Overruled. You can ask your questions.

MS. HEROLD: Okay. Sorry. I can put it up, Your Honor?

JUDGE CLARK: Yes.

MS. HEROLD: Okay. So it will be appearing, we can coordinate appropriately. It'll appear on both the screens and here, hopefully simultaneously.

One moment, Your Honor.

Can I bring the laser pointer to the Witness?

JUDGE CLARK: Yes.

MS. HEROLD: I forgot to give it to her?

BY MS. HEROLD:

Q Okay, Professor Madden. Were you retained by OFCCP?

A Yes. I was.

Q What were you retained to do?

A I was retained to answer a series of questions that are showing on the screen. The first three questions were:

"Were there differences in compensation between Asian and white employees in the production development job function at Oracle America at it's headquarters for the 2013 through 2018 period?

"Were there gender differences in compensation in the product development, information technology, and support job functions at Oracle America at it's headquarters for the 2013 through 2018 period?

"And were there differences in compensation between African American and white employees in the product development job function at Oracle

America at it's headquarters for the 2013 through 2018 period?"

And then depending on what I found there with respect to those first three questions, I was asked to review:

"What the relationship of Oracle decisions on job assignment and compensation at hire to any subsequent gender and racial compensation differentials."

Q Okay. So how did you answer the first question?

A Well in answer to the first question, yes. I did find differences in compensation between Asian and white employees in the product development job function at Oracle America headquarters for the time period.

Q And what were your conclusions?

A What I found that support that were:

"That Asian employees earn approximately 12 to 18 percent a year less than do white employees of comparable age, education, and seniority at Oracle. That the base pay rates of Asian employees averaged about 7 percent less than the averages for white employees of comparable age, education, and seniority. And that Asian employees

received an average of between 2500 and 10,500 fewer stock award units each year, than do white employees of comparable age, education, and seniority."

Q And how did you answer the second question?

A The second question, I also did find differences in compensation between women and men employed in the product development, information technology, and support job functions at Oracle America headquarters for the time period.

Q And what were your conclusions?

A The evidence I found that supported that is:

"That women earned approximately 18 to 24 percent less than do men --and this is for all forms of earnings --of comparable age, education, and seniority. That if we only look at base pay, as opposed to bonus and stock awards, the base pay rates of women averaged about 13 percent less than the averages for men of comparable age, education, and seniority. And that women received an average of between 6,000 and 12,000 fewer stock award units each year than did men of comparable age, education, and seniority."

Q And did you have an answer to the third question?

A Yes. I also found differences in compensation for African American and white employees in the product development job function at Oracle America at it's headquarters for the time period.

Q And did you have any conclusions regarding African American/white pay differences?

A Yes. I found that:

> "African Americans earn approximately 14 to 40 percent less than do white employees of comparable age, education, and seniority. I found that the base pay rates of African Americans averaged between 16 and 21 percent less than the averages for white employees of comparable age, education, and seniority. And that African American employees received an average of between 12,000 and 29,000 fewer stock award units each year than did white employees of comparable age, education, and seniority."

Q And what was your answer to the fourth question?

A All right. The question of what is the relationship of job assignment and compensation at higher to subsequent or to the 2013 or through 2018 gender and racial

compensation differentials, I found that for Asian employees about 60 percent of the compensation disparity arises from job assignment differences at hire.

And that the global career level and pay set for the starting job actually account for most of the racial disparity in pay for Asian employees though there is some difference, there is a statistically significant difference within job code currently, but most of the pay difference derives from that first pay, that first assignment of job.

Q And how about for women?

A Well for women I found that 75 percent of the compensation disparity for women arises from job assignment differences at hire and then over time, that refers to promotion. So it's job subsequent promotions. The global career level and pay set for starting jobs at Oracle, just the initial, account for about half of the gender disparity in pay.

The other 25 percent is the promotion and then the subsequent disadvantage experienced by women in moving up from their initial global career level also account for a large share of their current pay disparities. And that was not the case for Asians. For Asians it was all initially, but for women there's a promotion difference. And then for women as well, there are significant differences that remain though they're much smaller within the current jobs.

Q And finally conclusions for African American employees?

A For African Americans, over 75 percent of the compensation disparity arise from job assignment differences at hire and over time. And the small number of African American employees for the most part -- the most I ever get in any one year to analyze is 30 it's difficult to put a lot of controls into the analysis. So I couldn't do the same kind of careful sifting through of how these disparities arise for African Americans, because they're just weren't enough African Americans to have data answer these questions.

Q Did your study cause you to reach any overreaching observations?

A Well yes, I would say there's some things that we should bear in mind as we sort of go through the details of the analysis that are about to be presented. Is, first of all, is that Oracle's compensation data reveals statistically significant gender and racial pay gaps in total compensation in base pay and in stock awards.

Secondly, I think it's important -- and I'll explain that in more detail to come -- that economic theory would suggest that product line assignments by Oracle should not affect these compensation disparities.

Third, the pay gaps persist among not just similarly qualified employees but also among similarly

qualified employees assigned by Oracle to the same job and career level. So the pay disparities exist within job codes as well as with people when we don't consider the job assignments that Oracle made.

Oracle did not systematically retain data regarding many of the factors that I now understand Oracle to be claiming it considers in setting pay, including product line assignment, rendering a statistical analysis of such factors impossible.

And finally, statistically significant gender and racial differences in Oracle's assignment of global career level, explain a large share of these gender and racial pay gaps.

Q Okay. So let's turn to your study. What data did you analyze?

A Well basically, Oracle provided to the Department of Labor, which then they shared -- the Department of Labor shared with me, copies of their payroll and human resource electronic files: and these included racial and gender identifications, hire dates, ages, education, and compensation, basically complete employment histories. And they also provided applications for some employees, not on paper they were electronic, but they were pictures of applications. We also had applications for some of the employees in the class.

And I want to mention that to include data on any variable in a statistical analysis there must be data on the variable for a large proportion of the employees. If you have data on only a handful you can't make a judgement about what the role of that data might be, because it's not, you don't have it for the larger group. You want to have enough data or at least a sense of explaining why the data is missing and understanding that if you only have 10 percent data on 10 percent of the people that the 90 percent should be just like the 10 percent. You have to have some statistical basis for using a data on a characteristic. The fact that you have it for a handful of people doesn't enable you to be able to do a statistical analysis.

Q What specific questions did you study with the data?

A Okay. So to answer those general questions that I started out with, I started with some specific statistic econometric economics questions. Basically, is the compensation paid to Asian employees less than that pay to white employees with equivalent credentials? Is the compensation paid to women less than that paid to men with equivalent credentials? And is the compensation paid to African American employees less than that paid to white employees with equivalent credentials?

Q So why did you study employees with similar

credentials as opposed to studying employees assigned to similar work?

A Well what we want to look at here, this is an analysis that's designed to see whether there was a differential treatment of African Americans relative to whites, Asians relative to whites, of women relative to men by Oracle. So we want to look at people that come to Oracle who are as much the same as we can use data to say.

But what we don't want to do is use Oracle's decisions on those people, because Oracle's decisions is what we're testing. We're testing whether those are race neutral and gender neutral. So we want to look at, okay here's what they had when they come to Oracle. When they're the same as they come to Oracle what happens after that?

Q How did you determine who had equivalent credentials?

A Well I use what is -- it's the workhorse, the standard approach that economists and, broadly, social scientist today now use in thinking about labor markets and in thinking about compensation, and that is human capital theory, which was developed by the late professor Gary Becker for which he received the Nobel prize in economics. And it's a widely accepted analysis of the determinants of productivity differences and, therefore, of compensation differences across employees. And I want to talk about this.

Because what economists describe as discrimination -- obviously the courts, the legal system can decide whatever they want is discrimination -- but how economists describe discrimination is it's when people who have the same productivity, the same ability to contribute to the employer, are getting different outcomes at the employer. The problem is we never observe productivity, particularly in complex workforces, you never observe -- you know, if you've got piece rate in a factory you observe productivity. But for complex work, you can't observe productivity.

So what the human capital theory does is it emphasis rather than productivity, what makes people more productive and that is the investments that individuals make in their skills. That's what makes them productivity. So rather than see the productivity itself, we're looking at the particular skills and investments that individuals have.

And the classic -- the most important human capital components that are basically included in every study and are often the only components included in studies are: experience which is measure by age of people, older people have more experience, and time with an employer, which is employer seniority or tenure and the education of the individual. Age and education are the classic things. We often don't have time with an employer, but if we have time with an employer,

that's a perfectly reasonable thing to use.

Q So I think you just discussed this about productivity in observing productivity, Professor Madden, I'm sorry, I changed the slide on you.

A Oh. Oh. Sorry. All right. Yes. As I say, economists expect that individual compensation will vary with individual productivity. And that productivity is not observed or recorded at Oracle or anyplace else. I mean, in any complex job you don't know what any individual is exactly producing except in rare cases. So we use the characteristics that make one employee more productive than another rather than productivity itself.

Q And what are the implications of applying human capital theory for studying racial and gender disparity?

A So what we want to do here is we want to figure out whether race or gender is having a role, as opposed to differences in compensation which might arise from race or gender differences in productivity are the qualifications. So, if there's race and gender differences in the qualifications, we may have race and gender differences in pay, but they're not discrimination or evidence of discrimination, they're just evidence of other differences or some prior differences that exist by gender or by race.

So it's necessary to control for any systematic differences between the racial or gender groups in the

qualifications and, if we really want to look at what the effect a hands off -- so we're really looking only at what individuals come with and not Oracle decisions -- we want to look at those qualifications possessed at hire. And I want to point out that qualifications that are possessed by equivalent proportions or at equivalent levels by both racial or gender groups that we're comparing, after controlling for the other qualifications we're using, cannot affect the disparities.

So, for example, if the same proportion of women and men have college degrees, a college degree may be very valuable to Oracle but it's not something that's relevant to comparing the group differences because that characteristic is the same by group, there's no reason to actually control for it, because it's the same. So things that are the same between the groups, either in the absolute level or in the distribution across the groups cannot affect the measured race and gender disparity.

Q So does that mean that you consider as many qualifications as possible?

A No. And, in fact, this is something that has come up in my teaching of federal judges that I had been encouraged by the Federal Judicial Center to make a point of, is they point out to me that to the lay person it seems adding more qualifications will make things better, well

that's not true. Adding qualifications that don't differ across the group, although they do differ across individuals and across individuals are important for compensation, may act -- may but not necessarily, actually reduce the precision or accuracy of the major group differences. Particularly, if you've got a, you know, relatively small numbers of data, or lots of variables, you just don't -- you're using up statistics to measure things that don't matter -- using up data to measure things that don't matter at the expense of what does matter, which is the group disparity.

Similarly, adding qualifications that are based on Oracle decisions, which are referred to in the econometrics literature as endogenous variables, potentially affect the very gender and race disparities that the analysis is designed to measure and finally just adding to many variables -- this is what I was getting at actually on the first dot as well -- is adding so many qualifications that there's fewer than 50 employees from each group, so 50 women and 50 men, that have the characteristics it makes it -- it leads to -- it leads to statistical imprecision. You just simply don't have enough data to appropriately measure the affect.

Q Okay. So what studies -- or what techniques did you use?

A Again, just like I used the workhorse of economics for sort of the theory, human capital theory, I use the

workhorse of social science, multiple regression analysis, as the statistical technique.

Q How do you set up such an analysis?

A Well you have to figure out what you're going to explain that's called the dependant variable, and what you're going to use to explain it which are called the independent variables. My analysis, particularly the first set I'm going to present, use medicare taxed earnings, which include base pay, bonuses and stock awards actually paid during the year. I want to point out, that any earnings that are deferred from federal income tax because they are placed in a pension plan are actually included in medicare earnings.

I was rather -- I mean medicare earnings are used all the time in litigation on discrimination because they include pension plan contributions. I was rather surprised and amazed to see that the expert Dr. Saad, in his report, claimed that medicare earnings exclude pension income. That is -- I've just never heard anybody claim that and it's demonstrably wrong. That medicare earnings are used commonly in these analyses precisely because they include all things actually paid, regardless of how the worker makes decisions about sheltering pension income.

Q Okay. So the compensation is the dependant variable, what are the independent variables?

A The independent variables that I use that I

particularly that I start out with in human capital model are experience, which I measure with time in the labor force and time with Oracle, and education which is the highest degree obtained.

Q Okay. Can you walk me through your methodology that you used?

A Okay. So basically, I'm going to use regression analysis, and I want to look at the role of group differences versus -- I mean, not whether these characteristics matter for individuals but rather they matter to the group disparities. So we're going to compute the racial and gender disparities in compensation.

First of all, with no consideration of any other relevant characteristics so what are the differences in pay before we look at any human capital variables. Then I'm going to go through a series of analysis that consider disparities in compensation with alternative relative characteristics included. We can then compare whether these relevant characteristics, which may be quite relevant to individual outcomes, are at all affecting the gender or racial disparities.

If when I add a control variable, I see that the gender or race disparity goes up, then it says that actually the Asian employees or the African American employees or the women employees actually have more of this characteristic

than the comparison group. If the racial or gender disparity goes down, then they have less of a disparity. If there's no difference, then racial disparities or gender disparities and relative characteristics do not account for the racial disparity. And it gives us some sense of how important individual characteristics are to measuring the disparities.

Q And so in applying your methodology you use regression analysis?

A Yes. And I use regression analysis to measure the affect of race or gender after accounting for whatever variety of employee characteristics have been included in that particular regression analysis. And I want to ask the question does it yield similar results as various sets of employee -- of characteristics are controlled. So this is the details of how I am making these comparisons. So if yes, then the group differences do contribute. If no, then the group differences -- if yes, then group differences do contribute to the explanation of observed difference. If no, then group differences do -- group differences do contribute it and their effects can be quantified by the differences in the pay gap with and without the qualifications. So the pay gap as it changes as we're adding qualifications tells us whether these things are important or not.

Q So I got a little confused there. So, if the control yield does yield similar results, it does not

contribute?

A Right.

Q Okay. And if it --

A Doesn't, then it is contributing.

Q It does. Okay. Okay. So can you provide me with an example?

A Yeah. Let me give you a hypothetical, this has nothing to do with any data in this case. So we want to look at whether gender or racial differences in productivity or qualifications account for a gender gap in compensation. So let's say we've got a 20 percent gender pay gap in the country or in the organization we're looking at. So we can ask this regression analysis yield to similar results with and without controls. This is actually totally common in the literature. So we ask, do experience a difference explain part or all of that gender pay gap. It could be the case that women just have less experience than men and that's --

So we run an analysis, we get the 20 percent pay gap with no controls, then we add experience controls in. And if the 20 percent pay gap doesn't change, then group differences and experience don't explain the pay gap. But if the 20 percent pay gap, when we add experience, becomes a 10 percent pay gap then what we -- when experience is applied then we know that the group difference is in experience. The differences in experience between men and women account for

half of that gender gap. So the gender gap, once we control, once we compare people with the same experience, it's not 20 percent it's 10 percent.

Q And is there a statistical method you use as you're running this analysis?

A Yes. As I say, I run regression analysis it's the -- I mean, there couldn't be any dispute that this isn't the appropriate way for measuring gender differences in compensation after considering the affects of race or gender differences in relevant characteristics. That what it does is it measures the impact of explanatory variables on the depended variable compensation -- net of all other differences in the regression -- and therefore the regression coefficient for race or gender provides an index of the impact of race or gender on compensation after adjusting for everything else we have in the equation.

This is the technique that's commonly used for example, it's been used to explain outcomes in pay for CEOs, it's been used to explain outcomes in pay for MBA graduates of Harvard over a 25 year career. It's been used to explain gender differences in pay for law graduates at Harvard, it's been used to explain these differences for veterinarians, it's been used for doctors, it's commonly used for the most sophisticated of occupations, because these are the occupations where you want to control for the affect of other

characteristics.

Q So is it true that regression analysis is used more commonly with blue collar or white collar jobs?

A Well often with blue collar you don't have to -- I mean it took -- you use it with blue collar if something matters. If you're looking for somebody having a license or something, to do some sort of asbestos removal or something of that form. But no it's much more likely to be used in, for example, university faculty cases or in the research that's looking at more sophisticated jobs.

Q What is the role of exogenous and endogenous variables in designing these analyses?

A Well I happened to mention endogenous early on, but I want to come back and explain what that is. It comes from the Greek. Exogenous variables are "XO" outside the system being analyzed and that's what determines them. So the education of an employee, Oracle is not effected. People come to Oracle and they have an education, nothing Oracle does is affecting that. I mean, in some sense they're affecting it because, if they don't hire high school dropouts, you don't have high school dropouts there, but for the individuals included in the analysis, Oracle isn't affecting their individual outcomes.

The value of endogenous variables are determined within the system being analyzed. So that they're not a

value that you have before you come in to the system. There's a value that's determined -- that the system itself is effecting. And in fact it's often the case that there are several exogenous variables and the same endogenous variables are determining all of those variables.

Q And so how do you apply that concept here?

A All right. So the exogenous variables in this case -- as I said there may be several exogenous variables -- are the characteristics controlled by employees not by Oracle, they determine compensation, and they also determine job placement. That's my point, is that an exogenous variable is a variable that's determined by the same variables within the system. So you use education, you use experience, and you use the subject area of that education and experience -- which in this case I've developed this job descriptor based on Oracle job titles to measure the area of experience and education. All of those characteristics are what Oracle uses to set compensation and also what they use to set the job placement. That the same characteristics, these exogenous characteristics, are effecting the endogenous characteristics those variables set by Oracle.

Now the endogenous variables are the employee characteristics assigned or controlled by Oracle and not by the employee. And those are the things Oracle is using, what it observes on the education and experience and the areas of

those education experience of employees. It's compensation, it's global career level, it's who's placed in management, and potentially work assignments such as product line assignment and job title.

Now it is the case that Oracle has some effect on Oracle tenure of employees because, if they fire somebody they don't get more tenure, but those people aren't in the database. The people that have parted from Oracle and would have more tenure. For any individual who's still within Oracle, they're really controlling whether they stay at Oracle or not at that point. So that's why the Oracle tenure is also an exogenous variable. Because while Oracle can in some sense effect it at a macro-level, for the individuals who are studying, you know, if the person stays and Oracle doesn't fire them, that experience tenure or seniority is an exogenous characteristic that Oracle isn't controlling. They're not controlling when people come to the firm.

Q So let me see if I've got this. So, if you include an endogenous variable in a regression analysis, would the regression analysis be considered biased?

A Yes. That's the universal acceptance in the common metrics literature. The inclusion of an endogenous variable as an explanatory variable then biases all the other coefficients in the analysis.

Q And similarly, drawing on your research background,

if you presented a regression model to an audience of economists that relied on an endogenous variable that controlled for that, what would be their response?

MS. CONNELL: Objection. Lacks foundation, calls for speculation.

MS. HEROLD: I apologize, Your Honor. I intended it to be a hypothetical.

JUDGE CLARK: Okay. Overruled. You can answer this question.

BY MS. HEROLD:

A I would be laughed out of the room and never invited back. That this is just a cardinal, well-accepted rule of econometrics. You do not include an endogenous variable. An endogenous variable is an independent variable. An endogenous variable is one to be explained. It is not one of the explainers.

MS. CONNELL: I'm going to also object that it lacks foundation as to what all economists would think.

JUDGE CLARK: Overruled. I think it just goes to the weight of her testimony at this point.

MS. HEROLD: Your Honor, I'm going to next move into the actual study, so I didn't know whether we wanted to take break now or did you want to wait for a little bit?

JUDGE CLARK: No. Wait for a little bit. Thanks.

MS. HEROLD: Okay. That's just fine.

JUDGE CLARK: Keep moving.

BY MS. HEROLD:

Q Okay. So what are the results of your study as to Asian/white pay disparities?

A Okay. I think, let's start with just looking at some of the results before I hit you with the massive tables. All right.

So this is from table 2a of my report and it's showing the disparities between Asians and whites for the year 2013. It starts off with giving you the number of workers. This is the number of Asian workers and white workers who are in the product development job function for the full year at Oracle in 2013. And now of those 3,000 --

Q Professor Madden, I'm sorry, where are you -- where are you indicating?

A 3,584.

Q Okay.

A 2013. Or maybe you want me to -- let me see if I can get this laser working, let's see. Do you see it?

Q We think it's on, you just have to press the middle.

A The middle, okay. Do you see -- oh there it is.

JUDGE CLARK: Back of the courtroom.

BY MS. HEROLD:

A So there's 3,584 workers of whom 72.5 percent are

Asian. So we've got, you know, we're really talking about approximately 1,000 whites and 2600 Asians in this analysis. And, if we just look without any controls at what the race coefficient is, it shows as negative .237. That can be interpreted approximately as a salary disparity for Asians relative to whites with no other controls of 23.7 percent.

Now in actuality because of the algorithm, and that this is done with logarithms, it's actually the true percentage difference is a little less than 23.7. I have not made those transformations. It's commonly done we just use this as an index. So but I do want to acknowledge that the true difference and if I was trying to compute damages from these numbers I'd go to the true differences. But it is the case that a bigger number is more of a disparity and a lesser number is less of a disparity. If I add --

Q Professor Madden, how close is that gap between the race coefficient and the percentage difference?

A I'm sorry, I should have computed this. I have an example in my report, but my guess is it's somewhere that the true difference probably of that is like 22 percent rather than 23.7 percent. So it tracks closely, but it is less. And I just want to acknowledge that, that is the case that I've done that.

Now if I add -- oops I just lost -- there. Now if I do another regression analysis and now control for race and

gender, the race coefficient drops to .220 or a 22 percent approximate gap. It's dropped down a bit. Why did it drop down a bit? It dropped down a bit because the Asian population at Oracle has more females than the white population does and women earn less than men. And so that's why, once we control for gender here, the race disparity between Asians and whites goes down. So the 22 percent is basically saying this is the difference that would be the case if the gender composition of Asians and whites were controlled to be the same.

All right. Then the third row you see a race coefficient of minus .125. What have I done there, I've added age to the analysis. And what I add is age, I've actually -- the way I add age is I control for age and I control for age squared.

And that is a common technique which simply says an additional year of age has a different effect if you've been at Oracle -- if you're 60 years old than if you were 25 years old. It recognizes the well understood phenomenon in labor economics that younger workers have bigger changes in their share -- in their experience level as they accumulate ages than older workers who are adding to their -- or adding to their skills at a lower rate with an increasing year.

But that drop of minus .2 to minus .125 really shows that the Asian workers here that I'm comparing are much

younger than the white workers and that, that accounts for a lot of the differential here. So that's an example of a group difference that is mattering and is a non-discriminatory factor and should be taken into consideration. And I want to point out that all of these are adding things. So this analysis includes the effects of gender and age.

When we move to column 4 now, I'm adding the highest degree. And about half -- a little, a little, a little less than half of the people here, we don't have degrees on and so in that case, they're just put as a don't know category. So I compare all the don't knows together. But when we can add information on degrees, the disparity actually increases a little bit, but that's really small. It goes from 12 -- negative 12 -- .125 to negative 12.8 percent as a fraction. So the education of Asians and whites is relatively similar once we control for age.

The fifth column adds a control for race -- I'm sorry, adds a control for time at Oracle. And I do the same thing here that I did with age, I have time at Oracle and I have time at Oracle squared. Because you're specific knowledge of Oracle changes a whole lot more between your fifth and sixth year at Oracle than it does between your twenty fifth and twenty sixth year. So it's allowing that effect to decrease and indeed, when we add that, the

coefficient goes down to minus 121.

But basically the only thing that's mattering in gender, age, education, and time at Oracle in explaining the race disparity is age. But that's the big effect here.

Q Could the measured Asian differences in compensation have occurred by chance?

A And no, it does not, is my answer.

Q How do you know that?

A And the reason it does not is that I -- is that probability theory tells it is not. Probability theory is the way we use to see whether this is random variation that might be causing these race disparities or is it something that's truly in the data as opposed to random variation. And probability theory is what we use to test that.

Q Is that related to the term statistical significance?

A Yes. Statistical significance is a term used by scientist -- physical, natural, and social -- to refer to the confidence you have that what you -- in the accuracy of the relationship you've measured. You know, is it really random variation or is it a relationship that's truly there. And it's determined by the probability that the relation to -- relationship you have is actually false. That it's due only to chance or random variation.

Now in legal and in some academic context a number

or a relationship is labeled as statistically significant, if the probability that it's false is five percent or less. And I will use that here. Though I have not consistently used that in my research work. I will use five percent to measure statistical significance here, as we discussed.

So how do we get that probability? Okay, this is stat 101, we're going to do some coin flips here, okay. So we expect that a fair coin is going to be heads half of the time it's flipped and tails the other half. Because of chance, however, when you flip a coin there's going to be some variation from this norm, from this expectation, even if you have a fair coin.

So if you flip a coin three times for example, you're never going to have half head half tails because you've only got three coins. So there's eight possibilities, divide that graphic down the middle. So when we flip a coin three times, it's got to be one of these eight possibilities.

You either get three heads, the first one. You get head, head, tail, the second one. You get head, tail, tail the third one. You get tail, tail, tail the fourth one. You get tail, tail, head the fifth one. You get tail, head, head the sixth one. You get tail, head, tail, the seventh one. Or you get head, tail, head. Those are all the possibilities that you can get.

So, if we ask the question from flipping the coin

three times -- and let's say we can absolutely compute the probability of getting various heads and tails combinations from three flips of the coin with these -- so what proportion of the time, if you have a fair coin, are you going to get at least two heads and three flips of a fair coin. Well out of all these possibilities the first one, the second one, the sixth one, and the eight one gave me those outcomes. So half of the time. Half of the time when you have a fair coin, you're going to get two heads and one tail in your flips.

What is the probability of getting three tails with a fair coin, well that's only one of these possibilities but that's still one in eight. So you could have a fair coin and get three heads one out of eight times or 12.5 percent. So There's no way with three flips of a coin that you're ever going to pass a five percent probability standard of knowing whether you've got a fair coin or a loaded coin. You could get -- because you've gotten three tails you could get -- it could be a totally loaded coin that only flips tails, if that's the only thing it will believe, but you wouldn't know that with only three flips.

If you do four flips -- well you're doing the same sort of analysis of all these combinations -- you would get 4 tails 6.25 percent of the time. So with four flips, as well, you would never have evidence at a five percent statistical significance standard to say that you've got a loaded coin.

You need five flips of the coin to know that your coin only can turn up tails as opposed to being a fair coin.

So this is the effect of having enough data to be able to see the relationship. With three or four flips you can never pass muster with statistical significance, you absolutely need five flips -- could you next?

Q Oh. Sorry.

A So you need five flips to get five straight tails, only then is it a possibility to conclude that the coin is loaded with a five percent or lower probability of making a mistake. Now it's this kind of probability that's used to look up probabilities of lots of outcomes: such as Powerball, games of chance in Las Vegas, or other things.

The Powerball lottery, for example, to win Powerball you have to get five of the right balls correct and the Powerball, to get the jackpot. And your probability of doing that is 1 in 292,201,338. That's why probably nobody in this room has ever won the Powerball jackpot. I've only gotten that -- and you can see all the other -- I mean, they have other possibilities. Of getting any kind of prize including getting the Powerball right or getting one of the white balls right, your chances are a little less than 1 in 25 of having any outcome for that kind of -- for your investment in a $2 ticket. So the odds of winning the jackpot is, as I said, 1 out of 292 thousand 201 338. If we

put that in a fraction or in a decimal, that is equivalent to .0000000342, or 3.42 out of a 100 million, .0000342 percent chance, or 342 out of 10 billion. Very low probability. Similarly there's lots of other games of lotto that you can look at these kind of chances.

Okay. So let's go back now to the study of compensation at Oracle and to look at the outcomes. You can see here that what I have is not -- I don't have a probability there. What I have is standard deviations for showing statistical significance.

Can we go to?

And I have those if we look at all the remaining years beyond 2013 through 2018, I'm showing statistical -- I'm showing standard deviations. Let's talk about how standard deviations relate to that probability.

All right. So these are two -- so probability is a likelihood that an event will occur in the long run with numerous replications using the same or constant system. It's expressed as a value between 0 and 1. Standard deviation is another measure used by scientist -- and for reasons that amaze me by the courts, because it seems to be much less obvious than probability -- but it's a measure of the likely hood that an observed difference, for example, compensation differences between white employees and Asian employees, could have occurred purely by chance when the true

difference is actually zero.

As the number of standard deviations increases the likely hood that the difference could have occurred purely by chance decreases. So standard deviation goes up, probability goes down. So the probability it becomes less likely to be chance as it goes down, standard deviations is less likely to be chance as it goes up. So as the number of standard deviations the level of statistical significance decreases.

So, if we're using a five percent standard of statistical significance, this is actually equal to 1.96 standard deviations. So there is a probability of five percent the difference measured as 2 standard deviations that's rounding the 1.96. So, if you've got two standard deviations, the probability is five percent that there's no difference, zero or no difference is truly zero and no difference. So this is roughly the probability of getting all tails in four to five flips of a fair coin. If you have three standard deviations the probability is .3 percent, .003 is truly zero or no difference.

Now how does that translate into the table. I want you to look here, this table's a little fuzzy here. Oops I'm sorry -- but this last column here standard deviations. So this is showing the difference for Asians and whites of the same gender, the same age, and the same education, and the same time at Oracle, that first 6.36 standard deviations for

2013 that translates into a probability of .00000001 percent. The standard deviation of the second one here of 8.36, that translates into a probability of .000000000000003 percent. 8.19 standard deviations for 2015 is .00000000000001 percent. 2016 is going down a bit to 5.67 standard deviations, that's .0000007 percent. 2017, 4.83 standard deviations, it's a probability of .00007 percent that, that could have occurred by chance. And the lowest standard deviation there, minus 4.71 is .00001 percent.

