SUPERIOR COURT OF THE STATE OF CALIFORNIA
COUNTY OF SAN FRANCISCO
UNLIMITED JURISDICTION

ELIEZER WILLIAMS, a minor, by SWEETIE WILLIAMS, his guardian ad litem, et al., each individually and on behalf of all others similarly situated,	)	
Plaintiffs,	)	
vs.	)	No. 312236
STATE OF CALIFORNIA, DELAINE EASTIN, State Superintendent of Public Instruction, STATE DEPARTMENT OF EDUCATION, STATE BOARD OF EDUCATION,	)	
Defendants.	)	

DEPOSITION OF MICHAEL JOHN PODGURSKY, Ph.D.
Los Angeles, California
Tuesday, August 12, 2003
Volume 2

Reported by:
CAROL ANN NELSON
CSR No. 6974
JOB No. 44003

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Defendants.

Deposition of MICHAEL JOHN PODGURSKY, Ph.D., Volume 2, taken on behalf of Plaintiffs at 555 West Fifth Street, 35th Floor, Los Angeles, California beginning at 9:11 a.m. and ending at 5:06 p.m. on Tuesday, August 12, 2003, before CAROL ANN NELSON, Certified Shorthand Reporter No. 6974.

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INFORMATION REQUESTED

(NONE)

INSTRUCTION NOT TO ANSWER

(NONE)

Los Angeles, California, Tuesday, August 12, 2003
9:11 a.m. - 5:06 p.m.

MICHAEL JOHN PODGURSKY, Ph.D.,
having been previously sworn, was examined and testified further as follows:

EXAMINATION (Resumed)

BY MR. AFFELDT:

Q Good morning, Dr. Podgursky.

A Good morning.

Q How are you feeling this morning?

A Wonderful.

Q I remind you that you're still under oath and ask if there's any reason today why you cannot give your best testimony.

A I'm fine and I -- I can think of no reason.

Q Great.

What is your involvement with the Fordham Foundation?

A The -- Well, I guess early on in my research I encountered Chester Finn -- Everyone calls him "Checker" so it's hard to avoid saying that -- but Chester Finn at some education conferences, and we began to talk and -- and he found -- we were on the same wavelength I'd say on a lot of policy issues so -- and so we've been --

I've been working with people there. He's the editor of EDUCATION NEXT or associate editor. I've written a number of papers for their journal, or that journal, and the Fordham Foundation has sponsored two studies I've done. The first was an article that appeared in a volume of theirs and it was called A Layman's Guide to Teacher Training and Licensing. Dale Ballou, B-a-l-l-o-u, and I wrote that. And then we did -- they sponsored that charter school study which was also published by the Fordham Foundation. So I -- I have interaction with "Checker" and I've run into him at conferences and so on. I've refereed papers for EDUCATION NEXT, so. . .

Q What is the mission of the Fordham Foundation?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: I really don't know. There are many foundations in education and I -- I'm sure it's in the will of Mr. Fordham to make education better or something like that. I don't really know.

BY MR. AFFELDT:

Q When you say you're on the same wavelength with Chester Finn, what do you mean?

A Well, we've had many discussions about reform of teacher training and licensing and I think that while Chester Finn is not an economist I think he sees much

merit in the way economists look at education policy issues on -- for example on school choice, charter schools, and I think in the area of teacher training and licensing he's -- the Fordham Foundation and Dr. Finn are quite interested in alternate teacher certification and alternate pass into teaching and those types of reforms, so he was very interested in -- in discussions. So I've been in conferences they've sponsored and I've run into Dr. Finn at conferences that other people have sponsored talking about teacher quality and -- and teacher quality issues.

Q Does Fordham Foundation advocate school choice?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: Well, I -- I -- they are very interested in charter schools and so I -- I don't know if they advocate it. I mean I know that they've been involved in projects that revolve around charter schools. Checker Finn wrote -- coauthored a book. Now, of course, he's the president of the foundation, so you asked me what does the foundation do. I don't really know. Well, I mean I know some things they do and they have been involved in charter schools and papers about charter schools and Dr. Finn coauthored a book on charter schools that's got a lot of attention. It was

published by one of the University Presses, as I recall.
BY MR. AFFELDT:
Q Does the work of the Fordham Foundation support expanding school choice?
MS. DAVIS: Vague and ambiguous. Calls for speculation. Asked and answered.
THE WITNESS: Well, I -- I think they've stimulated discussion about school choice. I guess that's the way -- You use the word "advocate" and I don't -- that -- and I'm not sure they're advocates. They're promoting discussion in the policy arena of choice options, including charter schools.
BY MR. AFFELDT:
Q In that question my word was "support."
A Okay. If -- If -- They promote discussion. I'd prefer to answer it by saying they promote a policy discussion about choice, so they bring it to the -- they promote the idea of it and the discussion of it as a policy option and analysis of it and, you know, bringing it to -- the discussion to the table when you're talking about school reform. So I guess by that definition -- that would be my definition of "support" and using that definition I'd say they -- they promote the discussion of choice.
Q Does the Fordham Foundation also within the

context of school choice support vouchers for private schools?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: I'm not an expert on the law here, but it's my understanding that foundations aren't supposed to, you know, particularly be advocates or enter the political arena but they support research and scholarly writing and research publications surrounding choice areas and vouchers, a variety of things that are associated with school choice.
Can I add one more point on that?
BY MR. AFFELDT:
Q Sure.
A If there's one area that I think the Fordham Foundation is really more associated with than choice is really the standards, what people call the standards, based for school reform which is really what states are doing more of, saying what kids should know and learn and, you know, establishing assessments and then developing rewards and sanctions for schools that meet those targets. I'd say Fordham's interest has been much more in that than in choice, although -- although they see choice as a piece of the larger package, but I think their impact in the policy arena in terms of discussion

and papers and so on has been more on this issue of standards-based reform than vouchers or something like that.
Q What is your involvement, if any, with the Hoover Institute?
A Oh, just very, very indirect. I guess the Hoover Institute nominally publishes the EDUCATION NEXT and -- but I've never been to the Hoover Institute. I mean I know Eric Hanushek who's at the Hoover Institute, but that's -- I don't have any involvement really with the institute directly.
Q You've never been funded for any work by them, the institute?
A No, the EDUCATION NEXT gives a very small, you know, like $250 or I think I maybe got something like that for one of the papers I wrote or two for EDUCATION NEXT but they've never supported my research.
Q Are you connected at all to the Koret Task Force?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: No, I am not.
BY MR. AFFELDT:
Q Do you know what the Koret Task Force is?
A Yes, I know what it is.
Q What is your involvement, if any, with the

Abell Foundation?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: Katherine Walsh was at the Abell Foundation, and I have -- you know, as I indicated yesterday I had discussions with her on the paper, not her original paper but her rejoinder, and they paid me a very small amount of money, a couple hundred dollars, for writing, for my contribution, something like that. I don't remember the exact amount but it was very small for my contribution to the Walsh -- to the rejoinder, to Linda Darling-Hammond's rejoinder, so the second paper that we discussed yesterday, and that's my only involvement with Abell.
BY MR. AFFELDT:
Q You've done work for the Smith-Richardson Foundation as well; is that correct?
A Yes.
Q What is your understanding of their mission?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: Smith-Richardson funds a wide range of education research, so I have looked on the web at the many, many, many education projects they fund and they seem to be pretty much across the board. They do seem to fund a number of quantitative research projects

in education, but I -- it's hard for me to detect a -- kind of a central theme so I -- I really can't answer. They support education projects and research.
BY MR. AFFELDT:
Q What is -- I think you mentioned yesterday the -- I'm going to say the name wrong but please correct me -- the National Commission on Teacher Quality?
A Yes. It's -- I think it's the National Council on Teacher Quality.
Q So what is the National Council on Teacher Quality?
A It's a -- a Washington-based organization that disseminates information and promotes discussion of teacher reform and particularly alternate routes into teaching, things like alternate teacher certification. It's -- Well, that's -- that seems to be their primary mission, and I was asked to be on the advisory board, so it has a number of people like E. D. Hirsch and I think Herb Wahlberg is on the advisory board, so it has a number of folks like that on it.
Q And how does it go about promoting teacher reform other than disseminating information?
A Well, it sends out a -- the primary thing that I can see that it does is it sends out a -- it has a web

site with lots of links on school reform issues and particularly on teacher quality and content knowledge and things like that and it does a weekly newsletter, electronic newsletter, that kind of surveys developments. It's a useful newsletter. And they seem to be jointly sponsoring -- I believe they're jointly sponsoring a conference in October in Washington with the American Enterprise Institute on sort of teacher quality and reform of teacher training and licensing and I'm writing a paper for that conference.
Q What is that paper going to be on?
A The paper is going to be on -- There's a variety of papers on a number of issues but the -- the person who's framed the particular panel I'm on is Rick Hess, H-e-s-s, at the American Enterprise Institute and he wants to have four papers analyzing different models for reforming teacher training and licensing, and it would help if I could draw something on it. He's got it laid out as a matrix. Do you want me to draw out what --
Q Sure.
A May I have a piece of paper?
Rick kind of visualizes sort of three models of reform of teacher training and licensing and he -- if you think of two dimensions here, he's got if you put

testing here and sort of you think of higher standards, so sort of low, high, and then you have sort of reform of teacher training programs, so standards for teacher training programs -- teacher training programs -- and he's -- he's kind of assigned -- Okay. So -- And this is low, high.
So what -- what Rick Hess, Dr. Hess, wants is for four people to write papers to talk about the sort of costs and benefits and the merits of strategies for reform associated with each of these cells. So for example, he gave me the low, low. In particular this is sort of more of a market-oriented perspective that you focus on standards for schools but then you sort of relax entry and sort of relax the regulation of the labor market but focus your regulation on whether kids are learning in terms of standards and so on; whereas here with the testing, this would be sort of you put more weight on a test and -- and use that as your primary intervention and here would be sort of the high standards on testing, high standards for teacher training programs, so this is sort of the kind of probably more the position of the National Commission for Teaching and America's Future and organizations like that. And then high -- this high, low, I don't remember who's writing this paper. So the point is there's four

people writing papers here on reform to kind of layout sort of the case for or against these particular types of reforms.
Q Whose writing the high, high?
A A fellow named Gary Sykes, a professor at Michigan State.
Q Okay. Thank you for your illustration.
A S-y-k-e-s.
MR. AFFELDT: Why don't we mark that as Exhibit 4.
(Podgursky Exhibit 4 was marked for identification by the court reporter.)
BY MR. AFFELDT:
Q Are you familiar with the process by which teacher preparation programs in California are accredited?
A Well, I've -- I've read about it on the web site. That's the extent of my knowledge.
Q Which web site?
A I'm sorry. The -- I guess it would be on the CTC web site.
Q And what did you read about accreditation?
A Well, I just -- I don't recall a great deal but that they are -- there is a review process and there are approved teaching training programs and they're examined

and they're expected to meet certain standards, and that's about all I recall.
Q Do you know the name of the entity that engages in teacher accreditation in California?
A You mean the state entity?
Q Yes.
A I -- I thought it was CTC.
Q What's your understanding of the role that accreditation plays in teacher credentialing in California?
A Well, I -- I'm viewing it as sort of the -- the way it's done in -- in virtually every state. Virtually every state has a -- either the State Department of Ed or if they have a teacher commission, the teacher commission periodically reviews teacher training programs and approves -- you know, either approves or doesn't approve them and generally you -- you have to -- in order to be licensed you have to attend a teacher training program that has state approval. So that's -- I'm -- I -- I view California as operating very similar to the way other states do this.
Q I think, as you've testified, you're -- Correct me if I am wrong -- you're in favor of relaxing teacher credentialing standards; is that fair?
MS. DAVIS: Vague and ambiguous.

THE WITNESS: Well, let me -- I'm in favor of allowing other entrants to provide teacher training. I don't -- So when I say "relaxing," I want to make clear I'm not promoting -- saying we should have bad quality but in my view it's -- states aren't particularly good at regulating in this area and moreover it's not clear to me what criteria should be used for approving a teacher training program other than, you know, the same general standards that you would apply to a higher ed institution, but I don't think that the best way to reform teacher training is to begin to layout more and more detailed criteria for running a teacher training program.
In my opinion we should -- we should -- it's in the best -- it's in the best public interest now to allow some organizations to experiment. For example, it's my understanding that Sylvan Learning Centers through a subsidiary called Kantor -- I believe that's K-a-n-t-o-r -- now collaborates with some school districts in running these district-based licensing programs.
Now, that might be a very good idea. I think we should evaluate that and I think that what -- what I'd like to see is allowing more competition and to -- to see if we can get better teacher training rather than

simply relying on the -- the same cast of characters, if you will, that have traditionally been providing training. In other words, you can either try to reform the traditional, the sort of current entrants or you can allow new entrants to come in and compete, and I like the idea of more competition to force everyone to do a better job. So that's what I mean by relaxing the standards. I would like to see a situation where the state permits others to enter who -- who argue that they can run a good teacher training program to provide more competition for the incumbents who are already in the market.
BY MR. AFFELDT:
Q And I think you said in there that you think the teacher programs should be -- Well, what I heard you say was that institutes of higher ed should generally be reviewed and accredited according to their current process and that there's no -- you didn't see a need for additional review of teacher preparation programs?
MS. DAVIS: I am going to object to the extent that mischaracterizes testimony.
THE WITNESS: I didn't say that. I -- I believe I was just saying to you how California operates and I wasn't taking a position one way or the other on that. I -- So. . .

BY MR. AFFELDT:
Q Well, under your -- do you think there's a need for teacher preparation program accreditation?
A Yes, I think that the state of -- the proper role for a state education agency is to review programs that train teachers, so I think there is a proper role to say these are a set of legitimate or acceptable teacher training programs.
Q And by the same token should the state be reviewing the experimental programs?
A Yes.
Q What's your understanding of the certification needed in California to teach English language learners?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: I'm not -- I don't know the details of what's required to be a -- You're talking about ESL teachers, or bilingual?
BY MR. AFFELDT:
Q The whole category of teachers that teach English learners.
A Can you repeat the question?
MR. AFFELDT: Can you reread the question, please.
(Record read as follows:
"Q What's your understanding of the

certification needed in California to teach English language learners?")
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: Well, you -- I'm still a little bit unclear. California has a bilingual ed certificate. So are you asking me how much do I know about what it takes to be a certified bilingual ed teacher in California?
BY MR. AFFELDT:
Q Do you know the different types of certifications that exists for teachers of English learners in California?
MS. DAVIS: Same objections.
THE WITNESS: I -- I know that -- I believe that the elementary school that is multisubject teachers are required to take in their course of their training to learn something about, you know, non-English speaking learners but I don't know the details of the licensing of bilingual ed or ESL teachers in California. I know they're licensed and they have to meet certain criteria similar to those in other fields.
BY MR. AFFELDT:
Q What's your understanding of what's required to earn an emergency teaching permit in California?

A As I recall to teach -- to be an emergency certified teacher you must have passed CBEST and you must -- you must have a bachelor's degree and you have to have met all the other -- you know, background checks and so on. And in addition, you must have demonstrated either through a test or through your academic major the content knowledge if you're a single subject teacher but you may not have completed all the required pedagogical course work. So basically you have to have passed all the tests but you're short on course work.
Q And that's pedagogical course work?
A Yes.
Q Do you have an understanding of under what conditions waivers are granted in California?
A Not intimate. As in most states the school district has to request permission for a waiver and claim that they can't -- it's my understanding they have to state that they can't find a regularly certified teacher.
Q And do you know what types of certification requirements can be waived under the current process in California for waivers?
A I -- I don't recall.
Q Do you know if there are any limitations on what requirements can be waived by the CTC?

A I do not recall, but I also know that these things keep changing so whatever I may have read has changed. It's important to understand these things are changing because of federal law and is going to require states -- there will be no more of these at least in theory in 2005, so states are tightening up across the board on this.
Q Do you know how many emergency credentialed and waivered teachers were teaching last year in California's public schools?
A I don't recall the specific number but I remember looking at one of these reports that are -- that are submitted I guess to the legislature that showed the number on waivers and the number of emergency certified teachers was going down and interns was rising. Off the top of my head I'd say maybe 4,000 emergency but I -- but I think the important thing that sticks in my mind is that there was a clear downward trend on waivers and emergency.
Q Do you recall what was happening with respect to the preintern numbers?
A They were going up a bit as I recall.
Q Do you have a sense as to whether California will be able to have all highly qualified teachers in -- under the No Child Left Behind definition in its

classrooms by 2005?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: I think it will be hard for almost any state to be in full compliance, including California; the reason is that these licensing systems are very complicated and -- and with a dynamic labor market with teachers coming from other states, new teachers entering, teachers dropping out for a while, it's very difficult to have every teacher at every hour during the school day in full compliance with these systems.
It's important to keep in mind that in law there's one license, in medicine there's one license, architecture there's one, veterinary medicine there's one. In teaching it's not uncommon for states to have hundreds of licenses, certificates and endorsements, so they're a very complicated system. I guess the other way to put it: Virtually no school district in the U.S. is in full compliance. Virtually every school district in the United States has some teachers teaching on emergency certs or waivers or just not certified or some nonfull certificate, even the wealthiest school district.
BY MR. AFFELDT:

Q Are you familiar with California's proposed definition for what constitutes a highly qualified teacher under No Child Left Behind?
A I'm not -- I -- It's my understanding that the interns will play a big role in their -- in their definition of fully qualified -- or highly qualified.
Q And what do you mean when you say "a big role"?
A Well, they would be considered highly qualified. And there are a lot of them so. . .
Q Do you know how many?
A According to McKibbon, McKibbon's report, there's about 8500 currently. I think that's due to go up this fall.
Q Do you have an opinion as to whether interns are highly qualified under the No Child Left Behind Act?
MS. DAVIS: In California?
MR. AFFELDT: Yes.
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: I -- I think -- Well, the -- it's difficult for me to answer that question because the law -- the federal law is so vague that I -- I'm not sure what the federal government means by "highly qualified," so it's difficult for me to step into the mind of the U.S. Department of Education regulators or

indeed the congressmen who pass the law because -- because as I've indicated it's very difficult given the current licensing systems of any state that I've looked at to have every teacher always have their teachers cert fully -- you know, have full standard certification, again, because you have lots of people entering the market, new teachers, you have teachers who drop out for, you know, 10 -- drop out for 10 or 15 years, raise a family and come back in, they're changing states. So it's -- it's just a very complicated market and it's going to be hard for any school district or any state to fully comply.
BY MR. AFFELDT:
Q Is that a long answer to say you don't know whether or not interns qualify as highly qualified under the federal No Child Left Behind Act?
MS. DAVIS: Asked and answered.
THE WITNESS: Was that the question?
BY MR. AFFELDT:
Q That was the question.
A Oh. Well, then, I guess I'm not entirely sure, so I don't know.
Q Have you reviewed the Academic Content Standards?
A Briefly. I -- I know they're there and

they're -- they're detailed by field but I can't cite chapter and verse by field.
Q When did you review them?
A Oh, I've been reading about them for quite sometime and -- and I saw they were -- examples were reported in Professor Darling-Hammond's report. But I've been reading about debates about the academic standards in California for some time. I spoke at a conference here, here in L.A., at about the math and science -- well, the conference was about California's content standards and at that time they had -- you know, there was a big -- a lively discussion of the science and math standard, and so, you know, I read through and I saw a lot of discussion of those standards and how they were changed and the controversy surrounding them so. . . But again, I can't cite you chapter and verse as to what exactly the standards say about what kids should know in seventh grade about geometry, if that's -- but I have -- I have looked at these.
Q My question was when did you look at the Academic Content Standards for California?
A Well, I -- I can't -- I've -- When -- I guess I could say when was the last time that I looked at them because I have been looking at them. I -- I -- I try to follow what's developing in education and California

gets a lot of attention, so I mean I looked at them -- probably the last time I looked at some part of the standards was a couple of months ago.
Q Which part were you looking at then?
A I don't recall.
Q Do you recall what the purpose for your looking at the standards of California was at that time?
A I'm -- I'm sure it was pertaining to this case so. . .
Q Prior to that occasion when was the last time you looked at the California Academic Content Standards?
A Well, as I said, I try to follow the policy, debates on K-12 education, so, for example, Quality Counts is a publication that comes out from EDUCATION WEEK once a year and they grade states on teacher quality but they grade states on their standards and their assessments of the standards and so on, and I look at that and I see how states stack up and they -- they score states on -- on the character of their standards and their assessments, so there's a lot of information that comes out about the standards state by state. The Fordham Foundation publishes a report card, or has in the past, that graded states on the quality of their standards. So, you know, it just -- California pops up on the radar screen if you follow these discussions

periodically, and I can't -- I don't remember every time that California has popped onto the radar screen but California is a very important state and it pops on the radar screen frequently.

