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JAN 29 2009

By _____ Deputy

STATE OF MINNESOTA

COUNTY OF RAMSEY

DISTRICT COURT

SECOND JUDICIAL DISTRICT
CASE TYPE: CIVIL OTHER

In the Matter of the Contest of
General Election held on November 4, 2008,
for the purpose of electing a United States
Senator from the State of Minnesota,

Cullen Sheehan and Norm Coleman,

Contestants,

vs.

Al Franken,

Contestee.

Case No. 62-CV-09-56

AFFIDAVIT OF RICHARD D. SNYDER REGARDING MOTION IN LIMINE

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

Richard D. Snyder, being duly sworn, states and deposes as follows:

1. I am one of the attorneys representing Contestee Al Franken.

2. Attached is a true and correct copy of the transcript of the deposition of King Banaian taken on January 27, 2009 and exhibits used at the deposition.

Richard D. Snyder

Subscribed and sworn to before me
this 29th day of January, 2009

Mary L Peterman
Notary Public

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MARY L. PETERMAN
NOTARY PUBLIC-MINNESOTA
My Commission Expires Jan. 31, 2010

STATE OF MINNESOTA DISTRICT COURT

COUNTY OF RAMSEY SECOND JUDICIAL DISTRICT

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- -

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- -

DEPOSITION

The following is the deposition of KING BANAIAN, taken before Jean F. Soule, Notary Public, Registered Professional Reporter, pursuant to Notice of Taking Deposition, at the office of Fredrikson & Byron, P.A., 200 South Sixth Street, Suite 4000, Rainy Conference Room, Minneapolis, Minnesota, commencing at 5:15 p.m., Tuesday, January 27, 2009.

* * *

APPEARANCES:

On Behalf of the Contestants:

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PROCEEDINGS

Whereupon, the deposition of KING BANAIAN was commenced at 5:15 p.m. as follows:

KING BANAIAN,
after having been first duly sworn,
deposes and says under oath as follows:

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EXAMINATION

BY MR. BURMAN:

Q. Professor Banaian, my name is Dave Burman. I'm one of the lawyers for Al Franken, the contestee in the election contest that's going on.

Have you ever testified in a deposition before?

A. No, I have not.

Q. Have you ever testified at trial?

A. No, I have not.

Q. I'm going to be asking you a series of questions. You will quickly discern that I don't know what I'm talking about when it comes to statistics. Don't sort of dumb down your answers for my benefit. Assume that I've been fed questions by somebody who knows a lot more than me about statistics, and so you give the full scientific explanation you need to give for that person to understand what you did here. Is that acceptable?

A. Yes.

Q. And, nonetheless, I'll probably follow up with some dumb questions, and I hope you'll excuse those and do your best to answer them for me.

Let me show you first what's been marked as Exhibit 1. Have you seen Exhibit 1 before?

A. No, I have not.

Q. How did you learn that your deposition was being taken in this matter?

A. I was informed of this by Jim Langdon, the attorney on the Coleman side.

Q. And this is a notice of your deposition and a subpoena that Mr. Langdon accepted on your behalf.

A. Uh-huh.

Q. If you could turn to the last page, is the Exhibit A? Do you have that in front of you?

A. Yes, I do.

Q. And have you brought the materials that are listed on Exhibit A?

A. No, I have not. I was not -- I've not seen this before, so I did not have these instructions.

Q. Do you have a CV?

A. I believe one was available.

MR. BURMAN: And perhaps, Mr. Ralph, if you could forward it to me? If you could e-mail it to him, he could send it to me.

MR. RALPH: In fact, I have a hard copy of the CV with me.

MR. BURMAN: Oh, okay.

MR. RALPH: And if you'd like, we could copy that.

MR. BURMAN: Sure. During a break we'll get a copy of that.

BY MR. BURMAN:

Q. The second item is, "All documents provided to you by Contestants, their attorneys or representatives concerning this matter."

Have you done any search for the materials that you received that would fall within that category?

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A. I received working files, Excel files from the lawyers for -- for -- for Coleman, who have given them to me and then asked me to verify them.

Q. And we're going to turn in a little while to an Excel spreadsheet that your lawyers forwarded to me that I think you have been working on. The materials that they provided you, are those all reflected in that spreadsheet?

A. Yes, they are.

Q. And let me show you what's been marked as Deposition Exhibit 2. Is that the spreadsheet that you have prepared and provided to us?

A. Yes, it is.

Q. So the information that's in there is information that -- some of it, anyway, you obtain from the attorneys for Mr. Coleman, but you verified that information?

A. Yes, that's correct.

Q. And is there any information that you were provided by them that hasn't found its way into Exhibit 2?

A. No, there is not.

Q. And, then, No. 3 on the list that's

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the last page of Exhibit 1 asks for, "All documents which you have or will rely upon in formulating and providing your opinions and/or testimony in this matter."

Is there anything other than Deposition Exhibit 2 that falls within that category?