I'm going to point that all but those last two, 2017 and 2018, those are probabilities that there's a true racial effect there after these controls, it's less than the probability of winning the Powerball which was .0000342 percent. So these are highly statistically significant outcomes.

Q Okay. So moving back to your chart.

A Okay. So I want to show -- so the pattern we observed for 2013 was really -- the takeaway we can take from this, is that the disparities -- nothing is explaining, that's in this table, is explaining that Asian disparity we started out with in column 1. The actual existence of a disparity survives all of the additional variables. If we look at what kind of exogenous characteristics however lowers that racial disparities, the only one that's really having an effect is in the 3rd column in age which is showing that

Asians are younger.

Basically what we're seeing is that it's not explained, the disparity survives age, education, and time at Oracle, and gender. The Asian employees are younger, have less overall experience and this accounts for about 40 percent of that overall racial difference in compensation. And they earned -- that last column 5 shows that Asians are earning 11 to 18 percent less than white employees of the same gender, age, education level, age, sorry, time at Oracle and it's 5 to 8 standard deviations well beyond statistical significance mostly at the level of winning the Powerball.

Q What else did you consider that could impact Asian/white pay differences?

A Well obviously there's other considerations. It can be -- because education and experience is simply measured with quantities here -- it could be that Asians and whites have some sort of systematic difference in how they select majors or what their specialties are in their prior employment when they come to Oracle. So it could be areas of expertise. It could be job placement, though that as I say is an endogenous variable that's part of what Oracle is deciding but that could account -- that the compensation differences could be, because Asians are placed differently given the same qualifications. Or it could be narrowly defined skills: programming language, platform or operating

system experience, different levels of complexity of the job.

Q What did you -- what did you consider?

A To look at areas of expertise I used the job titles which Oracle assigned, but used them as sort of an indicator of what the potential area of experience and the potential area of prior education could be. And I use that to try and look up do areas of, do areas of expertise explain these racial differences.

Job placement, basically, once I take that job descriptor, which is the Oracle job title, and add global career level, I have the job code. So I add global career level and control fully for the job code that the individual is in. Now for the more narrowly defined skills there is simply insufficient data. There's nothing that allows you to look at that.

Q Specifically on that last point, did you have data from Oracle about product-line assignment?

A No.

Q Okay. And in your experience either -- in your experience let's just say consulting, have you ever seen an employer maintain a skill library?

A Yes. Well I'm not sure I can say -- I mean, I have worked on other fairly scientifically sophisticated companies and they have databases that employees regularly contribute to, to notify the company of what their characteristics are

with respect to narrow skills. So when they need something for a particular product, they can go to that database and find people that have the skills, a more narrowly defined skills.

Q Okay. So let's turn to job descriptor, so did you make this up?

A Well I didn't -- I made up the use that -- the pulling the job title out of the job code, but I didn't make up the job descriptor in that sense. I called it job descriptor because I am pulling the job title words out of the job title and taking out the GCL, taking out the global career level or the grade that's on here or whether it's management or not.

So, I mean, a major job here is software development, this is the job descriptor of software development, so what I want to do is put in a control for given your age, and let's look at are you in software development and presume that if your in software development, you've got a university degree that's relevant to software development and your prior experience has also been in software development.

So I'm using this, even though it is -- this is being assigned by Oracle, I am using the description of what the person is in as a indicator of the qualitative area of their education and experience. And it's

all based -- this the -- you can see, you know, I used it -- I told them all the same regardless of whether they have a job code that's in lower case or all caps or software developer or software development, I put that all in one job. And the full Appendix A lists all of the jobs and how those were put together and they were all based on Oracle job titles. But taking out the alphamerics of the job title from the management and global career classification.

Q So let me see if I have this right. So the job descriptor that you used is basically Oracle's job titles with the global career levels removed?

A Yes. And -- yes.

Q And the way you're using job descriptors is as a proxy for an exogenous characteristic?

A Yes.

Q Okay. Let's see. Okay. So let's move on. Can you take us through your findings applying the job descriptor?

A Yes. So now I want to reacquaint you. This is the table we were looking at before -- it's table 2a in the report. But now I've taken out the first four rows and I'm starting with five which is where we left off in the prior discussion and the levels of significance -- and I'm looking at what the effect of now adding whether you are exempt or not exempt which is pretty trivial and the job descriptor.

So looking at how the particular job title you're in is effecting the disparity between Asians and whites.

And what you see here is basically there's almost no difference. It goes down maybe a percentage point, not even a percentage point. But basically the race coefficient, once you put in the area of work, is not any different and we have highly statistically significant results. So they don't account for any of the race disparity in compensation. I mean, the race compensation is still there -- or the race disparities are there highly significant and at most you get maybe half a percent difference but very little difference.

Q And can you explain what you did in column 7?

A Now column 7 and 8 here -- let me see. Column 7 and 8 are now adding sort of the assignment of level of job: whether you're in management or not, which has a little bit of a boost for Asians that actually increases the disparity, and then you add global career level. You look at what the grade the individual is assigned given their area, given their degree, given their experience, given their prior experience and we get now a big drop. So it's actually the job placement that's explaining most of the difference, it's about --

You know, as you can see here, that we're basically running a 12 percent differential in 2013, we add in job placement and it drops to .04. In 2014, we're basically

running around an 18 percent differential, we put in job placement, the racial disparity becomes 7.9 percent. In that 2015, the racial disparity is running about 15 to 16 percent. We put in the career classification and it drops to 7 percent. In 2016, the racial disparity is running sort of 11 to 12 percent, we put in the global career level and it drops to 3.8 percent. In, 2017, the racial disparity is running -- sort of jumping around a little bit here -- between 10 and 13 percent, we put in global career level and it drops to 4.6 percent. And in 2018, the disparity is sort of running 11 to 13 percent, we put in global career level and it drops to 4 percent.

Q What does it mean that in column 7 the coefficient increased a little bit for a manager?

A Well assuming, and it's got to be the case, that managers are making more than individual contributors. Asians given their education and experience are more likely than whites to be in management. But it's the grade level within management and the grade level as an individual contributor that is different for Asians.

Q What conclusions did you draw from applying these?

A Basically areas of expertise, is measured by job titles, at Oracle do not account for the racial disparity in compensation between Asian and white employees. It is the placement in lower global career levels than white employs

who are the same gender, age, education, time at Oracle, and areas of expertise that accounts for most of the compensation disparity. Having said that, however, Asian employs still earn approximately 4 to 8 percent less than white employees of the same gender, age education, time in Oracle, and job placement. This compensation differential is 2.67 to 5 standard deviations well beyond the standard of statistical significance.

Q Did you consider other traits in Oracles database?

A Yes. Mainly in response to Dr. Saad's report. I looked at his claims that patent bonuses, time in current jobs, and organization names are other characteristics that we might look at to explain the racial disparity.

Q And do you have an opinion about whether -- sorry, there we go -- do you --

A I basically think none of these traits should be included.

Q Okay.

A Okay.

Q Okay. So can you start by explaining your opinions regarding patent bonuses?

A Yes. I mean, patent bonus, I would have no problem including a control for patents earned prior to employment at Oracle. In other words, patent is clearly showing innovation, it's showing creativity, it's showing skill and

the patents you got before you came to Oracle are truly exogenous. That's not what we have here.

What we have is whether you have ever gotten a patent bonus at Oracle. You can get a patent bonus with not having a patent. I don't know whether if you got a patent you always got a patent bonus, because the materials provided me by Oracle said that it's totally discretionary as to whether you get the patent bonus. There's no actual data on whether you actually got a patent, which is amazing that there's not a record of the patents itself. And the one thing that would be exogenous isn't even included in this measure. So I looked at the patent procedure --

Q I'm sorry, Professor Madden, what is the one thing that would be exogenous?

A The patents -- the actual patents you receive that you have your name on prior to your employment at Oracle. That would be a purely exogenous variable that I would agree patents -- I mean, I agree patents are something you can look at, I'm just not -- that's not what we have here.

And then I'm really concerned here that I don't know there's no data or information, which Oracle surely must have, on how employees were nominated or records of how patent bonuses link to patents. I mean, if you're going to use that, it seems to me you've got to provide some evidence of how you created that variable and how accurate it is of

patent performance.

And then it's also the case that it may be that there's no problem with how people get listed on patents, but it depends on what kind of job placement you have, what kind of assignment you have, how do you decide whose names are on the patent. I mean, that's just -- I just don't know how that happened here. So the way it's developed it's really a totally endogenous variable and it's hard to pick out how you could get some exogenous factor out here.

But I want to point out that even when you add this, it decreases the disparity some but the disparities remain large and statistically significant. And here is now what I've done is I've added -- what you're seeing here is we have -- we're controlling here for everything but the job -- the global career level. And if we add whether you got a patent bonus, you can see that there's a little bit of drop of about 2 percentage points in the Asian disparity here but highly statistical significance. So Asians in deed seem a little bit less likely to get that patent bonus, but it's not explaining the disparity.

Q So column 1 in this slide is column 7 of your last --

A Yes. Of the prior table.

Q Okay. Okay. Okay. Now what can you tell me about time in current job?

A Well time in current job is a really endogenous variable, why because it's showing promotion. I mean Oracle's decisions when you promote somebody is affecting time in current job and how long it takes. But having said that, we don't need to worry about it, because it makes no difference. And here what I had to do of course because I'm going to be -- when I look at time in current job, I have to control for the current job, so I have to put in the career level -- and you can see here when I add in time in current job, it virtually has not effect on anything. It's a very small -- I mean, it does drop a little bit, but there's very little difference here. That's not a variable that matters. It's totally endogenous but it's also not something that's having much of an effect.

Q Okay. Now let's turn to -- what are your thoughts about organization name, also called call center?

A Yes. It's a budget center and again that assignment is totally endogenous that's Oracle's assignment. And I would imagine those assignments should be made based on education and experience and the areas of that education and experience. So it's based on -- I mean, that's why it's endogenous. Organization names aren't coming randomly from outside the system, it's something that's being determined in the system. It does not indicate product line which I understand is why Dr. Saad wanted to include it. And

finally, a third thing and I'll talk about -- let me see am I doing -- let me think of how. And the fourth -- economic theory expects that product line would not affect compensation, let me explain why.

You have somebody that has their skills and they can work on a product line that's highly profitable to the company or one that's middle profitable to the company. I've got the same skill levels as an employee. It's true that the company is going to be willing to put more into the budget for pay for a more profitable product. But why would I be willing to accept a job at lower pay because the company's making less profit on the product that they're having me work for given my skills.

It is the case that profitability effects the demand curve that the employer has for people in that particular line if it was showing that line. But pay is determined by two variables, or two factors. It's determined by the demand curve and it's determine by the supply curve. But the willingness of an employee to work -- I'm not going to be willing to accept lower wages simply because your product's less profitable. If you put me there, I'm going to leave. A person of -- that what's determining pay within the firm should be the skill of the individual. And the product line, what happens is because your demand curve drops, is your going to employ less people, you're going to have a

lower wage bill but it's going to come on employment not on wages.

Basically, you could think of this as there's a horizontal supply curve, I've got my, you know, my reserve wage, this is what I can get across a lot of products. The demand curve is changing for high profitability and low profitability but it's not changing wage, it's changing employment. So it would -- as a matter of economics product line should not effect compensation for persons of equivalence -- if their skill is the same in the various product lines.

The fourth thing is that it is a fluid characteristic that changes for many employees, and I've noted that when it changes there's not a pay change. That when you move between product lines employees don't get a pay change for it. So I don't see any evidence that at least these organization names to the extent that the organization names create a difference in pay when we're looking at the same employee -- perhaps for the same reason I just said. When the same employee moves between organizational codes, I'm not going to take less salary given my skills, because that organization has more or less profitability for Oracle.

And finally the real problem is in addition to the endogenaity is there's literally hundreds of organization

names. So the addition of these to the analyses basically destroys the ability of the statistics to yield any sort of precision.

Q What do you mean by precision?

A Precision is being able to accurately measure what the effect of any characteristics are. The effects of education, the effects of experience, the effects of the disparity in the gender and race disparity in compensation.

Q Okay. So you looked at some specific organization names, what do you draw from them?

A Yes. These are examples of the organization names that Dr. Saad enters as separate skill groups or separate product line groups. One of the big products is Siebel products, and I looked at all of the organization names of which here there are eight, they're all in Siebel products. And for all of these Dr. Saad is implying that they're all producing different products because he enters them separately. And it looks to me like they're all producing Siebel products.

And similarly another big product of Oracle is Java, and we also have eight different of -- eight different organization names that have Java products. Another example is SQL, structured query language, there are seven of these that I found that Dr. Saad is implying they're all different products, but they're all involved in the production of SQL.

And then we get to some of the more popular current ones and there are really an explosion now of organization names. Fusion products, I didn't even count, but you can see there's got to be about 40 or more organization names that are in the Fusion products. And then when we go to cloud applications, the cloud products, there's probably a 100 names, I haven't counted them.

But you can see that there's just these organization names are just well beyond any definition of a product. And you're adding hundreds and hundreds of variables, I mean these are just the tip of the iceberg with respect to the 500 or 600 organization names that are added in his regression analyses.

Q And what are the -- what is the impact of adding so many variables, so many different organization names?

A It, it, it -- well basically once you've added all these organization names, we only are going to be comparing gender or race disparities when there are both women and men, or Asians and whites, and African Americans and whites in each of these codes. Anytime there's only one race in these codes and who had the same job code. So to be in the analysis now of the race and gender disparities, you have to look groups that have the same job code, have the same organization name, and have the same age and education.

It basically means that you're now computing your racial or gender disparity on just a very small set of the data, because effectively the race and gender disparity doesn't get computed, when any of these job codes and organization codes have no racial or gender disparity in them. So it's taking
-- and it's sometimes called slicing and dicing -- it's taking the data and spreading it so thin that you can't -- you're destroying the statistics, you don't have any more precision, you don't have any more ability to actually observe race and gender differences.

Q Did you also look at the counts of employees by organization?

A Yes. This is showing that the point I made about employees moving between organizations. This was the table R5 that occurred in my original report. And it was pointed out to me in my deposition that there was a computational error in creating that table, and that we had not realized that Oracle did not fill out the organization name in some job actions that didn't involve organization. And so we ended up counting a blank as an organization name. So effectively -- and effectively what happened is most of these people had a blank in their records so it added an organization name for all of them.

So what's here is the number of organization names

that employees have of outcomes between 2013 and 2018 that's the first column. The second column is the number of employees that have those, but it's basically overestimating by one organization name for everybody. And I've replaced it then correcting that error, and you see the new table R5 here, and you can see roughly that basically we dropped an organization name. But basically half of the employees have more than one organization name in the time period and you can see that a substantial number have more than four so that they're changing over time. And we don't see any change in salary associated with those organization name changes.

Q So is this study what caused you to call -- to say that organization name was a fluid characteristic?

A Yes. That's what I mean by a fluid character, but for many employees they're going across organizations.

Q Okay. So did you look at the large number of organization names?

A Yeah. This table -- this is table R6 from my rebuttal report. And this is looking at the counts of employees and control variables in Dr. Saad's compensation regressions. I'm going to lead you -- we're talking about Asians here, so the Asian is product development here from 2013 to 2018, Asian/white comparison. This is the number of whites in the analysis and this is the number of Asians in the analysis. Remember both of these matter and for the

Asian/white analysis it's really the count of whites that are getting spread thin, so we go from 700 to 1,000 white employees for comparison and the organization names is the main contributor, the job code contributes as well, but you can see that we go in -- he goes from 364 to 547 variables with a standard that you need 50 whites and 50 Asian Americans for each of these variables to get an accurate statistic.

You can say there's no way you can do that with these kinds of numbers of variables that you're just spreading this data out. To estimate coefficients that are of questionable reason to contribute to compensation in anyway, but make it impossible to get precise tightly measured effects of disparity.

Q So just trying to translate the math into a visual. So is the effect of the organization name control as the high number just sorting the employees into smaller and smaller groups?

A Yes. I mean, it's tossing people -- it's basically tossing people out of the race comparisons. That anytime we don't have Asians and whites in the same job code, in the same organization, they're not going to get a measure. And it means there's going to be fewer and fewer comparisons. And they're going to be less precisely measured because there's variation that occurs. And you're just not going to

get a good measure of the disparity, or of any of the other variables in the equation. It's not only the gender or the racial disparity.

Q And what does organization name do when you file?

A Well and in fact you can see that, that is -- where's my -- there it is -- you can see that in fact that, that is really removing everything. That, once we add organization, everything becomes non-significant. That organization name is doing it, but it's an artifact of the statistics, is that we end up throwing out most of the comparisons we can make for not very good reasons.

MS. HEROLD: Just for the Court's benefit we've got a couple more slides before we get to a good pause point.

JUDGE CLARK: Okay. That sounds good. We'll go about five more minutes or so.

MS. HEROLD: Okay.

BY MS. HEROLD:

Q So you mentioned earlier also considering -- you mentioned narrowly defined skills. What did you do to analyze these?

A Well I would have loved to have had information to be able to analyze that. I mean, certainly I have no problem with thinking about differences in programming languages, differences in specialization in cloud technology, artificial intelligent -- all of these things indeed are things that

could warrant differences in compensation. I would be surprised that there were group differences in them, but there could be.

But there's no data. As I said, I'm surprised that there was no data identifying which employees have these skills, unlike other firms that I've worked with where there were databases maintained and employees could actively contribute to show the employer what these skills were that they knew what were valued and could provide -- could provide their backgrounds in it.

Now there are -- I was asked about this -- there certainly are anecdotal data that you have some evaluations or some comments and promotions or some hiring documents that provide such data, but this is on a haphazard basis. These aren't data that are useable for statistical analysis. For statistical analysis, we want to know that every employee has roughly the same chance to provide the data on whether they know C++ or whether they've worked in cloud, or you know. But having it mentioned for 20 or 30 or 40 employees informally when that's determined by the person writing out things by hand and not determined by any systematic inclusion of the data, it just makes statistical analysis impossible.

Q Does that also implicate, I think what is called in economic terms, response bias?

A Well response bias, yeah. I mean, it's a problem,

it's a problem you have in lots of qualitative survey research, where you ask open ended questions. For example, you ask somebody why you moved to this location and you say because my mother lives here. And then you say but you had this good job, oh well I had to have the good job, you know. I wouldn't have -- you know, I only had to have a good job and then I took here because my mother was there, but they don't mention the good job. I mean, it's is they're bringing up they're not ill motivated, but you just simply put down what's coming to you and it's not -- if your not doing it on a standardized basis you don't know what else is there. It's just something that makes very questionable data.

Now, Dr. Saad did provide some evidence of this. For example, he did this study for software developer 4 on doing a word study of that. And actually when we look at that, there's actually -- that study provides no evidence that those narrower characteristics account for the gender -- or the Asian/white differential.

This is from table R7 of my report. Is that what we look here is when we look at the -- there's 521 software designers -- I'm sorry that should be software development for employees that were hired off of these requisitions. 399 of them were Asian and 122 were -- I'm sorry, 122 were white employees. But when we look at the salary there was a 3 percent -- 3.3 percent differential not statistically

significant. When I add a control for education my education controls, it becomes 3.8 percent meaning the Asians who were acquired had actually higher education and got 2.25 standard deviation.

If I don't use education but use the 24 clusters that Dr. Saad designed, again the race coefficient goes up to 3.6 percent and it's 2 standard deviations. So if I use both education and cluster, it's a 3.7 percent differential. But there's no evidence here that there's cluster differentials that explain away -- that those cluster differentials Dr. Saad develops, have anything to do with the Asian/white disparity in compensation.

I want to point out that there's lots of other problems with that particular analysis. When I looked at the backup data, you have the ability in the program to have the program select the number of clusters you want, Dr. Saad didn't do that. He had it selected at 24 and there is evidence in the programming that other levels, other numbers of clusters were provided so it looked like there was some sort of picking going on as opposed to the number of clusters.

I also invite you to simply look at those word clusters, because it's showing sort of a what Ms. Herold called response bias or response whatever you called it. But it's showing how people might describe things differently

because several of these descriptors have the big words that matter, be knowledge and skills, okay. Now that's important in I'm sure in all 24 clusters, it's just a matter of how somebody wrote up the cluster. I mean, I don't find this is being very informative at all and certainly not connected to any explanation of disparity.

Q So have you reached any final conclusions?

A Yes. I want to emphasize that the Asian disparities we see in my table 2a, Asian/white disparities can come from only two sources. Either Asian employees have systematically inferior narrowly defined or unmeasured credentials or qualifications to those of white employees that have the same observed experience and education levels. And I mean inferior, because it is inferior in the sense that they warrant less compensation. So you're scoring inferior on these narrower skills because what your narrow skills are warrant less compensation. It's either that or Asian employees with equivalent credentials and qualifications are paid less. Doesn't have to be either or, but it can only be those reasons or some combination of the two.

MS. HEROLD: Your Honor, this would be a good break.

JUDGE CLARK: Okay. It is -- let's take a 10 minute break. We'll start back at 11:00 o'clock, Dr. Madden

you're free to step down.

We're off the record.

(Off the record at 10:48 o'clock a.m.)

JUDGE CLARK: Okay. We're back on the record, all parties are present, Dr. Madden has retaken the stand.

Ms. Herold.

MS. HEROLD: Okay. Sorry, just getting our technology figured out here.

I'm sorry, Your Honor, we put it down during break, we just got to get back to where we were.

JUDGE CLARK: No problem.

THE WITNESS: A review.

JUDGE CLARK: A quick review.

MS. HEROLD: Exactly. Speed reading. Okay.

BY MS. HEROLD:

Q Okay. Professor Madden, you ran a similar analysis as to gender pay differences, correct?

A Yes. I did.

Q What can you tell me -- can you walk me through your analysis of gender pay disparities?

A Yes. Table 1a of my July 19th report, basically, performs the same sort of analysis we just went through for table 2a for the Asian/white disparity, for men versus women. Of course, the differences here, we have three job subfunctions. We add information technology and support,

which are very small. I mean, most of this is product development as well. But we do the same thing then for gender.

And as you can see here, using the same kind of approach we have --

See the red? Oh there it is.

-- there's 4,327 people that are men or women employed in these three job sub functions, 26.3 percent of them are women so a little over a 1,000 are women and about 3,000 are men. The overall differential is 21.3 percent when we have no controls whatsoever. When we add race/ethnicity -- it includes the Asian, African American, and it also includes a Hispanic control -- the difference drops to .199. And again this is showing what we saw with the Asians that the Asians are more female and the women are slightly more a minority member group than are the men and so that's why that goes down.

The age has literally no effect when we put in the age control, unlike it did for the Asian/white difference, it has no effect for women. So there is an Asian difference -- there is an age difference between the Asian and white comparison, there isn't between men and women so age doesn't have any factor there. Age of course matters for individuals, but it just doesn't matter for group comparisons for men and women. When we add education we still have the

same result, and when we add time at Oracle we still have the same results.

So for women none of these variables are changing effectively the disparity. And that's true, we can see it for every year. Let's go down to the bottom here. For 2018 the disparity is 24.2 percent, add race and ethnicity it's 23.5, add age it's 23.1, add education it's 23.8, add time at Oracle it's 23.9. So it's basically all moving around a 24 percent differential no matter what we add. And that's true of every other year in this regression.

And you can see that the effects actually, the statistical significance -- this is well, this is well beyond powerball range here -- that when we're looking at men versus women that, that disparity for men and women of the same race/ethnicity, the same age, the same educational attainment, and the same time at Oracle is very large and significant.

Q So from these first five columns do you have any conclusions?

A Yes. That the gender difference cannot be explained at all by differences in age, education, or time at Oracle. The ethnic and racial diversity of women have a small effect but not very big. And that women earn approximately 17 to 24 percent less than men and this differential is 11 to 12 standard deviations, well beyond any

standards of statistical significance.

Q As with the Asian/white pay differences were there other things you considered?

A Yes. Exactly the same, the areas of expertise, and I use the same approach. The job placement and then I think about more narrowly defined skills and I have the same measures. I use job descriptor to measure the job titles to Oracle, sorry, to measure the areas of employment, prior employment and education, job placement. And I have for men/women I still have insufficient data to look at these more narrow skills.

Q Okay. So taking your factors -- did I go the right way?

A Yes.

Q -- can you explain the effects of these controls?

A Yes. So this is picking up here where we started at the end of table -- at the end of table 2a this is where we had on the first slide, this is where we were at the end and we now add the effect of job descriptor.

And job descriptor is having more of an effect on the gender disparity than it had on the Asian/white disparity where it had very little effect at all. In fact, there is some evidence here that women -- the area of women's prior experience and education is in less financially remunerative areas and that it decreases the disparity.

If we add a management control, we get a further -- unlike the Asians you remember that went up -- we got a further diminishment, which says that women are less likely, given they are in the same time at Oracle, in the same job descriptor, have the same age, education, and prior experience that we have a bigger difference, a lesser likelihood of them going into management. And so once we control for management that accounts for some of the disparity.

And as we had for Asians you see the big effect is global career level. That is the global career level that is different for men and women who have the same age, the same educational degree, the same time at Oracle, and are in the same general area of specialization as measured by job title.

Q So column 8, there it shows the gender coefficients for employees similarly qualified and assigned to the same job code, is that right?

A Yes. The same job code. These are people -- actually yes. These are people in the same job code.

Q Okay. So for these last four columns what are your conclusions?

A Well that area of expertise, column 6, accounts for about 20 to 25 percent of the gender disparity. So 75 to 80 percent of the gender disparity survives the control for area of expertise. It's Oracle's placement, however, just like we

had for Asians, in the lower global career levels than men of the same race, age, education, time at Oracle, areas of expertise, and management that counts for most of the disparity. As we saw in that last column, 8, women earned 5 to 6 percent less than men of the same race, age, education, time at Oracle, and job placement as measured by Oracle's job code. And this compensation difference is 4 to 5 standard deviations well beyond statistical significance.

Q As with the Asian/white pay differences, did you consider other traits that were in the Oracle database?

A Yes. And you see another one here, because Dr. Saad introduced another one, but we've already looked at pay, bonuses, time in current job, and organization names for the racial disparity between Asians and whites. I'm going to look at those for the male/female differences, but for the male/female differences, Dr. Saad introduces another concern and that is leaves of absence.

Q Okay. So first as to patent bonuses, do you have an opinion about whether it should be included?

A Yeah. I mean, this the same -- this is the repeat of the same slide I showed for Asians. That I would have no problems including patents prior to employment at Oracle. That's clearly a valid concern for compensation and clearly something that's exogenous. We don't have that. We don't even have patents owned at Oracle. What we have is a patent

bonus and a system that Oracle that self describes as totally discretionary as to how that's awarded. So I find it an endogenous variable. Patents themselves earned at Oracle could also be endogenous if there's -- if the assignment of job code or organization affects your ability to get listed on a patent, or if there's different decisions about who gets listed on the patent developed by the team.

But all of those aside, in fact, in the end you don't have to worry about it very much, because this patent thing has very little effect. It decreases the disparity, the gender disparity by one or two percentage points and it remains large and statistically significant.

MS. HEROLD: So just a note to my opposing counsel here, we had an order issue, so the next slide is a little bit out of order.

BY MS. HEROLD:

A So we'll go past it.

Q Yeah. We're going to go past it and come back.

A All right. So this is the effect. So this is the column 7 of table 1a that we've seen earlier, and here I'm now adding a patent bonus. And you can see here that it's one or two percentage points that you generally see. That it is lowering, it is lowering the gender disparity, but the gender disparity remains is highly statistically significant.

Q Okay. So next I'd like to ask you about leaves of

absences. Did you review Dr. Saad's reports?

A Yes.

Q And did you observe that he proposed a factor relating to leaves of absences?

A Yeah. He includes various experience measures in his model and then adds the cumulative leaves of absence for employees on top of that. That is not the way it's usually done in the literature. That it is proper of course, if you take a leave of absence, you're missing out on some experience on some training that might have occurred at Oracle because you're there. So it is proper -- the way this is usually handled and the way I did it in my original report, is I deducted the cumulative leave of absence from time at Oracle. Because I had their start date and I computed time at Oracle based on your start date, but when you took a leave of absence you weren't there so that should be deducted from the tenure or seniority I gave you.

That's not what Dr. Saad does. And my concern is that who takes cumulative leaves of absence? Mothers. The most common -- overwhelmingly common reason for a leave of absence is parental or child care leave, or maternity leave. This is much more likely to go to women than men and they take it for longer time periods.

So the use of -- you took accumulative leave of absence as opposed to the effect of that leave of absence on

your skills -- labels some people, women, and the coefficient of that is reflecting any discrimination that may occur or any disparity that may occur for mothers and ineffectively doing that rather than adjusting experience which is the true effect of the cumulative leave of absence is a justification of discrimination against mothers and the gender coefficient becomes the gender coefficient that occurs after you allow discrimination against mothers.

Q Okay. So can you explain what concerns you about how his leave of absence -- cumulative leave of absence control works?

A Yes. Let me take you to table R4 from my rebuttal. And this table is a bit different than the tables we've been looking at, so I want to go through it a little more carefully and make sure everybody understands.

First of all, this is Dr. Saad's data and Dr. Saad's model. You can see here we've got all these variables so it includes all his job codes and all his organization names. Because you know, we've got 500 -- what we're going being 414 and 551 different control variables in the analysis. And I've got here the number of women in the analysis, so you can see we're spreading the women out very thinly over that. But the columns are different here than we've been looking at.