Q My question was not when was the last time you read anything about the Content Standards of California. Prior to the couple of months ago when you say you reviewed some portion of the standards, when was the time prior to that that you last looked at the California Academic Content Standards themselves, if you remember?

A I don't remember.

Q Do you have any opinion as to the quality of California's Academic Content Standards?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: My sense in reading these discussions and from, you know, the -- Various organizations have done report cards or surveyed the standards of states, and my sense is of the -- like the Education Commission of the States, like the Fordham Foundation, like EDUCATION WEEK, and my sense is that they're pretty good vis-a-vis other states, they're pretty detailed and they seem to be fairly content rich and I think the mass standards got fixed as a result of a lot of public debate, much coming from math professors

and so on. So I think there's been a good debate in California and my sense is that yours are -- you have a pretty good set of standards.

BY MR. AFFELDT:

Q And is that opinion derived on your review of other organizations' assessment of the standards as opposed to your own independent assessment?

A Yes.

Q Are you familiar with the content of the California high school exit exam?

A No.

Q Are you familiar with California's -- California's curriculum frameworks?

A No.

Q Are you familiar with the term "opportunity to learn"?

A Yes.

Q What does that term mean to you?

A It's -- It's my understanding that this is an argument that's made about resource availability in K-12, that essentially an argument that kids need enough resources to -- to meet the standards, so they can't meet the standards unless they've been taught the material.

Q Using that definition, do you think that

students should be provided an opportunity to learn?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: Well, it is a vague and ambiguous term, I have to agree. So sure, I think it's -- the state -- every state has an obligation to run schools to give kids an opportunity to learn, so that's the job of states and I think that's -- that's a good idea.

BY MR. AFFELDT:

Q And the opportunity to learn should include, should it not, the opportunity to learn the state's defined Academic Content Standards?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: Well, states have said what kids should know and do at various grade levels and that's what schools should be doing and so they should be allocating their resources to -- to best achieve that goal, so yes.

BY MR. AFFELDT:

Q Do you have an opinion on the extent to which California students are being provided the opportunity to learn the state's Academic Content Standards?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: That takes -- That takes me beyond what I was focused on in this case and I really don't have an opinion on that.

BY MR. AFFELDT:

Q Are you familiar with the various professional development opportunities for teachers in California?

A No.

Q Are you familiar with -- Are you familiar with the state's programs, if any, to increase the numbers of credentialed teachers in California?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: Well, I -- I know that there -- I've read about some on the web site. I'm not sure specifically what you mean. The state is spending hundreds of millions of dollars running schools of education and that's -- that's one goal is to provide teachers for California public schools, so I -- Is there a specific program you're interested in? They're doing lots of things. There are many approved teacher training programs, many of them are publicly funded. And then you have intern programs and you have district-based intern programs. These interns are receiving, you know, pay while -- so there's a variety of things that are being done to staff schools.

BY MR. AFFELDT:

Q Are you familiar with any specific legislated programs in recent years that have been enacted to increase the numbers of credentialed teachers in California?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: I remember reading about some but I don't remember the details at the moment.
BY MR. AFFELDT:
Q Where did you read about those?
A On the web site, the Department of Ed web site.
Q Are you familiar with any specific state programs enacted in recent years to increase the retention of credentialed teachers in California?
A No.
Q Are you familiar with any specific state programs enacted to reduce the attrition of credentialed teachers from hard-to-staff schools in California?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: No.
BY MR. AFFELDT:
Q What's your understanding of the term "hard-to-staff" in terms of hard-to-staff schools?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: If there's an official definition of that in the state, I don't know what it is.

BY MR. AFFELDT:
Q My question is: To the extent you've used that term in your writings, what does it mean for you?
A I'd say that it's schools in which there's higher turnover of teachers and you have a higher share of teachers on emergency or licenses or waivers, teachers -- in general, schools that don't have enough qualified applicants in certain fields.
Q Have you read Linda Darling-Hammond's deposition in this case?
A Yes.
Q All of it?
A Yes.
Q When was that?
A Well, I've -- When was the first time I read it? When was the last time I read it? Or when --
Q How many times have you read it?
A Well, I've looked back -- It's a very long deposition so I can't say I read it cover to cover over and over again, but I have glanced back at it just even in the last couple of days. And of course I read it when I wrote my rebuttal several months ago in more detail.
Q In writing your expert report in this case, did you receive any outline from Mr. Salvaty?

A No.
MS. DAVIS: Vague and ambiguous.
THE WITNESS: No.
BY MR. AFFELDT:
Q From anyone else?
A No.
Q Did you receive any assistance from anyone in writing the report?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: No. I wrote it -- a draft that professor -- I mean I did write an early draft and -- and Mr. Salvaty made suggestions or it was circulated with suggests, some of which I incorporated and some of which I didn't, but if that's what you mean by "help." And then I submitted a final report.
BY MR. AFFELDT:
Q Are there any changes you'd like to make to your final report?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: No. Well, I gave you some papers that I would have cited if I were doing it again right now, but I don't have -- other than that I don't have any changes.
BY MR. AFFELDT:
Q I am going to hand you what we will mark as

Exhibit 5.
(Podgursky Exhibit 5 was marked for identification by the court reporter.)
BY MR. AFFELDT:
Q If you could review that and let me know if that's your expert report in this case.
A It looks to be the report. I believe it is.
Q If you could look at page 2, the last paragraph, the third sentence in reads:
"Conversely, Professor Darling-Hammond apparently believes that all teachers who do not meet her definition of 'qualified' (including those with 'intern' credentials) should - as a general rule at least - be banned from teaching in public schools altogether. In order to ensure that her standard is met, Professor Darling-Hammond proposes that California 'prohibit' low performing schools from 'having more than the state average proportion of teachers without preliminary or clear credentials' and that California 'require' schools to show 'annual progress' in their hiring of 'qualified' teachers."
Do you know what the current state average per portion of teachers without preliminary or clear

credentials is in California?
A Statewide?
Q Yes.
A I suppose it would probably be -- Off the top of my head it's probably 20 percent. No, that's not -- It's not that high statewide. Less than 20 percent I would imagine.
Q Okay. Assume it's around 14 percent.
A Okay.
Q Assuming it's 14 percent or thereabouts, then that would mean that approximately under Professor Darling-Hammond's scenario at least 14 percent of teachers at a low-performing school would be permitted under her proposal to not have a preliminary or clear credential; correct?
A Well, she has two levels of her proposal, as I read it, sort of the short run and the long run. It's my understanding in the long run she wants it at zero but in the short run with her 20 percent standard, then yes, you should permit 14 percent.
Q So at least in the short run Professor Darling-Hammond isn't proposing a ban on interns or even emergency credentialed teachers; correct?
A Yes.
Q Is it your belief that all credentialing

requirements that a state enacts should only be enacted if they can be demonstrated to improve student achievement?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: States have to make decisions and what they should try to do is evaluate their program after they implement it, so ultimately I would like to see evidence for what they do but in -- you know, I think they can make reasonable changes in policy with, you know -- People have to make decisions, and sometimes we don't have full information on -- on the decisions we make so -- but ultimately it would be good to evaluate what they're doing. I mean that would be very desirable.
BY MR. AFFELDT:
Q Can there be any basis for making a state policy decision other than being able to show a direct link to student achievement?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: Well, in my opinion the -- we're running schools in order for students to learn, so we ought to be focusing on student achievement gains in making these kinds of decisions. If -- If you have no

evidence and you have to make a decision, then you -- you make the best decision you can, you use common sense and logic to proceed. I think that that's my best answer to your question.
BY MR. AFFELDT:
Q Well, for example, is it appropriate in your view for a state to make a policy decision based on moral or ethical grounds as opposed to promoting -- or rather as opposed to serving a direct established link to student achievement?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: Well, yes. We teach the justification for civics education as we -- for defense of our democratic values. But ultimately we'd want to know if the kid's taking civic education or -- or internalizing those democratic values. So even -- even where we're -- we're making ethical decisions we -- we ought to at least look at evidence and see if the way we're spending money is achieving what we're trying to accomplish.
BY MR. AFFELDT:
Q Sure.
A If we want to teach kids tolerance, for example, and we spend money in schools to promote

tolerance, then we ought to at least try to get some evidence to figure out whether the money we're spending to teach tolerance is accomplishing our end. The decision to teach tolerance is an ethical one or a political ethical one, but if we're going to spend money we ought to at least find out if we're achieving what we're trying to achieve.
Q By the same token would it be appropriate in your view for the state to decide that they want all students to have a teacher with roughly the same preparation and training so that high minority schools and low income schools aren't disproportionately served by underprepared teachers compared to other schools -- Would that be an appropriate decision? -- even without established evidence that the better prepared teachers are going to result in improved student achievement?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: Well, you've used the word "underprepared," and so I don't agree with labeling intern teachers as underprepared. Indeed, from the evidence I've seen in California and other states, many of these intern teachers have more content knowledge and more experience and can bring many things to a classroom, so I'm -- I'm -- I object to the use of the

term "underprepared" when you refer to intern teachers as compared to probationary teachers who pass through traditional ed programs.

But in the more general point you've raised is should every public school in California or school district have a similar portfolio of teacher credentials, is that sort of a laudable goal, and I think that it probably would not be a wise goal because I think the labor market conditions vary so much across school districts, a thousand of them in California and in other school districts across the country, that you need to get -- you need to develop different ways to get qualified people into the classroom and the way to get qualified teachers into the classroom in L.A. Unified may be different than the way you get qualified teachers in the classroom out in some rural -- small rural district. It is different based on my experience and study in this area, so I don't think it would be well advised to try to have one size fits all for every school district in the United States.

BY MR. AFFELDT:

Q My question isn't trying to really define what -- who's in and who's out in terms of qualified or unqualified, so for purposes of this question if you want to include interns, feel free to.

The question is: If the state -- Is it appropriate for the state to decide that they want all children to have a certain -- teachers with certain types of preparation even when they haven't been able -- just for the moral or ethical reason of wanting all students to have access to teachers with X type of preparation even when there may not be evidence that teachers at X type of preparation lead to improved student achievement?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: I think a much better goal for the state would be to focus on student achievement and give school districts flexibility as to how they achieve that end; I think that that's a much more laudable goal than trying to ensure that every teacher has -- has gone through an identical training program or has sat through the same education courses or has exactly the same credential. I -- I don't think that that is a reasonable policy. I think the best way to ensure that kids are learning is to focus on student learning and give the school districts some flexibility as to how they achieve that end. It may be that a school district decides it's easier to teach kids geometry with a computer program than with a certified geometry

teacher. What -- What the bottom line is are the kids learning geometry. In my opinion we should -- the focus should be on whether kids learn geometry, not the -- not the details of the delivery mechanism for learning geometry.

BY MR. AFFELDT:

Q If you could turn to page 3, at the second full paragraph, the third sentence says:

"As demonstrated below, there is no statistically significant positive relationship between the percent of teachers with preliminary or full credentials and student achievement gains."

By "demonstrated below" are you referring to your empirical analysis of credentials in student achievement that you did for this report?

A Yes.

Q Anything else you're referring to there?

MS. DAVIS: If you need to look over the report, that's fine.

THE WITNESS: Well, this is the introduction, and I think "below" means everything that follows it, so it not -- not only am I referring to my statistical result but I'm also referring to my discussion of -- or my critique of the studies that Professor

Darling-Hammond cites, so I would add that.

BY MR. AFFELDT:

Q Looking at your footnote 1, the last sentence says:

"In effect, Professor Darling-Hammond would have CTC regulators in Sacramento take over the hiring and personnel decisions of hundreds of local school districts. I'm aware of no precedent for this in any state."

What's your basis for asserting that Professor Darling-Hammond would have CTC regulators take over hundreds of local school districts in terms of their hiring and personnel decisions?

A Well, I'm referring to what she's proposing on page 80 of her report, and it -- for example, she's -- in that section she's claiming that she wants an audit and close scrutiny and evidence in effect from -- coming from school districts concerning the unavailability of fully certified teachers. It -- What she seems to be proposing is sort of a team of inspectors that would travel around the state and audit the -- and be looking over the shoulders of a thousand personnel directors and looking at all the applicants that are coming into every school district office to see who really applied for the job. I mean there's -- I'm aware of no state that's

ever sat down and conducted such an audit of the personnel offices of school districts. So it's -- it's very intrusive and would require a much bigger staff for CTC as well.

Q Is an audit where an outside entity comes in and reviews the decisions made by a local school district the same thing in your mind as taking over the hiring and policy decisions of local school districts?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: Well, the way you've stated that, no, but what -- what you're saying -- what you're effectively doing is you're requiring these school districts to justify thousands of hiring decisions and having them look over the -- their shoulder. So I think it's -- while they're nominally doing the hiring, this type of regulation is -- is transferring much of the decision away from the local school district school personnel to the state.

BY MR. AFFELDT:

Q You don't claim that Professor Darling-Hammond actually proposed that the CTC take over hiring and personnel decisions?

A No.

Q And when you say "hundreds of local school districts," what's your basis for saying "hundreds"?

A Well, there are about a thousand school districts in the state and many of them that have low-performing schools are schools with high percentages of noncertified -- or non -- by her definition not fully certified teachers. So this -- I don't know how many this would affect but it seems to me that it could be hundreds of school districts.

Q So the "hundreds" there was a figurative number rather than a literal number that you determined based on some review of facts?

MS. DAVIS: Vague and ambiguous. Mischaracterizes his testimony.

THE WITNESS: I -- It seems to me because Professor Darling-Hammond was very vague about this that you could have the state intervening in hundreds of school districts.

BY MR. AFFELDT:

Q What's the cutoff level at which -- that would trigger the state intervention in hundreds of school districts?

A I believe it was 14 percent. If you were above the state average in the percent of uncertified -- not clear or preliminary credentialed teachers, then it would be triggered.

Q That was for particular low-performing schools?

A Yes. I forgot that.

Since we're at the end of a question, could we take a break now?

Q Sure.

A Okay.

(Recess.)

BY MR. AFFELDT:

Q Do you have any idea how often districts in California hire uncredentialed teachers when credentialed teachers are available?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: No.

BY MR. AFFELDT:

Q Do you know if the state has any mechanism for determining when districts hire uncredentialed teachers even though credentialed teachers are available?

MS. DAVIS: Same objections.

THE WITNESS: No.

BY MR. AFFELDT:

Q Do you know how many districts in California delay hiring until after the start of the school year so they can better assess their hiring needs?

A No.

Q Do you know if the State of California has any

mechanism for determining that?

A No.

MS. DAVIS: Same objections.

BY MR. AFFELDT:

Q Do you know how long it takes on average for larger districts to get back to candidates on whether or not they're being extended a job offer as compared to suburban districts in California?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: No.

BY MR. AFFELDT:

Q Do you know whether the state has a mechanism for determining that?

A No.

Q Do you know what steps the CTC goes through to provide authority to school districts to hire teachers on emergency permits?

MS. DAVIS: Can you repeat that?

(Record read as follows:

"Q Do you know what steps the CTC goes through to provide authority to school districts to hire teachers on emergency permits?")

MS. DAVIS: Okay. Thank you.

THE WITNESS: No.
BY MR. AFFELDT:
Q Do you know what a declaration of need for fully qualified educators is?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: I assume it's -- it's the statement or form that -- that has to be filed with CTC to -- to request a waiver or an emergency certified teacher. All states have something like this, so I'm -- I -- I'm speculating that that is the form that has to be filed with the state.
BY MR. AFFELDT:
Q Have you ever heard of that form with respect to California before?
A Well, I think I've encountered the term. There's a process -- an application that has to be filed and -- and I -- I've -- I think I've read that that's what it is. It has different names in different states but it's the same generic -- or I believe it's the same generic process.
Q Do you know whether other states require districts to demonstrate an adequate search has been conducted and that there are no suitable individuals with credentials available prior to allowing districts to apply for emergency permits and waivers?