So when we look at 2013, there's a coefficient here

of negative .0177 that is the gender coefficient for his model. But the whole line here for 2013 this is all one model. This is not as we've been looking at before where I was putting -- reporting a gender coefficient as I added different variables. That's not what's happening here.

What I'm showing here is for the model where he gets this gender coefficient of negative .0177, I'm showing what the effects of other variables in that same model are. What --

Q Professor Madden, let me see if I have this right. So in the charts that you use, they kind of move from left to right adding controls?

A Yes.

Q And this presentation goes from right to left, right? Where the conclusion is the first column?

A The conclusion is the first column and these are the effects of the various controls that computed that first column. These are not gender coefficients these are the effects of the variables themselves.

And so he finds that for women who took -- that for every year of absence their salary drops minus .0479, 4.8 percent for every year of cumulative leave. Now let's look at what he finds in that same model is the effect of other measures of experience. He finds that the people who have more tenure at Oracle, for every year of experience you have

at Oracle your salary drops .0096. For every year at Oracle your salary is reduced 1 percent in his model. Prior experience minus .0034, for every year at Oracle, maybe go to the next slide so I can --

Q Sure.

A Yeah. Drops a third of a percent, minus .0034. This next one is total Oracle years that has basically no effect.

So what he has is he has a model here where he tells us that the gender difference is minus .0177, that women who take leave loose 4.8 percent of their salary for every year of leave they've taken, but it's in a situation where increases in experience are actually reducing compensation. And reducing the year of leave per cumulative leave of years is multiples of the effect -- of the negative effect of experience. So additional cumulative leave here, particularly towards the bottom, is lowering compensation 10 times as much as a positive year of experience actually lowers compensation.

So effectively what he has is why -- you've got to ask the question, why is cumulative leave lowering compensation five to ten times percent more than other measures of experience and why are those measures negative? Remember experience is giving you less salary. Well the reason is sort of the effects of because he's got endogenous

variables in here. I mean, he's having these negative effects, because what does experience do? Experience gets you a better job, experience gets you a higher GCL.

When you control for the salary grade, the job code as he's done here, what you're showing is the people who are spending -- who have spent more time at Oracle that are within a GCL are being paid less than people who've had less time at Oracle and within a job code.

And think about this, the lower job codes, the lower levels, people are coming in bright young individuals are coming in . People who've gotten stuck in that job code, who are older, and aren't being promoted out, those are the people with more experience. So the reason why this overall experience is going negative is because of this effect of controlling for job code. In the lower job codes, we have the bright young rising stars and the older people who've gotten stuck in those job codes and that's why the experience looks negative. And if you had not put job code in, you would see positive effects of experience because experience is what helps you get to higher GCLs.

But I want to point this out, however, because the problem is that his model which is showing more experience gives you less wages controlling for job code, is actually penalizing women who will have then less experience. They actually get an additional negative effect when they actually

have more experience -- or have less experience. I'm sorry. Have less experience because of the cumulative leave of absence. And it's showing the whole farce of putting a job code in and of using cumulative experience. This --

Q Professor Madden, can I interject with a question? So when you say that the additional cumulative leave lowers compensation 5 to 10 times, what columns are you looking at?

A I'm comparing the coefficients in column 2, the coefficient of --

Who sees the bouncing ball? All right.

-- comparing the coefficients in column 2 on what the effects of a year of leave is, which reduces salary from four to ten percent or basically five to ten percent in this time period with the effects of having more experience. More experience is lowering wages, and taking a cumulative leave of absence which gives you more experience is lowering wages by a factor of 5 to 10 more.

Q So you're looking at column 3 compared -- the coefficient on column 3 compared to the coefficient on column 2?

A Well that's the one I would focus on, tenure at Oracle, because that's really what the cumulative leave should be counted against.

Q So when you get looking at 2013, you get a 5 times and when you look at 2017 you're getting more than 10 --

A Yes.
Q -- is that correct?
A Yes. That's correct.
Q Okay. And then a second question I have is -- again correct me if I didn't get it, I know you will -- is that -- so when as you show in the first set of rows, which is his, Dr. Saad's, analysis, that his data shows with his controls that pay decreases 1 percent with every year at Oracle, you don't think that's right, is that right?
A It's right -- no. I mean, that's not the general effect of experience, but it's right within his model. His model isn't computed incorrectly, it's the artifact of including an endogenous variable and getting biased coefficients on the other variables as a result. I mean, that isn't the true effect of experience, it's showing the effect of including an endogenous variable that you shouldn't have included in that fashion in the model.
Q Okay. Okay. Okay.
A So the second panel down below here --
Q Oh. I'm sorry.
A Oops.
Q Sorry. Going back, sorry.
A The second panel now here is including cumulative leave in years in the model in the way I did it, which is the usual way that I've always seen in the literature, I've never

seen the way that Dr. Saad does. And so what I do is I take, as I did in my report, the cumulative leave in years of absence and take it out of tenure at Oracle so that women, or whoever is taking the leave absence, their tenure at Oracle is corrected. And that's the only change I make. I'm doing everything else the same way, it's the same model, Dr. Saad's model.

And you see when we do that, the gender effect blossoms. I mean, we're getting gender effects that's more like what you showed in my report that we do have organization name and job codes in here, but you're getting statistically significant gender disparities that range -- that are in the range of 3 to 4 percent. Which is what a little lower than I showed because I didn't have organization name thinning out the data but controlling for job code. And that his, Dr. Saad's, including a control for what I would call mother disparities, is why he incorrectly estimates the gender disparity. But I still get, of course because I've also go the endogenous variable here, I still get the negative effects on experience.

Q So in that bottom set of columns there, that reflects that you applied Dr. Saad's model in all respects except for correcting the cumulative leave of absence variable to correct the tenure, is that right?

A That's correct.

Q And so just with that single change in column 1, which is where he has the findings, that changes that to, it looks to me like about a 3 percent?

A 3 to 4 percent.

Q Yeah. Pay gap. Okay.

A Yes.

Q And standard deviations 3 to 4, correct?

A Yeah. More than 3 standard deviations.

Q Okay. And are those standard deviations statistically significant?

A Yes. Well beyond 2.

Q Okay. So I think that this, you've covered most of that?

A Yes. That's the conundrum here, you can't -- I mean that shows the sort of problem with his model. Why would more cumulative leave of absence, which decreases experience, lower compensation 10 times more than adding to experience does? I mean, it just makes no sense. The reason why it's happening is that I think this is consistent with discrimination against cumulative leave takers, otherwise known as mothers.

Q And what would the correct model look like?

A As I said, it deducts the cumulative leave of absence from experience and as we showed this results in statistically significant disparities by gender. And you can

-- and that's what we can see when we compare the gender effects in the two different approaches.

Q Since this slide doesn't have the yellow blocking the right of it, so the bottom set of rows then indicates that with the corrections you made, you still have very large controls, right?

A Yes.

Q You haven't changed that about the number of his controls?

A No. We have -- as you can see actually what different is we removed the cumulative leave of absence as a control, so all of my controls are simply one less than he had. It's keeping everything else in there, it's just removing cumulative leave of absence and subtracting it from Oracle tenure.

Q Okay. So let's go back to the other traits since leave of absence was the differed one. So what about time in current job?

A Again, as I said for the Asian/white comparison, that time in current job is a measure of time in a promotion and is therefore an endogenous variable and shouldn't be included. But we don't really have to worry about it one way or another, because it really has no effect, it's minimal effect, on the size of measured race and gender disparities.

Q Okay.

A And you can see that here. So I have to add global career level in, because we need a control for the job when we look at time in current job. And you can see here that the coefficient changes from .049 to .046, .056 to .053, point no change, .424 .42, .46 .46, .50 .50, .51 .49. It basically has no effect on the gender disparity. So even though it's a problem and it's endogenous it isn't relevant to the issue. This is implying that men and women have approximately the same time in job, there's not a group difference there.

Q Okay. And moving to organization name, organization name Call Center.

A Yes. I mean, well again, I have the same list of concerns that I had before with the Asian/white difference. It's an endogenous variable, it does not indicate product line, multiple, you know, -- some products have multiple, multiple, multiple numbers of organization names associated with them. It's a fluid characteristic that changes for many. The economic theory argument, you may have a demand difference because of product line, but because employees have the same -- if we're looking at employees with the same skill, there's no reason why they take lower salaries to go to a less profitable product.

Q So those concerns, the charts you referenced earlier it's the same for gender?

A Yes.
Q The same issue.
A Yes. Yes.
Q Okay.
MS. HEROLD: This is, just again warning --
BY MS. HEROLD:
A And I also want to say --
MS. HEROLD: -- to my opposing counsel here, I have to go back to the slide we had out of order here.
BY MS. HEROLD:
A Okay. But --
Q I'm sorry. Go ahead. Go ahead. Sorry.
A I didn't get to one --
Q Oh. I'm sorry.
A I didn't say. For them I would remind everybody it's a fluid characteristic that changes for many employees and when those changes occur there isn't any change in salary, in compensation. And then finally, I want to look at the number of variables that are added to the analysis relative to the number of women that we're trying to measure the effects of to show the imprecision results. The slicing and dicing of the data.
Q Okay. Let me get back to that slide, sorry.
A That's where you put it out of order.
Q Yeah. Sorry. This was a mistake.

A There it is.

Q There we go.

A Now here -- now Dr. Saad actually measures all of these job functions separately. And usually the problem -- the problem that happens is that the number of women are low. So we can see, for example, in support staff, the number of women in his models go from 20 to 42 and his number of controls go from 57 to 91. He doesn't even have enough women to scatter over these analyses. So it's no wonder there's no effect there.

If we look at info tech, which he analyzes separately, we see we've got sort of a 124 to 148 women. And here the number of variables go from 102 to 125, of course you can't control for that and look at a gender disparity with any reliability.

Now product development is a little better in that now we've got about a thousand women but we've got 500 variables effectively. So we still don't have enough women in any organization and enough men to do any reliable statistics.

Q Okay. So let me -- let me take us back to where we were. Okay. So this is your chart, I believe that applies organization?

A Yeah. And, you know, because organization just washes out all the gender comparisons, we get a lower gender

coefficient and the standard deviations go down. Then we do have a few years that remain statistically significant in my model. And Dr. Saad's model which was using a slightly different measure of compensation, we got everything significant. But I mean, we're sort of looking at the some of the same kind of levels of effect. Do you see my -- when I have -- I'm getting effects that are sort of about 3 to 4 percent after we control for organization which is consistent with what Dr. Saad's model showed.

Q Okay. And again as with Asian/white differences, you considered narrowly defined skills?

A Yes.

Q Or perhaps more accurately you couldn't?

A I couldn't, yes. Because there's no data on it. I remind everybody the anecdotal data which is there is not data that you can reasonably statistically analyze. And the one we did look at for software developer 4, shows that the cluster is -- unlike with Asian, as we're going to see that there is some effect on disparity, it's less than a third however. It doesn't certainly make it go away.

So this is looking at those 24 clusters, which have the same problem. Remember the clusters seem arbitrarily selected, there's some question about the whole word methodology itself and whether it's true science. But here you can see that the gender difference for women is .035

percent. There are 89 women so the difference of the 521. So we've got fewer women. The disparities make this a little more problematic to measure in terms of counts of the two groups.

Education lowers it a bit and clustered lowers it about a third, that's where I get the third, the cluster lowers the disparity from .35 to .024, but it -- I mean, we don't have statistical significance with these small numbers at all but it gives you a sense of what the potential for cluster to have an effect is.

Q So I think this is what you just said, but I just want to make sure I caught it. So it's the small number of employees here that is -- and small number of women within that group of 521 that's driving the standard deviation down?

A Well, yeah.

Q Well partially.

A It's less precise.

Q Yeah.

A It's less precise than the models where we have more people in them.

Q Okay. So as with Asian/white pay differences, do you have any final conclusions?

A Yes. I want to come back again to this point that there's only two reasons why we have the disparity in these final columns. It's either that women have systematically

inferior -- and again inferior in the sense that their unmeasured qualifications when they have the same objectively measured qualifications as men -- are inferior in that they warrant less compensation than is given to men. Or with equivalent credentials and qualifications including equivalent unmeasured credentials and qualifications, they're being paid less. Those are the only two reasons that we could of had. It's got to be one or some combination of the two.

Q And so as with the Asian/white conclusions, for these gender conclusions, when you talk about the systematically inferior, unmeasured, narrowly-defined credentials, by unmeasured you mean there's just no data, right?

A Yes.

Q Okay. So let's move on. Lets turn to your study of African American and white pay differences, is it correct you used roughly the same approach?

A Yes. I did. Though the small numbers of African Americans make it more difficult to apply -- do all the things I've been able to do for Asian/white and male/female comparisons.

Q Okay. Okay. So this is a similar chart that you've had for Asian/white and gender --

A Yes.

Q -- pay differences?

A Yes. And it starts out the same way. The first column is showing you the number of workers that are in the study . And you can see that these are much smaller than the numbers we had for the men and the women and the Asians and the whites. This is the number of African Americans and whites in product development for the full year in each of these years. And the numbers range total from 772 to 1,008 and the African Americans range from 2.3 percent to 3.5 percent of this total. So basically we've got about 30 African Americans that we're estimating all the racial differentials on here. If there's a smaller total number and African Americans are just a very small number. So statistics are going to be much less precise.

And you can just see it going on here, because look we've got a differential here of 22.9 percent by race without any controls and it's not statistically significant, that's just the number of observations that make that so. The differential for Asian/whites and for male/female were at these levels and were highly statistically significant because we had more observations.

If we add -- or maybe I should go down to an area where we've got a little more African Americans. Let me go to 2017, so we've got more people to actually run a count. There our race coefficient is 53.8 percent and 4.19 standard

deviations. If we add gender, again, the African Americans are more likely to be female and female earn less, we get a little bit of a drop but nothing important drops to .508. If we add age, they are younger just like the Asians were but not as quite dramatically so, the coefficient drops to 44.446 so they're somewhat younger than the whites. When we add education there's basically no effect. The education coefficients, that these coefficient of race disparity is roughly the same between columns 3 and column 4 showing that in terms of degree levels, African Americans and whites are roughly the same. And then when we add time at Oracle, we also get very little difference here.

Q So before we move on to your conclusions, if you could look at the left most column after year, number of workers?

A Yes.

Q So as I recall from table 2a, which would be Asian pay differences also product development, I think that number was like 4,000 or 3- or 4,000 I think. So why is it so small -- I mean, it's a very small number of African Americans and it's just the comparators which is whites?

A The comparators are white, and remember for those Asian -- for that Asian count it was 72 percent Asian. So basically we had, you know, in the range of 1,000 whites which we have here and then we have a handful of African

Americans across these various numbers. So that's the difference, is that whites were a small component of the Asian/white total number and African Americans are a really small number and those are the two we are putting together. So that's why the number of observations drop so dramatically.

Q Okay.

A And more importantly, it's that percentage, it's not only the total which is small, it's that the group we're comparing to is so small we simply can't have very much power in statistical analysis.

Q Okay. So what conclusions were you able to draw from this?

A Well the African American/white compensation differences are not explained by gender composition, education, or time at Oracle. They are younger and therefore have overall less experience and this accounts for at most a fifth of the overall racial difference, it doesn't account for very much. And it was a large racial difference.

So after 2013, African Americans earned 30 to 41 percent less -- that's the fifth column, the last column -- than white employees of the same gender, educational level, age, and time at Oracle, and this compensation differential was about three standard deviations. Now on the other tables we're talking 11 to 12 -- I mean we weren't getting those

kinds of numbers and it was 11 to 12 standard deviations. So the difference is really coming from the counts here and the power of the test.

Q So for the -- so for your results in column 5, except for 2013, though, all -- the pay gaps shown are all statistically significant.

A Yes. And as you remember, for 2013 they weren't even significant to start with because the numbers were so small. It wasn't the controls that yielded that result.

Q Okay. Like with Asian/white and gender pay differences did you consider other things?

A Yes. Just as I did with the Asian/white differentials and the male/female differentials, I look at areas of expertise and use the Oracle job alphameric job titles to make a job descriptor. I look at job placement by adding to the job title the global career level which gives me job code to look at the effect of job placement. And then of course the more narrowly defined skills like program languages, platform, or operating experience and complexity I don't have data for, so I didn't analyze that.

Q So this is the back half of that same chart?

A Yes. So now we -- so table -- this is the column 5 we were looking at before. So now we add job descriptor to see how that plays out and you can see that job descriptor is decreasing consistently the size of the racial coefficient.

So this, like for -- I mean, we didn't have that effect for Asian versus white difference, but for male versus female and for white versus African American there is some evidence, there's different areas that account, of specialization, that account for some of the differential. And if we add the management control, that tends to decrease just like it did for women. So African Americans are less likely to be in management given that they're alike on all the other variables.

And the real big difference here as it was for Asians and for women is the job placement. It's the global career level of their jobs that are really different. These measured race coefficients here are much larger than we saw for any of the other groups, but they don't meet standards of statistical significance because of the counts.

Q So given the small numbers of African Americans, is it significant that the standard deviations reported up through column 7 here exceed or approach statistical significance?

A Yes. That's pretty dramatic. Now I commented on this NFL study that I published in the *Journal of Sports Economics* about black coaches. When Mr. Cochran came to me to do this study, I said if it's only three black coaches in the NFL it's going to be very hard to show statistically significant differences. I looked over years, but I was

looking at -- basically what I was looking at was their performance as coaches and how it effected whether they were maintained and whether they were hired. And what was really dramatic was how statistically significant it was. It just says that there's a really -- for this to happen there has to be a very stark pattern, because it has to be very tightly clustered around the difference for small numbers to show this. Because if there's a lot of variation with small numbers, it's going to all wash out.

But the fact that these are showing with such small numbers says that it's very -- that there's not a lot of variance around this difference. That this difference is virtually experienced by all of the African Americans versus all of the whites.

Q So from these last four columns what conclusions did you draw?

A That the areas of expertise difference they occur between African American and white employees, but it accounts for no more than 20 percent of the racial disparity in compensation. That basically, as we found with the others, it's Oracles placement of African American employees in lower global career levels than white employees of the same race, age, education, time at Oracle, and areas of expertise that account for most of the compensation disparities.

And while after that 2013 year they clearly earn

less than white employees, statistically significantly so, of the same race age, education, time at Oracle, and job placement including fully the job code. The differences here are -- the compensation differences are much greater than they are for Asian employees, for women. There is just simply insufficient numbers to permit precision in the actual estimation of the differentials.

Q So unlike in -- unlike with the Asian/white and the gender pay, gender pay studies you considered other factors, other traits in the Oracle database, you didn't do that with the African American data?

A No. There just isn't enough data to add these other variables and talk about them meaningfully.

Q So do you have any final conclusions regarding your studies of Asian/white compensation differences?

A Well again this parallels what I said for Asian/white comparisons and for male/female comparisons, is that the only reason why African American employees are paid less than white employees, once we've controlled for all of these variables, is they have to be systematically inferior with respect to the narrowly defined or unmeasured credentials or qualifications given they have the same measured and objective qualifications. And again the inferior is in terms of their particular narrow skills have to be inferior in terms of their merits for compensation. Or

alternately African American with equivalent credentials and qualifications are paid less, it can only be one of those two or both of those explanations.

Q And I'm sure at this point you know what question I'm going to ask you now. But so as to the narrowly defined credentials or qualifications, that there is no data that was made available to you on those?

A That's correct.

Q Okay. So let's move on. Did you do anything to see how alternative approaches affected your outcome?

A Yes. I mean, in any studies like this, there are decisions you make about how to measure things that reasonable people could make differently, that there are ways of measuring things, ways of defining things that could be done differently. And so what you -- what's common in the research literature is you do something called a robustness test. If you make alternate reasonable choices does it affect your results. It's the robustness of the results in the sense of are your results sensitive to how you make reasonable decisions about how to handle the data.

Q And what specifically did you consider here?

A Well I specifically looked at the treatment of missing education, thinking about the job descriptor to measure specialization. And I particularly looked at thinking about looking at current job descriptor versus job

descriptor at hire. And also thinking about using alternative measures of compensation, is that going to affect the results.

Q Okay. So take me through -- let's start with missing education. So first of all what's the problem -- what was the problem with the education data?

A I mean, there's a lot of missing education data. Well that's not surprising, that happens with a lot of employers that education data is missing for a lot of employees. I've never seen a science/technology firm that has this level of missing data on education. But it was -- it was present for a little less than half. I have there's no education for more than half of the employees and what that means is, when I include all employees in my analysis during the class, I've got a big group of employees that are in the don't know area. So how is that having an affect? How I can look at that and say:

"Well what happens if I, rather than put them in as don't know. And maybe, for example, what happens if all the men in there have PhDs and all the women have college degrees? And that's really where the difference is coming from. That there's a big difference in these don't knows in the education they have."

Let's restrict the analysis only to those people that I have the actual education data on, and see if that is going to give me any different results. So that's what I did. I looked at whether I could account for the racial and gender compensation differentials whether it changes when I have only employees with education data. And those are the B section of table 1, table 2 -- table 1 and table 2. I couldn't do this for African Americans because there weren't enough after I took out the people I couldn't do it. But for the Asian/white comparisons and for the male/female comparisons I could do an analysis looking just at those that which we had education.

Okay. And you can see here, it's the same analysis, this is the front of 2b comparable to the front of 2a. We're now down to 1173 total workers and a slightly more Asian, 76.1 percent. And I suspect the reason for that is Asians are younger, they're more recent hires, and they're more likely probably to have education for the more recent hires and that's what may be going on here.

But what I want -- do you remember what we found in this table that the only thing that really mattered was the age column, that the Asians were a lot younger, you see the same thing here. That the only thing that matters when we look only at those people with education is that the age effect reduces the Asian/white disparity, but nothing else

matters, adding education doesn't -- so the education effect here of after age is exactly the same as we saw in the other table. And then adding time at Oracle having no effect, that's what we saw when we had the don't know category. So having the same pattern occurs as with all employees for the exogenous variables.

There's no effect on the Asian compensation gap of adding controls for gender, education, or time at Oracle, but a large decrease for age. The missing education data do not account for the -- including those in the way I did in table 1b do not account for the Asian compensation disparity.

Q This says -- it appears to be the back end of that?

A Yes. Now this is looking at the rest of the table. And here you see, again, looking at the job descriptor, we're getting no effect of adding for the subject area of your potential experience -- sorry -- and your education, these coefficients are roughly the same.

We add the management control, we get -- this again is the same sort of effect that we see that there's sort of a bigger difference in 2017 and 2018 but it's small. And the thing that matters is the global career levels, that, that's what drops the disparity, though it remains statistically significant for everything other than 2013 for this group even with looking controlling for -- using only the people with education data.

Q Do you need to stop and take a drink?
A Yeah. Let me get some. So you can --
Q Okay.
A So this is summarizing again, for the endogenous, potential of the endogenous variables, there's no effect on the Asian compensation gap of adding controls for job descriptor or management, but a large decrease for global career level. The treatment, whether you include them or not or how you include them, are not accounting for the Asian compensation disparity nor do they affect the pattern of findings on the effects of specific characteristics.
Q So if the missing data were skewing the results you wouldn't see the same patterns and --
A That's correct.
Q -- here you did, right? Is that the test in the nutshell?
A Yes.
Q Okay. So did you run the same test for gender?
A Yes. And that's table 1b in comparison to table 1a. And you'll remember on table 1a, we basically had no difference for any of these variables and you see that here. These coefficients are going for each year. They're all the same coefficients as we compared gender only to controlling for race to controlling for age to controlling for education to controlling for time at Oracle, they're all exactly the

same -- not exactly, but they're all roughly the same coefficients, none of these group characteristics matter. So there's no pattern of as we call -- as with all employees there's no pattern of any of these characteristics.

There's no effect on the gender compensation gap of adding controls for age, education, or time at Oracle. There's the very small effect for race is still there. But that is the difference between the coefficient in column 1 and column 2, a very small effect as we saw in the other table. The missing education data do not account for the gender compensation disparity.

Q And then moving -- you did the same thing with the back end of that table?

A Yes. Now the -- yes the back end of the table again, here, remember what mattered. We saw some effect of job descriptor, and we see that here that the job descriptor drops the coefficient a bit but it remains statistically significant. The management control dropped it a bit, and we see that here, that's a job placement. And really what effects the whole thing is the global career level, that's what drops the gender coefficient, though it remains significant, and we see that same pattern exactly.

So again, I want to say, it's the same pattern with the -- if I restrict the analysis only to employees with measured education is the same pattern as with all employees

for the endogenous variables. No effect on gender compensation gap, of adding controls for job descriptor -- actually that's probably a little strong, it does drop it but in the same way that it did before. There's a small decrease for management placement and a large decrease for global career development. The missing education data do not account for the gender compensation disparity, nor do they affect the pattern of findings on the effect of specific characteristics.

Q All right. So now tell me about the robustness test you did relating to job descriptor at hire?

A Yeah. Okay. Job descriptor, I mean when I use current job title, current job -- I mean, in a sense it's aggregated enough, but it was an endogenous variable. Closer to exogenous would be looking at the job descriptor the people have when they come to Oracle. I mean, it's still, Oracle's still assigning it but, you know, when they've been at Oracle a while you can have more Oracle decision making on what that job descriptor your in.

So here what I want to do to control for sort of the level of your education is I want to the specialization areas for education and for prior experience, I want to use the starting job descriptor as an indicator of specialization.

Q As opposed to the current job descriptors, because

that's what you used in the other?

A Yes. Yes.

Q Okay. Well now I lost track here. Okay. So again this is the first part of the table, in table 2c?

A Yeah. This is table 2c that was from my original February 19th report here, where you can see that now. What I include here is in order to be included in this analysis you had to be full year in the product development job code and you had to have data on your job at hire. So that's why you see fewer people because we didn't have job at hire on everybody, so that's why it reduced. So we're only looking at people for whom we have their job at hire.

And as you can see, what happens here is the Asian effect only column 1, it was only looking at the disparity with no other controls, column 2 adds gender, we get the same decrease. Column 3 adds age, that's the big decrease that we're always seeing. Column 4 adds education and Asians are equivalent to whites in education. Column 5 adds time at Oracle. And column 6 adds the job descriptor at hire. And the job descriptor at hire for this group, actually shows a little bit -- it contributes to -- removing the disparity. The disparity drops a bit, but it's still a very large disparity and still statistically significant, but there is a bit of a drop.

So it reduces the gender -- that's a mistake that

should be the Asian compensation gap, sorry about that, by about 10 percent, but it remains large and statistically significant.

Q So what do you take away from the robustness test of adding the initial -- the job descriptor at hire? I mean, is the conclusion that it made a difference or it didn't?

A I mean, either one. I mean, the job descriptor at hire is showing a lessor disparity, but remember we're seeing -- I guess we haven't gotten there yet. But the Asians, the big problem for Asians, as I said it when I first started the discussion today, we haven't gotten to that evidence yet, is what happens to them at hire. That once they're at Oracle things seem to proceed very well, other than having a disparity within job code, within their current job code, but they move through jobs similarly. So it's probably not surprising that we're seeing the effect in the job descriptor at hire.

Q Okay. And did you do a similar thing for gender?

A Yes. And that would be table 1c, comparable to 1a. And here you again see that for gender, none of these things matter until we get to job descriptor at hire. And we're still seeing that gender descriptor at hire is having a bigger effect for women and it is -- these labels -- let's see, what do I see for 1c -- it has a bigger effect, it's adding about 15 -- it takes about 15 percent of the gender

disparate effect away.

So we're seeing what we saw with the regular gender disparity, is that it is dropping. There is evidence that women are in different areas than men and that accounts for some of the disparity. It doesn't make the disparity go away, it doesn't account for anywhere near most of the disparity but it does account for some.

Q Okay. So you mentioned earlier that you reviewed Dr. Saad's report, correct?

A Yes.

Q Did Dr. Saad raise anything about specialized education in his initial report?

A He didn't address education at all in his initial report.

Q Did he raise it in his rebuttal report?

A Yes. In his rebuttal report, he submitted simultaneously with my rebuttal report, he looks at education and adds a consideration of major, as it was in the data, and aggregated the majors into four or five, six different areas of major.

Q So you mean college major? Major in --

A Yes. Well your major it can be undergraduate or whatever the major of you're your highest degree was.

Q From education?

A Yes. From education.

Q Did you use data regarding majors in your initial report?

A No. I did not. I was concerned about both education and your prior experience. And thought the job descriptor was going to be in general a better measure to measure both of those effects, though I remained worried about that having endogenaity to it. It isn't a pure, measure of the area of your education and experience. Certainly a major is a pure exogenous measure of your education.

Q So do you have any opinions about his critique of your report because you did not use major data?

A I certainly have no problem with using major data, I did a more conservative --

MS. CONNELL: Objection, Your Honor. I just want to assert that there is a motion *in limine* order that deals with this, so I just want to make sure that she's not about to violate your order.

JUDGE CLARK: Ms. Herold, you're not -- you're not asking for stuff related to anything that's been excluded, correct?

MS. HEROLD: No. I'm asking -- the motion *in limine* order as I understand allows her to provide her opinions and responses to his reports, but just not to testify regarding analyses she conducted. I can find the

order if you want, but that's where I understood the line to be.

JUDGE CLARK: Ms. Connell.

MS. CONNELL: Well I just want to make sure that I made the objection for the record, I'm not exactly sure where she's about to go, but it seems like she's about to --

JUDGE CLARK: Understood.

MS. CONNELL: -- go into that area and I just want to make sure that the motion *in limine* order is kept in mind.

JUDGE CLARK: Thank you. Overruled for now. Go ahead, Ms. Herold.

BY MS. HEROLD:

Q Where was I -- did you have -- did you have any opinions about the validity of Dr. Saad's critique of your report for not including major data?