A What do you mean by "demonstrate"?
Q Demonstrate in any way to the state.
A I'm not aware of any state that asks for any detailed information other than a statement that they can't find a qualified certified teacher.
Q Which states are you aware of that at least require such a statement?
A Over the years in looking over states virtually every state that I'm familiar with has some type of waiver mechanism and in some states they'll call it a waiver, in some states they call it a temporary certificate, in others they'll call it an emergency certificate, in other states they'll call it a provisional certificate. It's -- That's part of the problem of comparing one state to another is there's just a bewildering set of terms for similar phenomenon. But every state whose licensing I've examined has some mechanism for a school district to tell the state regulators that we've -- we've conducted a search and we can't find someone with a standard credential, and so -- and districts proceed to hire -- can proceed to staff the position.
I've encountered states that -- where districts apparently proceed to do the hiring without even bothering to -- to get permission. You end up seeing

more certified -- more teachers lacking certification in the classroom than the number of waivers that are sort of on file in the State Department of Ed office. There's apparently a fairly wide range among states and how aggressively they monitor this. So even though the requirement is on the books, the impression I have is that in many states district behavior is not carefully scrutinized.
Q Which are the states in which district behavior is not carefully scrutinized that you're aware of?
A Well, it's -- it's a combination of states and districts. I know that in Missouri there's some districts that seem to have more uncertified teachers than one would expect based on waivers filed. I found that in Massachusetts there were -- some districts seem to be reporting more unlicensed teachers. I can't name particular states. I've just encountered this in other states. It's a very complicated system and compliance is -- varies.
Q Which are the states that are on the other end of the spectrum, that require in your view a large amount of monitoring of district hiring practices with respect to emergency permits and waivers?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: Well, I think as a general rule

states that have a smaller number of school districts it's easier for them to monitor this, Maryland for example. But it -- in general hiring is a pretty decentralized process in the states and I don't know that any state is particularly aggressive in -- in -- in this area, that the districts file their requests for uncertified teachers -- I mean for emergency teachers. And, you know, in most cases these have to be renewed every year, so it's -- it's supposedly a short term -- so supposedly it's a short-term phenomenon. So I just don't think that -- I'm not aware of any states that -- that are -- that require a great deal of information when schools make these applications.
BY MR. AFFELDT:
Q Page 4 -- Let's go off the record.
(Telephone interruption.)
BY MR. AFFELDT:
Q The first sentence on page 4 at the top says:
"There is also little evidence that variation teacher pay by school districts is any higher in California as compared to other states with a mix of large urban and rural districts."
Are the other states that you're referring to there the ones that you discuss later in your report?

A Yes. In particular it's -- it's Chart 14, I'm referring to Chart 14, so it's the states that are in Chart 14.
Q Which of the states in Chart 14 have significant shortages of credentialed teachers in any of their districts?
A Could you repeat the question?
Q Yes.
To the extent you're aware, which of the states in Chart 14 have shortages of -- significant shortages of credentialed teachers in any of their districts?
A Well, I -- I think the problem of teacher shortages that is by in particular fields in urban districts, special ed, math, and sciences, is very common in major urban districts, so I -- so certainly in New Jersey, in Trenton or Passaic, I would suspect you'd see this. In Ohio, Cincinnati, Cleveland. Texas, certainly this has come up in discussions in Dallas and Houston. Michigan, Detroit; Illinois, Chicago; New York State. We just had a court case on this -- or this issue in New York City figured prominently. And Pennsylvania, you know.
This -- This concern about teacher shortages in urban districts and high levels of teachers that don't have regular certification has come up in many urban

districts. It's -- It's really a pervasive claim or complaint. The only one that I would -- in that group where I'd say it's probably less -- one hears fewer complaints is Washington and that's a -- that would be Washington State.
Q Not Washington, D.C.?
A No, certainly not Washington, D.C. Washington State everything is mellow and happy in Seattle. It's -- They have no problems that the rest of us have.
Q Am I reading your chart right to say that Washington has the smallest variance in salary?
A Yes, that's the -- the first bar is the starting pay variation and the second bar is the variation in master's degree, 20 years experience scheduled pay, so they seem to have less variation than the other states.
Q And that's variation at starting in master's within districts within the state?
A Yes -- No, it's between districts.
Q Between districts within the state. Thank you.
As part of your work on this report you conducted a new analysis; correct?
A Yes.
Q What were you looking for in this analysis?

A Can you be specific about what analysis you're talking about?
Q Your analysis of teacher credentials in student achievement.
A Oh. Well, I was seeing if the relationship held up when you looked at gain-scores as opposed to levels.
Q By "levels" do you mean -- what do you mean?
A The -- The -- If you just compare teacher credentials with the level of student achievement at a point in time, so level with respect to the STAR test, this percent of kids who are above the 50th percentile. That's how districts are -- are scored or that's one of the STAR scores. A gain would be whether you're improving, where you're bumping up the percentages to or above the 50th percentile.
Q Have you ever done an analysis like this before --
A Yes.
Q -- this report?
Where was that?
A Well, we went over this yesterday. The -- I -- In that article in the -- Yesterday we talked about studies I'd done looking at teacher credentials and student achievement gains and I said that I did that in

some analysis with Missouri data or Missouri achievement test.
Q Let me just interrupt so you don't have to repeat --
A Okay.
Q -- what you did yesterday.
Specifically I mean an analysis like the kind that you did in Charts 1 to 4 in the appendix of your report where you analyzed student achievement against credentialed teachers and then you controlled for some demographic factor and then you looked at gain-scores.
A Okay. Well, then in that case I'd say most -- the most -- the closest analog would be what I did in Missouri looking at gains at the district level and then I did a similar -- similar charts in South Carolina in their school finance case. South Carolina like California tests every year although in their case it's from three through eight -- or does annual testing grades three through eight.
Q And did you reach similar conclusions --
A Yes.
Q -- as you did California?
A Yes.
Q Why did you choose as your dependent variable the percent of students in grades who scored at or above

50th percentile?
A That's what's reported on the -- for schools on the web site and it's -- it's comparable across grades. If you just use scale scores, you -- you would -- If they weren't vertically scaled, then it -- it wouldn't be meaningful to look at a change in scale scores. But this is a measure that it makes sense to say "Did you gain?" If it went up by 5 percentage points, it means that you moved 5 percent of your kids above the -- the median on a nationally norm test, so it's sort of meaningful to look at gain-scores.
MR. AFFELDT: Can you read his answer back, please.
(Record read.)
BY MR. AFFELDT:
Q What do you mean if the scale scores weren't meaningful -- weren't vertically scaled then it wouldn't be meaningful?
A Well, there's -- this is -- the kids are taking different tests at different years and you can scale those. It's kind of arbitrary how you scale a test. You know, you can make the -- It's not only arbitrary, it's complicated because it's not the same test. So, for example, if they're not vertically scaled then -- then looking at a change of 5 points at one point on the

test if you go from a -- suppose the mean of the test is -- is 500, then if a kid made -- you know, went from a 350 to a 360 and another kid went from a 480 to a 490 between the two years, it -- those -- those differences in the scale score might not be comparable -- Okay? -- because again, it's a different test.
Now, there are ways that the -- the test developers can put common items on a test so -- so you can look at changes in scale scores. But in any event it's simpler to just look at a measure like percent above the median on a nationally norm test, and indeed that's exactly what the -- the -- to compare changes across years, and in fact that's what's reported. These kind of gain-scores are reported on the state web site.
Q Another term for the process of comparing two different forms of the same test is equating; correct?
A Yes.
Q And the purpose of equating is to enable users of the test to be able to draw -- be able basically to compare different forms of the test as if they -- they had the same -- on the same scale of scores; right?
A Yes.
Q Is it your understanding that the STAR tests are equated from form to form?
A I don't know about the scale scores. I don't

know if they are or not. I -- I chose instead -- And I don't even remember if the scale scores are on web site, but the STAR scores are by percentile are what's commonly used, not only in my study but in the studies that Professor Darling-Hammond cited, including the Betts study.
Q Are the raw scores on the web site?
A I don't believe so.
Q Do you know if the mean scale scores are reported for each school?
A I don't remember. I don't believe so but I think they've -- what they report is by breakdowns by quartile. I don't believe the scale scores are actually on the web site.
Q But in any event you don't know if the STAR scores are equated from form to form?
A I don't; and so even if they were on the web site, I would prefer to do it the way I did it because of these equating problems.
Q Do you know if the Stanford 9 is equated from form to form?
A I believe it's equated, nonetheless there are problems with taking -- I'm not convinced that you've solved the problem of -- of having an equal interval measure in comparing scale scores between tests. It's a

very complicated psychometric problem and I -- I much prefer the approach I took.
Q But the Stanford 9 is a nationally norm test so it would stand to reason that the different forms are comparable and thereby equated, wouldn't it?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: What you're doing is you're comparing schools at different levels of achievement and comparing gain-scores at different parts of the scale, and I know from the research on teacher effects that there can be problems with these -- with using scale scores whether they're equated or not in looking at teacher effects or ranking schools in terms of gain-scores and so I'm, again, reluctant to -- to use the scale scores for an exercise like this.
BY MR. AFFELDT:
Q My question was simply that it would stand to reason that the SAT-9 is equated because the test is nationally normed and used to compare student scores on and across the nation; isn't that right?
A Well, that does not mean it's equated from one grade to the next, that you can meaningfully compare that a five point gain from grade four to five means the same thing as a five point from grade nine to grade ten in reading. That's what you're saying, you're saying

they fixed that problem, and I'm saying I'm not sure they have.

Q I'm simply trying to establish that one form of the test is equated to other forms of the test.

A Oh, no, I agree with that at a grade level, sure. Within a grade there is form A, B, C, D, and E and those are equivalent. But we're talking about -- at least I thought we were talking about comparing between grades, the grade four form versus the grade five versus the grade six, and I understood you to be asking me whether it would be appropriate to look at it -- compare a ten point gain from grade four to grade five to a ten point gain scale score from grade seven to grade eight, and that's what I'm worried about. But across different versions of the test at the same grade level, I have no problem with that.

Q Other than the problem that you identified in terms of equating the test between grade levels, are there any other problems you would be concerned about in terms of using a scale score?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: Well, I'd have to see the study but that's the biggest concern. My biggest concern is when you're looking at changes from one grade to the next, you have to worry about this issue if you're using

scale scores.

BY MR. AFFELDT:

Q Under your study since you didn't account for student mobility, you're basically assuming that all the kids that took the test in the fourth grade are also taking the fifth grade version of the test a year later; correct?

MS. DAVIS: Asked and answered yesterday.

THE WITNESS: Yes.

BY MR. AFFELDT:

Q So isn't it -- does it really matter for purposes of your analysis whether the fourth grade version is equated to the fifth grade version, because the point is you're just trying to measure assuming you were using scaled scores how students scored in the fourth grade versus how they scored in the fifth grade and since they're all taking the same test in the fourth grade and the fifth grade, you're -- you're measuring a change in achievement?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: Are you done?

BY MR. AFFELDT:

Q Yes.

A They're not taking the same test at fourth grade and fifth grade, and that's what the problem is.

So how -- So the problem is that they're taking a different test in the fourth grade than in the fifth grade. It has different items on it. So the question -- So the question is how do you compare the scores. And the State of California does it, the comperability, by simply saying on the basis of national norms what percent of the kids are above the 50th percentile -- And in fact on the web they report the 25th, the 50th, the 75th percentiles -- and that's a fairly clear way to compare the two grade levels and look at changes. But if you just looked at the raw score or the scale score and make that change, then it -- it wouldn't be -- it would be misleading potentially. And in particular it would be misleading if you started trying to compare different changes, if you compare four to five versus six to seven versus seven to eight.

Q Are you familiar with how the State of California ranks schools using test scores under the API?

A I read it -- I read about it early on in this work but, you know -- and I know that gain -- or I believe that gains play a role in it but I can't remember the details of how API was used. And I couldn't use API here because it's a school-wide

measure, if I recall, and I wanted to look at particular grades.

Q Assuming that we're talking about the Stanford 9 which -- Strike that.

When you use the term "50th percentile," you're talking in comparison to a national sample?

A Yes.

Q So why couldn't you compare a mean scale score to a national sample?

A Well, you could do that.

Q And couldn't you do that for both the fourth and the fifth grade and compare the change?

A No, because you would have to have some kind of standardized measure. In other words, I think you would need to use a standard deviation and look at changes in standard deviations. The problem we keep coming back is that does a -- is what's the meaning of a -- of a change in points when -- Well, you'd have to convert to a standardize measure, and percentile is a standardize way of comparing the two tests, and if you're going to do what you're saying, you'd have to do standard deviations; and you could do that, it just makes it more difficult to interpret and the state -- and the state would confuse everyone if they put standard deviations up on the web site. So percentiles is easier to

understand and it's a fairly straightforward way to deal with this problem.
Q Did you run your analysis looking at any other different dependent variable?
A No, I didn't -- I didn't use scale scores. I just did it this way primarily because I think this was consistent with what Betts had done and -- I can't remember what Goe studied. The Getler -- Was that his name? -- Fetler, the Fetler study used the API measure. I can't remember what Goe's estimate was but I believe this was more consistent with what Betts had done.
Q You also didn't run the analysis looking at student scoring above the 25th percentile level --
A No, I didn't.
Q -- right?
Does using the 50th percentile in any way limit the likelihood of improvement in scores?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: Well, it -- obviously you can -- Yes, it limits the potential improvement 50 percent. You can improve 75 percent if you're at the 25th percentile but only 50 percent if you're at the 50th percentile, so it -- I mean on the other hand it limits -- you're trading off the potential gain but you're gaining a potential loss.

BY MR. AFFELDT:
Q What do you mean by that?
A Well, if you're at the 25th percentile you can only fall by 25 percentiles. So some schools go up, some schools go down, so you're -- you know. I mean in the data people -- schools don't swing by huge amounts either way but the median is -- it's symmetric, you can pick up gains and you can pick up losses in kind of an equal way.
Q But using the 50th percentile as the dependent variable means that you're not capturing the achievement gains between, for example, the 30th and the 40th percentile; correct?
A Oh, I see what you're saying. Yes, that's correct.
Q Or for that matter are you -- for the gain measure you're capturing any improvement for those students who are at the 60th percentile who improve to the 70th percentile?
A That's correct.
Q And when you analyze the gain in the -- between grades, what was the -- how did you do that analysis? I'm not asking the question very well, but what constituted a gain under your analysis when you compared fourth and fifth graders?

A I just took the difference in the percent above the 50th percentile, their STAR score, so I just took the grade five minus grade four or grade eight minus grade seven.
Q So, for example, if there were 35 percent of the students in the school above the 50th percentile in grade four, 38 percent in grade five, then 3 percent was the gain?
A Yes.
Q Are students of low socioeconomic background less likely to score above the 50th percentile generally speaking?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: Yes.
BY MR. AFFELDT:
Q And are students who aren't of low socioeconomic status more likely to score above the 50th percentile generally speaking?
A Yes.
Q And from what you know about the distribution of credentialed teachers in California, are students above the -- at or above the 50th percentile more likely to have teachers with a preliminary or clear credential?
MS. DAVIS: Vague and ambiguous. Calls for

speculation.
THE WITNESS: Yes.
BY MR. AFFELDT:
Q And from what you know about the distribution of credentialed teachers in California, are students scoring below the 50th percentile less likely to have teachers with a preliminary or clear credential?
MS. DAVIS: Same objections.
THE WITNESS: Yes.
BY MR. AFFELDT:
Q In fact, the lower students score on the STAR exam, the more likely they are to be taught by a teacher without a preliminary or clear credential; correct?
MS. DAVIS: Calls for speculation.
THE WITNESS: Yes. I mean you're just restating what's in the first bar of each of the graphs, and that's correct, on average what you're saying is correct.
BY MR. AFFELDT:
Q Do you agree that students of low socioeconomic status are more likely to be mobile than -- than students who aren't low SES?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: Yes.

BY MR. AFFELDT:
Q Given the lower -- by definition the lower scores found in low-performing schools, is it correct to say that low-performing schools would likely tend to have bigger gain-scores than moderate or high-performing schools?
MS. DAVIS: Same objections.
THE WITNESS: I -- I don't know that you could say that, no. I mean it -- I don't agree with that statement.
BY MR. AFFELDT:
Q Well, there's more room to grow; correct?
A It -- You're still moving a -- If you make a 5 percentile gain -- or percent gain, you've moved the same number of kids past the threshold -- Okay? -- so it doesn't -- it's the same number of kids you've moved past the threshold. No matter how much room there is to grow, you've moved the same number of kids past the fixed threshold.
Q But in a low-performing school you've got more kids to pass a threshold than a middle or high-performing school; right?
A That's true.
MS. DAVIS: Vague and ambiguous.
THE WITNESS: That's true, yes.

BY MR. AFFELDT:
Q And --
A That's why they're low performing.
Q That's why I -- I said by definition --
A Right.
Q -- one would have more ability to achieve bigger gain-scores in low-performing schools.
But as an empirical matter, do you know whether in fact under California's STAR testing programs low-performing schools have tended to make bigger gains than middle- or high-performing schools?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: I do not.
BY MR. AFFELDT:
Q What does the term "regression towards the mean" mean to you?
A May I return to your other point and then I'll answer this question?
Q Certainly.
A I will note that I did control for free and reduced lunch status in that regression; so to the extent what you're saying is a problem, I at least partially dealt with it by including free and reduced lunch status. So if high poverty schools did indeed have greater gain-scores on this, I would have mopped

that up with percent free and reduced lunch as on the right-hand side.
May I return to your second question, regression to the mean?
Q Yes.
A Yes, I know what it means.
Q Okay. What does it mean to you?
A It means that there's randomness in the world and if you look at random variables at a point in time and then look at their -- where they are, the same variable if you will, at a future point in time, there will be a tendency for the ones that were -- the observations that were exceptionally high the first time you looked at them to be closer to the mean and the -- those that were exceptionally low when you first looked at them to be closer to the mean. So in the context of -- of this, say, test, schools that did exceptionally bad in one year or schools that did exceptionally good in another year, if they're -- if that's due to just random -- randomness, the pure random component in test scores, you know, little Sally had a tummyache that day and little -- little Joe guessed right and what have you, all the sort of random elements that enter test scores, you're going to tend to see those two schools converge over time simply because of this randomness in

the test component.
Q When you said you partially controlled for the effect of low socioeconomic status of students, what did you mean by "partially"?
A Well, as I indicated in the report I think free and reduced lunch status isn't a very good -- it's a -- it picks up some variation -- or it picks up probably a good part of the variation in SES but it's still not picking all of them, and so as I've indicated I -- it's not -- it's not a perfect measure of socioeconomic status by any means; so I've partially controlled for what you said but there may be some left because free and reduced lunch is not -- has -- is not a perfect measure of socioeconomic status.
Q Is there a better measure you're aware of?
A There is not a better available measure that I'm aware of. I mean what I would like to know in any of these studies what the mother's education is. I mean in these studies that's one of the best predictors is parents' education, particularly the mother's, in terms of student achievement, but there's no state that I'm aware of that has that data -- that collects that data so. . .
Q So you used the best data you have available?
A Yes.