A I think it's fine to include major data. I have no objection to doing that. I think the approach I used was far more conservative, because it was a much more refined measure of what the specialization may be than a college major would be. But for him to be able to make this case that somehow that matters he has to analyze the effects it has the way I have on how adding that changes the disparity and he has not done that.

MS. HEROLD: Your Honor, could I with opposing counsel approach to have a conversation off record?

JUDGE CLARK: Yes. Actually we'll just go off the record temporarily.

(Off the record at 11:59 o'clock a.m.)

JUDGE CLARK: We're back on the record.

BY MS. HEROLD:

Q Okay. So you also mentioned that a set of robustness test you did about alternative methods of compensation, what did you mean by that?

A Well I looked at the components of medicare compensation, base pay, bonuses, and stock awards separately. As looking at another measure. I have also want to say that Dr. Saad didn't use medicare compensation for seemingly the wrong reasons, but what he did was use base pay bonuses, and the stock awards in the year they're made, I used in the year they're paid. I think that it's reasonable to use either one. There's not a problem.

But from everything I've seen that's not the issue. I mean, whether you use stock awards in the year they're paid or the year they're made, that's not what's accounting for any of the differences in our results. That either compensation measure I think are reasonable things to use. I have a slight preference for using them in the year they're paid, because I know they're received. Using stock awards in the year they're made, doesn't necessarily mean that the person receives them, but I don't think it's unreasonable to

do that. I have no problem with that. And I don't think that's something we should worry about.

But here to look at the effects of how I've combined things, is I look at the separate components of compensation, base pay, bonuses, and stock awards to look at whether they -- how one might put them together as having an effect separately.

Q So as to -- I got lost on one issue back there. So as to medicare earnings, they do not reflect stock awards at the time of issue, correct?

A No. It's the time they're paid.

Q Right.

A It's when you get the income that's when you own the medicare tax. So that's when they're included in medicare earnings.

Q So how did you study these components?

A As I said, I used them separately, such that basically of tables 1 and 2, sections d, e, and f, and g repeat the analyses replacing medicare earnings -- the analyses of a, b, and c -- with base pay or stock awards. And sections 3b and 3bc -- of b and c of table 3, repeat the analyses of African American disparities replacing medicare earnings with base pay or stock awards.

But they're less of them because basically the Asians and the Asian/white comparisons and the male/female

comparisons I do all the analyses controlling for whether you have education or not, I repeat the whole thing. But for the African Americans because I couldn't look at people at starting job or I couldn't look at only those with education data, because there's so few, that's why there's only two tables for them where there's four tables for the other groups.

Q Okay. So lets walk through this with the Asian/white pay differences, table 2d, can you explain what you did?

A Yes. This is table 2d. So this is looking at differences in base pay now, so it's not looking at all compensation, it's base pay for --

Q And base pay that means salary, basically?

A Yes. That means the pay rate. And you'll see that when we look at the number of workers here, there's many more workers than I had in the medicare compensation. Why is because base pay not only gives us the ability to study a different form of pay, it also enables us to include different workers.

When I was using medicare earnings, I had to have people that were in the class the whole time, because the earnings were being owed over the whole year. And using base pay, it's a pay rate. So if you're in the class at any point in the year, even if you're only there for a part of the

year, the pay rate is still a valid indicator because it shows what rate you would have been paid for the whole year. So the reason why there's a larger number is I include people that are hired during the year or that leave during the year. Where as the medicare pay you had to be there the full year to be analyzed that you're in the class.

So this includes -- anytime you're in the class. And I use your last pay observed for the year that you're in the class, that's the base pay that goes in for any employee. So that's why the differences -- the counts are bigger for base pay. Now when I look at the race compensation -- differences for base pay, you can see, first of all, the differences are smaller than I observed, but the patterns here for base pay are exactly the same that adding gender deceases the compensation 1 percentage point, a little bit for Asians, .147 versus .136. Adding age is a big factor. Adding age drops the Asian/white disparity by about a half, consistent with what we did before. Education doesn't do anything, to the extent it has any effect it increases the disparity a little bit but really not very much. And adding time at Oracle also really doesn't do very much.

So looking at base pay we sort of get the same story that Asian American employees are younger than white employees and that accounts for a proportion, a fairly -- you know, a fairly large proportion actually of the differential,

but the differential remains significant even after that.

Q So any additional conclusions?

A Well for base pay I sort of go through the same kind of thing. Is that Asian/white base pay differences are not explained by age, even though age reduces it, education or time at Oracle once age is controlled, they are younger, and they have less overall experience and this accounts for about 40 percent of the total difference in base pay. And they earn approximately 5 to 7 percent less than white employees of the same gender, educational level, and time at Oracle and the compensation level difference is highly significant, 5 to 8 standard deviations beyond 0.

And this is the rest of table 2d, so we now look at the effects of job descriptor. And here we see a same story, you know, job descriptor is not -- the coefficient of race, without job descriptor in column 5 for 2013 a .069. Once we control for job descriptor here, we sort of get a bounce up depending on the year, but basically there's no difference. Job descriptor is not having an effect for Asians.

Management control, whether they're in management it increases like we saw before, the disparity a little bit, but it's basically the same. What happens is once we control for global career level, they are in jobs with lower global career level given a control for management, a control for the area through job descriptor, a control for time at

Oracle, age, and education. It drops, but it's still a statistically significant disparity.

Q Any conclusions you didn't already address there.

A Well that's sort of what I've said but -- so the area of expertise doesn't account for anything in base pay, it's the placement in lower global career levels for employees with the same characteristics. And even when in the same job code, Asians are earn 2 to 3 percent less than white employees who are the same gender, age, education, time at Oracle, and job placement, and it's 4 to 5 standard deviations beyond 0.

Q So let's stick with the Asian/white pay differences, but let's move on to stock awards.

A Yeah. Stock awards. Now here what I used we're back now to you have to be in the job the full year because we want to look at stock awards for people who are there the full year, so the counts go down a little bit. The statistical model is slightly different that I use for stock awards. Why, because most people don't get stock awards. And the typical regression model expects a continuum, there's not a continuum here. Most people don't get it and then some get it. And the-- there's a special regression analysis called a tobit analysis or a limited dependant variable analysis that accounts for sort of that kink of most people not getting it and then start getting it. So I use the

standard regression model for analyzing data where a whole bunch of people are at zero and then a smaller group gets something and that's what I used.

And the second thing is what I used is the stock award count. That individuals -- so these are physical numbers of stocks. Individuals can take either stock awards actual counts, or they can take stock options. And Oracle values the stock options are one fourth about -- four times -- one fourth the value of the stock award. And I used -- I put everything in the stock award classification regardless of what the employee picks about stock options versus stock awards.

And here you can see -- and so we're measuring the stock awards and these are the year they're paid, so these are the year they're given. They're not like my medicare compensation which is the year they're actually paid, this is the year they're given. And you can see the pattern of what happens with the stock awards, that the difference in stock awards for Asians versus whites with no controls, goes from a difference of 2,459 fewer stock awards to Asians in 2017, to a total of 7,240 fewer stock awards to Asians than to whites in 2018. And then we start looking at what accounts for it.

We look at gender, and again gender decreases some of that because there's more women among Asians and women get

less stock options so we're making -- once we make Asians and whites the same gender composition there's less of an Asian disparity.

Here when we add age there is an effect but it's not -- it's going back and forth. Sometimes it's more, Sometimes it's less. Why? Because remember this a kinked regression, we've got a whole bunch of people that are zeros, but the people that are actually in the component that are getting the stock awards those are the older workers and there's less age disparity between the group actually getting stocks. So that's why age doesn't count, we don't see the age factor here.

Education again, doesn't explain any of the difference, and time at Oracle is not explaining any of the difference, the set of regressions coefficients, the number of stocks you're offered, is roughly the same.

Q So two questions about what you did here. So if looking at column 1 and the race coefficient, that is obviously not a percentage, that's a number of RSUs?

A Yes.

Q Correct?

A That is the number of RSUs, yeah.

Q And so that's the --

A It's not a percentage.

Q And that's the differential, right?

A Yes. Yes. That's the differential.

Q And similarly, so you don't attempt in this analysis to value the stock awards?

A No. I'm just looking --

Q You're just counting them?

A I'm just looking at the count.

Q Okay. So what conclusions can you draw from that first --

A That the Asian/white stock award differences are not explained by gender, education, age, or time at Oracle. They received between 2500 and 10,000 fewer stock awards than white employees of the same gender, educational level, age, and time at Oracle. And this compensation differential is 2 to 4.5 standard deviations beyond zero.

Q You applied additional controls to this too, similar with your total compensation and base pay studies?

A Yes. So now we look at things like job descriptor. And job descriptor is having a bit of an effect here on the stock awards, you can see that the gender -- that the Asian disparity goes down once we control for the job descriptor. Once we control for management, we also get a movement down. And when we control for global career level, there's literally no difference.

I mean, this is literally an example of race not mattering in the last column. Not only do we have low

standard deviations, the sign actually is going positive and negative. So once Asian Americans and white employees are in the same job code, there is no difference in stock awards. That the difference in stock awards is coming from not being in different job codes. There is no difference unlike the other components of compensation.

Q So that's your conclusion, right?

A Yes.

Q The conclusion is it's all coming from the global career level?

A Yes. That's what's accounting for it.

Q Okay. You mentioned as well that you studied bonuses. Did you do that as to Asian/white?

A Yes. I did. They're mentioned in footnotes in my report, basically there's only significant numbers of bonuses being given in 2014 and 2018 in the data I was given. In 2014, there was no disparity between Asians and white employees in getting bonuses. In 2018, there was. Asians had a disparate bonus rate, but there were two white employees that received bonuses in excess of 100,000. And if I remove those two white employees at the very high outer range bonuses, then there is no Asian differences and white differences in bonuses.

So bonuses are not an important part of the story, though I did look at them. They're only given in two of the

years and I don't think the evidence is strong of an Asian/white difference in bonuses.

Q Did you do the same components of compensation studies as to gender?

A Yes. Table 1d is looking at the differences in base pay, for men and women and again, we've got the same -- we've got bigger numbers here as we did before. Because if you're in the class at any point, I pull out the base pay rate that you're getting and put it in the analysis. But we see basically the same sort of pattern here, that nothing really is mattering. That the coefficients are sort of the same as we go across adding all of these variables suggesting that in terms of base pay rate, the characteristics, any characteristic differences of race, age, education, or time at Oracle by gender are not contributing to the group differential and don't effect the size disparity.

Q And is that correct, that at column 5 this standard deviations 14 and 15?

A Yes. They're huge differentials. Yes. So the base pay differentials are really large.

Q Any conclusions from that first five columns?

A That we can't account for the gender differences in base pay by their age, their education, or their time at Oracle. They are more ethically and racially diverse and that has a little bit of effect like it did before. Women

are earning 12 to 13 percent less than men, of the same race educational level, age, and time at Oracle, and this is 14 to 16 standard deviations beyond Powerball probability.

Q And that's as to salary -- base pay, correct?

A Base pay. That's base pay. The base pay rate that they're getting.

Q And then similarly you did the back end?

A Yes. So the back end again, what we see is we look at base pay again. We see the -- I mean, this job descriptor is having more of an effect for women. We're not finding much effect for Asians, but the area you're in it doesn't make the -- I mean, there's still huge salary gaps, base pay gaps, 9 to 10 percent, 13 to 14, 15, standard deviations. But it is about a 20 percentage -- 2 percentage point difference. So that women are in less lucrative areas than men. But it doesn't account for. It doesn't make the gender disparity go away, it just takes a small nick at it.

If we control for whether they're in management, as we saw with the medicare earnings that also decreases, but the big thing is they're in different global career levels. That's what's accounting for the difference. When they're similar with respect to management, job descriptor, time at Oracle, education, and age, they are in lower GCLs and lower global career levels and that accounts for a lot of the difference. It accounts for more than half of their gender

disparity here. But they're still, within the job code, there are very large differences as we go from 7 to 9 standard deviations in base pay rates for men and women who are in the same job code and have the same other characteristics.

So as I summarize it here, the areas of expertise account for no more than 20 to 25 percent of the gender disparity in pay. That Oracle's placement of women in lower global career levels than men of the same race, age, education, time at Oracle, and areas of expertise account for most of that base pay disparity. And women still earn 3 to 4 percent less than men of the same race, age, education, time at Oracle, and job placement and this differential is 7 to 9 standard deviations. Again that's Powerball probability levels.

Q Beyond. Beyond Powerball?

A Yes.

Q Okay. So again as with Asian/white pay differences you also studied the component of stock awards for gender?

A Yes. And that's shown in table 1g from my original report. And here again we're now going back to people that are employed in the class for the full year, so we don't have people that move in and out as we did for base pay. And we see that women with no controls getting 6,231 fewer stock awards than men in 2013. And the largest difference they

experienced is in 2014, where they're getting 11,981 different -- fewer stock awards than men, but that's with no controls whatsoever. Those differences are all statistically significant.

When we add controls for race, ethnicity, age, education, time at Oracle, it's basically having no effect. In other words, group differences in these characteristics are not accounting for any of the gender disparity.

Q Like with the stock award study you did for Asian/whites, is the stock award data noisy?

A Yes. I mean, the stock award is -- think about -- I mean, base pay is sort of a very stable rate, that's your pay rate, you know, that doesn't bounce around year to year. Stocks bounce around year to year. If you've got a lot of stock in one year, you're probably going to get less the next year. I mean it's -- there's tremendous variability in it. So that's, that's why it's harder to see patterns in that data because there's so much more variability in it. While base pay it's easy to see patterns, because it's less volatile. So that's why the standard deviations are so much higher, because the pattern is much more tightly measured. There's less variability.

Q What conclusions were you able to draw from the first five columns?

A That there are no gender differences in race,

education, or time at Oracle that account for stock award differences. That women earn approximately 6 to 12,000 fewer stock awards in a year than men of the same race, educational level, age, and time at Oracle. And this compensation differential is 2 to 9 standard deviations. Again statistically significant.

Q And the back end again, you applied additional controls?

A Yes. So now this was our last level here. Which we showed column 5. When we add controls for job descriptor, again we can see which we consistently see in the gender data that job descriptor accounts for some of the gender disparity and we see that in stock awards. Management, also, women are less likely to be in management, that accounts for it. And when we finally add -- but it remains statistically significant in every year but 2018. We would have highly statistically significant gender differences until we get to the GCL, the global career level.

Where effectively we have a difference that's significant in the first year, but beyond that nothing is significant. And indeed in 2018, it actually becomes positive, so after we control for job code, there is no difference between men and women in actually getting stock awards is what this shows. It's all coming from the job code.

Q And did you do a bonus study with gender?

A Yes. I also did a bonus study for women and men. And for that study if found a significant gender differences for 2014, and no difference for 2018. But again the other years there are no bonuses and it was only one of the two years that showed a significant difference by gender.

Q And did you do the same study -- oops sorry. I think I've moved on here. Did you do the same study for the components of compensation for African Americans?

A Yes. Well I looked at base pay and I looked at stock awards for both of these, yes, and those are tables -- for African Americans the base pay appears in table 3b of my original report and the stock appears in table 3c.

Q Can you walk me through 3b?

A Yeah. Again, you can see we've got more people that helps us a little bit with African Americans to get better statistical precision. And you can see here that we see the same result we've been seeing that we have no effect of gender, age, the African Americans are younger, and they're getting lower base pay rates though highly statistically significant. Education isn't giving us much, time at Oracle isn't giving us much.

And why I'm saying that is that the race coefficients are the same in columns 5 and 4, in columns 3 and 4 that the drop in race coefficient happens between

column 2 and 3. It's age which accounts for some of the difference in base pay differences by race. So there's no differences in gender composition, education, or time at Oracle. Once age is controlled that account for African American/white compensation differences, they are younger, have less overall experience, and this accounts for a little less than a third of the overall race difference in base pay. And African American employees earned about 16 to 21 percent less than white employees of the same gender, education, level, age, and time at Oracle and that is a 3 to 4 standard deviation difference.

Now if we look at job descriptor, we can see again as we've seen with the African American data consistently, that there is the case that African Americans are in somewhat less remunerative areas, but the differences still remain. And they're less likely to be in management. But what really makes everything disappear is GCL, the job code.

It is the case, however, that the job code -- those differences actually that the race coefficient is actually larger than exists, other than 2015, than exists for the other groups. And the lack of significance is coming more from the small numbers and we do actually have significant racial differences in base pay for 2017 and 2018 within job code.

Q I think you reached these conclusions, I think you

already articulated these.

A Yes. I think I've already said those. Unless you want me to say --

Q No. So I want to make you talk more at this point. So what about stock awards, did you analyze those separately?

A Yes. That's table 3c and we're back now to requiring you to be there the full year to analyze this to get the stock awards. And again these are the stock awards in the year they're given. And we can see that African Americans are getting here between 12,760 and 33,392 fewer stock awards than whites when we control for nothing but the race difference. But what is more important in looking at this table, is none of these characteristics matter in that difference. That, that differential when control for gender, we control for age, we control for education, we control for time at Oracle, it's not shifting very much, in a substantive way, the disadvantage that African Americans have in stock awards.

Q So it means --

A So it's no their age, it's not their gender, it's not their education, it's not their time at Oracle that account for that deficit.

Q So this is like the stock award analysis with Asians in which base pay and total compensation, age made a

difference for both Asians and African Americans, but here it doesn't?

A Right.

Q Because it's a tobit analysis, is that correct?

A Yes. And it's the tobit analysis, so we're effectively -- it's putting you in zeros if you're the age of people with the zeros. And basically we've got more African Americans there, but they're all going down there, so that's why age isn't mattering.

Q Okay. And the conclusions from the first five columns?

A Is that there's no consistent racial differences in race, gender, age, or time at Oracle that account for the stock award differences. They earn about 12 to 29,000 fewer stock awards than whites of the same gender, educational level, age, and time at Oracle, and it's about 1 to 2 standard deviations beyond 0 because we have such small numbers of people. And as I have here the lower standard deviations are basically an artifact of the small number of African American employees leading to less precision in the estimation of disparity.

Q And then the additional controls?

A Yes. Okay. So now we add job descriptor and we would again see as we've seen consistently for African Americans is that some of that disparity is coming from being

in areas that are less remunerative. And some of it comes from being less likely to be in management and basically the GCL really drops the statistical significant totally away. Though I do note that unlike some of the other things we've looked at we still have all negative effects. But they're statistically equivalent to zero because of the small number of African Americans that we're looking at.

Q And the conclusions you draw from that?

A The conclusions I draw from that is that the areas of expertise account for between 25 and 75 percent of the racial disparity in stock awards.

Q I think that's an error.

A Yeah. Let's skip that comment.

Q Yeah.

A Oracle's placement of African American employees in lower global career levels than white employees of the same race, age, and education time -- time at Oracle, and areas of expertise accounts for most of the award disparity. And while the stock award disparity is large the lower standard deviations are a fact of the small number of African American employees leading to less precision.

Q And did you do an analysis of bonuses for African Americans?

A No. I did not. There were just simply not enough people to do that.

MS. HEROLD: So, Your Honor, I'm getting ready to move on to another topic, would you like to take lunch at this point?

JUDGE CLARK: How much more time do you think you have with Dr. Madden?

MS. HEROLD: I would guess about an hour, if we're able to keep up our same pace.

JUDGE CLARK: Okay. It is 12:30, we'll go ahead and take an hour lunch. And Dr. Madden, your free to step down.

Ms. Herold, we had a conversation here at the bench and I said I would give you an opportunity at the end of the session here today if you wanted to put that on the record or not.

MS. HEROLD: Yes. I would like to.

JUDGE CLARK: Go ahead.

MS. HEROLD: So OFCCP would like to put our objection on the record to the exclusion of testimony by Dr. Madden -- by Professor Madden of her analysis of educational data relating to majors. This analysis -- she was responding -- she conducted this analysis after she received the rebuttal report from Dr. Saad, which was the first occasion in which he raised any analysis of the major educational data. It was --

JUDGE CLARK: Okay. Ms. Herold. I understand,

you're making your record, but this is the exact argument as I recall that was made in a motion *in limine* that I let all the parties brief and I reviewed your briefs thoroughly and I issued a written ruling regarding the untimeliness of these reports. You're talking about the October 11th, the October 31st, and the November 7th reports, correct?

MS. HEROLD: I'm only talking about one component of it. It's just this one slice.

JUDGE CLARK: One slice of the three reports that I've excluded from evidence because they were not timely disclosed, correct?

MS. HEROLD: Yes. That is your ruling.

JUDGE CLARK: Okay. So you're just -- at this point this is all on the record so what is your point today, why are you making this argument now?

MS. HEROLD: My point is that OFCCP is being prejudiced by this exclusion disparately to Oracle. Oracle's expert made an analysis that was not responsive to the initial report and has gained an advantage in which they are allowed to respond to testimony by Professor Madden that Professor Madden is not allowed to respond to the testimony Oracle's presented.

JUDGE CLARK: Okay. Anything, Ms. Connell.

MS. CONNELL: I mean, it's fully briefed, Your Honor. These are the exact same arguments that you already

ruled on. There's a history of the disclosure calendar that we argued about and they had the opportunity for staggered reports, they didn't want it. So I believe this has already been addressed, and I don't have anything further.

JUDGE CLARK: Anything further, Ms. Herold.

MS. HEROLD: No. I disagree with my assertions of Oracle's Counsel, but that's fine the records clear.

JUDGE CLARK: Okay. I find that this is all covered by the written order excluding the testimony. Your objection is overruled, it's noted for the record.

We'll be off the record until 1:30.

(Whereupon, at 12:32 o'clock p.m., the hearing was recessed for lunch.)

--o0o--

AFTERNOON SESSION 1:30 o'clock p.m.

JUDGE CLARK: Okay. We are back on the record. All parties are present, Dr. Madden's retaken the stand.

Ms. Herold, you may continue.

DIRECT EXAMINATION RESUMED

BY MS. HEROLD:

Q Good afternoon, Professor Madden. This morning you mentioned a couple different times in your testimony you made reference to a job code, do you remember that?

A Yes. I did -- do.

Q So where did you -- did you review any documents in preparing your study which provided you with any information about job code?

A Yes.

Q What were those?

A Well certainly the database has job codes and I was aware I had that for everybody. And secondly, I looked at Power Point presentations that were delivered to Oracle employees who were involved in compensation study.

Q Okay.

MS. HEROLD: Your Honor, I'm going to show an exhibit to the witness through the screens, it will not be there.

JUDGE CLARK: Okay.

MS. HEROLD: So just to kind of --

JUDGE CLARK: Thank you.

MS. HEROLD: So is it already up on the screen?

JUDGE CLARK: It is for me.

MS. HEROLD: Yes.

BY MS. HEROLD:

Q Okay. So this is -- do you see that, Dr. Madden, document that appeared on the screen in front of you?

A Yes.

Q It's Plaintiff's Exhibit 353.

A Yes.

Q Is that the Power Point -- or is that the training presentation you were referencing?

A That's one, I mean, there were a few of them as I recall.

Q And it was -- aside from the training materials, was there any other things you recall reviewing?

A Not that I recall. I think it was the training materials.

Q And was there any deposition testimony?

A Oh. Yes. I'm sorry. Yes, the deposition testimony of Ms. Wagner also indicated the job code was used in compensation setting.

Q Okay. So we can now --

MS. HEROLD: So for the Court and opposing counsel, we're going to switch back to the Power Point on the screen.

JUDGE CLARK: Thank you.

BY MS. HEROLD:

Q Okay. So let's --

MS. HEROLD: One second we have a technical difficulty, we need to get the screens caught up.

JUDGE CLARK: Okay.

MS. HEROLD: It's 150.

Oh. What do we have to do? From current slide, right? There. It's okay, right?

It's happening, I promise.

JUDGE CLARK: It's no problem.

MS. HEROLD: Okay.

BY MS. HEROLD:

Q Okay. We're going to move to a new topic from what we did this morning, Professor Madden. So just stepping back, does your analysis assume that all individuals are alike in their capabilities to do work at Oracle?

A Absolutely not. They do not assume that. They don't assume that they contribute to Oracle profitability in the same way and therefore -- and the factors contributing to compensation levels. Because many relevant characteristics differ across individuals and effect their compensation. To determine compensation for individuals, you've got to control for everything by which individuals differ. It is necessary to include all of the relevant characteristics to study the

compensation of individuals. That's not the exercise I'm doing.

I am looking at the compensation disparities across groups. And it's different from individual compensation a very important way that we just went through all these tables showing, is that all of these things effect individual compensation. Gender, race, age, experience, prior experience, education, those all effect individual characteristics -- or individual compensation strongly. But we saw that in many of these analysis they don't effect the group comparison at all. And why, because the analysis of group disparities to be accurate only require the inclusion of relevant characteristics by which the compared groups differ. If the groups are alike in those characteristics given everything else among the characteristics, it doesn't matter and doesn't have to be included.

Q So can you explain a little further what you mean by group differences versus individual differences.

A Well, for example, if we want to know how well individual variation is being explained, then you look at the R-square -- that's the proportion of the variance in compensation that's being explained across individuals. That may be a relevant statistic, if you're trying to study individual outcomes.

For compensation disparity by group, however, the

regression coefficient on race and gender and it's statistical significance, the standard deviation, are the relevant characteristics. And my first note of this was -- I think it was Michael Finkelstein in the Columbia Law Review 30 years ago, 35 years ago made this point, that it is -- for discrimination cases, what matters is the regression coefficient on race and gender and it's statistical significance not the R-squared.

Q Is the analysis here, similar to something else, some other type of study?

A Oh. Yes. I think it might be helpful to think about it to due the well and great advance that American medicine gave to the world, and that is the use of medical clinical trials. So how medical clinical trials work is you take two groups of people randomly selected, you give one group the sugar pill, and one group the real pill. And then you see is there a difference in outcome.

Now among individuals some of them smoke, some of them exercise, some of them drink too much, and that may all interfere with the efficacy of the drug treatment. But we don't worry about that, even though we're not predicting individual differences. What really matters is the group difference and the drug trial works, if the group that you gave the pill to, has a different outcome than the group that you didn't. Even though there is tremendous variation among

individuals.

Now in race or gender disparity, or as I tell my students in social science, they don't let us randomly distribute people across race and gender, we can’t control that in the same way. But the comparable thing is you use regression analysis to control for all the measurable differences that exist between the groups, so that you're only comparing groups that are exactly the same but for race or gender, as near as your able to with the data.

Once that happens, then that simulates the random distribution that we get in clinical medical trials. Which incidently do not take place in laboratories, they take place out in the world and we've got everybody acting however they act and we're looking at the drugs.

Individual unobserved traits are going to effect compensation, but because both groups should have the same distributions of those traits once they're alike in everything we can use to make them alike. They do not interfere with the measurement of compensation disparity between the groups. So it's the same kind of principle. And distinguishing between studying group differences and studying individual differences.

Q So next, I'm going to go back to the questions studied, because incredibly at more than three hours in, we haven't gotten to them all. So what did you do to study the

relationship of Oracle's decisions on job assignment and compensation at hire to any gender and racial pay gaps you identified.

A Well I did several things, but one thing I did, is I studied the current compensation of the 8,126 employees for whom Oracle provided data on their starting jobs. And what I do -- that are in the class. And what I do for these people is I measure the effect of gender or race on current compensation after controlling for the things we've been looking at here: race, gender, age, education, experience and Oracle's job assignment at hire, that being the job code.

I then measure the effect of gender or race on current compensation after controlling for race, gender, age, education, experience, Oracle's job assignment at hire, and Oracle's current job assignment. So this is the added variable. So I have a gender or race effect controlling for race, gender, age, education, experience and Oracle's job code at hire, and then I do the same analysis for the same people controlling for all the same thing and add the current job assignment. So that tells me how the current job assignment is effecting salary versus the original job assignment. And I compare these results to the resulting gender and compensation effects.

Q So before you get into those analysis, when you talked about the 8,126 employees for who you have data on

starting jobs, what if the person was hired before 2013, did you include them?

A If I had that data, yes. Because remember my analyses are looking at lots of people that were hired before 2013. So if I'm looking at the role of individual job assignment, I have to consider how that is different across everybody. I do think I have nobody hired before 2010. So these are all people in the class and I have their initial job if they were hired and we have the data from 2010 forward.

Q So can you explain -- again starting with Asian/white compensation differences, can you explain your findings?

A Yes. Basically column 1 right here, this is for Asians, yes, it's table 6a from my original report.

Oops here we go. Here.

So the first column here is really we haven't done it quite this study, so it's looking at the Asian/white disparity in compensation, medicare earnings after I control for race, gender, age, education, time at Oracle, the job at hire -- that being job descriptor -- and the global career level at hire. So this is basically the job code at hire. And this is the salary difference that existed for Asians today given their job code and career level at hire.

Q So the difference between column 1 in this table

and the tables that we looked at this morning in table 2, is that it's the job at hire and global career level at hire?

A Yes. Not the current one.

Q Okay.

A All right. So then I add --

Where's the -- there's the red dot

-- column 2 adds exempt, non-exempt current status and the current job descriptor and column 3 then adds the global career level. So a combination of 2 and 3 reflects the total effect of the job code.

Could we -- so what I want to compare is the race coefficients in column 1 with the race coefficients in column 3. What you can see here quite generally is they're equivalent. That current job code doesn't contribute to the explanation of the Asian -- yeah. It's all done in the original. The whole gap occurred in the original assignment and those just go forward and they just continue forward to have the same gender -- or the same racial disparity in current years. So that the original -- once I control for the original placement of the person, that totally accounts for the race gap and everything else that happens afterwards, just stays the same.