Q In your analysis you didn't look at the change in the teacher variable between fourth and fifth or seventh and eighth grade, did you?
A No.
Q Did you consider doing that?
A I didn't because most of the effect of the teacher is going to be the fifth grade versus the fourth grade teacher because the kids are tested in the spring, so the -- the -- you know, the biggest bang is coming from the fifth grade teacher, not the fourth -- or at least more of the input, the teacher -- the time with the teacher is with the fifth grade teacher than the fourth grade teacher because of the testing cycle. So I considered it but I thought that using the grade eight or grade five teacher would be the preferred way to do it.
Q But the fourth grade teachers had an effect on the fourth grade score; right?
A Yes.
MS. DAVIS: Vague and ambiguous.
THE WITNESS: Yes.
BY MR. AFFELDT:
Q And wouldn't it be useful to know, also, the certification status of the fourth grade teacher and how the change in that status might have affected the change

in the gain score?
A Well, remember, as you pointed out, the fourth grade teacher affected the fourth grade score and I controlled for the fourth grade score. So I took -- I took into account exactly what you just described. In fact, you just made the good case for looking at gain-scores rather than levels, because the fourth grade teacher affects the fourth grade score and I'm taking account of the fourth grade score.
Q And by the same token would you agree that the teachers in grades kindergarten through three also had an effect on fourth grade scores?
A Yes.
Q Because these sorts of student achievement scores are the cumulative effect of the child's education to that point in time; correct?
A Yes.
Q Is it possible that a student moving from an uncertified teacher in fourth grade to a certified teacher in fifth grade would have a bigger gain than a student moving from a certified teacher to another certified teacher?
MS. DAVIS: Vague and ambiguous. Calls for speculation. Incomplete hypothetical.
THE WITNESS: It's possible.

BY MR. AFFELDT:
Q Can you test that hypothesis with the analysis that you did?
A Not the way you described it. You described it at student level story. I can only look at buildings and grade levels.
Q How did you determine the certification status for a fifth grade in a given building?
A Well, that was in the CBEDS file.
Q Did you look at an average?
A It was averaged over the building.
Q So you could do the same thing for a fourth grade?
A Right, if you're saying I could have put the fourth grade -- I could have put not only fifth grade certification of teachers but fourth grade -- average fourth grade certification of teachers in the model, I didn't do that. It would -- It would complicate the interpretation of the results greatly if you did, but you could do what you said.
Q And how would it complicate it?
A Well, because then the interpretation of the -- When you run a regression and you've got a bunch of variables on the right-hand side, then, you know, if you looked at the coefficient on a fifth grade teacher, what

you're saying is controlling for fourth grade certification what would be the effect of fifth grade teachers.
I think what you're trying to get at here is maybe -- is maybe partially addressed with the eighth grade. See, in the eighth grade we -- in fact we average over the whole building, so the eighth grade estimates would get at some of what you're talking about because in CBEDS you can't -- you don't have a grade level assigned to eighth grade teachers, you just know what building they're in. So in those estimates we averaged over all the math teachers and over all the English teachers in the building, so that would -- so if the -- so that I believe would begin to get at what you're talking about in the eighth grade level. But in the elementary since we knew the credentials of the fifth grade teacher, I thought it was appropriate to control for the fifth grade teacher, to isolate their contribution as opposed to averaging over the whole building.
Q But in the eighth grade, teacher variable was still your independent variable?
A That's correct.
Q But it was only your independent variable on the eighth grade end?

A No, it was at the -- the teacher certification rate was averaged over the building and overwhelmingly the buildings were seven/eight so -- or six through eight, there were some six through eight, so it was the average of math teachers over the building.

Am I answering your question?

Q You are answering my question, but I guess you're -- I don't understand how your explanation gets at what I'm asking because you're comparing -- you're still not able to compare the average seventh grade math teacher's certification to the average eighth grade math teacher's certification even at that -- at that level; is that correct?

A Well, that's correct, but I wasn't interested in comparing the seventh grade certification to the eighth grade certification. I was interested in trying to identify the effect of this presence of certified teachers on student achievement gains.

By the way, I'm using a shorthand here of course, the presence of fully certified teachers on student achievement gains.

Q As defined in your report?

A As defined in my report.

Q Would you agree that the gain that you're looking to measure whether it's seventh to eighth or

fourth to fifth is going to be a relatively small gain averaged over the entire State of California at the 50 percent percentile national level?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: Well, it's a -- when you get in this area of testing, you've got to be a little careful when you say "small" and "big." But it's obviously the gains -- the gain, it's going to be a smaller number than the level. The percent of kids in the school at or above the 50th percentile is typically going to be larger than the change in the percent of kids at or above the 50th percentile as you go from one grade level to the other.

BY MR. AFFELDT:

Q All right.

A That's generally true.

Q But the Lake Wobegon effect aside where everyone's above average, generally speaking nationally 50 percent of the kids are going to be above the 50th percentile and 50 percent are going to be below; correct?

A Right, and that's about what is true in little above -- like Lake Wobegon in California is little above than that, the norm, as I recall, yes.

Q And California being approximately 10 percent of the U.S. population is not going to be that different than the national population?

MS. DAVIS: Well, he just said it was a little above.

THE WITNESS: I believe my recollection was -- You're -- You're right, because of the Lake Wobegon effect almost every state that uses these tests are -- more than 50 percent of the kids in almost every state are above the norming -- the mean -- the median of the norming population, so I think the answer to your question is yes.

BY MR. AFFELDT:

Q And with the natural regression toward the mean that occurs in these situations, isn't it true that one would not expect to see a large difference in any given year of students moving above the 50th percentile nationally?

MS. DAVIS: Vague and ambiguous. Calls for speculation. Asked and answered.

THE WITNESS: This is a technical question. Could you repeat it because I have to think about it carefully.

MR. AFFELDT: Can you reread the question, please.

(Record read as follows:

"Q And with the natural regression toward the mean that occurs in these situations, isn't it true that one would not expect to see a large difference in any given year of students moving above the 50th percentile nationally?")

THE WITNESS: I think the answer is no to your question, and the reason -- it's a little bit complicated -- is because I think you're correct to say because we're looking at changes in -- in this measure that there's going to be more measurement error. That's correct, and there will be a tendency over time to the extent there's measurement error there for that to go to zero. So I'm trying to -- I'm walking through this aloud. I probably shouldn't do that but I can't help it. That's the way I think.

So there's -- So there's -- there's a true gain score and there's the transient part. So there's -- What you're saying is there's more noise relative to the true trend in looking at change than looking at a level. I agree with that. But does that mean that you're more likely to see increases or decreases, and the answer is no. Actually -- You're actually more likely to see increases or decreases because there's more measurement error. Do you see what I'm saying? To

the extent you've introduced more noise into your measure, you're more likely to see gains and you're more likely to see declines.

But let me emphasize that this -- that doesn't affect these -- The question here is whether it biases these estimates, and econometrically you've assumed that measurement error in your error term in these regression models and your regression model assumes that your dependent variable has measurement error and it's mean zero and it's random. So I think that much of what you're talking about in terms of regression to the mean has been captured in the regression model. Maybe not. Maybe you'll convince me otherwise here, but so far I don't think that I'm convinced.

BY MR. AFFELDT:

Q Well, if you say you agree that you're more likely to see increases and decreases --

Right?

A Yes.

Q (Continuing) -- when you're looking at the whole sample of the State of California as you did here --

Correct?

A Yes.

Q (Continuing) -- aren't those increases and

decreases going to cancel themselves out over this bigger sample?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: Well, what you're -- what you're saying, if I can translate it, is if you look at Table 2 and go across the table -- Look at Table 2. Maybe we could do Table 1. Let's just do Table 1. It's the same point; okay? And you see the row that says R squared? That's what I think you're saying, is the R squared as you go from column one to column two to column three, you see, when you go over to changes, you've -- you almost explain none of the variation, there's a lot more randomness out there, and your model explains a lot less of the variation as you go from column two to column three. That's absolutely right.

Does that mean that you're -- you're -- you're still getting -- you're biased -- you have a biased estimate of the effect of emergency certification or preliminary? No, it doesn't. But it does mean it's harder to see it; okay? I will grant that. It's the right way to do it but it also makes it a little harder to detect the effect of those variables because now you're looking at changes versus levels. But that's -- that's the way -- that's the nature of the beast, is if you're going to estimate the effect of a teacher

variable, you've got to look at gains. But I think what you're saying is once you look at gains you got more measurement error in the data, and that is true.

BY MR. AFFELDT:

Q And my point is that there's much -- there's a much smaller slice of the iceberg that you're trying to explain the variation in. You're only trying to explain the variation in the tip of the iceberg when you're looking at a gain score.

A Well, the problem is to pursue your metaphor is you've got a whole sea of icebergs out there, and -- and you -- you're right, socioeconomic status is -- Let me see if we can build on this metaphor. You've got the ocean and there's waves and the tips of the icebergs are going up and down, so there's a lot of variation out there, but -- but that's what you have to work with. I mean that's -- to really test the effect of teachers you have to look at changes, you have to look at gain-scores if you're going to get a causal. If you're trying to get at the causal effect of these teachers, you have to isolate, you know, the gains that are associated with teachers that at a particular grade level for the reasons I describe in the paper, that you have such a powerful effect of socioeconomic status you have to -- you have to control for that, and that's why looking at

gain-scores is so important. And as I said, it's sort of widely recognized among the research community that that's how you have to isolate if you're going to get -- look at causal effects of interventions, curriculum, teachers, class size you look at gain-scores.

Q Looking at Table 1, is this the same data that is reflected in Chart 1 or is that Chart 2?

A Yes -- Well, I'm sorry. Chart 1 -- Yeah, Chart 1 and 2. Chart 1 is -- is row one and Chart 2 should be row two, yes. So each -- there's two charts per table.

Q Right. Just a different way to display the same data?

A Yes, I think it's kind of visually useful to look at it.

Q And if you would just walk me through Table 1, the first row, first column minus .217, that represents what exactly?

A So that's if the -- if the percent of teachers, of grade five teachers, without preliminary or clear certification goes up by one percentage point, the percent of kids at or below the 50th percentile on the fifth grade Stanford 9 drops by .217 percentage points, so it's a pretty straightforward interpretation.

Q Percent of student as above the 50th percentile dropped .217?

A That's right.
Q And then the number in the parentheses?
A Is the t statistics, so that's the ratio of the estimated coefficient to the -- well, actually it's the absolute value of the -- I got rid of the negatives. But it's the absolute value of the ratio of the estimated coefficient to the estimated standard error of the coefficient. So if that's bigger than 1.65 -- 1.645, it's significant at the 10 percent level; if it's bigger than 1.96, it's significant at the 5 percent level, .05 level; and if it's bigger than 2.56, it's -- it's significant at the .01 or 1 percent level. It's one of the few things I can still remember as I get older. I forget my telephone number but I can remember the critical values on t tests.
MS. DAVIS: We're getting a little close to lunch. It's just about noon so let me know when a good breaking point is.
MR. AFFELDT: Okay.
MS. DAVIS: You had me starving yesterday.
MR. AFFELDT: Did I?
THE WITNESS: Listening to economists drone on --
MS. DAVIS: It's your fault.
THE WITNESS: -- ad nauseam.

BY MR. AFFELDT:
Q Looking at Chart 1 on the first bar there, how do we know that that means for every 1 percent increase in teachers without preliminary and clear credentials this is the effect?
A Well, without meaning to be glib, I told you so.
Q Okay.
A I mean I probably -- if what you're saying is I should have -- I probably could have labeled it a bit clearer, and if that's true I apologize. But that is what it is.
Q But it's basically, as you said earlier, data from the chart -- or the table rather?
A Yes, it is. And it could be -- Really, I should have labeled the axes better on that and made it clearer. I apologize.
Q And in the bottom label on -- I forget what you call it -- the horizon, the last bar, should that be grade four dash grade five gain score instead of grade five dash grade five?
A I'm sorry. Can you tell me where you are?
Q Sure. I'm on Chart 1, lower right-hand corner.
A Oh, yes. I'm sorry. That's a typo. It should be grade five minus grade four.

Q Grade five minus -- the second number should be --
A Grade four.
Q -- grade four?
A I'm sorry. That's a mistake.
Q Could you just initial that and date it?
A This is the exhibit?
Q Yeah.
A Okay. And clearly in the next table that's wrong, too.
Q Right.
A That is wrong everywhere, yes.
Q Yes, Charts 3 and 4 also say five to five?
A I know.
Q So it should be eight and seven?
MS. DAVIS: Yeah, it should be eight and seven?
THE WITNESS: Oh. Doggone it. Okay.
BY MR. AFFELDT:
Q I just want to make clear on Charts 3 and 4 the data that you analyzed was eight and seven, not grades five and four?
A Yes. It's -- I -- Excel makes it too easy to copy the charts and just put in new data and I forgot to correct the labels.
MS. DAVIS: John is fantastic at finding typos.

THE WITNESS: No, I -- And I'm -- And I'm a bad proofreader for myself and I -- I apologize. I stand corrected.
MR. AFFELDT: Why don't we break for lunch.
MS. DAVIS: Okay.
(Lunch recess.)
EXAMINATION (Resumed)
BY MR. AFFELDT:
Q Dr. Podgursky, with your analysis the relationship between teacher credentials and student achievement that you did for this report, can one compare the gain-scores between, say, for example, students who have had only uncredentialed -- Strike that -- students who have been in schools with only credentialed teachers K to 4 -- K to 5 to students who have been in schools with uncredentialed teachers K to 4 but had a credentialed teacher in K to 5 -- Sorry -- had a credentialed teacher in grade five?
MS. DAVIS: Vague and ambiguous.
THE WITNESS: Remember, these are -- you're -- What you're describing is -- The scenario you're sketching out is logical but you're assuming individual classroom level data and, remember, I'm using data that's grouped, so it's hard to make that transition; remember?

So in this context you'd say could you compare -- So it would be difficult -- or more difficult to do what you're saying because you're -- I mean what you're saying is could you find a school where none of the kids were -- where -- let's put it this way, where all of the -- 100 percent of the teachers were certified grade K through 5 and then compare that school to a teacher where none of them were certified grade K through 4 and all of them were certified in grade five, and I can assert with almost certainty there's no such school in the sample. I mean, you know, what you're dealing with is averages here and --

Q Right, but just assuming there were such a school in the sample, could you do that analysis with your study?

MS. DAVIS: Incomplete hypothetical.

THE WITNESS: Well, you'd have two observations. Preferably you'd have a bunch of schools in both cases and you could then in principle do it.

BY MR. AFFELDT:

Q With your data?

A Oh. Well, not -- No, I can't do it with my data but I could do it with this hypothetical data that we're discussing here.

Q Right.

A You could do it with grouped data if you had that much variation.

Q Right. But you couldn't do it with your data because you didn't look at certification status of teachers other than at the grade five and grade eight levels?

A That's right. Well, no, grade five. Grade eight, remember, I did it building-wide.

Q And then taking your point that there may not be any or at least many schools that meet the criteria I laid out, is it true that you -- with the California data you could do that analysis and look at different percentages other than a hundred and zero of credentialed teachers for example comparing schools that were 80 percent or 50 percent?

A Well, I -- Yes, you could go -- go back and you could put the school-wide percentage in the elementary. You could take a fifth grade percentage and you could also include a fourth grade percentage or K through 4 percentage or include other measures other than fourth grade. But again, I'd emphasize that I have controlled for a fourth grade achievement in an effort to -- and the model that's underlying this assumes that the effect of all those prior teachers is imbedded in your fourth grade score.

Q Because you were just looking at the effect of the fifth grade teacher?

A That's right. I'm sorry. That's right. I answered too quickly.

Q You also analyzed as part of your study for this paper the relationship between certification status and reading scores; correct?

A Yes.

Q Why didn't you report that in your report?

A Oh, you know, I apologize. I forgot. I -- I've done this in other states and I forgot that I did -- You have to give me a moment. I may have only done math here. I -- I apologize. That was my aging memory. In another state I did math and reading and I -- in California I only did math. I -- I misrecalled.

MR. AFFELDT: I am going to mark this as Exhibit 5 -- Exhibit 6.

(Podgursky Exhibit 6 was marked for identification by the court reporter.)

BY MR. AFFELDT:

Q Let me ask you to review that and let me know if you recognize it.

A Yes, that's mine. Yes.

Q What is Exhibit 6?

A It's an E mail from me to Paul Salvaty.

Q Dated April 13, 2003?

A Yes.

Q And it says:

"Paul, Here is a new draft. Please look it over as soon as you can. I'd like to make one more minor change as soon as I get the output from my assistant. I only report gain score results for mathematics. However, I have asked him to check the results for reading as well."

"I also added a few citations...," et cetera.

Does this refresh your recollection as to whether you did a --

A Well --

Q You have to let me finish.

A Oh.

Q (Continuing) -- whether you do an analysis of results for reading as well as math?

A To the best of my recollection we never did get around to doing the reading analysis. And I know that we didn't do that -- we certainly didn't do it at eighth grade because once I thought about it, there are no reading teachers in eighth grade so you couldn't really replicate the results there. I mean for the most part you don't have separate reading teachers, and I -- we

just never got around to doing it is the best of my recollection. So I only reported what I -- what I did up -- up through April.
Q In elementary school one's reading teacher is also one's math teacher; correct?
A Yes.
Q So you don't have a separate reading teacher in elementary school?
A In general, yes, that's correct.
Q And are you aware as to whether the STAR testing program tests on reading and language arts in the eighth grade as well?
A I believe they do, yes.
Q And you're familiar, I assume, with the fact that California eighth graders are taking an English/language arts course as part of their curriculum, are you?
A Yes.
Q So why couldn't you look at reading scores in the eighth grade -- because they didn't have separate reading teachers?
A Well, I could have looked at reading. I just didn't get to it in the time I had and a number of -- my recollection, I believe Betts did both but I think that Fetler did math. And it's generally felt that the

schools have a bigger effect on math scores than on reading scores because so much reading comes from home, so I thought that reading is -- Excuse me -- math is a better place to test theories about teacher effects so I -- I didn't get to the reading analysis.
Q Did you look at any other subjects?
A No.
Q I am going to hand you what we will mark as Exhibit 7 and ask you to review this and let me know if you recognize what it is.
(Podgursky Exhibit 7 was marked for identification by the court reporter.)
THE WITNESS: It's -- It's my regression output and it's the output for reading, so we did do reading for fifth grade. We didn't do it for eighth grade.
BY MR. AFFELDT:
Q And how can you tell that, that you did reading by looking at this?
A How can I tell what?
Q That you did do an analysis on reading by looking at this.
A Well, now it refreshes my memory that I did do the analysis for reading because I recognize my programmer's SAS output.
Q I'm asking you to identify what -- what in this

document would tell me, someone who's not a programmer, that you did reading.
A Oh, okay. Well, we can walk -- why don't we walk through it together. First is the -- The front end is obviously it says STAR output on the first line, and this is a list of the variables --
Q Where do you see STAR output?
A Oh, I'm sorry. At the first "Data Set Name:" California, Teachers.California underline STAR.
Q Okay.
A And there's a whole variety of variables in the model -- I mean or in the data set. And more importantly as we turn to page 4, the -- I'm pretty sure on page 4 "ucertem" means emergency. So the -- And if we go to the bottom of page 4 we --
Q Hold on a second. Let me make sure. When you say the fourth page of this document --
A Yes.
Q -- which is Bates stamped STATE-EXP-MP 0054?
MS. DAVIS: Yes, and then it has got a "4" here.
THE WITNESS: Uh-huh. Okay. So at the bottom we see the regression results, so this is the -- ucertem is the coefficient, is .314. So this is the simple result that corresponds to the first bar. So this says

if you raise the percentage of teachers with emergency certification by one percentage point -- Wait a minute. What -- AP -- Well, no, that's math. Hold it. Hold it. Hold it. Hold it. Math. Oh, I'm sorry. What? Oh, oh, I -- I see -- I see what's going on here. Okay. Okay. Okay. Okay. This -- Yeah, this is not output for reading. This is output for math because if you look at page 4 -- So I apologize. It takes -- I use a different statistical package so it takes me a minute -- a few minutes to orient myself to SAS, S-A-S.
Okay. So if you go to page 4 --
MS. DAVIS: Which is Bates No. -0054.
THE WITNESS: -54.
BY MR. AFFELDT:
Q Go with the lasts two Bates numbers.
A Okay. Page -54. Okay. The dependent variable is -- is the math, grade five math, the percent that are above -- above the fifth percentile, so this regression output is for the -- for math.
Q And you're getting that by looking in the middle of the page where it says "Dependent Variable"?
A Yeah. Yeah.
Now -- Oh, you know what? I think -- Okay. I'm sitting here scratching my head because why does this have the wrong sign? Yeah. Okay. What -- Yeah.

Okay. So this -- this is what happens when you pull a printout out of a stack. The -- This is defined as the percent not emergency certified. So he -- my programmer sometimes uses not so informative names for variables, and I'm pretty sure that this is -- this is why he has that 100 minus p emergency cert. So this is -- this is the percent who aren't emergency certified. So instead of running emergency certified on the right-hand side, he ran the percent who -- or 100 minus emergency certification. Okay? So what we're looking at is a regression of the percent who aren't emergency certified on fifth grade math scores. Is that clear? So this is output from November, so it's just some output he ran at some point.

Q How do you know it's from November?

A It's on the front page, Monday, November 18. So this is -- You know, it's some preliminary work that we did and he did some runs where instead of running it on emergency certified, he ran it on one minus emergency certified -- or 100 minus so. . .

Q And that would give you the number of teachers certified?

A It should.

Let me emphasize, this is output from November so there may have been some changes in between, so we're

looking at some early output here.

Q The one minus emergency certified would also include people on waivers, wouldn't it?

A Yes.

Q And it would also --

A That's right.

Q And it would also include people on intern credentials --

A That's right.

Q -- correct?

A The reason I chose to run the model in the final report, two ways: one with percent emergency certified and one with percent with clear or -- Is it provisional? -- provisional and clear.

Q Preliminary and clear.

A Preliminary and clear. Like I say, every state has different terminology.

One of the reasons I did emergency is I believe two of the three studies that Professor Darling-Hammond cited used that emergency as their measure, the Fetler study and I'm pretty sure the Goe study as well. So that's the reason I did it. My -- My preferred model would be just to say what's the percent who are -- have preliminary or clear cert. But since two of the articles she cited used emergency, I replicated what was

in the literature she was citing.

Q And this is an output of which one of those models?

A Well, the variable we're looking at here, ucertem, I believe is -- is just he took 100 minus emergency certification. Now, this is of course something I'd have to check but that's what I believe it is. Yeah, it's -- in this sample we're looking at its mean. You could see its mean is 87 percent so --

Q Where are you looking?

A On page 4, top of page 4, ucertem, 86 -- the mean is 86.7 percent. So I think that's what -- what he's got in his -- and this is unweighted output so it means you're counting every school the same weight, so I think that's what we're looking at here. So, like I said, this is preliminary output and I said, "Well, run it the other way, Don," at some point.

Q Do you know if he did?

A Sure. Yes, because that's what I finally reported.

Q So this data is not reflected in your report?

A No, I didn't -- this is not reported. This is just some preliminary. And I apologize. When I sent you -- I just sent you everything you asked for, so I took the stack of things that had a lot of printouts and

I sent it all, so some of it will be preliminary output and this is an example.

Q If you look on the first page of Exhibit 7 there's some fuzzy handwriting in the upper right-hand corner.

A Yes.

Q Do you have any idea what that is?

A I have absolutely no recollection.

Q Looking at the list of variables and attributes --

A Yes.

Q -- which start on the first page and run through the first three pages of Exhibit 7, can you identify for me what the "A4MathNPRR" means?

A It -- It might be the number right or something like that. It might be the raw score. I -- I -- I don't remember. I'd have to go to the -- we -- what -- See, the way this works -- the way these data were created is the State Department of Education has these big files with all of the STAR scores in them and so we just downloaded the whole file, and so this is just everything that was in the file even whether we used it or not. And so this is -- this is a variable name that they created, I'm fairly sure, and so I'd have to go look at their documentation off the web. We never use

that variable. It could be the number. I just don't remember what that variable is. It's not something we used to the best of my knowledge.
Q And "A4MathP25" would be the percent of fourth graders scoring above -- at or above the 25th percentile?
A Yes, I believe so.
Q And similarly for the -P50 and -P75?
A That's correct.
Q Do you recall what "A4MathScore" means?
A I believe it is a scale score.
Q Is that reported by an individual test taker or a mean for the school, do you recall?
A No, this is -- this is -- the unit of observation here is the school, a grade in the school.
Q So then if that's the scale score, it would be the mean scale score for the school?
A At that grade I believe so.
Q And then this -- the next variables go on to list for reading variables. Does that indicate that you downloaded and organized reading data?
A This -- Those are the reading scores but -- and that's why I was indicating to you -- we didn't go back -- The real heavy lifting here was going to the CBEDS file and pulling off all of the fifth grade

teachers and then going to other files and getting their certification and the -- the certification information about them, so we did that for the math teachers but we didn't do that for reading teachers, to the best of my recollection. And so even though I have the reading score here, the certification data pertains to the -- Well, actually this is elementary. Well, it would be for the -- Yeah, actually it would be -- it would only be -- I'm sorry. It would be for the fifth grade teachers, so this is for all fifth grade teachers. In addition, I think we also pulled in any teachers who said they -- they were math teachers as well, but that's the way the certification variables were constructed.
Q Again, in the fourth and fifth grade the same teachers are teaching reading and math generally speaking; isn't that true?
A Generally speaking, yes.
Q So you already did the heavy lifting to get the math teachers their certification status. Do you recall having then linked the -- at least the fourth and fifth grade level the -- the same teachers to their -- to the reading score files?
MS. DAVIS: Calls for speculation.
THE WITNESS: I -- To the -- To the best of my recollection I focused -- we didn't do the reading

regressions and when I wrote it up we focused on the math because the -- at least one of the other studies, I think the Fetler study, had focused on math and we couldn't replicate the reading results for grade eight. So to the best of my recollection I didn't go back and do an analysis of reading, and that's what I can recall right here.
Now, I should also point out that I didn't have -- you have my printouts and I don't, so I'm -- I shipped them all to you so I'm just going on the basis of what I can recall. I wasn't able to review all the printouts before I came here.
BY MR. AFFELDT:
Q What do you mean when you said you couldn't replicate reading scores at the eighth grade level?
A Well, because there -- there weren't -- aren't reading teachers. Well, in discussion with my RA we thought it was too hard to pin down who's a reading teacher; although there is English/language arts, reading crosses a broader part of the curriculum. I mean students are reading in social studies, they're reading in math, they're reading in all their subjects, so it didn't -- so we didn't feel that you could pin down a reading teacher.
Q What is the "Num" mean under the column type?

A It's numeric.
Q That's a numeric file?
A No, it's a -- it means it's a numeric variable. It's a number. If you go to page 2, there's one that says "Char" which means it's character variable, like letter. It has letters in it basically.
Q And what does the column titled "Len" mean?
A It means its length, the maximum length.
Q And what does "8" mean -- eight numbers, it's as much as any -- it's as long as the length of any entry?
A Well, it means that's the amount of space that you've allowed for the entry. It may mean that it gets that long, but if it doesn't it will pad a zero on the left side.
Q What does the column "Pos" mean?
A That's the position in the file. So it sort of starts at one and goes up to however wide a record is.
Q So the first entry position is 560, what does that tell you?
A It means that it starts at column 560 and goes for 8 columns to calls 560 to 568.
Q And you know that because the next entry starts at 568?
A No, because the length is eight. These are

sorted alphabetically, not by position, so that's why these positions jump around. You can tell it to sort it by length position or other things.

Q And "Label," what does the "Label" column mean?

A It says whether the variable is labeled, so that -- that means you can type in a description of the variable. And so my research assistant who sometimes doesn't use the name really has simply put in the label length for the variable. So like I said, this is a file from November and he -- he hasn't really labeled the variables in an informative way.

Q Do you know what the difference between "A" and the "F" is in the Variable description? If you look on page -- the first page, all the variables start with an "A" and if you look on the second page a little ways in down it shifts to an "F."

A My -- My best guess is is that the "A" would be the -- I'm trying to remember. I think these are 2000. The fifth grade scores were what year? 2000? Yeah, so they were -- were administered in 2002. So probably the "A" -- the "A" is -- are the '02 scores and the "F" are the '01 scores for the same school, and so I suspect that's the case because we use "A" as a dependent variable and "F" probably means the previous year. I -- I would have used a different symbol, but he chose "A"

and "F" for some reason which I'm sure made sense at the time so. . .

Q And --

A So it would be a one year lag score.

Q And if you drop about three quarters of the way down on the second page which is Bates number ending in -52, the "FMathEnr" and then the next line it's "FMathPcEnr," are those enrollment figures, percent enrolled?

A I would imagine that's what they are but I'd have to go to the documentation on the Department of Ed web site to -- to confirm that. Like I said, we just downloaded their whole file.

Q Did they use the same variable names?

A I believe that these are basically the variable names they used, is my recollection. We -- We -- I suspect Don put the "A" and the "F" in front of them when we were merging the variables because you can't have -- when you merge files you can't have the same name for the variables. But I think that the variables -- The ones at the bottom starting with probably "count," those are variables we created; but everything above that I suspect are variable names that were created by the Department of Ed. Now, again, these are -- I would have to confirm this, you know. I'm

just -- I'm guessing. This is an informed guess at this point.

Q Under "count" what -- what is "pbach"?

A I don't know. I think these are variables we carried over from the CBEDS file and I think that's bachelor's degree probably and 30 could be more than 30 -- There -- There are a lot of variables in the CBEDS files about teachers and percent with bachelor's degrees, percent with master's, percent with more than 30 hours of graduate credits.

Q So that would be --

A I'm speculating that that's what those variables are. He just carried over -- He just grabbed anything off the CBEDS file that we might want to use and so he put other things on there. We have -- We have females, males, Hispanics, less than bachelor's degrees, master's. These are just a bunch of variables that came off CBEDS that we pulled off.

Again, when you do something like this you grab anything you might want to use and just keep it and carry it along with you even if you never use it. There's some possibility that you might want to use it. So I suspect bachelor's -- "bach30" may be students with shy 30 hours of a bachelor's degree. I just don't know for sure. Percent of teachers that are short.

Q Or it could be percent of teachers with a bachelor's plus 30 hours of course work done --

A That's right, because there's a master's 30. You know, I think you're right. I think it's sort of a salary schedule kind of variables, bachelor's, bachelor's plus 30, master's, master's plus 30. I think that's what it is.

Q And again, are these your variable labels under "count" or are those ones that are from the CBEDS database?

A I don't know. I suspect there are names for variables that came off of CBEDS but I would have to go back and check that.

Q Looking at the fourth page in, Bates number ending -54 --

A Yes.

Q -- under "Descriptive Statistics," what does "Intercept" mean?

A It -- May I have a piece of paper? May I write on it?

Q Sure.

A It's the easiest way to illustrate a point like this when you run these regressions.

So in this case we were -- the regression is math 50 percent plus, so that's the percent of kids that

are 50 percent above the median on the Stanford 9 at grade five, and in this case we've got the variable that's labeled "ucertem" which is in fact the percent who aren't emergency certified. So let's call it -- Let's just for the sake of argument call it "Full cert." I'll put quotes.

So what you're doing is you're -- You know, your data looks something like this. And so you're telling the regression to fit -- I mean you're telling the computer to fit a line that minimize the squared distance between any of those points on a line. That's what you're doing when you run a regression. So there's an intercept, and that's -- so that's what this intercept is. I mean for the most part you never really care what the intercept is. It's the slope that matters, it's the effect of changes in full certification. So the intercept is just this point where the line intersects the y axis.

Q Thank you for the illustration.

We will mark that as Exhibit 8.

(Podgursky Exhibit 8 was marked for identification by the court reporter.)

BY MR. AFFELDT:

Q So looking at this printout from Monday, November 18, what's your current recollection as to

whether or not you ran an analysis on reading scores?

A I -- I do not --

MS. DAVIS: Vague and ambiguous.

Go ahead.

THE WITNESS: I do not recall that we -- we analyzed reading. And again, I -- I think basically I started with math because much of the literature that's cited about teacher effects is on math teachers -- the Fetler study, that study by Coble and Hawk of North Carolina, the Goldhaber and Brewer study. So many of these studies that estimate -- that look at the effect of teacher credential actually are on math and science teachers, so that's why I started with math is to sort of fit in with the literature and to the best of my recollection we just didn't get to reading.

Q I will hand you what we will mark as Podgursky Exhibit 9.

MS. DAVIS: Do you have a copy for me.

MR. AFFELDT: Oh, I'm sorry.

MS. DAVIS: Thank you.

(Podgursky Exhibit 9 was marked for identification by the court reporter.)

BY MR. AFFELDT:

Q Let me know when you've had a chance to review that.

MS. DAVIS: I have a question. Were these documents separated in any sort of way or were they just pulled from a bunch of data runs?

MR. AFFELDT: I believe these are the only data runs that we received as part of --

MS. DAVIS: These two.

MR. AFFELDT: -- Dr. Podgursky's production.

MS. DAVIS: Okay.

MR. AFFELDT: Don't hold me to that.

MS. DAVIS: I won't. No. No. I was just curious because this one started at 4 and 5 and the other one had -- you know, so I wasn't sure if we were missing a page or what was happening. I won't hold you to it if you printed it right off or pulled it. From the production it looks like --

THE WITNESS: Okay. I'm ready to proceed.

BY MR. AFFELDT:

Q Do you recognize this document?

A Well, I -- I recognize it as -- as output from -- from my -- from Don Watson.

Q Do you have any idea what the date of this output is?

A No. Unfortunately, he -- he -- that got trimmed off here, and so I don't -- It's -- It's preliminary. It's from this earlier vintage. I would

suspect it's around the same time. I note that at the top Don -- that Don is responding to my -- This is -- I laughed when I saw this because this is a source of -- I tell Don that he doesn't label his output well enough and labels the variables and it's hard to interpret them, and so he put in there grade five, it says five, it is fifth. So it's -- But it's some preliminary output is my -- is my recollection.

Q And why do you think it's preliminary?

A Well, because he's got this -- Well, let me see now. Let me check. Actually, it doesn't look like it lines up now. Okay. Let's see. Yeah, so I take that back. I think this is probably a final output from looking at it. This is for grade five.

Q And why do you think it's the final of it?

A Because it looks like the coefficients match what's in the report. If they match what's in the report, it's the output that goes with it.

Q Where do you see the matching?

A Well, let me check. Give me a moment.

This is the -- Well, this -- this is the output that matches -- Hold on. Before I speak, let me check.

Yeah. This is -- This matches the output in Table 1 for grade five for emergency certification.

Q And where are you connecting the dots?

A Okay. If you go to the page labeled -- He's still got the variable -- This is consistent with what's in the table. The -- This would be the row that goes with grade five teachers with emergency certification. The -- The variable is still defined as percent of teachers without emergency certification, but that's okay. If you -- If you corrected that all you would do is change the sign. It wouldn't make any difference in the R squared. It would only affect the intercept. So this number 21 -- Go down. It says "ucertem," so 21668 is -- is the -- consistent with what's in Table 1 row 2 which is minus .217. It's just the sign gets reversed because it's one minus the right variable or a hundred minus the right variable.

Q You have to back up and walk me -- What numbers are you referring to in which document?

A Okay. This document here.

Q Which is Exhibit 9.

A Exhibit 9. Okay. The "ucertem" on the last line of that page it says --

Q The first page?

MS. DAVIS: Of that page he said.

THE WITNESS: Of the first page.

(Continuing) -- is .217 and that corresponds with the .217 on page 23 of my report, Exhibit 5.

BY MR. AFFELDT:

Q Okay. It's actually -- On Exhibit 9 it's .21668, you're rounding up to .217?

A That's correct. And the t value is 14.89. Okay? It's the same because -- Well, the sign is just reversed because it's a hundred minus emergency certification.

Q And explain that to me. The -- The Table 1 row says percent of grade five with teachers emergency certification?

A Yeah.

Q And the analysis based on Exhibit 9 was derived from taking 100 percent of teachers and subtracting those who aren't on emergency certification?

A That's correct.

Q So if we have 30 percent of teachers on emergency certification, we'd get 70 percent from that calculation?

A Yes.

Q But 70 percent -- But the number is 30 percent who are on emergency certification, not 70 percent?

A Yes.

May I respond now?

Q Please.

A It makes no difference. If you run a regression and you take any of your variables and -- You know, if you run a regression and you regress y on x, you'll get an R squared and you'll get a result -- you'll get whether x is statistically significant or not. Now, if you go into the same regression and instead of regressing y on x you regress y on 100 minus x, all that's going to happen is the regression is going to flip the sign and all that happens is the intercept changes. The R square won't change and none of the statistical tests will change but the new coefficient will just be minus what you had before. So if you had B on the first one, you'll get minus B on the second one. You can prove that very simply.

Q And in the -- And does it change the sign that we were just looking at, the minus .217?

A That's right. So it's -- Since I wanted to report the effect of emergency certification, not the effect of 100 minus emergency certification, I -- I just change the sign.

Q Because in your table it comes out to a positive .21668. So in -- I'm sorry. In Exhibit 9 the output came out to a positive and so you made it a negative in your Table 1?

A That's right. That's right.

Q Okay.

A And so -- so then on -- So then if you go -- And then F Math Percent Enrolled is -- is the free and reduced lunch percent of the math, the percent of the kids who took the math test who were free and reduced lunch eligible.

Q So is that refreshing your recollection on what the "F" means in front of the variable where they were comparing "A" to "F" in Exhibit 7?

MS. DAVIS: It calls for speculation.

THE WITNESS: Right, I think -- You know what? I think that's what it is. I know it's what it is here and it's probably now what the "F" means over there. Right. Because the state does report the scores of free and reduced lunch eligible kids. Well, any rate, I know it's -- as far as what we're concerned with that's what it is, it's the free and reduced lunch -- percent of kids who were tested on math who were free and reduced lunch eligible at grade five.