So the Asian and the white employees start with a disparity of 6 to 10 percent and that continues through the rest of their careers. The Asians never catch up, they don't

get any worse, so it implies that sort of the pay growth and promotions for Asians and whites are the same after hire, it's all in the original assignment that's creating the difference.

Q Did you look at the assignment -- at this assignment question for Asians any other way?

A Yes. I did two other studies. I did an analysis of race or gender differences in global career level coming from the GCLs, the requisitions that had the largest numbers -- had the largest numbers of requisitions. And I did an analysis of the race differences in starting pay, controlling for the GCL of the requisition, rather than for the GCL they actually got. So it's considering what the requisition pool they came in for.

Q Okay. So is this next slide, from your initial report?

A Yes. No. This is from my rebuttal --

Q Okay.

A I think it's my rebuttal report. Yes.

This initial thing is looking at people who are applying for a requisition for an IC4 job, individual contributor 4 rating. And the orange is showing you if they got the same as they applied for and are Asian, and the blue is if they got the same as they applied for and are white.

So 60.4 percent of whites applied for GCL 4 jobs

and got them. 62.8 percent of Asians applied for GCL jobs and got them. Of the people that didn't get them, 24 percent of the Asians got a lower, while 12 percent of the whites got a lower. So Asians were much more likely to get a lower requisition when they applied for GCL 4. And 27 percent of the whites got a higher IC level and only 13.3 percent of the Asians did. And that is statistically significant at a probability value of .001, and .05 remember is statistically significant.

So Asians Applying for IC4, which is a very large entry job, were much more likely to be put in a lower position and less likely to be put in a higher position than were white employees. White applicants -- well white employees. These are all employees.

The next one is looking for a higher level which is a smaller group but IC5 applications. And we can see here that whites, 89.9 percent of white applicants got IC5 when they applied for them. Only 68.9 percent of Asians did, and that's because 26 percent of them got a lower requisition, got a lower global career level. While only 6.3 percent of whites applying for IC5 got lower. And 5.1 percent of Asians got higher, 3.8 percent of whites got higher, so there's a slight edge for Asians in getting higher, but it didn't offset the fact that such a large proportion got lower.

So overall, in fact, that's highly -- that's even

more statistically significant it's .00005 statistical significance that Asians who applied for IC5 were much more likely to be put in a lower position, a lower IC level, than were whites.

Q And this next slide was the second test you did?

A Yes. This is the second test. So here and now what I am analyzing is looking now across all the -- all the requisition levels, all of their GCLs and I look at the -- I control for characteristics here: race, and gender, age, education, the year of hirer, the job descriptor and the global career level of the job requisition. So I'm really controlling for the whole job code of the requisition. And what I find when I do that looking at all the requisition data, Asian employees were given 3 percent lower starting salaries than were whites. This is 2.5 standard deviations, so statistically significant, and there were 766 such requisitions that could be studied.

So I want to point out that while we've been looking sort of in the range of 3500 Asian and white employees this is only dealing with a small share of employees that are members of the class, but it certainly supports the same point that initial jobs are different for Asians.

Q And where did you get that pool of 766 requisitions?

A Those were from Dr. Saad's data that he presented in his original report. His July 19th report where he had a great deal of discussion about people getting higher and lower, and he showed generally that Asians did not get lower overall. And then he -- but what he failed to do in controlling for that is exactly what the career level of the job being applied for was.

And here's the nature of the problem. Is basically people that apply for low job levels are more likely to be moved up. People that apply for high job levels are less likely to be moved down. And because Asians are more likely to be in the lower job level applications, it looks like they're getting higher, but it's really they're getting higher because they're applying for the lower GCLs. So when we control for GCL and then look at the effect, then the Asian effect comes through, and that's what this analysis is doing.

Q Did you reach any opinions about the -- the adequacy of the -- the pool of requisitions that Dr. Saad looked at in his report?

A Yeah. The requisition studies I worry about. As I said, that I pointed out there were only 766 here that I looked at. That if we look at Dr. Saad's initial assignment as something that he looked at, there were 1517 Asians, I want to point out that isn't even the majority -- that isn't

even a large portion of the people hired between 2013 and 2018. That there were actually 2,581 people hired so the study he did in his analysis only includes -- includes less than 60 percent of the people actually hired.

But if we look then at the unique individuals that are in the overall class in the study, we're actually looking at about a quarter of them. There's 5,598 unique employees in the medicare compensation disparity analysis, and there's 6,480 -- because if you're in the class at all at any point your included -- in the base pay study. And 23 percent of those are represented in Dr. Saad's study. 27 percent of the people in the medicare study are represented in Dr. Saad's study. So he's only looking at a small portion of the initial placements even when we look at these requisition studies. But when looked at properly they do show the Asian disparity the same as the more general studies do.

Q Did you do -- did you come to any opinions regarding Dr. Saad's pay growth opinions?

A Yeah. Well pay growth is -- because this is showing promotions. So there's two ways you can have a different current job code, or a lower GCL. You can be start in a low one and then continue at that which we saw for the Asians, or you can start in the same or lower. But the difference increases because there's less promotion. In fact, for Asians we see that promotion is not the issue,

because once we -- let's see this is the Asian, this is table R10 from my rebuttal report.

And what I measure here is the -- it's basically Dr. Saad's model that he did in his July 19th report looking at pay growth, but he did two things that were rather strange that I correct or that I change in my analysis.

The first thing he did is he excluded anybody that changed jobs. That is he discluded [sic] promotions. Well the big way you get pay growth is by getting promotion, and the whole point is that's what you want to look at. Is you want to look at is there -- are there difference in promotion rates. So I want those in.

The second thing you have to point out is he's committed a common fallacy here, is there is a tendency for regression to the mean in statistics. What that means, if your particularly high in pay, you expect you're less likely to get a pay increase. If you're particularly low in pay, you're more likely to get a pay increase, and that's what we mean by regression to the mean. That over time, those that are too high, get less. Those that are too low get more.

And the salary levels of Asians as they start are lower, so if we put in a control for starting pay, which you need to do when you're doing an analysis of change. I do those two things and I end up -- I end up showing -- I mean you need to do that -- but I end up showing indeed that even

when we do that for Asians there is no evidence of different pay growth. So there's no evidence of promotion differences for Asians. Which is consistent with what we found when we looked at how GCL at hire predicted current wages versus current GCL where we saw that the Asians and the whites actually continued after the disparity at the beginning there's no change. So they're getting promoted or getting pay growth at the same level, it's the original assignment that's the issue.

Q Did you do a similar study in regard to gender?

A Yes. I did the same thing for gender. So we go back. Table 6a we had done for Asians and table 5a does the same thing by gender. Now this is a study where we look at your race, your ethnicity, your age, education, time at Oracle, job at hire, and global career level at hire these two things being the job code at hire and look at what the gender disparity in salary is for 2013, 2014, 2015. So it's relative to your job at hire and this is the disparity of women in their current jobs given what they had at hire.

So what we want to look at is what happens to that disparity, does this -- for Asians -- if they behave the same as Asians and they get the same promotions and it's all the assignment at hire, we should see this 11 percent coming across the table, the 13 percent coming across the table, the 9.9 percent coming across the table, and we don't see that.

We see in column 3 that when we actually control for -- add a control now for your current job code -- which is the combination of these two tables, two rows -- that the gender disparity in wages drops by half.

So that's where -- this is showing what I said at the beginning here that about half of the disparity for women is coming from differences in promotion. They start at a lower rate but they -- if we look at their current job code that makes half of that disparity go away.

So the reason why they're 11 percent if we only control for the original job code and 4 percent if we add for the current job code, is given their original job code they are less likely than their male comparators to be at a higher job level. And so when we control for the job level now, because the men are at a higher job level than the women who started the same, the women have lesser disparity.

Q So if the gender disparities were going to be the same as for Asian/white pay differences, one in three would roughly match, Right?

A One would what?

Q Columns 1 and 3 would roughly match.

A Would roughly match and they don't. And the fact that they don't is showing that it's not only the current -- the job you got originally, but there's also promotion differences.

Q Did you do a similar study -- or did you look at these different ways as well for gender?

A Yes. I did a parallel to what I did for Asians is I also look for GCLs. Given the GCL you applied for, did you get lower or higher. And then I look at differences in starting pay controlling for the GCL of the requisition. Okay.

And as you can see here, for those applying for IC4, applying for jobs that are individual contributor level 4 jobs in the requisition, 71.9 percent of the women and 60.7 percent of the men get -- vie for IC4 and get IC4. If we look at the probability of getting of higher only 8.6 percent of the women got a higher GCL but 18 percent of the men got a higher GCL.

If we look at getting lower, the men are also more likely to get a lower GCL, but they're very close, 21.3 versus 9.5 and it doesn't compensate for that big difference in getting the higher GCL. So we again show a statistically significant disadvantage for women in placement -- in getting a better placement than they applied for those applying for IC4 the probability is .017, where .05 is statistically significant.

When we move for IC5 the result is not statistically significant, the probability is .172, but again there's some smaller numbers here. But 82.6 percent of the

women get the same thing they applied for, 73.3 percent of the men do, and 6.5 percent of them actually got a higher IC level, none of the women did. The men also are a little more likely to get lower but that difference is what, it's 3 percentage points why the difference in getting higher is 6.5 percentage points. It's not statistically significant but the pattern is still moving in the same direction.

Q And you did a similar study as to the requisitions?

A Yes. Now this is looking at your wage at -- it's starting pay at Oracle, controlling for your race -- I'm sorry this is women -- so controlling for your race, your age, your education, your hire year, your job descriptor and your global level of the job requisition, the job -- so it's a job code of the requisition.

And women given that they're applying for the same job code as men, earn 3.8 percent less in their starting salary and that is 3.63 standard deviations highly statistically significant, and 841 people in that study.

Q And did this requisition database have the same problems that the size had for Asians, the Asian requisition pool?

A Yes. You again see that we have 60 percent of the women -- of the women and men hired in the period and less than a quarter of the total people that are in our medicare compensation or base pay studies. So it only accounts for a

small -- this is looking at initial placements for a small share of the population at issue.

Q Okay. Now moving again to the same pay growth analysis for gender?

A Yes. Okay. Yes. This is table R10 now for women employees, we did this for Asians. And now again it's Dr. Saad's pay growth study except I put back in the people that got promotions and job changes and therefore got pay raises, because that's what we want to look at, and I control for starting pay. He found no gender effect, but indeed I find a significant difference in gender growth in salaries at least for 2013 through 2016 is statistically significant, controlling for starting pay that there is evidence in this data as well of promotion differences for women.

Q Were you able to do any testing of assignment for African Americans?

A Yes. For African Americans table 7a is like 5a and 6a. So we look at what happened to them at hire. So we look at their current wages given their gender age, education, time at Oracle, and their job code at hire and these are the salary differentials. There is sort of nothing in 2013. But from 2014 on we have very large amounts of salary differentials. So the statistical significance again is small because we had to have information on the job at hire so we've got fewer than 30 people in most of these. But if

we compare between column 1 and column 3 as we did for --

Can I have the next?

Q Oh. Sorry.

A -- column 1 and column 3 we can see, too, even though they're not significant, we see the same sort of pattern that there's indications of differences in promotion by race because the coefficient is measured much lower. Once we put current job in on top of the original job at hire, once we put in the current job code, we explain, roughly -- well more than half of this difference. So it's consistent with African American disparities in initial placements as well as current job and current job due to differences in promotions accounting for the disparity.

Q And is the thing holding the statistical significance back again the just small numbers?

A Yes. These are very small numbers. These are smaller than any of the other tables because you had to have information on job at hire, as well, so it's got to be less than 30. I don't recall right now how many, but it's -- you know, we're probably talking 20, 23 people. But the pattern in the coefficients is telling about -- showing that, supporting at least, that there is a promotion difference as well.

Q So these studies about assignments thus far were about total compensation. Did you look at base pay

separately?

A Yes. I looked at base pay. I looked at the initial placements and promotions using base pay. So I did the same thing as we did in tables 5a, 6a, and 7a but I did it for base pay. Where I have more people.

Q Okay. So let's start with the Asian/white base pay differences.

A Okay. Well if we look at base pay it gives us comfort actually that we get the same results. Is that basically when we look -- when we control for their original job placement and look at their current salaries, their salaries are roughly 2 to 3 percent lower than whites when we control for everything in the original placement statistically significant in column 1.

Table 6b, when we move to column 3, we see roughly again the same coefficients. So for Asians, there's no evidence as I mentioned in my very first report and confirmed in my rebuttal report, there's no evidence of promotion differences causing the Asian/white disparity, it's all in the initial placement.

Q And moving to gender?

A And moving to gender, we again see the same phenomenon that we have what -- we have about a 7 to 8 percent difference in compensation, again highly statistically significant for the women in base pay. When we

look at the current salaries and control for their job code at hire. When we go to column 3 which brings in the job code currently, we actually drop the disparity in half. So again, this is supporting that women are moving between job codes less well than their male comparators.

So the male comparators we see less of a disparity because what happens for example, is a female -- a woman got hired in GCL4 and she was earning 7 -- and she's now still in GCL4 earning 7 percent less than the man, comparable man that was hired in GCL4, but he's moved to GCL5. And so that's why there's a lesser disparity when we -- she now isn't compared with him because she's not in GC5, she's in GC4.

Q Were you able to do this same analysis with African Americans?

A Yes. We did the same analysis for African Americans using base pay. And here because there's a little less variance we get a little more statistical significance, but what's really important here is comparing the race coefficients in column 1 to the race coefficients in column 3 and we see the same point. That there is evidence of promotion differences because the race coefficients in column 3 are lower than those in column 1 -- I'm sorry -- are higher. The absolute value in column 3 is lower than the absolute value in column 1, they're both negative numbers.

Q Okay. So last area, I expect to hear cheers rising

from the crowd. Were you asked to study anything about Oracle's prior pay policy?

A Yes. I was asked to analyze whether Oracle's gender or racial differences in compensation are correlated with those reflected in the prior pay data for those employees. And because, if this were the case, the gender and race salary differentials reflected in prior pay data would be similar to the gender and race differentials in starting salaries.

Q Okay. So the next slide is I think your -- where you report some of your findings on this.

A Yes. So that's my strategy. Now this is comparing people -- women who are the same by race, age, education and hire year. And this is their starting salaries. So I think we should -- I'll concentrate on tables 2, 3, and -- columns 2, 3, and 4. We can talk about 1 and 5 if you want but they're more there just for comparison.

So what we're looking at here, is employees in class period jobs with prior pay data. The gender difference in starting pay among those employees is 12 percent, 9 standard deviations. If we look at the prior pay for these people, their salary difference was 12.3 percent, and 6.15 standard deviations. 1258 were looking at the same people. And if we actually look at the difference between starting pay and prior pay they virtually zero. So people basically

-- the gender differentials in starting pay are totally the same -- are highly the same as those in prior pay.

And we see the same thing for Asian employees, they had a 7.8 percent differential in starting pay, 4.94 standard deviations. If we look at their prior pay it's 7.8 percent less than those of the whites that were hired, 2.91 standard deviations. So that the difference between starting pay and prior pay is actually a little positive. Starting pay is a little higher, but it's not statistically significant, so this is basically zero. Starting pay and -- the difference between starting pay and prior pay totally explains the sort of difference in compensation between these employees.

And then the same for African Americans. African Americans the starting pay -- the effects are so small here, the numbers don't add up, but it's showing the small numbers. So African Americans earned 15.2 percent less in starting pay than whites in this time period. Their prior pay was 4.3 percent less, and the difference between them, the African Americans end up having the prior pay was actually higher than the starting pay. Again, that's kind of screwy because of the small numbers, but it's basically zero.

So effectively what we're seeing here is for people who are the same race or gender, age, education and hire year that starting prior pay is highly linked to starting pay.

Q Did you do anymore analysis of this?

A Yeah. Then I did an analysis looking at job descriptors. So this is the same analysis now, but now I'm using the same people but I'm adding the job descriptor they're hired into to see if that explains it. But we basically have the same effect and now I'll just look I think at column 4, which is the difference between the 2, and they're basically all zero. But even though we have significant differences at least for women and Asians in starting pay and in prior pay that effectively the difference between starting pay and prior pay is zero by gender and by race, once we put those two together.

Q Why would mirroring differ depending on specialized experience or job assignment?

A Well it could, I don't know that it necessarily --

Q You're just testing it.

A -- I don't have a reason I'm just looking at whether that could do it.

Q And then this is the final --

A And the final one I control for the starting global career levels so it's comparing people. So I mean when we do that we have less gender and race differences overall, but again, we see that the effect, these effects are all zero. That the starting job pay and the prior pay mirror each other. The disparities in pay -- I'm sorry, the disparities in pay mirror each other by race and by gender.

Q Okay. Just sticking with the prior pay topic for a second, when you were at Penn either in your role -- either in your role as Dean or as in charge of the various institutes you described, did you ever have -- were you ever involved in the hiring process?

A Oh. Yes. I was very much involved.

Q Did you ever have anybody come in with an outside offer?

A Yes. It was quite common.

Q And why did they do that?

A They wanted to get a pay increase, that's why they've got the outside offer.

Q And so did, in your experience, did Penn ever respond to that by increasing their offer?

A Yes. Most the of the time we did, sometimes we said congratulations, but sometimes we did.

Q And so when Penn did that, did you ever -- were you ever concerned about the gender racial parity effects?

A We absolutely were. We would go through and make sure all comparable employees --

JUDGE CLARK: Hang on, Doctor.

I think there's an objection.

MS. CONNELL: Yeah. I just want to make an objection that this goes beyond anything that's in her reports, and I think it lacks foundation and is not relevant

at this particular matter.

JUDGE CLARK: Overruled. I'm going to let her finish the answer.

Go ahead, Doctor.

BY MS. HEROLD:

A Yes. We would then go and make sure, because this was giving us information about what the market was. So we would go and look at all people that we thought were similarly situated and give them -- also correct their pay to represent this new information we got about what was out there in the market.

Q Okay. So final questions. Did you calculate damages for the gender and racial pay disparities you identified?

A Yes. I have.

Q Now the matter has been bifurcated, so we are not going to discuss your studies of damages, I'm just trying to establish that you found damages.

A Yes.

Q And so can you just roughly give us -- can you just roughly describe the damages you found?

MS. CONNELL: Your Honor, I think this goes beyond the scope of your MIL ruling, so I would object to her testifying even as to estimates of the damages.

JUDGE CLARK: I'm going to overrule the objection.

I think you can give us some general ideas about damages that you found.

THE WITNESS: yes.

JUDGE CLARK: The hearing has been bifurcated, it's a liability hearing and then we'll have a separate hearing on damages if necessary later.

MS. HEROLD: I understand, Your Honor.

JUDGE CLARK: I know you do.

BY MS. HEROLD:

A Okay. The damages range between 300 and 800 million from these analysis, depending on whether the Court decides that the appropriate comparison is column 5, column 6, or column 8. So if it's column 8 the damages are in the range of 300 million. If it's column 5 the damages are 800 million.

MS. HEROLD: Your Honor, that's all I have. I was asked before lunch if we could take a break on the early side for a facilities break.

JUDGE CLARK: Now? Ms. Connell, would you like a few minutes to get started or you're ready to -- do you need a couple minutes? You're ready to go.

MS. CONNELL: I'm ready to go.

JUDGE CLARK: Okay.

Doctor, do you need a break.

THE WITNESS: It's okay for now. I mean --

JUDGE CLARK: Okay. You just want to --

THE WITNESS: I'm not guaranteeing in about 20 minutes.

JUDGE CLARK: You don't want to go. Okay.

So go ahead and get started then, we'll stay on the record. Ms. Connell, you may cross-examine.

CROSS-EXAMINATION

BY MS. CONNELL:

Q Good afternoon, Dr. Madden.

A Yes. Good afternoon. I would just want to see, let me get a pen out, because I want to take notes and make sure I follow your question.

Q Sure. Let me know when you're ready to begin.

MS. CONNELL: Can you take the projector down, please?

MS. HEROLD: Oh. Yeah. I'm trying.

BY MS. CONNELL:

A All right.

Q Good afternoon, Dr. Madden.

A Good afternoon.

Q Dr. Madden, this is not the first time you've been retained as an expert witness by OFCCP, correct?

A That's correct.

Q Over the past five years you've been retained by OFCCP at least five times, correct?

A I don't know about that. Let's see, 1, 2, 3 -- I know of three. Maybe if you tell me what they are, I can tell you whether you agree with it.

Q Well you recently -- one of those cases was OFCCP -- a recent case versus OFCCP versus Enterprise Rent-a-Car, correct?

A Yes. That's one of the three.

Q And you gave testimony in that case under oath, correct?

A Yes.

Q Okay. Let's see if we can refresh your recollection, we've got that testimony here. Provide a copy to your counsel.

MS. HEROLD: Objection, Your Honor, she recalls this testimony, so I don't know what we're doing with this.

JUDGE CLARK: So I'm going to let you ask questions.

MS. CONNELL: Yeah.

JUDGE CLARK: Go ahead. Overruled for now.

BY MS. CONNELL:

Q I want to draw your attention to page 1139 of the transcript, lines 8 through 16 -- excuse me lines 8 through 21.

MS. CONNELL: Cliff, can you pull that up?

BY MS. CONNELL:

Q And in that case, you were asked under oath how many times you've been retained as OFCCP -- by OFCCP as an expert witness and you estimated 5 to 10 times, do you recall that testimony?

A As you can see here, I was guessing. You asked me now I said:

> "In the last 5 years -- 5 to 10, last 5 years I'm sorry, last 5 years, 10 is too high. Last 5 years probably 5 to 8."

But here you were naming -- you said 5 specific cases and I can think of three. I can think of this one, Enterprise, WMS, there might be others, but if you're asking me for specific cases?

Q I didn't ask you for specific cases, I just asked you if you've been retained by OFCCP at least five times?

A In the last five years. I'm sorry, you -- no I thought you asked me if I'd had five cases in the last five years. I mean, I will stand by this as a guesstimate, but I can’t as I sit here think of what the other two cases are. I can believe they're there, but I just don't recall them.

Q Okay. So you don't dispute that you've been retained by OFCCP to testify as an expert witness in the past five years at least five to eight times?

A I don't dispute, nor do I agree with it, I'm

telling you I'm not sure.

Q Okay. But this was testimony that you gave under oath at the recent case of OFCCP versus Enterprise?

A And it was a guesstimate, I mean, I'm clearly saying that I'm trying. If you want to be precise about what it is, I'd have to know what the cases are. It's quite possible that's the case, I just don't remember other than the three. It may well be the case, I just am not recalling them.

Q All right. And as you state on your CV that's attached to your initial report in this case, you've testified in court five times since June of 2015, correct?

A I don't think I have any cases on my CV. My CV is academic and I never put cases on my CV so I'm not quite sure what you're referring to.

Q Okay. Well let's look at your initial report, page 125.

JUDGE CLARK: Is that Plaintiff's 1?

MS. CONNELL: It's Plaintiff's 1, yes.

BY MS. CONNELL:

A My CV quits at page 123 of that report.

Q 127, sorry about that. Okay. I'm drawing your attention to attachment B of your expert report.

A Yes.

MS. HEROLD: Counsel, this just doesn't match. I

think it's 125 what you said before.

JUDGE CLARK: So I have attachment B in front of me and that's what I believe Ms. Connell's asking about, so --

MS. CONNELL: Right. Whatever page it is.

MS. HEROLD: Okay.

BY MS. HEROLD:

Q This is attachment B to your expert report. And does it accurately reflect that you've testified in court five times since June of 2015?

A Absolutely, but it's not my CV.

Q Okay. But it is attachment B to your expert report?

A Yes. Yes, ma'am.

Q And out of those five cases you've testified -- out of those five cases in which you've testified, two were as an expert for OFCCP, correct?

A Yes.

Q And this case makes the sixth time that you've testified in court since June of 2015?

A Yes. So this actually probably shows my prior testimony, I was simply wrong in what I was guessing the OFCCP testimony was. Because this is going back to June 2015, so this is almost five years and there's only -- there's this case plus these two. That was the three I was remembering that's why I was having trouble.

Q This is testimony that your expert testimony, I previously asked about retention.

A Oh. Okay. It's possible there's a retention I'm forgetting about.

Q Okay. So this case makes six times that you've testified in court since June of 2015, correct?

A Yes. Yes, ma'am.

Q Meaning that half of the times that you've testified in court since June of 2015, have been for OFCCP?

A Let me see, 1, 2, 3. Yes. You're right.

Q And the other half you also testified on behalf of the plaintiff, correct?

A In these cases, yes.

Q Now Dr. Madden, you continue to hold an academic appointment, but that's part time now, correct?

A Yes. It is.

Q At present you currently spend more than half your time on expert witness work, correct?

A Yes. I do.

Q And you're a founding partner of Econsult corporation, correct?

A Yes. I am.

Q And Econsult is a consulting firm whose work includes litigation support, correct?

A Yes. It does.

Q And the work you're doing on this case is through Econsult, correct?

A Yes. It is.

Q You're a founding partner meaning -- strike that. As a founding partner you own about 8 percent of Econsult, correct?

A That's correct.

Q And Econsult has been retained several times by OFCCP, correct?

A I don't know about other than my own.

Q OFCCP is your client in this case, correct?

A Yes.

Q And, Dr. Madden, this is the only case where you've ever offered an expert opinion that involved a software-technology company, that is a company whose products and services relate to the computer software -- relate to computer software, correct?

A I think so.

Q You don't have any reason to believe that, that's not true, correct?

A Yeah. But I'm not recalling all of my cases, but I can’t think of another one.

Q And as you testified, you used the human capital theory as the basis for your approach in this case, correct?

A That's correct.

Q And under the human capital theory, as you testified today, the only factors that should be considered in a statistical analysis of whether there is gender and racial discrimination in compensation by an employer are what you call exogenous factors or characteristics controlled by the employees, correct?

A No.

Q Isn't that what you state in your rebuttal report at page 2?

A Show it to me, I don't think so.

Q Let's take a look.

MS. CONNELL: Can we pull up page 2 of the rebuttal report which is P-2.

JUDGE CLARK: Ms. Herold, can you have someone turn this off, the projector screen that's still up on the wall?

MS. HEROLD: Sure.

JUDGE CLARK: Or have it go dark. Thank you.

Okay. Sorry about that, Ms. Connell, continue.

MS. CONNELL: Sure. I'm waiting for page 2 of Dr. Madden's rebuttal report.

BY MS. CONNELL:

A Page 2 seems to be a table of contents.

JUDGE CLARK: We don't -- I don't think we have it up yet.

THE WITNESS: Okay.

JUDGE CLARK: Yeah. I think we're still waiting.
BY MS. CONNELL:
Q And if I can draw your attention to the first bullet point, you say:
"Statistical analysis of whether there is gender or racial discrimination in compensation by an employer are required to use only exogenous characteristics of employees. Exogenous characteristics are those that the employee not the employer control."
You stated that in your rebuttal report, correct?
A That is correct. And it's not based on human capital theory, it's based on statistical methodology norms.
Q Okay. But that is an approach that you applied in this case, correct?
A I used the standards of scientific science -- of sorry, of scientific statistics, yes.
Q Including that you consider only exogenous characteristics, correct?
A Well no. I violated that, you clearly saw me I put endogenous characteristics in the model to see their effect. But my advice or my scholarly opinion is that only the exogenous characteristics should be used, but I did use endogenous characteristics.

Q You used -- but your -- as you state in your rebuttal report, exogenous characteristics are the only ones that should be considered to determine whether there is gender or racial discrimination in compensation, correct?

A That is correct.

Q And so by exogenous characteristics, you mean characteristics that are unrelated to Oracle, correct?

A That Oracle doesn't control. They are related to Oracle, because you care very much about the employment and experience of your employees I would presume.

Q But that Oracle does not control, correct?

A That's correct.

Q Dr. Madden, you know what a job analysis is, correct?

A Yes.

Q And as you testified at your deposition:

"A job analysis is a study that involves looking at a job, figuring out what the components are and then grouping them into job classifications."

Correct?

A Correct.

Q And as you further confirmed in your deposition:

"Job analyses are typically used in your experience in discrimination cases,

to look at whether there are differences in jobs."

Correct?

A Yes. To control for differences in jobs.

Q But you did not conduct any job analysis of Oracles jobs, correct?

A I did do analysis which control for jobs, if that's what you mean. I did not separately -- I used Oracle's job analyses, I didn't do a different one.

Q You yourself did not conduct any job analysis, correct?

A That's correct. I used Oracle's job codes.

Q But you haven't seen any documentation or read any deposition testimony saying that Oracle intended to use it's job codes to similarly situate employs for purposes of Title 7, correct?

A As I said in my deposition, no I have not. And I presume Oracle is not run by fools, you would never make such a statement.

Q So you have not formed any opinion, you yourself, or even looked at the issue of which employees at Oracle perform similar work, correct?

A I assumed that Oracle knew what it was doing when it set job titles and I used those job titles.

Q But you your --

A I didn't independently evaluate what people were doing. There's no way I could do that and I don't think I would if I had access to do that. I think should use what Oracle has says are the same jobs.

Q You issued two reports in this case?

A I'm sorry.

Q You issued two reports in this case, correct?

A Yes. I did.

Q And as you state in your initial report, it contains the results of the study that OFCCP asked you to perform relating to racial and gender differences in compensation at Oracle headquarters from January 1st, 2013 through December 31st, 2018, correct?

A Oracle didn't -- I'm sorry. OFCCP did not tell me what to study, they asked the questions, I decided what to study to answer the questions. So OFCCP asked me some questions and I then designed the studies that answered the questions.

Q And your initial report contains the results of your study of racial and gender differences in compensation at Oracle's headquarters, from January 1st, 2013, through December 31st, 2018, correct?

A Yes. It does.

Q Similarly -- or not similarly -- but your rebuttal report responds to the comments and analyses of Dr. Ali Saad

that are included in his expert report, submitted on July 19th, 2019, correct?

A Yes.

Q And in conducting your analysis here, you control only for systematic differences in qualifications between men and women or between racial groups at the time of hire, correct?

A No. I control for variables to show there aren't systematic differences, so the only way I could do that is to control for those variables. I control for variables that aren't systematically different, as well as those that are. I simply say that the only ones that matter are those that are.

Q But my question was, you control only for any systematic differences in qualifications between men and women, or between racial groups at the time of hire, correct?

A No. I'm saying that I control for some characteristics that are systematically the same, it's not only those that are systematically different.

Q But you're studying them at the time of hire, correct?

A That's correct. Well that's what I think should be done. I certainly did characteristics after hire.

Q And again you compare only equivalently qualified groups of male and female employees, or groups of Asians and

white employees, or groups of African Americans and white employees, correct?

A That's the goal of the analysis, yes. To make those group -- those employees -- I group among the race -- I group by race to do a comparison between whites and African Americans that have the same characteristics, group them in that fashion, yes.

Q And you believe:

> "That any characteristics that effect whether an individual employees are paid more but that are not possessed by equivalent proportions or at equal levels by both races or by both genders do not matter in an analysis of whether race or gender effects compensation."

Correct?

A Yes. I believe that's a direct quote.

Q The analyses you conducted regarding pay at Oracle are not designed to set individual employee compensation, correct?

A Yes.

Q Yes, that's correct?

A Yes.

Q You believe that a statistical analysis designed to set individual compensation is fundamentally different than

an analysis designed to determine differences in compensation among groups, correct?

A Yes.

Q And you acknowledge that if you want to determine whether any individual should be paid more, you must control for every characteristic by which any individual differs from others, correct?

A Yes.

Q You also believe that by controlling for qualifications that do not differ between groups that you are comparing, for example, gender or race, even when they do differ among employees within each gender or race, that may render a group analysis less precise, correct?

A Yes. It may.

Q And you further believe that compensation differences that cannot be explained by differences in credentials that employees bring to Oracle are suspect if they are associated with gender or race, correct?

A Yes.

Q And when you say associated with gender or race, you mean they differ by gender or race across groups of employees, correct?

A The subsequent provision of those, yes.

Q And when you say suspect, you mean potentially tainted by discrimination, correct?

A Where do you say suspect? I don't know where I said suspect.

Q You just agreed with me that you believe that compensation differences that cannot be explained by differences in credentials that employees bring to Oracle are suspect.

A No. I said subsequent not suspect.

Q Well let's take a look at your report at page 7.

MS. CONNELL: Can you pull that up?

JUDGE CLARK: Again, this is P-1?

MS. CONNELL: Correct.

BY MS. CONNELL:

Q P-1 at page 7 of your report. Let's see if you look at the --

A Yes. That report says that, I didn't just say that now, but that report says that.

Q Well the records -- the record will reflect I said it and you agreed with me. But in any event that's what you state in your report.

A Well I, that statement I agree with.

Q All right. And as you earlier confirmed credentials that -- strike that. So my follow up question was, when you say suspect do you mean potentially tainted by discrimination, correct?

A It could not be the result -- it could be something

other than discrimination, yeah but discrimination's one thing that could do it.

Q You gave some examples of exogenous characteristics such as education, correct?

A Yes.

Q And prior work experience, correct?

A Yes.

Q And you contrast exogenous characteristics with what you call endogenous characteristics, correct?

A Well it's not what I call endogenous, it's what statisticians use to define variables.

Q But that is what you -- and you use that terminology as well, correct?

A Yes, ma'am.

Q And for definitional purposes, endogenous characteristics are other characteristics that influence compensation, but that are controlled by the employer, correct?

A Yes. So they're basically determined by the exogenous characteristics as what you're studying.

Q You believe that job responsibilities are an endogenous characteristic, correct?

A The assignment of them, yes.

Q Well in your report at page 8 you state: "The values of other characteristics that influence compensation

such as" -- well strike that. And you believe that managerial responsibilities are endogenous characteristics, correct?

A Yes. Oracle picks who it has as managers, they don't come from outside.

Q And you believe that global career level is an endogenous characteristic, correct?

A Yes. People don't walk into Oracle having a global career level.

Q And you believe as you state in your report, that any endogenous characteristics cannot be used in any analysis of whether discrimination has occurred, correct?

A That's correct. I'm sorry did you say any -- did you say endogenous -- I might have -- it's any endogenous characteristic cannot be used.

Q That's what I said.

A That's what you said, okay.

Q Instead, as you state in your report:

"It is your expert opinion that endogenous characteristics, if they are used at all, can only be used to assess the mechanisms by which discrimination occurs."

Correct?

A Yes.

Q And, Dr. Madden this is --
A And this is discrimination as economists defined it. Of course courts are free not to agree with economists they pick their own definitions.
Q I'm going to get there. This is not the first time you've applied human capital theory when evaluating claims of discrimination, correct?
A I've done it my entire career in every single case or research I've done.
Q All right. And that would include --
A As would any other economist.
Q And that would include cases like Cooper versus Southern Company, correct?
A I'm sure I did, I don't remember that case very well, but yes I'm sure I would always use human capital theory.
Q And Puffer versus Allstate Insurance Company?
A Yes.
Q Williams versus Boeing?
A Yes.
Q Gosho versus US Bancorp Piper Jaffary?
A Yes.
Q Okay. You were not asked by OFCCP to make any assumptions informing your opinions in this case, correct?
A No.

Q Similarly you weren't asked by counsel for OFCCP to make any assumptions, either, correct?

A Correct.

Q But nevertheless there were some assumptions that you made in conducting your analyses, correct?

A That the job codes represent -- I guess the one assumption I made was that job codes represent areas of training and experience.

Q Isn't it true that you also assumed that absent evidence to the contrary, all employees are equivalently qualified by gender and race?

A No. I didn't assume that, but I think that should be assumed. But no I did not assume that. I think that's -- as an American I think that's how we should approach all cases that people are assumed to be equal unless there's evidence to the contrary.

Q Okay.

A But I'm not using that in my analysis.

Q Well let's take a look at your report, your initial report at page 46 it's Plaintiff's 1. Under the title of assumption. Beginning of the second paragraph you state:

> "In the absence of evidence to the contrary, I assume that employees are equivalently qualified by gender and race."

Correct?

A It says that but it's not necessary to the model. I think as an American that, that's how we start everything.

Q So that is an assumption that you made in this case?

A It's not relevant to the model, but I assumed it, yeah, it's here. I would assume that as an American not as a model.

Q And as you state in your report here on the page, you also assume that:

> "No presumption that one group's unmeasured qualifications or jobs are on average inferior to those of another group should be made when groups have on average equivalent measured qualifications."

Correct?

A Yes. And again, I'm saying that more as an American. I think it's the next thing that's really an assumption of the model.

Q Your analysis control only for certain factors that are measured in some quantifiable way such as age, education level when available, and time at Oracle, correct?

A They do measure those. They also use job descriptor which aren't quantifiable, those are entered in a

qualitative variable fashion.

Q Your analyses do not control for factors that are unmeasured, meaning not captured in some quantifiable way to be used in a regression model, correct?

A That's correct. I didn't make up data. I only used things I had data on.

Q Your reports don't contain any opinions about whether or to what extent decision making at Oracle is centralized, correct?

A That's correct.

Q Now as you've made clear, Dr. Madden, you're an economist and not a lawyer, correct?

A That's correct.

Q And for purposes of the work you did in this case you define compensation discrimination to mean: "Differences in earnings for comparably qualified persons as they entered Oracle," correct?

A That's how I as an economist define it. I of course did other kinds of analyses that would permit different definitions if the law -- if the Court wanted to do that.

Q But that's how you defined it for purposes of this case, correct?

A That's how I define it as an economist.

Q And because you're not a lawyer you don't

understand -- you don't have an understanding of how the definition that you used for compensation discrimination compares to the legal definition of compensation discrimination, correct?

A That's correct.

Q For purposes of your analyses you treated employees who came to Oracle with equivalent education and work experience as similarly situated, correct?

A Yes.

Q And again, because you're not a lawyer, you don't have an understanding of how the definition you use for similarly situated compares to the legal definition of similarly situated, correct?

A That's correct.

Q Nevertheless, you acknowledged that Dr. Saad used a different understanding of similarly situated in his report, correct?

A I don't know about that, he answered a different question.

Q Well you, as you stated in your rebuttal report you concluded, that Dr. Saad defines similarly situated persons as those performing the same job and the same tasks, correct?

A Could I see that, I don't remember that statement?

Q Sure. We can take a look at your rebuttal report, which is P-2 at page 10. Second sentence:

"Dr. Saad defines similarly situated persons as those whom Oracle has defined as similarly situated, that is as those whom Oracle has assigned the same job and the same tasks."

Correct?

A That's correct. I did write that, yes.

Q You also believed that Dr. Saad studied compensation differences within a job, correct?

A Well we both did that. He did it, I did it, yes.

Q Well as you state in your rebuttal report, you believe that Dr. Saad's study answered different question from the question that you addressed in your report, correct?

A Yeah. I think he's looking -- he's looking at is there a pay difference within the same job. He's not looking at whether there's compensation discrepancy across the whole slew of factors that effect compensation.

Q Your analyses do not furnish evidence that every woman in the population you studied was paid less than some men performing substantially similar work, correct?

A No. There were certainly some women that made more than some men.

Q And you agree that merely finding an aggregate disparity in pay between men and women in a company does not necessarily prove that every woman was paid in a

discriminatory manner, correct?

A That's correct.

Q In order to determine whether a given woman was underpaid, you would have to look at individual cases, correct?

A That is correct. But you can use statistics. You can use in general -- I have done this in other cases -- you can sort of look at top 1 percent and look at what the gender differential is between the top 1 percent of women and the top 1 percent of men. You can use 50 percent, you can use the 40th percentile, you can look throughout the whole income distribution.

Q But you would need to look at individual cases, correct?

A Well this is not -- no. I wanted to give that, because it's not individual cases, it's looking at sort of where you are in the overall income distribution, what's the evidence that gender's having an impact.

Q I want to take a look at table 1 which we looked at earlier today. It's on P-1. Okay. So table 1 reports the results of the regression analysis on medicare earnings for women compared to men at Oracle's headquarters, correct?

A Yes.

Q And medicare earnings is a measure taken from employee W-2 data, correct?

A Yes.

Q And medicare earnings reflect the medicare taxed amount received by the employee from Oracle in that calendar year, correct?

A Yes.

Q And you agree that medicare earnings can sometimes reflect earnings based on decisions made in other years such as exercising stock options that were awarded previously but were exercised in the year being studied, correct?

A Yes.

Q This table 1a analysis looks at all employees aggregated across the three job functions as long as they had been there the entire year, correct?

A It includes all employees employed in any of those three job functions, yes.

Q In a single analysis that includes both ICs and M career levels, correct?

A Yes. But table 6 -- column 6, 7, and 8 control for that.

Q You mentioned job codes. This analysis includes employees who worked in over 100 a different job codes in each of these years, correct?

A I'm sorry, I don't know. I would have to look at my output to answer that specifically.

Q Do you have any reason to believe that, that's

incorrect?

A I have no reason to believe one way or the other, it's certainly possible.

Q The model underlying table 1a, is the same model that you used underlying tables 2a, except that table 1a focuses on gender differences across the three functions while the table 2a focuses on difference between Asian and white employees in product development only, correct?

A That's correct.

Q Similarly the model underlying 1a is the same as the model underlying 3a, except that table 1a focused on gender differences across the three functions while table 3a focuses on differences between African American and white employees in product development, alone, correct?

A Yes.

Q Now looking at the columns, the various columns. As you testified this morning, column 1 controls for gender only, so that's the raw gender difference between men and women, correct?

A Yes.

Q And then in column 2 you've added a control for race or ethnicity, correct?

A Yes.

Q And that's generally the way this table works. Each time you move a column to the right, you're adding a new

control, correct?

A Yes. And keeping the ones before it.

Q Correct. So in column 3 you've added controls for age for each employee as of year end, correct?

A Yes.

Q And as you've explained in your report and this morning, you used age here in an effort to reflect experience at other employers, correct?

A Yes.

Q So age is a proxy for prior experience, is that correct?

A Yes.

Q You had access to resumes in this case for many Oracle employees, correct?

A For a minority, yes.

Q Initially, you looked at those resumes to see if there was specific prior experience in them, correct?

A Yes.

Q And the reason that you were interested in looking at specific prior experience is because it would have given a more precise estimation than using more generalized experience, correct?

A I don't know if it would be -- well yes, I guess, you would say it would be more precise. I would certainly want to use that if I could, but the problem was is I --

Oracle provided no system by which I could match the resumes to the employees.

Q Okay.

A So we weren't able to do that.

Q Well you anticipated my next question. You did not use the information regarding specific prior experience on the resumes because you determined that it was pretty much unusable, correct?

A That's correct. We just -- I mean, we could match some but we couldn't match a great deal of them and then we had many employees that there were no applications for. So it was just available for a very small share of the employees in the end.

Q Well you had them for thousands of employees, correct?

A We had resumes, but they weren't matched to employees. We had thousands of resumes, they weren't matched to the employees in the database and I was given no transport to allow that to happen.

Q So when you testified that you found this information unusable, you mean -- by unusable you mean something that was not going to be easily put into your statistical model, correct?

A I meant, it was something that couldn't be put into a statistical model.

Q Going back to table 1, in column 4 you add a control for education, correct?

A Yes.

Q And by education the control you used controls for the employees highest level of degree earned, meaning for example a bachelor's degree, a master's degree, or a doctorate, correct?

A Correct.

Q And as you testified this morning, that information is missing for more than half of the employees in this population, correct?

A Yes.

Q And so you coded those employees as unknown for education, correct?

A That's correct.

Q So the education variable that you used in column 4, does not reflect the subject in which the degree was obtained, correct?

A Column 4 does not. No. You need to go to column 6 for that.

Q My question's about column 4. So column 4 does not reflect the subject of the degree, correct?

A I'll repeat my answer. Column 4 does not, you have to go to column 6 for that.

Q And column 4 does not reflect the school from which

the degree was obtained, correct?

A I would never include that, no.

Q And it does not reflect whether the degree recipient earned honors, correct?

A Correct.

Q This education variable you used does not attempt to capture the relevance of the particular degree to any particular position that the employee holds at Oracle, correct?

A Correct.

Q You next add, in column 5, time at Oracle, correct?

A Yes.

Q And the time at Oracle variable that you used does not capture any time previously spent at an international affiliate of Oracle such as working at Oracle India, correct.

A No. That's correct. It would be in the age variable.

Q And it does not capture any time that the employee worked at a company acquired by Oracle prior to the employee becoming employed by Oracle post-acquisition, correct?

A I believe that's so, I'm not a 100 percent sure. I'd have to check that.

Q You did not make an adjustment to this time at Oracle variable to account for time employees -- excuse me. You did make an adjustment to this time at Oracle variable to

account for time that employees spent on leaves of absence, correct?

A Yes.

Q And you did that by deducting the sum of their leave time in the data from their time at Oracle, correct?

A Yes.

Q So for example, if an employee had been with Oracle for six years as of the date of the analysis, but had taken two separate six months leaves of absence, you would have to treated the employee as having only five years of time at Oracle, not six years, correct?

A Yes.

Q And you used that same approach to account for leave time for both male and female employees, correct?

A Yes.

Q Now as you recognize in your report, the characteristics added as controls in columns 1 through 5 and table 1a, are exogenous to Oracle, correct?

A Yes.

Q And as we've already testified, your view is that when determining whether discrimination occurred, you should only consider exogenous factors, correct?

A Yes. When you are -- yes. That's true generally. Right.

Q And as you further explain in your initial report

in table 1a, columns 6, 7, and 8 evaluate the effects of endogenous characteristics on the gender differentials in compensation at Oracle, correct?

A That's correct. Though I use job descriptor as an index of an exogenous variable, that would be the area of education and experience.

Q But you never do that for job -- for current job descriptor as you explain in footnote 13 of your report, you question whether you might be able to consider job descriptor at hire as an endogenous characteristic reflecting prior experience?

A Well I certainly do both. I think I did both.

Q In your initial report, you never opine that job descriptor -- current job descriptor could be used as an endogenous -- excuse me. In your initial report, you never opined that current job descriptor could be used as an endogenous characteristic, correct?

A I think I did, I would like to look at my report to check that.

Q Okay.

MS. CONNELL: Do we have a hard copy of Dr. Madden's report?

JUDGE CLARK: And Ms. Connell, when you have a good place to stop, let us know, we'll take an afternoon break.

MS. CONNELL: Okay. Well if she wants to take a

look at her report, then maybe this would be a good time.

JUDGE CLARK: Okay.

UNIDENTIFIED MALE: And I'll put a copy on --

JUDGE CLARK: Okay. Well we're going to go ahead and take a 10 minute break then and then Dr. Madden --

THE WITNESS: But I do have to go to the restroom, so I hope I have --

JUDGE CLARK: Yeah. You'll look at it hopefully before you hit the stand again.

MS. HEROLD: I have it actually.

JUDGE CLARK: We'll be off the record for 10 minutes.

(Off the record at 2:50 o'clock p.m.)

JUDGE CLARK: Okay. We are back on the record, all parties are present, Dr. Madden has retaken the stand.

Did you take a look at the report they asked you to?

THE WITNESS: Yes. Yes. I did. Shall --

JUDGE CLARK: No.

THE WITNESS: Shall I just answer?

JUDGE CLARK: No. Let Ms. Connell ask another question.

THE WITNESS: Okay.

BY MS. CONNELL:

Q I believe my question was, in your initial report

you never opine that job descriptor, current job descriptor, could be deemed an exogenous characteristic, correct?

A No. That's not correct.

Q Okay. Where are you?

A If you look at, as I number the report pages 28 to 29 as this report is numbered pages 30 to 31, I write: "Regardless of whether these assignments -- referring, this is now from table 2a the Asian difference" --

JUDGE CLARK: So Dr. Madden, hang on a second while we all get there, okay.

THE WITNESS: Okay. Fair enough.

JUDGE CLARK: Okay.

Do you want to bring it up or not, Ms. Connell?

BY MS. CONNELL:

Q I'm sorry, what page are you on?

A It's 28 to 29 in my report, but there's a number 30 to 31 on the corner, so I don't know how it works. Yes. All right. Here we are. Yes.

So if you look at the bottom here, I write:

"Regardless of whether these assignments -- and this column 6 of table 2a, so it's representing the job descriptor, the current job descriptor -- represent the areas of education and experience of the hires, or the more

arbitrary decisions by Oracle, they do not effect the compensation of Asian employees as a group versus whites as a group."

So there I'm explicitly acknowledging, that, that may reflect areas of experience and education. I didn't find it in the gender section. I probably omitted it there, but it does appear here and I don't know if it appears for race as well, but there's clearly an indication that I was considering it that way in this report.

MS. CONNELL: Here. Cliff can you move the -- I'm sorry, just the highlighted boxes.

BY MS. CONNELL:

Q At columns -- I want to draw your attention to page 16 of the report.

A Page what?

Q Page 16 of your report. At page 16 of your report, you state that:

"Columns 6, 7, and 8 of table 1a evaluate the effects of endogenous characteristics on the gender differentials in compensation."

Correct?

A Yes. It's an endogenous variable that I use as an index of an exogenous characteristic, as I said in my

testimony.

Q And as you explain, for purposes of determining whether discrimination occurred at Oracle, you consider only exogenous characteristics, correct?

A As a proper model, measure of an economists definition of discrimination, yes.

Q Okay. So let's go back to table 1a. So in column 6 of table 1a you add a control for job descriptor as well as exempt, non-exempt status, correct?

A Yes.

Q And I believe that you testified earlier that you believe that this control could be used to determine the type of degree that an employee holds, correct?

A It could be used to reflect the specialization and education and in prior experience, both.

Q So your testimony is, is that by looking at the job descriptor and job descriptor is as we testified earlier, it is similar to Oracle's measure for job family, correct?

A I don't know about that. It's the job title that Oracle gives. The alphanumeric job title. If that's job family -- I thought job family, I thought that's what the subfunctions are. I'm sorry, I haven't used the term job family and I haven't looked at that.

Q So you testified that is was job title without career level, correct?

A Yes. That's what it is.

Q So this would -- your job descriptors include employees ranging from the lowest IC level to the highest IC level and the lowest M level to the highest M level with that job title, correct?

A That's correct. To represent the area of specialization, yes.

Q And your testimony is that looking at that job descriptor, that current job descriptor, you can tell the type of education degree that an employee held when they applied at Oracle, is that correct?

A Well that's why I go back to look at hire to see how that works out. So either one you can use, but here I'm just using as an index the current job descriptor but we -- I also went back in the report and looked at the original job descriptor.

JUDGE CLARK: So, Dr. Madden, I don't think you've answered question.

THE WITNESS: Okay.

JUDGE CLARK: Ms. Connell, ask the question again, please.

BY MS. CONNELL:

Q My question was, I just want to make sure that your testimony is clear. You testified that column 6 in table 1a could be used to determine the type of educational degree

that an employee held when they applied at Oracle. I just want to confirm that, that's your testimony.'

MS. HEROLD: Objection. Misstates testimony.

JUDGE CLARK: Overruled.

BY MS. CONNELL:

A Okay. I did not never use the word type. What I said is it showed the area of specialization of education and prior experience, both.

Q So you could never tell the major of someone's degree by looking to column 6, correct?

A You would have to -- I mean, this is far to detailed for a major. I mean, majors are much more aggregated then this, so you would have to aggregate across these to get a major, this is more specific than a major.

So, for example, software development, that's probably computer majors in some sense. Somebody that's a marketing research person, is probably a marketing major. Somebody that's an internet sales consulting is probably got a computer background as well, but I'm looking at more specific than the computer background. So it's more specific than a major.

Q So those are assumptions that you're making when you say probably, you don't actually know that, correct?

A I'm a labor economist, I've done a lot of job coding, I think that, that's reasonably the case. I'm using

my professional judgement as an economist --

Q But my question was --

A -- can I finish. I'm using my professional judgement as an economist to make that claim.

Q But you still haven't answered the question, you don't actually know that from column 6, correct?

A Know that people who majored -- who are in software development had a computer major? No I don't.

Q Okay. No. Know that the specific type of degree that someone held when they were hired at Oracle by looking at column 6 in table 1a?

A I don't actually know -- I care about groups, not individuals. I don't know that the group of people that are in marketing research jobs are generally in marketing majors. That I indeed I did not check that detail, I don't know that.

Q That was not --

A But that's what -- oh. I'm sorry, I'm not understanding your question.

JUDGE CLARK: Yeah. That's sustained. The answer's non-responsive.

Ask your question again, please.

BY MS. CONNELL:

Q My question was, you don't actually know the type of degree, the field of study that someone -- that someone --

the type of degree that someone held when they entered Oracle by looking at column 6 in table 1a? You don't know that, correct?

A Well the type of degree is column 4, the area of specialization of the degree is column 6 --

JUDGE CLARK: Dr. Madden.

BY MS. CONNELL:

A -- and if you're asking me do I know that subject, no.

JUDGE CLARK: Dr. Madden, excuse me. Your answer is non-responsive, if you would just listen to the question you should be able to answer that question directly and not offer more information. So, if you can just listen to the question, and do your best just to answer that if you can.

Ask it again, Ms. Connell.

BY MS. CONNELL:

Q My question was -- from column 6, you don't actually know the type of degree that someone held when they were hired by Oracle, correct?

A That does not tell me the type of degree whether it's bachelor's, master's, or doctorate, that's the type of degree, that's the problem I'm having with the question. Type of degree is whether it's bachelor's, master's, or doctorate and that is not in column 6.

Q Nor can you tell the field of study, correct?

A Now that I can -- that I'm comfortable answering. I don't know for an individual that the field of study matches the job descriptor.

Q Okay. Now as we discussed, job descriptor is a variable that you created by aggregating Oracle's job titles in removing career levels, correct?

A Yes.

Q So column 6 does not include a control for an employee's job code, correct?

A That's correct.

Q Some of these job descriptors that you created contain thousands of employees, correct?

A Some of these what that I created?

Q Job descriptors.

A I would be surprised. I don't know. I don't know the answer to that question. But given that none of these studies had more than 4,000 people in them, for one of these descriptors to have thousands it would have to be one descriptor that is almost the whole data set and I don't remember seeing that.

Q How about the software developers? There are 1,000s of software developers in your software developer job descriptor, correct?

A I don't know within any of these equations that, that's true. I do not know that. I do not think, for

example in table 1a here, where I've only got 4,000 people that I've got 2,000 or more in that job descriptor, I don't know the answer to that question, but I'd be surprised.

Q Well let's take a look at your deposition transcript at page 81 lines 15 to 18. You were asked the question: "There are thousands of software developers in your software developer descriptor correct?" And you answered the question: "Yes." Does that refresh your recollection, Dr. Madden?

A I may have said that, but I said I don't have the data on that, and as I look at these numbers I mis-answered that. It may be the case, but I would be very surprised that out of 4,000 people I've got more than 2,000 that are software developers.

Q The test -- but you did give that testimony under oath at your deposition, correct?

A Yes. It was what -- I did the best I could. You might have remembered that I had just come out of surgery and had not been able to review any data before the deposition.

MS. CONNELL: I'll move to --

BY MS. CONNELL:

A So I don't -- I don't remember. I mean if I said that I don't --

JUDGE CLARK: So, Dr. Madden, I appreciate that. Your answer is non-responsive and it's also narrative at this

point. Just do your best to focus on the question that's answered [sic] and just answer the question that's asked. I appreciate that you have more information and that's --

THE WITNESS: Yes.

JUDGE CLARK: -- what Ms. Herold will have an opportunity to do if she needs to. She can clarify things on redirect if she needs to.

Ms. Connell, continue.

BY MS. CONNELL:

Q One of the job descriptors that you created is a job descriptor for apps developer, correct?

A Yes.

Q And the apps developer job descriptor contains individual contributor levels 1 through 5 as well as application developer architects, correct?

A Yes.

Q Another job descriptor that you created is for software development, correct?

A Yes.

Q And that software development job descriptor contains -- includes software developers at individual contributor levels 1 through 5, as well as software developer architects, as well as management level employees form software developer managers, senior managers, directors, senior directors, all the way up to vice presidents, correct?

A It includes all the employees in software development, yes.

Q And you don't know whether there are differences in the skills that are needed to be an app developer versus a software developer at Oracle, correct?

A No. The model tells me that. The model controls for that. But no I don't personally know that.

Q And as you testified at your deposition, you would rely on Oracle's judgement over yours in distinguishing the skills needed for these two different job descriptors, correct?

A Yes.

Q Looking now to column 7. You add a control for whether an employee is an individual contributor or a manager, correct?

A Yes.

Q But column 7 does not distinguish, between entry level individual contributors, and architect level individual contributors, correct?

A Right. It's only distinguishing whether you're in management.

Q And it doesn't control between entry level managers and vice presidents, correct?

A That's correct.

Q In column 8 you layer on a control for global

career level, correct?

A Yes.

Q And there can be many different jobs at Oracle across different job descriptors that are all mapped to the same global career level, correct?

A I'm sorry, say that again.

Q There can be many different jobs at Oracle across the different job descriptors that all have the same global career level. So you could have an apps developer 1 and a software developer 1, correct?

A Oh. Yes. I'm sorry, I just didn't understand. Yes. The same GCL code of 1, 2, 3, or 4, can have several different job descriptors, job titles.

Q And I think you testified earlier today that although you -- essentially by the time you get to column 8, your controlling for job code, correct?

A Yes.

Q And you're aware that at Oracle job codes are mapped to salary ranges, correct?

A Are not what?

Q Are mapped to salary ranges, correct?

A Yes.

Q And for the job codes at issue here those ranges are often quite broad, correct?

A Yes.

Q And as you testified at deposition, those salary ranges are broad to account for the fact that within a job code you have people with different educational degrees, different experience, and different skill levels, correct?

A Yes.

Q I want to ask you about a statistical concept known as R-squared. In a regression analysis, you define R-squared as measuring the proportion of the variation across individual observations that's explained by the particular variables in that regression analysis, correct?

A Yes.

Q In other words, R-squared measures -- the R-squared value measures the percentage of variation in the dependant variable that is accounted for by all of the explanatory variables in the model, correct?

A For individuals, yes.

Q And in your regression analyses in this case, the dependant variable is pay, correct?

A Various forms of pay, yes.

Q So a pay model whose R-squared is .5, is one in which 50 percent of the variation in pay remains unexplained by the model, correct?

A The variation across individuals, yes.

Q And a pay model whose R-squared is .2, is one in which the model explains only 20 percent of the variation in

pay and 80 percent of the variation in pay remains unexplained by the model, correct?

A Across individuals, yes.

Q Well you were asked these questions in deposition and you did not qualify them by saying by individuals, correct?

A I think it's informative, I think it explains it better to do that.

Q Okay. Well let's take a -- my question was -- yeah you didn't answer the question. My question was, at deposition when you were asked about R-squared, you didn't qualify your answers by referring to individuals, correct?

A I don't know. You'd have to show me that, I don't remember that detail.

Q All right. Well let's take a look at your deposition transcript at page 222, lines 4 through 10, actually the question begins up above.

JUDGE CLARK: So you need to start at 221?

MS. CONNELL: Yeah.

JUDGE CLARK: Got it.