BY MR. AFFELDT:

Q And you're pointing to variable on -- in the second page of Exhibit 9?

A Yes, "FMathPcEnr." It's actually not the percent, it's the proportion. If you go up and look at the means, it's .489 basically when you round. It's the proportion who are free and reduced lunch eligible.

Q It's a proportion of the total enrollment in that grade?
A No. My recollection is it's actually the proportion of the test takers who were eligible, so it's even better, it's actually the ones you got test scores from.
Q I am going to hand you what we will mark as Podgursky Exhibit 10.
(Podgursky Exhibit 10 was marked for identification by the court reporter.)
BY MR. AFFELDT:
Q I ask you if you recognize this document.
A Yes, I recognize it.
Q And what is this?
A These are -- Well, this is an E mail message from Don Watson, my associate, who's -- to Paul Salvaty and he's turned over a series of -- these are the S-A-S, SAS programs that -- that were used to create the data set. And then I believe -- I'd have to read the Read Me document. The Read Me document explains what everything is. I think the final data set is California underline STAR.sas, but I'd have to read the Read Me doc to confirm that. Yeah, it's -- it's -- that's the final estimation date is that it's California underline STAR.
Q And the Read Me document is the document that

explains how to combine and reassemble your data set?
A If you wanted to do that it explains step by step how it was done so these -- these jobs entered into these SAS programs.
Q And if you go two pages in, do you see there's another E mail, the same date, Thursday, May 29, 2003, this one at 5:10 a.m. as compared to 3:52 a.m., the earlier E mail, and this appears to be Don Watson forwarding the -- is this the fourth and fifth grade data set?
A Yeah.
Q Two more pages in is another E mail for the same date, 5:21 a.m. It appears to be the eighth and seventh grade data set?
A Yes.
Q Do you know why these were only sent in May as opposed to earlier in April when the other production was turned over to the defendants' counsel?
A Yes. My recollection was that I believe that the -- in the first round I sent you the -- these papers and I -- I believe that we sent you the final data set at that time. This is my recollection. Don had some problems with his hard drive and he had to recover and so there was some delay in getting the original -- these SASS jobs that created the various data sets, so he had

some computer problems and he recovered those and then we sent those later. So it was -- it was an innocent problem.
But my recollection was we sent you the final data set first and then I went back to Don after some conversations with Mr. Salvaty and I said, "Paul, do they want all the kind of stuff that went into creating the final data set?"
And he said, "Well, just send it along."
And my recollection was that this was about the time Don was having disk drive problems so he had to work with someone from Dell to get these back off. We almost didn't get them, period, but he was able to recover them. So I believe, to the best of my recollection, that's the -- that explains the difference in timing.
Q And according to your recollection you sent the complete final data set together with the earlier printouts in April?
A That's my recollection of the sequence of events.
Q I hand you what will be marked as Exhibit 11.
(Podgursky Exhibit 11 was marked for identification by the court reporter.)
BY MR. AFFELDT:

Q I ask if you recognize this once you've had a chance to review it.
A Yes, this -- I believe this is the Read Me file that was sent to Mr. Salvaty and this was written by Don Watson.
Q Okay. On the first page under the first description there which describes the first program, Builddata Files 4th.sas, the description reads:
"This program selects mathematics and reading scores for ALL students and Free and Reduced Lunch students by schools."
And the description under the next program Builddata Files 5th.sas reads:
"This program selects mathematics and reading scores for ALL students and Free and Reduced Lunch students by school."
And the descriptions on the next page under Test data 4th.sas which is the second program described reads:
"The Test data programs rename the original test variables and build reading and math variables that will later be used in the regression program."
And at the top of the third page the program Test data 5th.sas the description reads:

"The Test data programs rename the original test variables and build reading and math variables that will later be used in the regression program."

So am I correct to assume that you also constructed the ability to run reading analysis in your data files?

A No. Everything you're reading up to there is about the test variables, so that's -- so -- But you're correct, the reading scores are in the file, so the reading test scores are in the file.

But now everything subsequent to that is about teachers, and I need to talk to Don about this point but I -- I think you probably could run a teacher regression with the data we have. My recollection is that we just -- I did the math for the reasons I indicated and I just didn't get to it, there wasn't time to do an analysis of reading.

Q Turning your attention back to Exhibit 6, which was the E mail dated April 13 from you to Paul Salvaty --

A Yes.

Q -- you state on that date that you had asked Don to check the results for reading as well. Did -- What happened to that request?

MS. DAVIS: Asked and answered. We're beating a dead horse here.

THE WITNESS: I sent Don an E mail -- Don and I work on lots of different projects. I think it's important to put this in context. I'm the chairman of an economics department. I had 500 students in econ 4 and the final exam was approaching. You know, I'm a consultant on several other cases and I'm involved in a lot of projects. And I sent that to Don but I think it just got lost in the shuffle, is my best recollection. There were a lot of other things going on, and to the best of my recollection we just didn't get to it. And honestly I'm not trying to hide output. I just don't think we got to it. And to be quite honest, based on my results in Missouri and in South Carolina I don't think it would have changed anything. I said I picked math first because I think that gives the best shot to teachers. That's what people focus on in this literature and that's where it's expected, it's believed, that schools and teachers have the biggest effect, so I thought that we would start with math.

I do not believe we got to the reading; however, I don't believe it would have changed the story in any significant way, but that's entirely speculative. It's based on what I've observed with

other data sets, not with this one.

MR. AFFELDT: Why don't we take a short break.

THE WITNESS: Okay.

(Recess.)

MR. AFFELDT: Back on the record.

THE WITNESS: May the record show that Mike Podgursky wrote down "Hawk" because he couldn't think of how to spell it -- inadvertently wrote that down on one of the exhibits and he scratched it out and put "MP" there.

MS. DAVIS: To Exhibit 11?

THE WITNESS: Yes, Exhibit 11. That's my scribble when I was trying to think about how to spell "Hawk."

BY MR. AFFELDT:

Q The author Hawk for the court reporter's help?

A Yes.

Q Okay. So we have it --

MS. DAVIS: He doesn't get a break. He does spellings during the break.

THE WITNESS: During the break I've been doing spellings.

BY MR. AFFELDT:

Q Okay.

A May I add something for the record --

Q Certainly.

A -- during this moment of silence?

Q Certainly.

A I'm thinking about this reading business, and as I was discussing with your assistant during the break, it was a chaotic time. It was right before -- Final exams were approaching and I have 500 students in econ 4, I'm the department chair, et cetera. And now I'm remembering -- And I'm trying to remember why we didn't do reading, and now my recollection is is that I -- I remember discussing this with Don after I sent him the request and my recollection at this point was this was the issue: When we did the math teachers we took all the -- the grade five teachers of record but a lot of -- in the elementary schools you've got a lot of floating reading instructors who may not be tied to a grade and we did not include their characteristics for these floating, you know, pull-out reading teachers who aren't attached to a grade, so they'll just be a pull-out reading teacher at a variety of grade levels. Well, we didn't include their -- their certification rates in the reading calculations. So for Don to have done the reading regressions, we would have had to go back to the original data and grab all those pull-out reading teachers and put them back in to the analysis,

and there just wasn't time. It would have taken a whole lot of work and so on, so we just -- we just didn't get to it. To the best of my recollection that's why there were no reading regressions because we would have had to go back to the original data and put all those reading teachers, you know, Title 1 type teachers, back into the right-hand side or the calc -- the means for the building. So it would have been messy and taken a good deal of time. I apologize for not remembering that but. . .

Q Anything else?

A Well, you never know what I'll remember in a half an hour. It's the way my brain now works. It's a bit like that virus that was slowing down computers that was just infecting all the PCs.

Q If you could turn to your report, page 5, please. Did you look at any grades other than the fifth and eighth?

A No.

MS. DAVIS: Vague and ambiguous.

THE WITNESS: We -- I should say we picked fifth and eighth because we wanted to find the place -- we examined the data initially and looked at the grade spans of schools and so we zeroed in on the places where we could -- you got the largest sample of kids that were

in the same building for two consecutive years, so that's why we picked those two.

BY MR. AFFELDT:

Q But you didn't look at more than those two grades?

A No.

Q Is there any reason to think that there might be different effects if you looked at early elementary school teachers?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: It's always possible you could find different effects. I -- I -- In other cases I've looked at -- In South Carolina I looked at grade three to five gains and just averaged over a whole building and found very similar results. In Missouri I looked at three through ten at the district level. But I've not looked at anything below grade three, which is what you're talking about, I believe, earlier results. No, I -- I've not done anything below grade three.

BY MR. AFFELDT:

Q That is an important time for students to learn how to read, isn't it, grades K through 3?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: This -- That isn't my area of

expertise, but that's what I -- but when I read what the experts have to say, that's what the experts seem to say, that it's a very important time.

BY MR. AFFELDT:

Q Is there any possibility that you could have observed different effects in the high school?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: It's possible. I -- At high school matters become more complicated and at high school I think it's more much a question of content knowledge than pedagogy or certification. So to the extent that the uncertified teachers are uncertified because they lack content knowledge, then it may be more important. If it's because they, you know -- Again, I think at high school level content knowledge looms very large and that becomes an important factor.

And by the way, I'd say at high school that's probably where you would -- I think you'd -- you would tend to see where I think that these intern teachers would be attractive because, again, they -- they've demonstrated that they have the same -- they've passed the same hurdles for content knowledge as the preliminary and clear cert teachers.

BY MR. AFFELDT:

Q Why did you limit your analysis to only two grades out of at least twelve?

A Well, as I said, you -- I wanted to be able to look at gains and so I wanted to track a cohort through a building, and if you looked at high school you would have kids coming in from many different schools so you couldn't control for prior achievement. Say if you looked at grade ten, you would have kids coming in from -- many schools are organized seven through nine and then ten through twelve for high school, so you would lose a lot of schools that way. So again, it was driven by choosing grade spans that were the most common, choosing changes in grades where you got the largest number of schools where kids were in the same school for those two years. That's -- It's driven by that.

BY MR. AFFELDT:

Q But you couldn't have done eleventh grade?

A You mean ten and eleven?

Q Yes.

A We could have done that. I didn't do it. It's a smaller sample, but I could have done that, yes.

Q When you look at -- If you could look at page 6 --

A Oh, let me -- Wait. Oh, I couldn't. I take

that back. At the high school level you don't have a grade; so if you did it ten to eleven you would have had to average over all the teachers in the high school building so you wouldn't be able to pin down -- in math there aren't tenth grade math teachers, there are just math teachers in the high school, so you would have to average over all high school teachers. So you could have done it that way but you wouldn't -- you would have had a little more measurement error, you know, doing it that way. Go ahead.

Q Because doing it that way would create a little more measurement error?

A Right, because the kids -- the kids going from grade ten to eleven, you know, in theory may have only had contact with a third of the math teachers, although maybe more. But the point is you -- you don't know if they actually had contact -- Well, you're restricted to using the mean for the whole building for the math teachers as opposed to just the ones that taught tenth grade.

Q But you had that same problem with seventh and eighth graders?

A That's true, I had the same problem with seventh and eighth. Remember, in seventh and eighth is most of the schools are seven and eight -- Okay? -- the

junior highs, or maybe seven, eight, nine. So it's -- It's a little -- you are covering more of the school. Well, that's not true if it's ten, eleven, twelve. I didn't do it at grade ten and eleven. I could have, we didn't.

Q If you look at page 6, the third full paragraph, second sentence says:

"Thus, for elementary teachers our dependent variable is the grade 5 score in 2002 minus the grade 4 score in 2001...."

A I'm sorry. I lost where you are. Can you start again?

Q Sure. Third full paragraph on page 6.

A "Thus." Okay. The sentence starting with "Thus." Go ahead.

Q "Thus, for elementary teachers our dependent variable is the grade 5 score in 2002 minus the grade 4 score in 2001, and for the secondary math teachers, it's the grade 8 math score minus the grade 7 score."

In fact, as I understood your testimony earlier, it's the percent of students scoring above 50th percentile in grade five minus the percent of students growing above the 50 percentile in grade four; is that correct?

A That's correct. That's what I mean by "score."

Q And the same thing for grades eight and seven; right?

A Correct.

Q Okay. When you referred to a qualified teacher, what's your definition of "a qualified teacher"?

MS. DAVIS: Is that something in his report that you're referring to?

THE WITNESS: Yes, are we talking about something specifically --

BY MR. AFFELDT:

Q Not something specific in your report.

A -- or something philosophical?

Q You've mentioned the term several times over the last day and a half.

A Well, I guess it -- in my view a qualified teacher is a person who can do the job, that is to say that can produce the student learning. To me that's the real bottom line here, can the teacher get the students to -- to learn the material, raise the level of achievement in the students. And so in my view qualified is more about performance than about any particular set of credentials they're bringing to the job.

Now, if you're hiring brand new teachers, you do have to rely on credentials because you don't -- they don't really have a track record, so you look at content knowledge, have they had course work in what they're teaching, or if the law requires it are they certified in the areas -- their primary teaching areas.

Q What do you mean by certified in their primary teaching areas if the law requires?

A Well, that -- that's true, do they have a certification that -- some type of certification indicating competence in their teaching -- primary teaching areas. And then I said if the law requires it, because in some cases schools can -- for example, charter schools, it used to be the case that in California, and in some states it still is, that charter schools can hire teachers that weren't certified or they could have up to a certain percent of their teachers not holding state certification, so that's -- and private schools don't require certification generally.

Q In your view of a qualified teacher, is it necessary for a teacher to be trained in how to teach their subject matter?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: I think that schools -- I think

what we're learning and -- and -- is that there are a variety of ways to produce learning and one model is to have a teacher that has all the right credentials in front of a classroom with 20 or 24 students and produces the learning. But it -- I think that there are other models out there that may work and there is some suggestion that -- that there are schools experimenting with these models. For example, some schools are using very highly scripted instruction. This -- It's my understanding that this reading curriculum Success For All that's considered highly successful really doesn't require teachers who are highly knowledgeable in teaching reading, because -- because you or I could go in and step into a classroom and start teaching the kids to read with a Success For All curriculum because it's highly scripted. It says here's what you'll do today, here's how you'll do it, here's the curriculum you'll use, and so on. It -- It really doesn't give a lot of degrees of freedom to the teacher. So if that's your approach, if you use these highly scripted methods, then you don't really have to rely on a teacher who's, you know, certified in teaching reading. You would like an intelligent teacher and someone who gets along well with kids and can -- and, you know, can manage a classroom, but a great deal of knowledge about reading, the theory

of reading instruction, is unimportant because the whole curriculum is laid out for them.

And then as you get into questions of web-based learning or computer-based learning, you know, it -- it -- you may be able to rely more on other resources than the -- the teacher's particular expertise or pedagogical skills. So, you know, I'm -- I guess -- I forgot the question already because I was running on here, but I hope that answered the question; if not, I've forgotten what the question was so you can repeat it.

I guess my bottom line is there's more than one way to skin a cat. There's more than one way to produce learning and I don't think they all require a highly qualified teacher in the classroom.

BY MR. AFFELDT:

Q Other than reading models for beginning readers like Success For All, are there other -- are there scripted curricula beyond the third grade that you're familiar with which would not require a teacher knowledgeable in the subject matter that teach it?

A Oh, I'm sure there are. There's many types of modularized -- I don't know what the right terminology is -- but products to help kids learn particular things or topics in math and in science. Trigonometry, you

know, specialized materials for teaching trig or geometry, or, you know, particular laws in physics. I mean there are lots and lots of materials that are being developed, interactive materials, web based and so on to -- to teach those concepts. So if a teacher is a bit weak on it, him or herself, you can fall back on -- on these materials.

Q On page 7 of your report, the first paragraph, the fourth sentence says:

"While it is true that there is substantial research concerning the positive impact of quality teachers on student achievement, the definition of a 'quality teacher' elusive."

What substantial research are you referring to?

A What I'm referring to there is that -- and this is what Professor Darling-Hammond has kind of -- has kind of mixed in her report, one of the findings that's emerging as more and more analysis is done of these large data sets linking students over time that we've talked about -- that we've talked about yesterday is that there seems to be evidence of persistent differences and in many cases substantial persistent differences in -- in the gains of -- of one classroom versus another classroom, and most of the teachers are labeled -- most of the researchers are labeling these

teacher effects. You can -- You can look within the same school and you can see some gains -- some classrooms where there are gains on -- on achievement over the course of a year and some where there's much less gain, and this has shown up -- interestingly it's shown up in -- in different data sets using very different research methodology by different researchers but it's popping up in a lot of different studies. And so this literature -- So what these researchers are -- are saying is that they're calling these teacher effects that they observe, that's their measure of teacher quality.

Now, the problem, the elusiveness comes in in the finding that very little of the variation in these teacher effects, these differences one observes across classrooms, is associated with any of the characteristics of the teachers, any measurable characteristics -- certification, whether they have a master's degree, experience, sex, race, any of the kind of administrative data we have, even test scores, teacher test scores.

That study I gave you which I think is one of the most sophisticated in this area by Aaronson with that Chicago data finds -- it's a very sophisticated attempt to estimate these teacher effects in the

Chicago -- and a big sample of the Chicago public schools. And they found over 90 percent of the variation in these teacher effects was not explained by any of the characteristics of the teachers that you can measure. All the things we're arguing about here -- what kind of certification, are they certified, what were their test scores -- explained almost very little of the variation across classrooms, so that's what I mean by elusive. Hanushek and Rivkin, the paper of -- a number of these recent papers with the Texas data not only find these effects and they find that most of the variation is within school districts and within buildings, okay, at least very large variation in teacher effects, and Sanders who's done this work in Tennessee has found similar wide dispersions. So -- So that's what we mean, that they -- So on the one hand the evidence is suggesting that teachers are important, there's -- there's substantial differences across classrooms, but what it is about the teachers is elusive, so that's what I mean.

Q And my question was simply on the first part of the clause which is what is the substantial research you're referring to there?

A Okay. Well, I think I've indicated it.

Q The Hanushek and Rivkin --

A Hanushek and Rivkin's work on Texas. Actually, there's three -- Hanushek, Rivkin, and Kain who have some papers on Texas, and that work is summarized in the paper I gave you; Aaronson, the paper I gave you plus the citations. If you -- Actually, I elaborate on that point.

Q Is that what I'm looking at on page 8, the last full paragraph?

A Right. Yes, so it would be Sanders and Horn, Sanders and Rivers, Hanushek, and then I'd add that new Aaronson study.

Q Okay. Did the Sanders work study certification of teachers?

A No, Sanders did not -- I'm not aware of any case where he puts certification in his -- the effect of certification.

But the interesting point with Sanders' work is that he -- he presents a lot of data showing these wide dispersions and he's looking at situations where, you know, at least 95 percent of the teachers or 90 or 95 percent are certified, so you're seeing a tremendous variation of performance among the certified teachers.