BY MS. CONNELL:

Q So at 221. I guess, it would go all the ways backup to the line 10. The initial question was asking you about R-squared. You said: "That you would prefer to use your own definition." And then down -- beginning at lines

23, you said:

"I will tell you to the -- that's actually very close. I will tell you to the Federal Judicial Center's reference manual on multiple regressions, which defines an R-squared as: 'A statistic that measures the percentage of variation in the dependant variable that is accounted for by all of the explanation variables.'

Yes. Do you agree with that? Yes."

That was your testimony, correct?

A Yes. But I note the individuals come in the next set of questions, that clarification is made, following that, immediately following that.

Q The backup log files that you provided in this case, indicate the R-squared values associated with each of your pay models, correct?

A Yes.

Q None of the R-squared values appear in either of your reports though, correct? They're only in your backup files?

A That's correct. I never published R-squareds, they're not usually done in research, because they don't matter for this research.

MS. CONNELL: I'll move to strike as

non-responsive.

JUDGE CLARK: I'm going to let the answer stand.

But Doctor, you do have a tendency just to volunteer information that's not asked of you. So if you could just focus on answer the question. And if Ms. Herold wants to ask some follow up, she will be more than capable and more than glad to do that later.

MS. HEROLD: I appreciate the vote of confidence.

BY MS. CONNELL:

Q Dr. Madden, I want to turn to your base pay models, but before doing that, I just want to quickly acknowledge the other tables that you did regarding medicare earnings.

MS. CONNELL: First, can we pull up table 1b in the initial report?

BY MS. CONNELL:

Q In table 1b you use the same model as 1a except that the employee population you analyzed excludes employees that you previously had designated in table 1a as having unknown education information, correct?

A Yes.

Q That explains why the number of workers analyzed in each year under the column heading number of workers, is less than half in table 1b than it is in table 1a, correct?

A Yes.

Q And then as you move from left to right, you

continually add the same columns in table 1b that you added in table 1a, correct?

A Yes.

Q And similarly table 2b is similar to table 1b, except that in 2b you analyze the results for Asian employees compared to whites, correct?

A Yes.

Q And similarly in 2b you excluded from the model employees for whom you previously had designated their educational information as unknown, correct?

A Yes.

Q And you did not generate an analog of table 1b or 2b for African Americans, correct?

A Yes. I didn't have enough people, as I said.

Q Turning now to table 1c. Table 1c analyzes medicare earnings except in terms of the employee populations analyzed, it analyzes only those employees for whom you knew their job descriptor at hire, correct?

A Yes.

Q And in the model at table 1c, it's the same table as model -- same model as table 1a through column 5. But the columns and factors differ starting with column 6, correct?

A No. They differ starting at column 7. Just a minute. Oh. I'm sorry. No I misstated that. You're correct. Column 6 it starts the difference, yes.

Q So this has job descriptor at hire, where as table 1a had current job descriptor, correct?

A That's correct.

Q And then in column 6 -- excuse me -- column 7 -- strike that. So column 6 reports differences in current pay for employees who shared a job descriptor at hire along with columns 1 through 5 regardless of the job they held in the year being analyzed, correct?

A That's correct.

Q And then column 7 removes job descriptor at hire and adds whether the employee is currently exempt or non-exempt as well as their current job descriptor, correct?

A Right.

Q And then column 8 adds current global career level, correct?

A Yes.

Q And then column 9 adds back in job descriptor at the time of hire, correct?

A Yes.

Q So you don't include in this analysis, a control for global career level at hire, correct?

A No. This analysis does not do that.

Q And 2 -- excuse me -- 2c is the same model as 1c except studying pay for Asian employees, correct?

A Yes.

Q And you did not generate an analog of table 1c for African Americans employees, correct?

A That's correct. I didn't have enough data.

Q And turning now to the base pay models which are at 1d. Table 1d uses the same columns or factors as table 1a, but the groups of employees that you analyzed are slightly different, correct?

A Yes. And the dependant variable is different, too.

Q Correct. This is base pay and not medicare earnings?

A Yes.

Q And the model underlying 1d is the same as 2d except that 1d focuses on gender and 2d focuses on Asians versus whites, correct?

A Yes.

Q And the model underlying 1d is the same as 3d, except 1d focuses on gender differences across the 3 job functions and 3b focuses on differences between African Americans and white in product development only, correct?

A Yes. 3b is base pay. Let's see, this is. Yes. Table 1d and table -- is by gender, table 3b is the same thing by race.

Q In addition to base pay you conducted analyses of stock, correct?

A Yes.

Q And that's table 1g, correct?

A Yes.

MS. CONNELL: Can we pull up 1g of her initial report?

BY MS. CONNELL:

Q So table 1g uses the same model as table 1a, except in column 7, correct?

A Yes.

Q In column 7, you introduce instead of -- in column a [sic] you introduced a control for management level in column 7, but here in table 1g you introduce a variable called performance rating as a control, correct?

A Yes.

Q And you created this performance rating variable by taking the highest performance rating that you found for a given employee in the compensation tool for a given year, correct?

A Yes.

Q And the model underlying 1g is the same model underlying 2g, except that 1g focuses on gender differences across the 3 functions, while table 2g focuses on differences between Asians and white employees in prod dev only, correct?

A Yes.

Q And table 1g is the same model as the model underlying 3c, except that 1g focuses on gender --

A I'm sorry. I lost focus. Would you start again?
Q 1g is the same as 3c except that 1g focuses on gender across all 3 functions and 3c focuses on differences between African Americans and white employees in prod dev only, correct?
A Yes.
Q This morning you testified about these tables, correct?
A Yes.
Q But this morning when you testified, you testified that column 7 added a control for management -- a management control, correct?
A Yes. That seems to be a mislabeling. You are quite correct. Column 7 should be what it's labeled here, it should be performance rating.
Q And so the column -- so the table 1g that you testified about this morning was inaccurate in that it stated that -- your testimony this morning stated that column 7 added a control for management control, instead of performance rating, correct?
A Yes. It should be performance rating, which is in the report. It's a mislabeling of the column.
Q You made the same error with respect to table 3b this morning, correct?
A That's correct.

Q And you made the same error with respect to table 2g this morning, correct?

A Correct.

Q You also controlled for performance rating in your analysis -- so you controlled for performance rating of your analysis in stock awards, but you did not control for performance rating in medicare earnings or base pay, correct?

A That's correct.

Q In addition to analyzing base pay and stock awards, you also analyzed in your initial -- you did some analyses regarding bonuses, correct?

A Yes.

Q And you acknowledged in your report in footnotes, footnotes 4, 15, and 18, that you analyzed bonus differences by race and gender using the same approach as you use for stock awards, correct?

A Yes.

Q But you didn't include any of those regression results in your initial report, correct?

A No.

Q You ran those analyses for only two years, 2014, and 2018, correct?

A Yes.

Q And when you included all of the factors that you included in your stock awards, you found no statistically

significant differences in bonus awards by gender, in either 2014, or 2018, correct?

A I better check that. I thought I did. I'm sorry. I thought I had it in 2014. Just let me check.

Q It's at footnote 4 on page 13 of your initial report.

A Yikes. No. That's what I thought. I found statistically significant lower bonuses for women in 2014.

Q When you added --

A So I testified correctly, its 2014 was statistically significant lower but not for 2018.

Q But when you added global career level there were no gender differences in bonus, correct?

A That's correct.

Q And you did not find any statistically significant differences in bonus awards by race in 2014 for either Asians or African Americans, correct?

A Just a moment, because I don't remember doing it for African Americans that's what I have to check.

Q It's at page 38, footnote 18.

A Okay. Yes. I found no significant differences for African Americans.

Q Or Asians in 2014, correct?

A Or Asians in 2014 as I testified.

Q And when you removed in 20 -- and for 2018, after

you removed two white outliers who received particularly high bonuses you found no statistically significant differences in bonus awards by race in either year, correct?

A That's correct.

Q Dr. Madden, you also did an analysis regarding starting pay, correct?

A Yes.

Q In table 4, you present the results of your analysis of what you described as the ties between starting pay, gender, and racial differences and prior pay, gender, and racial differences, correct?

A Yes.

Q And for this analysis you wanted to focus on employees who had prior pre-Oracle salary information in Oracle's records, correct?

A Yes.

Q And among the 4,868 employees who had some value for prior salary, you ended up being able to use only data for 1,887 employees, correct?

A Let me check those counts.

Q I believe it's at page 49 of your report.

A Page 49. That is helpful, thank you. Yes. Well -- so your saying how many -- well I had 4,868 and then I had the sum of these three numbers, 12, 58, 1080 and 245 so about 25- what 2600 did you add them?

Q I believe that there were 1387 -- 1,387 employees that you analyzed, correct?

A No. That's not right. Look at table 4. The sum is 1258 -- oh I see but there's a double count of whites. So I can't simply add those. Yeah. I say 1,387, right.

Q Okay. And in part that's because over 1,000 employees had a 0 or a blank or unknown indicated in the prior salary field in the database, correct?

A Yes.

Q So looking at table 4, there's basically 3 panels, correct, looking from top to bottom?

A Yes.

Q And the factors that you controlled for are listed on the left above each of the three panels, correct?

A Yes.

Q And as you testified this morning -- well strike that. Your conclusion from the analyses reported in table 4 is as you wrote in your report, that: "Salary at an employee's prior employer closely predicts their starting pay at Oracle," correct?

A Can you point me to where I said that?

Q On page 49.

A I don't see the word predict, where are you getting that from, that's what I want to see the context.

MS. CONNELL: Can you pull up page 49, please,

Cliff?

BY MS. CONNELL:

Q Under base salary at hire, four lines from the top.

A Base salary at hire. Okay. I did write that. Yes. "Salary at an employee's prior employer closely predicts their starting salary at Oracle." Correct

Q And you base that conclusion in part on a comparison going back to table 4 of the gender and race coefficients in column 2 and column 3, correct?

A Yes.

Q And that's reflected in column 4 that difference, correct?

A Yes.

Q In other words, you note a correlation between starting pay differentials and prior pay differentials, correct?

A Yes.

Q And as you explain in your report, column 4 of table 4 shows that there is no statistically significant difference by gender or race between starting pay and prior pay, correct?

A Yes.

Q In other words, you interpret column 4 of table 4 to show that the correlation between prior pay and starting pay for the employees that you studied did not differ by race

or gender, correct?

A Yes.

Q You agree, however, that when looking at a regression analysis, a correlation between two variables doesn't necessarily mean that one is causal with respect to the other, correct?

A Yes.

Q And you further agree that even in a situation where an employer does not ask about prior pay, you would expect to see starting pay correlated with prior pay, correct?

A Yes.

Q And you would expect to see that correlation because both the prior employer and the new employer are looking at the same skill package that the particular employee has, correct?

A Yes.

Q In your initial report, you did not conduct any analysis that studied the specific job requisitions to which employees applied, correct?

A Yes.

Q Just to make sure that we're -- there's no double negative, yes that's correct?

A Yes. That's correct.

Q Okay. And to confirm, you did not conduct any

analysis in your initial report that studied whether there were differences based in race and gender, when comparing the level on the job requisition to which people applied and the level of the job into which they ultimately were hired, correct?

A Yes.

Q And when you use the word -- you use the word assign quite a bit in your reports, and when you say that a job was assigned by Oracle, you mean that the person holds that job at Oracle, correct?

A Yes.

Q You have a section in your initial report entitled Job Assignments at Hire that starts on page 50, correct?

A Yes.

Q And the section of your report -- that section of your report corresponds with tables 5, 6, and 7, correct?

A Yes.

Q And as you explain in your report, the purpose of the analyses reflected in tables 5, 6, and 7 is to study the role of job assignments at hire on gender and racial differences in compensation, correct?

A Current compensation, yes.

Q Exactly. Current compensation. So table 5a reports differences in medicare earnings between men and women after controlling for a series of factors, correct?

A Yes.

Q And table 5b has the same structure as table 5a in terms of the factors included, but the dependant variable in table 5b is base pay rather than medicare earnings, correct?

A Yes.

Q And in table 6a, this table parallels table 5a, except that it studies medicare earnings differences between Asian and white employees rather than men and women, correct?

A Yes.

Q And table 6b has the same structure as table 6a in terms of the factors included, but the dependant variable in 6b is base pay rather than medicare earnings, correct?

A Yes.

Q And turning to table 7a, this table parallels 5a except that it studies medicare earning differences between African Americans and white employees rather than men and women, correct?

A Yes.

Q And 7b has the same structure as 7a in terms of factors included, but the dependant variable in table 7b is base pay rather than medicare earnings, correct?

A Yes.

Q Okay. So since all of these tables have the same basic structure, I want to turn back to table 5a. In table 5a you state that the first column reports gender differences

in medicare earnings when you control for exogenous worker employee characteristics, which you define here as race, ethnicity, age, education, and time at Oracle, along with two other variables, job descriptor at hire and career level at hire, correct?

A Yes.

Q So again in the first column at 5a, you're looking at differences in current medicare earnings controlling with those variables including job descriptor at hire and level at hire, correct?

A That current for the year listed.

Q That's what I mean.

A Yes.

Q Right. So nothing in this column or in 5a generally evaluates how it is that a given employee came to have the particular job descriptor at hire, correct?

A That's correct.

Q Similarly, nothing in this column or in table 5a generally evaluates how it is that a given employee came to have the particular career level at hire, correct?

A Sorry. I don't understand the difference between these two questions, so I'm afraid I missed something.

Q The prior question was about job descriptor at hire and this question is about career level at hire.

A Sorry. I missed that, it's getting late. But

you're right, it doesn't talk about how you came to that, that's correct.

Q And that would be true -- well strike that. And in moving to column 2 of table 5a, you add controls for current job descriptor and whether an employee currently works in an exempt or non-exempt position, correct?

A Yes.

Q But nothing in this column evaluates how it is that an employee came to have a particular job descriptor, current job descriptor, correct?

A That's correct.

Q And then column 3 of 5a adds a control for current global career level, correct?

A Yes.

Q But again, nothing in this column evaluates, or in table 5a generally, evaluates how it is that a given employee came to have a particular current global career level, correct?

A Well, I think I would object to that characterization. Because we know that it had to have happened through differences in promotion. Looking at the disparity, because that's the only thing that it could be.

So how the gender disparity in global career level happens, we know it's got to be difference in promotion from the current, because we're controlling from the current and

we see the drop in the disparity.

Q But again, you're basing the conclusion that you just articulated based on differences in pay, correct?

A Yes. But it has to be a difference in the global career level, that's the only thing that could explain that. The pace of moving to higher level career levels have to be different to get this result, that's the only explanation that's logically possible.

Q But you're drawing that conclusion again, based on an analysis of pay data, not on -- you didn't analyze, for example if employees requested to transfer, or request a promotion, you didn't analyze the mechanisms by which they move from global career level to global career level, correct?

A I didn't look at the mechanisms by what why which the promotion levels were different, just that the promotion levels had to be different.

Q And that's based on your analysis of pay data, correct?

A Yes.

Q And as we discussed the structure of the model underlying this, the columns in table 5a is the same as the structure underlying the columns in tables 5b, 6a, 6b, 7a, and 7b, correct?

A Yes.

Q So in your initial report, you did do a promotions analysis that looked at career level advancement, correct?

A Yes.

Q You looked at the relative likelihood of advancement into higher career levels for men versus women, correct?

A What are you referring to? I want to make sure I'm following you here.

Q I'm referring to appendix B of your initial report.

A Oh. Appendix B. Okay. Yes.

Q You reported those results in Appendix B, but not in the body of your report, correct?

A I described them, I didn't report -- but I describe them in the body of my report, but the table is in the appendix.

Q And you reported results for only two global career levels IC3 and IC4, correct?

A Yes. Two of the larger ones.

Q The backup files for this analysis contain results you generated for other IC levels and M levels as well, correct?

A Yes.

Q And the backup files show that your models show no statistically significant differences adverse to women in any other global career level aside from the two that you

reported, correct?

A I believe that's the case because the data samples were much smaller. But I also believe that if you did an overall analysis, overall it's significant as well.

Q Well those results would be in your backup files, correct?

A What results?

Q The results of the analyses that you ran, correct?

A The result of these -- of this analysis, yes.

Q Okay. And the model -- your model also showed that women were statistically significantly more likely to be promoted from the M5 level to the M6 level, correct?

A That was the one case that was opposite, yes, for that particular promotion.

Q You didn't report that result in Appendix B, correct?

A No. Because it was very small. I mean, these are the large jobs, this is what's changed --

MS. CONNELL: Move to strike as --

BY MS. CONNELL:

A -- but this is what's --

MS. CONNELL: -- non-responsive.

JUDGE CLARK: That's sustained.

Ask your question -- ask another question.

BY MS. CONNELL:

Q Okay. You reported results in Appendix B for women but not for Asians or African Americans, correct?

A That's correct.

Q And as you testified in deposition there is no evidence of any difference in the likelihood of promotion, meaning career level advancement, for Asians compared to whites, correct?

A Yes. And that was in my original report.

Q Okay. I would now like to turn to your rebuttal report. Well before doing that, you've testified that job descriptor at hire could be an exogenous characteristic that measures the field or area of prior work experience or education, correct?

A Yes.

Q But you have never opined that job descriptor, whether at hire or at current job descriptor would be a permissible job control, correct?

A I don't understand what you mean by job control, what's the purpose I don't understand. Would it be permissible for what?

Q Well in your rebuttal report at page 13, you say:

"I use education, and non-Oracle experience along with other characteristics including time at Oracle and job descriptors, not as job controls but as

measures of the field or area in which education and prior work experience occurred."

A Sorry. Where are you? I didn't follow this because you started reading before I got this up. Where do you start in here?

Q It's at the very top of the --

A Okay. Let me read it, please.

Q Actually, sorry, I was looking at the wrong place.

A Okay.

Q It's in the middle.

A All right. Where are you starting, tell me?

Q About 1, 2, 3, 4, 5, 6, 7 lines down.

A I use?

Q "I use education" --

A Okay. All right.

Q --

"and non-oracle experience along with other characteristics including time at Oracle and job descriptors, not as job controls, but as measures of the field or area in which education or prior work experience occurred."

Do you see where I'm looking?

A Yes.

Q You don't deem job descriptor to be a permissible job control, correct?

A That's not how I use it. Whether it's a permissible job control depends on the question your asking, but how I use it is how I have here.

Q So you don't use it as a job control, correct?

A I use it for what I have here. I don't know what you mean by job control beyond this.

Q Okay. It's your term.

A Job control, where do you see that?

Q In the parentheses: "Not as job controls."

A Oh. I see. All right. So let me. I'm sorry. Let me. Yeah. I mean I'm not using this to control the job the person's in, I'm using it to control for the specialization of their -- of their work experience and their education, that's what that's saying and I agree with that.

Q So you're not using it as a factor to similarly situate employees, correct?

A In jobs. Right. That's correct.

Q Correct. Okay.

A Okay. In jobs, that I understand, yes.

Q Okay. Just so we're clear for the record.

A Okay.

Q You are not using job descriptor as a way to similarly situate employees for purposes --

A Within jobs. That's --

Q -- for purposes of comparison in your compensation analyses, correct?

A That's correct.

Q Earlier today, you gave testimony claiming that Dr. Saad's models included what you deem to be a motherhood control, correct?

A Yes. Acted as a motherhood control.

Q But you agree that Dr. Saad applied his adjustment -- his control for leaves of absence, in the exact same way for all employees regardless of gender or race, correct?

A Fully knowing that almost all of that leave was taken by women which he reports.

MS. CONNELL: I move to strike as non-responsive.

BY MS. CONNELL:

Q My question was -- sorry.

JUDGE CLARK: That's sustained. So ask your question again.

BY MS. CONNELL:

Q My question was, you agree that Dr. Saad applied his adjustment for leaves of absence in the exact same way to all employees regardless of race or gender, correct?

A Yes.

Q And you testified about the impact of pay from taking leave, do you recall that testimony this morning?

A I'm not sure what you're referring to, no.
Q You gave testimony this morning regarding the impact on pay for employees who took leaves of absence, correct?
A I gave -- I presented Dr. Saad's results on that, yes.
Q But that impact on pay that you testified about impacted all employees who took leaves of absence, regardless of gender or race, correct?
A Yes.
Q You also discussed Dr. Saad's use of a variable regarding patents, correct?
A Yes. Patent bonuses, not patents.
Q You agree though, that employees who develop patents are more productive than those who do not, correct?
A Other things being the same, yes.
Q And you agree that the innovativeness represented by patent attainment is arguably an exogenous variable to Oracle, correct?
A I'm sorry, say this again?
Q The innovativeness represented by patent attainment is arguably an exogenous variable to Oracle, correct?
A The innovation that leads one to do a patent is exogenous. The innovation tied to a patent at Oracle is not necessarily exogenous.

MS. CONNELL: I move to strike the second part of the response as non-responsive.

JUDGE CLARK: Overruled. The answer's going to stand.

BY MS. CONNELL:

Q So you agree that generally speaking patents may reasonably be included in an analysis of gender and racial compensation disparities, correct?

A I agreed that prior patents, prior to coming to Oracle.

Q You testified that Dr. Saad could have obtained data on patents prior to Oracle, but he did not do so, correct?

A I don't know that he could of. I didn't look at the applications to do that, but that's what you should do.

Q You did not do that either, correct?

A No.

Q In your rebuttal report and this morning, you discussed your views on using a control for time in current job, correct?

A Yes.

Q You acknowledge in your rebuttal report, however, that time at Oracle, not time in current job, but time at Oracle quantifies the experience within the firm that each employee has, correct?

A Yes.

Q You further believe that this experience within the firm allows employees to get more on the job training and therefore become more productive, correct?

A Yes.

Q So if additional time at Oracle generally allows employees to get more on the job training and become more productive, don't you also agree that additional time in a particular job allows the employee to get more on the job training specific to that job and therefore become more productive at that job?

A Yes. That would be the case.

Q You argue that time in job could be problematic if there was evidence that promotions took longer for women, Asians, or African Americans, correct?

A I said, if there were promotion differences, it could be take longer or less likely to occur period, its not only length of time.

Q You did not analyze the length of time to promotion in your analyses, correct?

A Not directly.

Q And the promotion analysis that you did do that we already discussed, you found no evidence of promotion discrimination for Asian employs at any level, correct?

A That in every promotion analysis I did that, that

was the case.

Q And in Appendix B of your initial report, you found promotion disparities for women in only two IC levels and no M levels, correct?

MS. HEROLD: Objection. Asked and answered.

JUDGE CLARK: Overruled.

You can answer the question.

BY MS. CONNELL:

A Yes. In that particular study, there were other studies of promotion.

Q You've testified that you disagree with Dr. Saad's use of organization as a control variable, correct?

A Yes.

Q As you state in your rebuttal report, you believe there is no reason to place equally qualified women, Asians, or African Americans who are in the same job in lower paying organizations within Oracle, correct?

A Yes.

Q And when you say place in this sentence, you mean the same thing as you mean by assign elsewhere in your report, correct?

A Yes.

Q Dr. Madden, you're aware that the job postings that Oracle uses are associated not only with the job code but also an organization, correct?

A Sometimes, yes. Not all the time. As I recall, I saw some that didn't have organizations on them.

Q You're aware that postings under the same job code can be for positions in different organizations, correct?

A Yes.

Q Neither of your reports contain any study of the rates at which employees are hired into the organization to which they applied, correct?

A No. Oh. Correct, yes. I'm sorry.

Q Okay.

A No the studies don't contain it, yes it --

Q Yeah. Yeah. Thank you for the clarification. And in your rebuttal report at page 23, you express the view that:

"Even if organization aligns to product and some products are more profitable than others, there is no reason for an employee of a given skill level and ability to accept lower pay producing product A when the same skills are paid higher for producing product B."

Correct?

A Yes.

Q The assumption underlying that conclusion is that the employees that you're discussing working on different

products have the same skills, correct?

A Yes.

Q You're aware that many employees at Oracle have the same job code, but very different pay, correct?

A Yes.

Q And in general, it's your view that if employees in the same job code have the same skills they would not accept those pay differences, correct?

A Would not accept the pay differences between two organizations, yes.

Q My question was, your view is that if employees in the same job code had the same skills they would not accept those pay differences, correct?

A Then I don't understand what pay differences you mean. I was saying employees in the same job code, two organizations would not accept a lower pay because it's less profitable -- the same job code is less profitable in another organization. I don't what you mean employees in the same job -- I mean, the only way I know how to answer that is what I just told you.

Q Right. And I've beyond organization. I just asked you if you were aware that many employees at Oracle have the same job code, but very different pay and you agreed with me.

A Yes. That's correct.

Q Okay. So it's also your view that if employees in

the same job code had the same skills they would not accept those pay differences, correct?

A No. I'm not saying that at all. African Americans, Asians, and women they have less alternatives to take different jobs. There may be differences because they're constrained because of their race or gender.

Q Well let's take a look at your deposition transcript at pages 116-20 to 117-6.

A Where are you now?

Q I'm starting at page 116. The question was:

"So you're aware that there are employees who share say a job title at Oracle some of who make more than others and who share the same job title, right?"

Your response is: "Yes. And you're saying that if those employees have the same skill they wouldn't accept those pay differences, correct? There's an objection" --

A Can I see what goes before this, I'm not sure what the context is of this discussion.

JUDGE CLARK: So let's finish the -- read the transcript again and ask her your question again. So the second part was?

BY MS. CONNELL:

Q "And you're saying that if employees had the same skill you wouldn't accept those -- they wouldn't accept those pay differences, correct?" There was an objection and then you answer: "In general, yes."

A And I can't tell, I need the context of this whole discussion.

Q But that was testimony that you gave under oath at your deposition, correct?

A Yes. But I need to understand the context in which it's being offered.

JUDGE CLARK: I understand. But it's Ms. Connell's exam. So if she wants to show it to you she can.

BY MS. CONNELL:

A I said that, but I don't know -- I can't interpret it in terms of what your just asking. I don't know what pay differences -- I don't see here an example of employees having job A and job B and deciding where the pay difference is that's what I don't understand.

Q Okay.

JUDGE CLARK: All right. I understand. Ms. Connell, ask another question.

BY MS. CONNELL:

Q So as you testified in deposition, differences in skill are one potential explanation for why employees in the same job title receive different pay, correct?

A Yes.

Q But you didn't do anything to study whether different skills required for different jobs within a single job code are fungible or not, correct?

A No.

Q And you didn't study whether jobs in the same job code but in different organizations require different skills, correct?

A I think that my analysis of the compensation effects of software designer 4 that were put into different clusters which effectively were different organizations, showed that, that didn't matter to the disparity. I don't know if that answered -- so I think that is a study of that.

MS. CONNELL: Move to strike as non-responsive.

JUDGE CLARK: Overruled. You can follow up if you need to.

BY MS. CONNELL:

Q So you just testified about an analysis you did of pay, correct?

A Yes.

Q But you didn't conduct any study of whether jobs in the same job code, but in different organizations require

different skills? You didn't do anything to study the jobs themselves, correct?

A Well I think it does do that. Because pay is showing the skills as we've just agreed and I look at whether, given that there's different organizations here, whether that can be associated with the disparity in income and compensation which is reflecting the skill. So I think it is responsive, I think that is the case.

Q And which table are you testifying about?

A It's in my rebuttal report.

Q Is it table R4?

A I don't have it. I don't remember what the number is, I don't have the rebuttal report here. I can find it in the slides, just a minute.

Q Other than your analysis of pay data --

A Do you want me to find this, or are we going to continue?

Q I would like to continue.

A Okay.

Q Other than your analyses of pay data, you did not do any study of whether jobs in the same job code but in different organizations require different skills, correct?

A No.

Q Just so the record's clear, that is correct?

A That is correct.

Q Okay.
A Other than the software designer developer 4 study.
Q You're aware that Oracle produced thousands of job requisitions related to the positions at issue in this case, correct?
A Yes.
Q There were even some individual job codes for which Oracle produced thousands of individual job requisitions, correct?
A Maybe. I don't know.
Q You have no reason to dispute that as true, correct?
A I have no reason to say it's true or false.
Q You did not review any of the job requisitions that were produced, correct?
A No. That's not correct. I did review them. I reviewed some of them.
Q Isn't it true that you did not look at them you asked -- your staff told me that there were thousands -- your staff told you that there were thousands of job requisitions?
A I don't remember them telling me that, but I did look at job requisitions personally myself.
Q You did not include them in any analysis that you did, correct?
A I think we just went through tables and regression

results that included them.

Q Specific job requisitions.

A Well, I mean, that's a piece of data that goes into the regression analysis that goes into the table looking at differences.

Q When I say job requisitions, what I'm referring to are actual job postings.

A Yes. I know. And that was underlying the tables that looked at how people moved up or down relative to their job requisition. It was in the table that looked at the IC level of the job requisition you were hired on. Those are all looking at job requisitions.

Q But you didn't utilize any of the specific data on the job requisitions themselves in your pay models, correct?

A I certainly did. I mean, table --

Q Just so we're clear, Dr. Madden, I'm talking about the text on the posting itself, the description of the job, including on the job requisition itself, not the level or the title, but the actual description of the job.

A Oh. Only the software developer 4 analysis did that.

Q And that was your analysis that was critiquing Dr. Saad's cluster analysis, correct?

A Showing that, that made no difference, yes.

JUDGE CLARK: Okay. Ms. Connell, we're going to

take another little afternoon break whenever you think it's appropriate.

MS. CONNELL: Okay.

BY MS. CONNELL:

Q You agree with Dr. Saad that actual jobs that employees at Oracle hold at various levels often have very detailed and very specific education and job experience requirements, correct?

A Yes.

Q You also acknowledge that all applicants of the same age, attainment, and specialization area are not equally qualified for all of these varied positions, correct?

A Certainly not as individuals, no. They are not equally qualified.

Q You were provided data files for review in connection with this case including Excel spreadsheets containing long commentaries that contain new hire justifications, correct?

A Yes.

Q But you concluded that these new hire justifications were unusable, correct?

A Yes.

Q And again, you deemed them unusable because this information was not something that was going to be easily put into your statistical models, correct?

A Because it was haphazard and wasn't standard for all people in the equation, which is what you need.

Q No. My question was, you deemed it unusable because the information wasn't something that was going to be easily put into your statistical models, correct?

A I'm saying the reason why it couldn't be is I didn't have it for everybody. You need data for everybody for a statistical model and I didn't have that. So yes it was unusable for that reason.

Q Generally speaking, if you found information was not something that was in a format that you could easily put in a statistical model, you did not study it any further, correct?

A No. That's not true.

Q Well let's take a look at your deposition again, at page 93 lines 15 through 24. You were asked the question: "In terms of the work that you yourself did, am I correct that you found that information to be not something that you could easily put into a format that you could include in your statistical model and so you didn't study it any further." And then you said: "I did not -- I did not study it any further. I waited to see how the case progressed, yes."

A Can I see what was above that?

Q Well that was testimony that you gave under oath, correct.

A I know it is, but I'm trying to understand the context in which I said this. Because I certainly used the job descriptor, I mean that was something that wasn't easily put in a format and I used that so I'm trying to see what kind of discussion we were having about variables here.

JUDGE CLARK: Ms. Connell, in the interest of time, please show her the question right before that, please.

MS. CONNELL: Sure.

BY MS. CONNELL:

A Oh. Boy this is really hard to say what this was about.

JUDGE CLARK: Okay. Thank you, Doctor. Ask another questions, Ms. Connell.

BY MS. CONNELL:

Q As far as you know, there may have been information in the new hire justifications about the specific products on which an individual was going to work, correct?

A There certainly were in individual cases, there just wasn't enough to do statistics.

MS. CONNELL: Okay. I'm at a good stopping point if we want to take an afternoon break.

JUDGE CLARK: Okay. Let's take a 10 minute break.

And we'll be off the record until 4:20.

(Off the record at 4:10 o'clock p.m.)

JUDGE CLARK: Okay. We're back on the record, all parties are present, Dr. Madden has retaken the stand.

Ms. Connell, you may continue.

JUDGE CLARK: Thank you.

BY MS. CONNELL:

Q Dr. Madden, in your rebuttal report you claim to have used regression analyses to test for differentials in initial assignments controlling for job applied for, correct? I'm referring to table R9 if that helps.

A Yes.

Q Okay. And table R9 reports differences in starting salary between employees by race and gender after controlling for a series of factors, correct?

A Yes.

Q So the dependant variable in table R9 is pay, it's not job assignments, correct?

A Right. It's controlling for the job applied for.

Q But the dependant variable is pay, correct?

A Yes.

Q And Dr. Madden, you criticized --

A It's base pay.

Q -- you criticized Dr. Saad for including what you deemed too few observations in his study of the levels into

which employees were hired, versus those to which they applied, correct?

A I'm sorry I don't recall that.

Q I'm now actually talking about table R8 if that helps.

A Oh. Well I'm not criticizing him for his inclusion, he doesn't have the data on it. I'm just pointing out how little the data reflect the total population in the class. I'm not criticizing him for excluding data, I'm just simply pointing out the lack of data.

Q That there are too few observations in the study of the levels into which the employees were hired versus those to which they applied, correct?

A Yes.

Q And according to your table R8, Dr. Saad included 1,659 employees in that study, correct?

A Yes.

Q And then in your table R9 -- but in your table R9 you included only 841 employees in your study of starting pay differences by gender, correct?

A Yes.

Q And that's because your table R9 includes only those employees from Dr. Saad's analysis who had information on prior pay, correct?

A I didn't realize that was the case. You may be

right. I'd have to check my output to check that.

Q It would be reflected in your backup file, correct?

A Yes. Yes.

Q But in any event your table R9 included only 841 employees, correct?

A For men and women, correct.

Q At the end of your rebuttal report you have a section entitle Promotions and Compensation Growth, correct?

A I'm sorry. I have what?

Q A section entitled Promotions and Compensation Growth on page 38, correct?

A This is my rebuttal report?

Q Correct.

A Yes. Okay.

Q You acknowledge that in your initial report you did not present any direct studies of pay growth, correct? It's the second sentence of this section.

JUDGE CLARK: I think it's the sentence right here.

THE WITNESS: Oh. Okay.

MS. CONNELL: Yeah. Yeah. Yeah.

BY MS. CONNELL:

A You're quoting my report. Okay.

Q Yeah, yeah, yeah.

A Oh. Yeah. My report doesn't -- yeah. Okay. That's correct.

Q Okay. And you made no reference in this section of your rebuttal report to the analysis from Appendix B in your initial report, correct?

A Right.

Q Because Appendix B is directly looking at a promotion, it's not looking at pay growth.

A When discussing Dr. Saad's studies of pay growth you criticize them for including controls that in your view undermine the ability to measure gender and race affects, correct?

A Yes.

Q And in particular you criticized the pay growth studies Dr. Saad reported for the controls for change in global career level and change in job title, correct?

A Yes. And not controlling for starting pay.

Q Dr. Madden, you understand Dr. Saad's pay growth studies in his initial report were responding to OFCCP's pay growth studies in the second amended complaint, correct?

A Yes.

Q And accordingly Dr. Saad adopted OFCCP's approach to studying pay growth and then proposed further refinements and adjustments, correct?

A That may be the case. As I said in my report, when he responded to things that weren't relevant to my report I didn't pay much attention to them.

Q Well the controls for change in global career level and change in job title were controls that OFCCP used in OFCCP's pay growth models that Dr. Saad then further refined, correct?

MS. HEROLD: Objection. Lack of foundation.

JUDGE CLARK: Overruled. You can answer the question.

BY MS. CONNELL:

A That may be the case. They were wrong in the OFCCP's study, and they were wrong in Dr. Saad's study.

Q So assuming that is the case, your testimony is that it was wrong for OFCCP to use those factors in a pay growth study, correct?

A Yes.

Q And in turn you modify some aspects of the pay growth models that Dr. Saad reported, correct?

A I include job changes, I include -- and I control for the pay at the start of the year.

Q So you remove change in global career level and change in job title, correct?

A I do that because that's how you get pay increases, yes.

Q So effectively you've removed variables that OFCCP used, correct?

A I don't know that. I didn't do -- I have no

knowledge of the OFCCP study.

Q In table R10, the modified analyses that you perform show no statistically significant differences in pay growth for Asians compared to whites in any year, correct?

A That's correct. There are no promotion and pay increase differences after start for Asians.

Q And then your modified analyses in table R10, you show no statistically significant results for women in two of the six years that you studied, correct?

A That's correct.

Q And you're not offering an opinion that every female employee in the three job functions at issue here at Oracle's headquarters location, experience promotion discrimination, correct?

A No. Correct. Correct. Sorry. I'm not offering that opinion.

Q And you're not offering any opinion that every African Americans employee in the product development job functions at Oracle's headquarters location, experience promotion discrimination, correct?

A No I am not. I'm not offering that opinion.

Q And the same is true for Asians, correct?

A I am clear that there is no promotion discrimination that I discovered against Asians in any of my analyses.

Q Dr. Madden, you authored -- well before turning to that. This morning you gave testimony regarding statistical significance, correct?

A Yes.

Q And I didn't get it precisely, I'm sure you'll correct me if I'm wrong, but I believe you testified words to the effect that statistical significance measures the probability that the measured relationship is due to chance, correct?

A Yes.

Q But that is --

A Could have occurred by chance.

Q Correct. But that is true considering only the factors for which you've controlled in the models, correct?

A That's correct.

Q Statistical significance does not say anything about whether the controls in the models are the correct controls to use, correct?

A That's correct.

Q You've authored an article entitled The Persistence of Pay Differentials: the Economics of Sex Discrimination, correct?

A Probably. I don't remember it.

Q Okay. Well let me see if I can refresh your recollection. If we look at Exhibit D229 on page 3.

A Okay. Yes. I remember that article.
Q This is an article that you wrote, correct?
A Yes. It is.
Q And you believe that this article is an authority that would be relied upon by people in the labor economics field, correct?
A I hope so.
Q You also authored an article entitled Gender Differences and the Cost of Displacement: an Empirical Test of Discrimination in the Labor Market, correct?
A Yes.
MS. CONNELL: And just to make sure we're talking about the same article, can we pull up Exhibit D228?
BY MS. CONNELL:
Q This is the article that you wrote, correct?
A Yes.
Q Dr. Madden, you were a member of the Gender Equity Committee at your employer at the University of Pennsylvania from 2000 to 2002, correct?
A Yes.
Q And you do include that on your CV among faculty committees at Penn, correct?
A Yes.
Q And in 2001 that committee issued a report entitled "The Gender Equity Report," correct?

A Yes.

Q And again --

A They published an article in the employee newsletter.

MS. CONNELL: And just to be sure we're talking about the right article can we pull up Exhibit D256?

BY MS. CONNELL:

Q This is the gender equity report from Penn, correct?

A Yes.

Q You were not involved in the design of the salary analysis reported in this report, correct?

A Yes.

Q But you had the opportunity to review the salary analysis before it was made public, correct?

A Yes.

Q And even though you didn't -- you didn't design the salary analysis, you did contribute to writing the report itself, correct?

A Yes.

Q And as you testified in deposition, your contributions to the report were likely in the section entitled Part 3 Salary Analysis, correct?

A Yes.

Q At no point in the process did you as a member of

the gender equity committee at Penn say to anyone you didn't think the committee should report out the analyses because they were poorly designed, correct?

A That I don't know. I don't recall.

Q Do you think that is something that you would recall if you had done that?

A No. It was 20 years ago and I know I had concerns about it but whether we -- I actually said -- made any recommendations about it to the committee I don't recall.

Q And if we turn to the last page of 256, down at the bottom, you're listed there as one of the members of the Gender Equity Committee, correct?

A I was one of 16 people on this committee that reviewed the study the university designed and offered to us.

Q So, yes. That's correct?

A Yes.

MS. CONNELL: Okay. I have no further questions, Your Honor.

JUDGE CLARK: Thank you, Ms. Connell.

Ms. Herold, anything further?

MS. HEROLD: Just a few. I may have a few technology hurdles here as I try to arrange the testimony --

JUDGE CLARK: Okay.

MS. HEROLD: -- but I ask for your patience.

REDIRECT EXAMINATION

BY MS. HEROLD:

Q During the cross-examination by Ms. Connell, you answered a question -- you answered a question about job codes and I don't have a transcript in front of me, but what I recall was that you testified that -- I think you said -- the question from Ms. Connell was: "Do job codes reflect training and experience." And I think you said: "Yes." And my question is, did you mean job descriptors, or did you mean job codes?

A I think both do.

Q Okay.

A I mean both do -- job codes -- I mean, as I used it I used job descriptor to describe the quality of training -- I mean, the specific area of training, the specific area of experience and education. But I would hope that when Oracle actually applies it's job codes to workers that it is considering skills and experience.

Q Okay. You also answered a question indicating that because you're not a lawyer you don't have a legal understanding of similarly situated. So early in your direct testimony today you provided training as part of the -- I think it's called the Federal Judicial Center, is that what it's called?

A Yes. And the Federal Reserve Bank training for federal judges. I did both.

Q What was the subject of that training?

A For the Federal Judicial Center I talked about the handling of statistical data in discrimination cases. For the Federal Reserve training I did that plus I also did damages, the training -- the economics and statistics of computing damages.

Q Would it be fair to say given your participation in that training that you're not wholly unfamiliar with the legal test?

MS. CONNELL: Objection. Leading.

JUDGE CLARK: Overruled. You can answer the question.

BY MS. HEROLD:

A I would hope so, but I am not a lawyer, I am not qualified to give a legal opinion.

Q Understood. You indicated that Dr. Saad looked at pay disparities within job codes, am I correct?

A Yes.

Q You also looked at pay disparities within job codes, is that correct?

A That's correct.

Q And so you indicated on one of the first of many in which you were volunteering information to my learned colleague here that you in addition to -- that you studied pay disparities beyond just pay disparities within job code,

is that correct?

A Yes.

Q What else did -- beyond pay disparities in job code what did you study?

A I basically looked at what are the pay disparities that develop as people come to Oracle with the same characteristics. That being the same age, the same education, the same time at Oracle, and to the extent we use job descriptor as a control for the qualities of the specialization of that experience. I looked at disparities for that. Then I look for -- so with and without controlling for job descriptor and then within job code. So I looked at three basically bottom line differences of what the disparities are. That is the disparities with what are clearly the purely exogenous characteristics of education, experience, education and experience. Then I add the sort of quasi endogenous-exogenous characteristics of job descriptor and got another measure. And then I looked within job code. I did three separate measures.

Q And then you answered a question about table 1a -- and if you need to see table 1a to answer this question let me know -- but Ms. Connell asked you a question about whether you aggregated across all job functions and you said that -- I think you said after column 6 you did not aggregate. Just trying to understand what it is that you did on that question

-- in column 6.

A The analysis -- the analysis applies -- includes for women and men. The male/female analysis includes the three job subfunctions. So it includes product development, it includes technological information support -- or support and information technology. Until we get to column 6, and it's across the whole table, it includes it. But once we get to column 6 we're controlling effectively with job title, because none of the job descriptors go across -- go across these job subfunctions. So there's effectively a control.

We also early on looked at job function controls, they were all non-significant, they didn't matter. So that's why we didn't put them in. They just don't matter in the analysis, one way or the other. But all of the analysis include all three of the subfunctions.

Q You indicated, again in questioning by Ms. Connell, that you would never include the school an employee attended when gathering educational data, did I get that right?

A Yes.

Q Why do you say that?

A Well I think I made that mistake early in my career. It turns out that once you control for jobs -- or once you control for a selection process that has hired employees into the same firm or the same category -- yes there are some schools that *US News and World Report* ranks

better than others, but they never matter. Because what happens is if the Human Resource Office is doing it's job, when it hires individuals from the quote: "lower rank schools," they're they superstars. And they've got -- when they go to the very highest ranked schools, they've often hired further down in the class. And the people end up being the same across school quality because they're coming from different point in the pecking order. In all of my research whenever I've looked at controls for trying to look at school quality, they've never mattered in anything I've looked at.

MS. HEROLD: I'm going to come back to page 81 in a minute, so if you could continue on to her deposition. Yeah. No it's okay.

Hold on I just need to get an exhibit up.

JUDGE CLARK: Sure. No problem.

MS. HEROLD: Oh actually wait, let me ask the question first.

BY MS. HEROLD:

Q Relating to questions you were asked regarding Dr. Saad's cumulative leave of absence variable, do you think he should have known that women take leave of absences more than men?

A He did know that they overwhelmingly do.

Q Why do you think that?

A Because he had it in his original report.

Q Are you -- if I could show Exhibit --

MS. HEROLD: What's it called again?

MS. HEROLD:

Q -- J103 at page 79 I'm showing you right here. Is this the page of Dr. Saad's report that you're referring to?

A Yes.

Q And the chart at the top, what does that reflect to your understanding?

A Oracle records reflect that women take more days of leave than men and that's an understatement. The table shows that the average woman has had cumulative leave of absence of 104 days and the average man has had 12. He clearly knew before he designed that study, including that, that this was going to disadvantage women. Even though he applied it the same for men and women.

Q Okay. I'm going to direct your attention next to page 81 of your depo which is Exhibit P-3.

MS. HEROLD: Oh. My goodness, a reading test this late in the day.

MS. CONNELL: I'm not sure what you're --

MS. HEROLD: You asked a question regarding this.

MS. CONNELL: Okay. That's what I was just wondering are you pulling up a --

MS. HEROLD: Just following up on the question you asked.

MS. CONNELL: Are you pulling up a clip that I referred to? I guess that's what I mean.

MS. HEROLD: Yeah. It's right above where you. I'm sorry, maybe I have the wrong page. Let me come back to that, I'm sorry, I might need a moment to pick that up.

BY MS. HEROLD:

Q Why did you not report the R-squared in your report that you found?

A Because as a journal editor, as a reviewer, and as a scholar R-squareds literally don't matter in the literature. That's nothing -- I mean if you've got a very low R-squared relative to the standard of the literature, it might matter, but nobody's interested in the R-squared in most studies. What they're interested in is the coefficients of the variables of interest and what their statistical significance is. So I think you would be hard put -- I'm sure I did it occasionally but I seldom report an R-squared in any of research and I seldom do it in expert reports for the same reason.

Q Is there a difference -- I think you testified about this, this morning -- but is there a difference between the use of R-squared and standard deviation in relation to whether you're conducting an individual study or a group study?

A Well certainly for a group study, it's particularly

not relevant. It's the sign on the coefficient and it's statistical significance for a group study. As I said in my direct testimony here, it may be important for individual studies, but it's also usually not even reported for individual studies to my knowledge, because that's not what -- that's not what people care about. You can have a high R-Squared because you put the wrong variables in. I mean, the best way to get a high R-squared is to put in a variable that's highly correlated and endogenous with the dependant variable, that's going to give you a high R-squared, that makes the model worse not better. So people don't care about that. They care about whether you've put in the right variables and what the individual variables effects are.

Q Now directing your attention to Appendix B of your report, again following up on some questions Ms. Connell asked. Why didn't you report the results you found in M5 and M6?

A Why didn't I report what?

Q The results you found regarding levels M5 and M6.

A Because it was such a small number of people. I mean I was -- I certainly will acknowledge that and I certainly gave that data to Oracle, I mean, I wasn't trying to hide it. But this is -- these two jobs are the big jobs that people are being promoted from and I thought was what was relevant. But I don't deny the effect on that -- I think

there's only a handful, I mean, there's not very many people in that. And it's not that it's not relevant or that I was trying to hide it. If I wanted to hide it, I wouldn't have sent it over in the backup data. But I was trying to look at the general experience of people in the product development class.

Q And when you said the largest -- when you just said the largest job levels you meant IC3 and IC4, that's what you're referring to not M5 and M6?

A Right.

Q Okay.

A And it wasn't M -- it was M5 I believe. It was M5 to M6, it was only one job, it wasn't two, I believe.

Q Okay.

A Remembering it, but I think that's the case.

Q But the findings nevertheless are in the backup data?

A Yes.

Q And then also in Appendix B, am I correct in understanding your testimony that you studied IC3 and IC4? Those are the large classifications, correct?

A Yes. Yes.

Q So did you reach any opinions about an analysis which included all different job classifications?

A I mean, certainly looking at that whole scatter

I've got to believe that given the overwhelmingly negative signs, I mean that gender, even if they weren't significant in the other areas, the signs were overwhelmingly negative. Other than that one M level and maybe there might have been another one or two small ones that were insignificant, but they were all negative. And given the negativeness of this particular large ones, in my opinion a test of them all would have showed an overall pattern of negative.

Q So I just want to clear up something about column 6 that you use in a lot -- I mean, use in all -- in a number of the tables, column 6 is the job descriptor column, correct?

A Yes.

Q So I'm just trying to clarify what I think you've testified. You use job descriptor as a index for exogenous characteristics?

A Yes.

Q And what are those exogenous characteristics?

A The area you emphasized in your education and the area of your prior experience before coming to Oracle.

Q Okay. So you're not using column 6 as a control for job title, per se?

A Per se, right. That's correct.

Q If you were using a control for job title that would be an endogenous characteristic in your view?

A That's clearly endogenous, yes.

Q So the time -- you answered a question from Ms. Connell that the time that you -- that an employee works in a particular job may give -- may be an indicator of the amount of training they have in that job, do you recall that testimony?

A Yes.

Q But nevertheless, you still think that time in job is an endogenous characteristic?

A Yes.

Q And why is that?

A Because it's effected -- it's length is directly dependant on promotion, on time to promotion and whether promoting. And I remind you that Dr. Saad's work show that it has a negative effect on earnings.

Q Did other studies -- did you do other studies of promotion aside from Appendix B?

A Yes.

Q And can you just review the numbers of those again?

A Yeah. Let me -- so I think the major one was looking at 5a, 6a -- 5a, 5b, 6a, 6b, 7a, 7b that looking at how controlling for -- where you're placed at hire versus where you are now, whether that explains the disparity. And the only way you can have a greater disparity in current than you had originally is if there's a systematic difference by race or by gender in promotion, which we found for women and

which we found for African Americans and which we did not find for Asians in our direct study of promotion -- I mean, everything we looked at for Asians, showed that to be true, including this study.

MS. HEROLD: Your Honor, I might need a quick break, so I can just organize the two references, but I'm not there yet, let me just try to finish through.

JUDGE CLARK: Okay.

BY MS. HEROLD:

Q Did you have -- you were asked a question about whether you studied the skills within a particular job code to which you answered no?

A Yes. I answered no.

Q Do you recall that testimony? Did you have any data that you could use to study skills within a particular job code?

A Now that was the whole narrowly defined skills is that there is no data. There certainly is comments on various kinds of forms and those comments are actually electronic. But the problem is, is that there's no way you're getting a standard across a large number of employees getting the same results. You know, a person -- one person may say I hired this person because they had C++, and another supervisor, another hiring officer, hired the person because they had C++ but that wasn't in their mind when they wrote

the comments. I mean that's the problem with open ended comments. Is it just doesn't give you the kind of data you need for data analysis.

Q The gender equity report which was kind of referenced right at the end of her questioning --

A Yes.

Q -- do you remember the document I'm referencing?

A Yes.

Q Do you remember what you did on the report?

A I think I talked to the committee about the pluses and minus of what the university did --

Q Professor Madden, I really just want to know what you remember, I don't want you to speculate. So do you remember as you sit here today what you did?

A Well, it was 20 years ago. No. I don't really remember the details.

Q Okay. That's fine. There were a number of questions Ms. Connell asked you about using the narrative files attached to, I want to say the term you used was called is new hires. I think that's -- I think that's what you said. Do you remember that testimony?

A Yes.

Q So were there narrative files produced relating to new hires that you saw?

A Yes.

Q So was your decision not to use data from those -- not to use those narrative files to secure data, was that based on a conclusion that it was just too hard?

A No. It was impossible. I mean, that's point, I mean that's what I've continually saying is that there's two problems with it. It's not -- we only have it for very small portions of the population, very small. And secondly, it's not standardized. So it's some individuals reactions and they may or may not have had if you ask them been concerned about the same thing that another individual wrote about a person, because it's open ended, it's free-spirited and it's just comments. You just can't statistically analyze that. Its not that it's hard, it's that it's impossible.

Q Okay. So I'm now going got direct your attention --

MS. HEROLD: I found the page.

JUDGE CLARK: Okay.

BY MS. HEROLD:

Q -- page 116 of your deposition, I've forgotten what exhibit this is, P-3. This was a page that Ms. Connell directed your attention to, if you just give us a second it should magically appear in front of you.

MS. CONNELL: What page are you on?

MS. HEROLD: 116 of the deposition.

BY MS. HEROLD:

Q Okay. So if you can read that -- I don't know if you can. Let's see if we can make this a little bigger. Okay. In the middle from line 9 to 15, Ms. Connell asked you a question about whether employees with the same skill would just not accept lower pay to labor economists. Do you see the question -- the answer to the question I'm referencing, lines 9 to 15?

A I see 9 to 15, yeah.

Q Yeah. So when you -- when you have opined earlier today and at this deposition presumably on whether when economists look at the question whether employees will accept lower pay --

A Yes.

Q -- when they have the same skills. Are you talking about individual decisions or are you talking about group decisions?

A No. I'm talking about both. I think it applies to individuals and groups.

Q Okay. Okay. Let me just --

MS. HEROLD: Your Honor, I think, I think, I think I'm done, can I just have a minute?

JUDGE CLARK: Do you just need a moment? You bet.

MS. HEROLD: Yeah. Thanks.

JUDGE CLARK: No problem.

MS. HEROLD: One more question.

JUDGE CLARK: Okay.

BY MS. HEROLD:

Q I'm taking you back to the deposition turning over to page 117 which continues the same discussion that was just referenced on page 16 [sic]. There's a question Ms. Connell asked you about -- the question at the top of the page and you're saying if those employees had the same skill they would accept those pay differences, correct?

A Yes.

Q And the answer reported here is in general yes.

MS. CONNELL: Your Honor, I'm going to object. It seems like she's just going to show her this deposition testimony, but it's not impeachment, or it's not --

MS. HEROLD: I'm offering for impeachment. I was leading to get to my question. I'm sorry. I'm just trying to direct --

JUDGE CLARK: The objections overruled. You can just go ahead an ask your question.

MS. HEROLD: Okay.

BY MS. HEROLD:

Q When you said in general, what do you mean?

A I mean, in general I actually meant that employees if they have the same skill they wouldn't go to two different organizations. So they have the same skill, I've got an organization that's giving me high pay and one that's low

pay, I'm not going to go to -- that's what I meant in general yes in answer to that question.

Q Okay.

MS. HEROLD: That's it, Your Honor.

JUDGE CLARK: That's all you have. Thank you, Ms. Herold.

Ms. Connell, anything further?

MS. CONNELL: Yeah. Just a couple more follow ups.

RECROSS-EXAMINATION

BY MS. CONNELL:

Q On redirect from Ms. Herold you testified that you did analyses of pay disparities within job codes?

A Yes.

Q And what you're referring there are your analyses responding to Dr. Saad's cluster analyses with software developers 4s, correct?

A No. I'm talking about column 8 through out the report. Those are pay disparities within job code.

Q Those are -- well you're not going more -- you're not controlling more granular than job code?

A No. But I'm looking at the pay disparity within -- I'm controlling for job code. Those are pay disparities within job code.

Q Those are pay disparities taking your analysis at face value between job codes?

MS. HEROLD: Objection. Argumentative.
BY MS. CONNELL:
A No. That's wrong.
JUDGE CLARK: Overruled.
BY MS. CONNELL:
A It's within job code. That's what the analysis does, when you control for job code you're looking for pay disparities within the job code that's what the statistics does.
Q But the most narrow control that you do is, assuming column 8 is job code, that's the most narrow analysis -- that's the most narrow control you use, correct?
A That's true.
Q Okay.
A Other than the software developer. But that is a pay disparity within job code.
Q Right. I just want to make sure that we're understanding each other and I think we are.
You testified when talking about Appendix B that you did not include the results of the M5 to M6 employee movements because -- or results, because it was -- the population was too small, do you recall?
A It was a small number of people.
Q Okay.
A But I presented it, I mean, I certainly wasn't

hiding it.

Q You didn't present it in Appendix B, it was in your backup file, correct?

A Right. But I certainly gave it to you.

Q There were 1,746 observations in that analysis, correct?

A But I don't think there were very many women. What's matter is the number of women. I would have to look at what the number of women were. Because I think it was a very small number of women.

Q And that would be reflected in your back up, correct?

A I believe so.

Q And just so we're clear, on redirect you gave some testimony regarding whether table 1a and whether the analysis included all job functions in one model, correct?

A I'm sorry, it's getting late so you better ask that again.

Q I just want to make sure that the record is clear. For table 1a --

A Yes.

Q -- on all columns you're always including all three job functions in the same model, correct? You never break them apart, correct?

A That is correct.

Q Okay. And with regard to leave time, you on redirect testified about Dr. Saad's knowledge of women taking more leave than men, you also knew that women take more leave than men, correct?

A I didn't look at it that way until I saw his results, but I certainly am aware of that is generally the case, yes.

Q But you deduct leave time for both men and women equally even though women take more leave, correct?

A That's correct but I do it to the tenure, I do it to the total experience. I have no problem with that and you do that in Dr. Saad's model and suddenly all the gender significance pops back up.

Q All right.

MS. CONNELL: Well I would move to strike the last part of the response as non-responsive, but otherwise I have no further questions.

JUDGE CLARK: Okay. I'm going to let the answer stand.

Anything further, Ms. Herold?

MS. HEROLD: One moment.

We are finished.

JUDGE CLARK: Thank you very much. Dr. Madden, thank you so much for --

THE WITNESS: Thank you.

JUDGE CLARK: -- time, thank you for being here.

THE WITNESS: Thank you.

JUDGE CLARK: You are free to go. Thank you very much.

THE WITNESS: Thank you.

JUDGE CLARK: Okay. It's 5:05, we're supposed to end at 5:30, anybody have anything -- I'm kidding. So we're going to go ahead and call it a day here.

You have one more witness, is that correct, Ms. Herold?

MS. HEROLD: Yes.

JUDGE CLARK: Okay. And that witness is going to be here at 9:00 o'clock tomorrow?

MS. HEROLD: Yes.

JUDGE CLARK: Okay.

And you're prepared to start your case tomorrow, Ms. Connell?

MS. CONNELL: Yes.

JUDGE CLARK: Anything further for the record today, Ms. Herold?

MS. HEROLD: No.

JUDGE CLARK: And Ms. Connell?

MS. CONNELL: No.

JUDGE CLARK: Okay. Thank you all, we're adjourned. We'll be back in session tomorrow morning at 9:00

o'clock. Thank you all. We're off the record.

(Whereupon, the proceedings concluded at 5:02 o'clock p.m.)

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REPORTER'S CERTIFICATE

TITLE: Federal Contract Compliance Programs v. Oracle America, Inc.

CASE NUMBER: 2017-OFC-00006

OWCP NUMBER: N/A

DATE: December 11, 2019

LOCATION: San Francisco, CA

This is to certify that the attached proceedings before the United States Department of Labor, were held according to the record and that this is the original, complete, true and accurate transcript which has been compared to the reporting or recording accomplished at the hearing.

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