Q Does Hanushek's work look at certification?

A No, the Hanushek on the papers that are cited there do not have certification.

Q Do you think that all students in California are entitled to a qualified teacher according to your definition of a qualified teacher?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: I guess my answer is no. I -- I think the students are entitled to an education and I think that the state has a good deal -- should be given flexibility as to how to deliver that education. I don't mean to be unduly harsh there but it -- it -- I think children can learn in a variety of ways. And certainly by qualified I'd want an adult who can help the kids learn, so in that sense yes, I want them qualified.

But the important thing that the state should be focused on is making sure the students have the resources to learn and that -- I'm aware of programs where students, for example at-risk students, do complete high school on -- through computer-based instruction. Now, those students are completing they're -- they're completing their program, they're graduating from high school, kids who probably would otherwise not have done, so using computer-based instruction. There are charter schools here in California that do that. Now, basically there's an adult in the room that helps the kids out but that adult

isn't certified in everything that the kids are studying.

So, you know, I think that there are -- there are a number of ways to deliver education services and I think it's important for the state to give kids the opportunity to learn, that's the key is to focus on, you know, making sure that learning is occurring.

BY MR. AFFELDT:

Q Do you think students and their parents should have the ability to decide whether they want instruction delivered in a traditional way with a certified teacher as opposed to having receive their instruction from a computer-based program?

A In general I believe that parents should have choices, so I would like to see parents have that choice.

Q And if parents don't want their children learning on a computer-based program but want to have them in a traditional system, do you think those parents -- that those students should have access to your definition of a qualified teacher?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: I'd like to see more choice for low income -- for all families but particularly low-income families.

BY MR. AFFELDT:
Q And my question was: If parents are choosing a traditional model of schooling for their children, should all of those teachers be qualified?
MS. DAVIS: Vague and ambiguous. Calls for speculation.
THE WITNESS: Well, I -- I've told you that I don't view qualified and certified as synonymous. I would want to give them the option of having access to qualified teachers. Now, does that mean every one of them has a clear credential? I don't considered qualified and clear credential in everything you teach as synonyms.
BY MR. AFFELDT:
Q My question was qualified according to your definition of qualified.
A I would like to see -- It's a laudable goal of public policy to give parents choices and I would like to see them have access through choice to qualified teachers.
Q Are you aware of any mechanism that the State of California has to ensure that all students receive instruction from a qualified teacher even qualified by your definition?
MS. DAVIS: Vague and ambiguous.

THE WITNESS: No.
BY MR. AFFELDT:
Q Are you aware of any system by which the state monitors students' access to a qualified teacher?
MS. DAVIS: Same objections.
THE WITNESS: As I've mentioned, the state is -- Let me back up and answer the question my way.
The state regulators can't measure teacher quality, period, is -- is my conclusion. It's too difficult to determine who's a qualified teacher and who isn't and it's very difficult to sit in Sacramento and know who's producing student achievement gains and who isn't; who's working hard, who isn't; who can control a classroom and who isn't. These are difficult to measure and as I've indicated this research suggests that there's a wide variation and it's -- you know, among teachers, and it's not well predicted by anything that the people in Sacramento can measure and point to.
So what's happening in California and in other states is that they're focusing on outcomes rather than the inputs, and so in my opinion a better way to regulate K-12 education is to focus on student learning and to -- to highlight where it's occurring and where it's not occurring and use penalties and rewards to -- for the schools and for districts who are producing

learning and give parents choices among schools. I don't think it's -- It's -- It's virtually impossible for state regulators to regulate something they can't measure; and since they can't tell who's a good teacher and who's a bad teacher, it's -- it's difficult for them to -- to regulate that from -- from a state capital. I think that school principals have a good sense of who's more effective and less effective but I don't think that that's known in -- in state education agencies.
BY MR. AFFELDT:
Q School principals by themselves can't have an effect on the labor market for teachers, can they?
A Can you elaborate on that?
Q Yes.
It's a simple point, perhaps not well stated, that the school principal through their individual decisions aren't going to be able to effect the labor market for their district much less the whole State of California in terms of where teachers want to teach?
A Okay. Yes.
Q Could the state determine who's qualified according to your definition by simply tracking student achievement gains in classrooms over time?
MS. DAVIS: Calls for speculation.
THE WITNESS: In -- In theory somewhere on down

the road many years from now if they had a really complete data that link students over time and so on, in principle they could; in practice no one is able to do that yet, even in Tennessee. It's something that's better done at the district or building level where they can understand and interpret the gains data as opposed to at the state level.
BY MR. AFFELDT:
Q Why do you need someone at the building or district level to interpret the gains data?
A Well, because if we're looking -- if I'm a principal in a school building, I know how students have been assigned to teachers and I know a lot about what's going on that can -- See, I think the gain-score should be one factor among others that determines an assessment of a teacher's performance. For example, suppose you've got an elementary school and you've got a bunch of boys who are given to acting out and you've got a man -- you've got, you know, five elementary teachers and one of them is a man who used to be an ex-Marine and so you decide perhaps that maybe we should put some of these boys that are having -- you're having trouble with, you know, classroom behavior, we'll put them in Mr. Jones' class as opposed to Ms. Smith's. Now, that well may mean that Mr. Jones will have lower gain-scores because

you've given some of the more challenging kids to Mr. Jones but you as the school administrator know that and you will take that into account when you look at your performance data but someone in Sacramento doesn't know that. It may be that there's some kind of team teaching or collaborating going on in your school say among all the fourth grade reading teachers, and so you know that they're all sharing resources on reading in your school but it's not being done in another school, so that really it's sort of the average of -- of all the teacher effects that you're observing as opposed to one particular teacher.

So in other words the administrator is going to know a whole lot more about how to interpret that data than someone in a state capital, and that's why I think it can be used along with other information to make personnel decisions and assignments and -- or you may be using a new curriculum, you may have experimented with a curriculum in two classrooms but not in two other classrooms at the same grade level. So there's just a whole lot that a -- that a local administrator will know that a regulator in Sacramento won't know.

Q Broadly speaking it is possible for the state to set up a system whereby they are able to see which teachers are producing greater gains and which teachers

are not?

A Well, this is a hypothetical, and hypothetically we -- we can -- we're trying to move towards that. It exists in some districts. It exists statewide in Tennessee, although there's -- there's some -- there's some glitches there and it's something we -- we should -- I think it's a laudable goal for states but I think that there's -- there's some, you know, challenges from getting here to there and I think states should work towards that. But, you know, it's not something that you're going to do overnight and it's not something that -- there are going to be some challenges building up to that. And some states may not choose to go all the way. I think this is a thing where you can do it at the district level, and, you know, it may be that it might work out best to let the districts do this and the state just sort of watches overall test scores.

Q Do you think California's low-income students have the same access to qualified teachers according to your definition as students who aren't low income?

MS. DAVIS: Calls for speculation.

THE WITNESS: I think -- If you look at what Hanushek and Rivkin show that they find that there's a very large dispersion of teacher quality as measured by

these performance gains within school buildings, so I think that there probably are some differences in teacher quality between buildings and between school districts on average but I think this research is suggesting that the -- that most of the variation in teacher quality is within buildings and within districts and not between buildings and between districts. So even if you leveled out differences between school districts, say between high and low SES school districts, you're still going to have a lot of the variation and teacher quality is going to remain, at least that's what this research is suggesting.

BY MR. AFFELDT:

Q Would you agree that credentialed teachers are more likely to have content knowledge than uncredentialed teachers?

MS. DAVIS: Calls for speculation. Vague and ambiguous.

THE WITNESS: What kind of credentials?

BY MR. AFFELDT:

Q Well, let's start with preliminary and clear credentials.

MS. DAVIS: Same objections.

THE WITNESS: Well, I've never seen any evidence presented in this case or -- or any evidence in

any of the -- in any of the studies cited that sheds light on that issue. That teachers with clear credentials have more master's degrees so they've been teachers longer, that's for sure, but I've not seen any evidence presented that there's a difference in content knowledge.

BY MR. AFFELDT:

Q In order to get a clear or preliminary credential, you have to have satisfied your subject matter requirement; correct?

A Yes. But to have a preliminary you have to have satisfied it as well. If I understand your question what's the difference between preliminary and clear; was that your question?

Q No.

A Oh, okay. I'm sorry.

Q Who's more likely to have satisfied subject matter knowledge, a teacher with a preliminary clear credential or a teacher who doesn't have a preliminary clear credential?

MS. DAVIS: Same objections.

THE WITNESS: Well, it depends on who the doesn't is. If you throw them all together, I don't know. I haven't seen any evidence on this. I think that the -- In particular I have seen no evidence in

this case or presented by Professor Darling-Hammond that teachers that have an intern credential, which is the biggest group of the other, have less content knowledge than preliminary and clear because they have to have passed the same tests. And often these are people who have in their previous work histories, you know, very good content knowledge. The program, after all, was started to recruit science and math teachers out of the aerospace industry. So I'm not -- I'm not at all ready to agree with that statement and I haven't seen any evidence on that presented in -- in any of the citations Professor Darling-Hammond has or in her report.

Now, if you're saying waivers, yes, they have not passed the content test. So I would agree with you if you say preliminary and clear versus waivers. Emergency is -- Well, emergency you have to demonstrate content knowledge, so I think -- I haven't seen any evidence. So I think it's most plausible in comparing waivers and preliminary and clear. If you say waiver -- If you say preliminary and clear versus emergency or preliminary and clear versus interns, I would say show me the data because I haven't seen it.

BY MR. AFFELDT:

Q And among those categories what is the biggest group of teachers that in the category of people -- in

the -- Let me ask it again.

Among teachers who are not preliminary or clear credentialed, what is the biggest group as between waiver, emergency, and interns?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: No, it's my understanding that the -- Well, actually, I -- I may be wrong about that. I know that emergency is going down and interns is going up, but at this point I suppose there are still more emergencies than interns. I don't remember the exact current numbers. But the point is the -- the state is moving away from emergencies towards interns, so if the trend continues the interns will be the biggest group.

BY MR. AFFELDT:

Q What in your view are the methodological minimum standards for studies of the effects of teachers in student achievement?

A Either random assignment, that is an experimental study design that involves random assignment, or you have to have prior data on student achievement, of the students of prior student achievement, so you can isolate the contribution of the current teacher versus the past teacher and all the other factors that a student brings to class in the fall.

Q If you have -- If you control for prior student achievement, does that also control for socioeconomic status?

A No, I should have added that you -- you should also -- if you don't have an experimental design, you should have prior student achievement and socioeconomics. I think that would be very desirable as well. If you have prior student achievement, you've -- you've controlled for a lot of it, a lot of the effect of socioeconomic status but not all of it, and so you would -- you would ideally want to also control for SES in terms of looking at the gains.

Q And why doesn't the prior student achievement sufficiently control for as you say the things that the student brings to school in the fall with them?

A Well, there's -- And some studies have found that achievement gaps widen as students pass through the school system and that would suggest that more -- you know, the kids are advancing faster from higher -- well, definitionally it means that kids are advancing faster from highest SES groups -- higher SES groups.

The point here in kind of nontechnical terms is that parents make investments in their kids. I mean more educated parents are continually making investments in their kids. It doesn't -- You know, it doesn't stop

at age -- at kindergarten or age two or three but it's continuous all the way through the school system and higher SES parents are doing more of that on average and lower SES parents are doing less of that on average in any school year. So you would expect, then, if that's true, then you -- even if you control for where you are in the fall, the gains may still be associated with socioeconomic status; so it may be that not because of the teacher but because of some home factors that, you know, Johnnie is learning more about math in -- in fifth grade than Susie is even though they're both exposed to the same teacher. Johnnie is getting more help at home from his well-educated parents and Susie is getting less help at home because her parents are less educated.

Q Have you ever conducted a randomized experiment?

A No.

Q Do you know anyone who has in educational research?

A Yes. There was a -- well, there have been small, little studies by educational psychologists but the -- the big ones have been the -- the Tennessee STAR. Here's another STAR, it's S-T-A-R, just like your test, but this was a class-size reduction experiment in a large group of schools in Tennessee where a group of

kids were randomly assigned to a small versus large -- well, smaller -- standard versus smaller classes in grades K through -- it may have been through three, certainly the elementary grades. So that's one of the most well-known ones.

Now, I do know that the U.S. Department of Education is -- is very eager to see more random assignment studies across the board in education research. Grover Whitehurst who's the head of the Institute for Education Sciences at the U.S. Department of Ed is a strong advocate of what -- of scientifically based research methods and by that he means if at all possible doing experimental study designs. And so they're pushing and funding a number of projects. Mathmatica, I mentioned the Mathmatica studies, there's two of them underway. One's looking at -- Well, one is up and running looking at Teach For America and there's another one that's in the early phases looking at alternate teacher certification at a number of sites. The U.S. Department of Education just put out a large request for proposals looking at teacher professional development and basically said that they wanted a well designed -- a rigorous research design that had random assignment and in a variety of delivery mechanisms for teacher professional development.

So although we have essentially no teacher research that uses randomized methods, I think five years from now we're going to see research that has used these designs. I should mention one more. Tom Kain is doing a study of national board certified teachers here in the L.A. Unified School District and I'm told that he's trying to implement a study design that has some elements of randomization in it. So, you know, the -- in the research community it's clearly understood there's -- there's powerful incentives and a strong desire to begin to implement more randomized study designs on teacher research, on teacher quality, and I think, as I said, five years from now we're going to see a number of good studies in the literature that have met that standard. Right now there's nothing.

Q Are there any other essential minimum standards you would add to the -- your list of methodological minimums?

A Well, even if you have randomization it would be good to get prior data on student achievement. In the nonexperimental context it becomes important not only that you -- you do a good job of getting information about socioeconomic status and prior student achievement but then you need to do a good job of analyzing the data, and so it's -- it's sophisticated

research. The statistical models are -- are complicated, and I think it takes -- I think we're going -- the best research is going to be by researchers who have very good skills in -- in research methods and -- and econometrics in the social sciences or quantitative social science methods, so it won't just be economists but it will be individuals well trained in statistical methods.

MS. DAVIS: John, do you plan on going to about 5:00?

MR. AFFELDT: Yeah.

MS. DAVIS: Maybe this is a good time to take a quick break?

MR. AFFELDT: Sure.

(Recess.)

MR. AFFELDT: Lynne, we're requesting the data sets of which are reflected as part of Exhibit 10, seventh/eighth grade data set, the fourth/fifth grade data set that was E mailed to Paul Salvaty. We haven't received those.

MS. DAVIS: What do you mean you requested them, right here or is somebody sending a letter or --

MR. AFFELDT: No, I am requesting them right now.

MS. DAVIS: And you're sure they're not already

in your production?

MR. AFFELDT: Yes, I double-checked with MoFo. All we've received are the documents that are on the page -- first page of Exhibit 10.

MS. DAVIS: Okay. So you are then requesting what? The document on page 116?

MR. AFFELDT: The electronic file on 116 and 118, I believe.

MS. DAVIS: And 118. Okay. I will look into that.

MR. AFFELDT: We also are requesting the E mail from Professor Berk to Dr. Podgursky, any E mail exchange between them that wasn't part of the production of either Berk or Podgursky.

MS. DAVIS: And you have again verified that that wasn't part of the production?

MR. AFFELDT: I have on Podgursky. I have to say, you know, I will double-check on Berk but --

MS. DAVIS: Okay. I'll look into that as well.

MR. AFFELDT: It would have been brought to my attention I'm sure by the MoFo folks -- paralegals as other things that are there when one expert is talking to another expert.

MS. DAVIS: I will look into that as well.

BY MR. AFFELDT:

Q Dr. Podgursky, is there -- I just want to make sure that we had finished talking about your methodological minimums for studies on teacher effects on student achievement. You had listed either random assignment or --

A Oh.

Q -- control for prior student achievement and then you said you would like to add SES if it's not randomized and you would like the nonexperimental context, the need to do a good job in analyzing the data.

A Right, that's important, you got to know what you're doing to use -- to use those data. I think that -- I think that covers it.

Q If a study doesn't meet those minimums, as you've laid out, is it a worthless study?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: The problem here is I don't think it adds much to our knowledge and here's -- and here's the problem: If you -- When you do these cross-section studies, if you don't have control for prior student achievement and you just have these -- these kinds of measures like free and reduced lunch status, which is what most of them have, one of these studies uses sort

of the 1990 average census information about poverty so it's -- it's a very poor proxy for the students who are actually taking the test are using SES data from ten years earlier, more than ten years, actually earlier, so given that we don't have good data on SES for these kids, doing a cross-section study -- Well, there's two things. One, you've got poor controls for SES; two, SES has powerful effects on student achievement; and, three, as you've pointed out over and over today there's a -- the kids in low SES schools tend to have more teachers who have -- or tend to have fewer teachers with preliminary and clear credentials, relatively few.

Now, the problem is that there are a lot of other things, you know, that are going on. There's neighborhood effects, low SES and so on; so the question is what's the causal effect of the teachers versus all those other things that can have a detrimental -- environmental factors, all those other environmental factors that could have a detrimental effect on student achievement. So it -- when you do these cross-section studies as I've argued in the paper, you're doing a poor job of controlling for those family background and SES factors that can affect student achievement that are also systematically associated with -- or correlated with high rates of emergency certified teachers or

high -- low percentages of clear and preliminary certified teachers. So what economists -- Econometricians call this an omitted variable bias. So you're systematically overestimating the effect of the certification because you haven't controlled for -- well for the SES factors. So you can do lots and lots of those kinds of studies but they're all biased in the same direction. So you can do 500 of them -- You see, if it were just a matter of not being a good study, well, then sort of the average flaw in the study might be mean zero. So if you did a thousand not very good studies and took the average of all their effects, then maybe if -- if on average some of them have weak methodology but tend to overestimate the -- the certification effect and another study has a weak methodology and it under estimates the teacher effect, and if you did a thousand of them you might hope that on average the effect is zero, you know, in terms of the effect of the weak study design. But the problem here is they're all -- when you -- when you do these cross-section studies, they're all biased in the same direction. So if you do a thousand of them, you're just getting a -- a -- you know, a better estimate of a biased coefficient. So they're just not adding to our knowledge, and I think that you just -- if you -- you

can't rely on those kinds of studies to answer this question. And I think this is well -- well recognized in the research community, that you -- that you've got to have these prior controls on student achievement.

BY MR. AFFELDT:

Q So does your methodological minimum apply to other educational research or only when studying teacher effects on student achievement?

A It -- It applies -- It depends on the intervention. You always want to have some prior data on student achievement. It's -- It's difficult to think of a circumstance where you wouldn't want to look at that. However, there -- there may be situations where you look at school-wide reform, so, you know -- and it may be a reform that is a couple of years, so you could -- you know, if you introduce a new curriculum. It could be that you look at data that's aggregated at the school level but you still want to have evidence of gains or changes in performance.

But certainly where you're looking at the effect of a classroom teacher and the kids go from teacher to teacher, see, the intervention is changing from year to year as you get a different teacher, so you've got to take account of that and look at year to year gain-scores. If you had the same teacher all the

way through elementary school, then you could -- it would be less of a problem; but you don't, you change teachers every year, so you've got to have a better control for what they had up to the time they have contact with the current teacher.

Q My question was other than looking at teacher effects on student achievement, in other areas of educational research do you still need to have either an experimental design or be able to control for prior student achievement?

MS. DAVIS: Calls for speculation.

THE WITNESS: I -- I just -- It's hard for me to imagine evaluating education policy variables that don't -- an effective study of an education policy that doesn't have one of those, one or both of those if this model of treatment group and a control group and controls for initial conditions is just sort of the standard model or paradigm for evaluating policy. As I mentioned yesterday, employment and training policy, welfare reform, I mean all of these have -- you've used longitudinal data and compare a group that gets some kind of a treatment versus another group that gets a different kind or no treatment and you look at changes over time and there are some measure of status, it could be whether they're employed, how much money they're

making, you know, weeks worked, but it's -- it's just a standard approach for -- for doing reliable policy research.

And in medicine, too. I mean in medicine it's very important. If you don't have random assignment, then you have to control for the initial medical conditions of patients receiving treatments. Just think how bad -- how poor studies -- nonexperimental studies would be if you -- if you just looked at -- You know, suppose a doctor is doing a treatment and he -- he makes a decision on what treatment to use based on the severity of conditions of the patient; well, then if you're going to study the effect of the intervention, then you've got to control for the initial -- the previous medical history of the patient and then look at the effect of a treatment versus control group. This kind of model is just standard in scientific research.

BY MR. AFFELDT:

Q Is this model another -- Is this another way for this model is the methodologically sophisticated model?

A Well, I think people would say scientifically based. It's a -- When I said nonexperimental -- When you mean methodologically sophisticated, was that the statement about the nonexperimental I made a little

while ago?

MR. AFFELDT: Let's go off the record.

(Telephone interruption.)

BY MR. AFFELDT:

Q I was referring to by methodologically sophisticated basically your minimums, your methodological minimums, either an experimental design or a well designed -- nonexperimental design that controls for prior student achievement.

A Yes, well, when you have the nonexperimental data you want large data sets in the nonexperimental context. Let's back up.

If you run an experiment and all you have to do is a t test, if it's really an experiment then it really doesn't take a lot of fancy statistics to analyze your results. Basically you can do a simple t test, look at the treatment group, look at the control group, is it a significant difference. But when you move into the nonexperimental realm and you try to control for teacher and school effects and you're analyzing these data over time, it's -- it's a lot more complicated statistical analyses and -- and it's -- it's more sophisticated statistical research and -- I don't know what else to say about it. It's more complicated and it's -- and it requires more statistical sophistication to do than a

simple t test or even a simple regression.

Q On page 8 of your report in the final paragraph on that page you use the term "methodologically sophisticated" in describing the Hanushek and Sanders studies, final paragraph.

A Yes.

Q When you use that term, what do you mean by "methodologically sophisticated"?

A Well, okay. If you want to -- If we want to get technical here, Sanders, Bill Sanders, is a statistician -- Okay? -- and he's got -- got a great deal of attention to his work in Tennessee and he uses -- he has a massive database with many thousands of students. He's estimated effects for large school districts and statewide and he has a model that's called a mixture model. It's -- It's a complicated statistical model that they actually use in -- he's an agricultural statistician. It's a model that was actually developed to look at when you breed pigs and livestock, you have complicated data about their -- their -- their genetic background, their heritage, and he's -- he's used that kind of a model. It's quite complicated, and he's come at it that way, trying to dealing with these large panel data sets and these effects that persist over time and so on. Now, Rivkin and Hanushek and Kain use a -- a

different procedure, what we call a fixed-effects model and to -- to take account of these student and teacher and district effects.

There's actually some work I forgot to mention earlier. Some researchers in the Dallas school system have estimated teacher effects. There's a fellow Webster and Medro, M-e-d-r-o, who published research in Dallas and they've used what are called HLM models, H-L-M, and these are called hierarchical linear models. All of these are -- And so they're coming at the question using -- Well, and then this Aaronson study does a -- I think it's a generalized least squares approach, GLS.

So I'm trying to respond to what you asked what does "methodologically sophisticated" mean, so I'm giving you an example of how these people have used more -- much more complicated statistical models to exploit or analyze these long -- large longitudinal data sets. And it's complicated, it really is, and it's complicated to estimate and you need to understand the -- you need a pretty good background in statistics to understand the way they're doing the work. And -- And I should also say it's at a -- it's at relatively early stages, and I think what we're doing is these guys -- these researchers are learning from each other,

so we're trying -- ideally what's going to come out of this crucible is sort of a best practice for doing this, so we've got competing methods and hopefully what will emerge out of many of these studies is an understanding of a best approach statistically to pinning these things down. I hope that wasn't too long-winded but you asked what I mean by "methodologically sophisticated."

Q Are there any alternatives to your two basic minimums of either a randomized design or a control for prior to student achievement that you're aware of?

A Well, there's -- there's another approach and economists have -- have used this. It -- There is some research on teachers and teacher variables, policy variables, that exploit a -- these are nonexperimental -- that exploit what are called natural experiments, so these are cases where -- In a true experiment the researcher controls who gets the treatment and who doesn't. That's the key. That's what's so powerful about an experiment. That's why you don't have to worry about all these background characteristics because I, the researcher, control who gets the treatment and who doesn't and I randomize it, so I don't really need to worry a lot about, you know, what your background is and so on if I've randomized the assignment. Now, it's still good to know that just in

case even when you think you've randomized you still may end up with all the -- You know, suppose I'm randomly assigning students to two teachers, Sally Jones and, you know, Susie Smith, and it turns out even though I randomly assigned it, sometimes, you know, you can flip a coin and get eight heads in a row, so you may have done a random assignment but Susie Smith ended up with some of the most challenging students, so you would still like to know about background. But the point is by doing randomization, you see, you control who's getting the treatment and who isn't, whatever the intervention is. Clear certified teacher, Teach For America teacher, intern teacher, whatever, you the researcher control who's getting -- who's in group one and who's in group two. And by the way, there could be ten groups. You know, it could be, you know, intern teachers, preintern teachers, clear, preliminary, emergency, waiver. You would control, you would randomly assign.

Now, sometimes the way -- there's capriciousness in the way policy gets implemented and you get something that approximates random assignment just through the way of a quirk in a policy. An example, actually, was in Chicago. There was an interesting study -- I don't think I cite it -- by

Levgren and -- I know the guy, I've met him, I've talked to him, a smart young guy -- that looked at the effect of teacher professional development. And, for example, in this one it turns out the way they -- it worked in Chicago was that -- This is called a regression discontinuity design, regression discontinuity design.

Basically in the Chicago system if you were -- if you were -- if you hit a certain level of -- I can't remember if it was a dropout rate or it was some measure of performance. It was either student test scores or dropouts or something. I don't know. It was some outcome variable. If you hit a certain threshold, then your teachers automatically had to get a certain kind of professional development; okay? And say that -- say that was, you know, 20 percent or you had a certain test score, there was some quantitative threshold and if you hit that your teachers in effect got the treatment; and if they were just, you know, a teeny bit below that, they didn't get the treatment. So basically your school -- you're comparing two sets of schools then, some of which were just arbitrarily below that cutoff versus some who were just arbitrarily above that cutoff. Now, if you -- So one type of -- What you could do to approximate random assignment is to take the schools then who were just a little bit above the cutoff

and a little bit above the cutoff but comparable in other respects and essentially throw away all the rest of the sample and just look at schools that were clustered around that cut point because in a sense it's just sort of arbitrary. I mean they're virtually identical but one was arbitrarily above the cut and one was below it, so that was an example of what researchers are calling a natural experiment.

There have been other cases. Oh, there's been studies that look at state-to-state differences in -- Most states require kids to stay in school until their 15th or 16th birthday. Now, what that means is that some kids are forced to stay in school a little bit longer than others based on when -- what month they were born, so you -- and that's essentially random. There's no theories that say kids born in January are smarter than kids born in June. But in effect the way the law's written you're forcing some kids to stay in school longer than others, so there have been studies that sort of looked at student -- some outcome variables in terms of student achievement and earnings based on month of birth taking account of these cut scores -- I mean these cutoff dates for dropouts. So I don't know. I could go on on that.

So you look around for natural experiments

where you get kind of what economists would say exogenous, the policy kicks in in a way that -- that kind of reduces problems of self-selection as to who's in and who's out. I mean a beautiful example would be a program where, you know, you got in the program based on some sort of random -- random way. I mean you -- you got in line and the people's order in the line was arbitrary and they ran out of money for the program, say it went alphabetically and you ran out of money at M, so everyone from A through M got the program and everyone from M and above didn't. I guess I'm -- I'm rambling on so I will stop it there.

BY MR. AFFELDT:

Q Other than a natural expert, are there other alternatives?

A Well, I just don't think you can -- I think -- I don't want to say we don't learn anything from other studies. You learn something about programs and -- and how they operate and I think that case studies can tell us something about the operation of programs and what's really going on. But when you really get down to causality, if you're trying to establish causality in a scientific matter, you need one of -- you need these high-quality studies, what I've said, this minimum threshold.

Q Is causality the only acceptable objective for educational research?

MS. DAVIS: Vague and ambiguous.

THE WITNESS: Well, I -- I don't know. You can do educational research for all kinds of reasons. But what we're talking about here is -- is making a decision about a constitutional standard. Professor Darling-Hammond is -- is citing this research and drawing causal inferences about the effect of certification, and so in that context to draw causal inferences you need to meet the standard that -- I think the consensus is you have to meet the standards I -- I described. Now, there's -- I don't know what else -- I'll stop there.

BY MR. AFFELDT:

Q What is a match comparison design?

A It's what -- The idea is that you -- you find another school, so you got a school that has the intervention or a treatment or has a high percent of -- I don't know -- of clear teachers and then you find another school that's similar to that school in all other respects except say the certification rate. That's what's generally called a match comparison.

Q Kate Walsh refers to a match comparison design as a gold standard. Would you agree with that?

MS. DAVIS: Vague and ambiguous. Calls for speculation as to what Kate Walsh means.

THE WITNESS: No, I wouldn't agree. By the definition I just gave, no, I wouldn't agree with that at all.

BY MR. AFFELDT:

Q Is a match comparison design an acceptable standard -- an acceptable way to conduct educational research on the effects of teachers on student achievement according to your opinion?

MS. DAVIS: Vague and ambiguous. Calls for speculation.

THE WITNESS: No, I don't believe -- Wait a minute. State the question. I want to make sure if I get yes and no right. Could you restate the question.

(Record read as follows:

"Q Is a match comparison design an acceptable standard -- an acceptable way to conduct educational research on the effects of teachers on student achievement according to your opinion?")

THE WITNESS: No, I don't believe it is an acceptable way. I think it's -- it's greatly inferior to the methods I described for the reasons I described. And the basic problem here, I've never seen it well

implemented. The problem is it sounds nice if you say well, I'm going to find a school that's identical to the school I'm looking at, but we don't have data that -- that's good enough to implement good match designs. Once you -- So the -- the way I've seen it implemented is we say well, here's a school that has a -- as the example I gave -- has a high percent of teachers with free and reduced -- I'm sorry -- with clear -- preliminary or clear credential and then you say well, here's another school that's similar. Well, what does "similar" mean? You know, it's -- is it in the same city? Is it in the same neighborhood? And usually what happens in these studies that I've seen is they say well, it has roughly the same percentage free and reduced lunch. Well, I've already told you what I think of free and reduced lunch as a control, it's not a very good control for SES. Everyone -- We all have a zero for -- you know, it's a binary variable, it says you're either free and reduced lunch eligible or you're not. Well, and that's supposed to proxy for all the inputs that come from a family. Well, you know, I have a zero and the guy who drove me from the airport in the taxi probably had a zero, too. But, you know, I probably have -- my kids probably have more home resources available, educational resources, you know, than the guy

who drove me from the airport in the taxi. On average that's probably true. So it's -- it's not picking up this family -- the family educational resources very well. And -- And, you know, it could -- there could be community factors. You know, it's in a different neighborhood with a different ethnic mix or, you know, just a whole variety of other factors. There could be a different curriculum. It could be a different principal.

So in practice when these are implemented they're -- you just don't know if the schools are really that similar. You know, if you could clone the school and make it identical in every respect but the teachers, you know, the teachers' certificates, that would be great, but that's not what nature gives you, that's not what the world gives you. It gives you another school that's in a different locale with a different set of students, a different principal, different set of teachers, and a whole variety of other factors all of which could account for differences in student achievement, so I think it's a very inferior study design to the one I described to you.

BY MR. AFFELDT:

Q When you randomize your subjects are also not going to be exactly identical in every way but the

intervention; correct?

A That's true.

Q So what's the difference between randomization and a match comparison design?

A Well, the difference is the law of large numbers. If you -- If you have a whole -- You want to have a big sample; okay? So if you do it -- if you did it with two teachers, one teacher and another teacher and you randomized, then there's a good chance that, you know, the teacher with the -- You know, suppose I do one certified -- Let's just broadly define -- certified and uncertified. If I do it with one, then it could be that you, the certified teacher, got a good draw of students and I, the uncertified teacher, got a bad draw of students, and so that's going to tend to bias it towards the finding of certification matters. But if I do it for a larger sample, if I add a second one, then the odds are that it could cut the other direction of randomization. So you've got a number of teachers -- a number of students per classroom, say 20 or 24 which is going to tend to move you towards an average, and then if you have more and more teachers then the law of large numbers is going to tend to give you more reliability. So I mean that's -- that's the way randomization works.

But with this kind of study design you don't

know if that's going to work in your favor. It could be that you're continuing to pick schools that are -- you know, are all better than the one you're looking at. You just don't know if you're -- if -- So adding more and more schools that look comparable, they all may be biased in a certain direction. And there's -- there's reason to believe that that might be the case. Why is it that -- See, this is the question you always have to ask in these kinds of study design: Why is it that this school -- what's special about this school that it has a high percent of clear and -- preliminary and clear teachers and all of these other schools don't? Why? Was it an act of God? You know, lightening struck there? You have to really try to convince yourself that these other schools are identical in other all respects and just for some idiosyncratic reason that school has a higher percent of free and clear teachers; okay?

And that's very hard to meet that standard that I've just sketched out, that you make a very convincing case that you've gone out and picked a comparison that's truly identical and that this -- these schools that have your -- your -- your treatment variable, your policy variable, are -- are in some sense idiosyncratic so. . .

Q How large do your numbers need to be in your randomized experiment to -- to sufficiently -- to have a

sufficient sample size and be satisfied with it?
MS. DAVIS: Calls for speculation.
THE WITNESS: There's sort of well developed statistical models that can tell you that. It's called minimum -- The point is you can write down -- there's statistical models that can tell you the minimum sample size. You see, that's going to depend upon -- It's kind of complicated -- how kids are clustered within schools or classrooms within schools, what the variance of the test score is. It -- It -- There's not a simple answer. But if you know, you know, roughly what the variance of your test is, you can come up with sort of a minimum sample size that can give you a certain -- a high probability of detecting an effect of a certain size. I think they call it minimum detectable thresholds or something like this, but it's something that you want to think about.
For example, a research institute like Mathmatica, when they lay out these experiments, this is a good example of the unique sophisticated people point I made, is that when they get their big grant from the -- from the U.S. Department of Education, when they get a million dollars to set up a study of -- of some intervention, let's say class size or alternate certification, then when they implement their

randomization scheme, they've got to know in advance that okay, let's suppose that I'm implementing a scheme that gives me at least an 80 percent probability of detecting an effect size of X and that effect size may be .2. So in other words, they lay out some criteria for -- for whether the experiment can detect effects of certain size and once they've done that then that tells them how big a sample size they need given some other parameters.
I'm sorry to give a complicated -- It's a complicated answer is the answer. So when you say how big does it have to be, it really depends on a variety of factors and the effect size you're looking for is what it comes down to.
MR. AFFELDT: This is probably a good place to break for the day.
MS. DAVIS: Okay. I guess before we go off the record what's your time looking like?
MR. AFFELDT: Well, it depends in part on how explanatory Dr. Podgursky needs to be in his explanations --
MS. DAVIS: Right.
MR. AFFELDT: -- but at this point I'm looking at still needing the five days that we asked for.
MS. DAVIS: Well, you didn't ask for five days,

did you? The intervenors had asked for a couple.
MR. AFFELDT: No, we asked for five on Podgursky and four on Gurston.
MS. DAVIS: I don't remember. I don't remember five. I mean I'll look into that, but we had five days total with the intervenors and chiming in with their two days usually. So I think Mike's only planning on being here through Friday, but we thought that was with the intervenors as well.
THE WITNESS: Well, if the intervenors want me I have to come back because I have to leave Friday at 5:55 is my flight.
MR. AFFELDT: Well, we asked for five days and so that's what we'll need.
MS. DAVIS: Okay.
MR. AFFELDT: It doesn't look like the intervenors have a lot of interest.
MS. DAVIS: No, no, but I was under the impression that the schedule was set up that we always tacked on two days for them, so we have a total of five days blocked off the calendar so I'm just surprised to hear to ask that you asked for five days. It doesn't mean that you didn't. I'm just surprised to hear it.
All right. Tomorrow 9 o'clock?
MR. AFFELDT: Yes.

MS. DAVIS: Okay.
(The stipulation from the deposition of Michael John Podgursky, Volume 4, is incorporated as follows:
"MS. DAVIS: We will notify you, the court reporter, of any changes within 45 days of receipt of the transcript.
"All else is per the code?"
"MR. AFFELDT: Right."
"MS. DAVIS: Okay."
"MR. AFFELDT: Which is the court reporter is going to keep the original and will send a copy to the deponent's attorney, Ms. Davis, with an errata sheet and the court reporter will notify all parties of any changes to the original and will send a certified copy to Ryoko Kita, R-y-o-k-o K-i-t-a, at Morrison & Foerster San Francisco.")
* * *

I, MICHAEL JOHN PODGURSKY, do hereby declare under penalty of perjury that I have read the foregoing transcript of my deposition; that I have made such corrections as noted herein, in ink, initialed by me, or attached hereto; that my testimony as contained herein, as corrected, is true and correct.

EXECUTED this _____ day of _____, 20___, at _____, _____.
(City) (State)

_____
MICHAEL JOHN PODGURSKY
Volume 2

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were placed under oath; that a verbatim record of the proceedings was made by me using a machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: _____

_____
CAROL ANN NELSON
CSR No. 6974