A. I've read books to look at data, to look at potential tests one can run, looked at code books that could be used in researching those types of tests.

Q. And what do you mean by a code book?

A. If one was to use different software for this analysis, you might want to see what tests might be available with that.

Q. And when you say different software, you mean different than the basic Excel spreadsheet software?

A. Yes, that's correct.

Q. So the formulas that you used for Exhibit 2 are basic Excel formulas?

A. Yes, they are.

Q. And, then, you said there were some other books that you looked at before you

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mentioned code books. What kind of books were those?

A. Basic statistical books. In fact, one was the textbook I had used when I was an undergraduate.

Q. And which book is that?

A. It's Wonnacott & Wonnacott, Introductory Statistics.

Q. And what other statistics books did you look at?

A. I cannot remember the title of the other book. It was loaned to me by a colleague.

Q. Loaned for this purpose?

A. For this purpose.

Q. And do you still have it at your office or have you returned it?

A. I still have the book.

Q. Could you check when you get back to your office and let Mr. Ralph know what the title of that book is?

A. Yes, I can.

Q. What were the code books that you looked at, if you recall?

A. The codes were online. We were attempting to determine whether another piece of

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software would provide better -- a better method to look at this data. We decided -- or I decided, nobody else informed me of this, I decided that it would be reasonable to rely on the information and the routines in Excel to answer the questions that I was asked to look at.

Q. And what was that other method or formula that you considered?

A. I looked at -- I looked at, basically, three different programs: SAS, SPSS, and STATA.

Q. Those are all acronyms, as I understand it?

A. Yes, that's right.

Q. And do you recall offhand what each of those acronyms stands for?

A. I do not, actually. We -- nobody refers to them by their full names that I know.

Q. I'm pretty sure that the SS at the end of the first two stands for social sciences, does it not?

A. I don't honestly know.

Q. SAS is statistical applications for the social sciences?

A. I don't know that, either.

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Q. You are a social scientist, aren't you?
A. That's correct.
Q. And those are statistics packages, at least the two that I'm familiar with, the first two, are they not?
A. Yes, they are.
Q. And they also have different formulas that you can apply to the statistics or to the data that is included within those packages?
A. Yes, they do.
Q. And do you recall what kind of formula or methodology you were considering using?
A. I had looked at additional tests, such as the Tukey -- do you wish me to spell it, T-u-k-e-y -- test as an alternative to the test I was -- I was using.
Q. And that would be an alternative approach to determining, in my rough understanding, whether the results you were seeing were statistically significant?
A. That is correct.
Q. And did you consider any other data

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besides the data that is reflected in Exhibit 2?
A. No, I did not.
Q. If you could turn to the last page again of Exhibit 1, No. 4, "All documents you may utilize to illustrate, supplement, or assist in your giving of testimony at the trial of this matter."
I understand that you may testify as early as Thursday of this week. Have you prepared any documents to assist in your testimony?
A. No, not at this time.
Q. What have you considered preparing?
A. I believe a graph of the rates of rejection of absentee ballots would be a useful graphic to have.
Q. Anything else?
A. I have -- I would look at describing in some way how the distributions of these data are displayed. I have not decided how I would want to do that yet.
Q. So these data that you're referring to are the data in Exhibit 2?
A. Correct.
Q. Any other data that you've

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considered using as part of your -- of reaching your conclusions or testifying to your conclusions?
A. No.
Q. There was a chart displayed in the opening statement of Mr. Friedberg. Did you have anything to do with preparing a chart for that purpose?
A. No.
Q. And I apologize if you've already said this. To date, you have not yet prepared the chart that you're contemplating that would show graphically the rejection rates?
A. No.
Q. No, you have not?
A. No, I have not. I'm sorry, I apologize.
Q. No. It was my question, not your answer.
Now, as I understand it from the formal disclosure of your testimony that's been provided by counsel for Mr. Coleman, your testimony is going to be about, as I think you just said, variations in rejection rates of absentee ballots, correct?

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A. Yes.
Q. Is there any other topic that you expect to testify or that you've been asked to examine for a contestant?
A. No.
Q. You have not, for example, been asked to look at differences in the rates or other factors related to acceptance of absentee ballots?
A. No.
Q. And you've not been asked to examine what might explain the differences among counties in terms of rejection of absentee ballots?
A. No.
Q. You haven't been asked to look at how many absentee ballots were wrongly rejected?
MR. RALPH: Objection to form.
BY MR. BURMAN:
Q. I should have said have you?
MR. RALPH: Same objection.
THE WITNESS: Please repeat the question?
MR. BURMAN: Sure.
BY MR. BURMAN:

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Q. Your testimony is about differences in the rates of rejection, but some rejections are proper, correct?
MR. RALPH: Objection, foundation.
THE WITNESS: Yes. Some will be rejected for reasons stated by the law.
BY MR. BURMAN:
Q. And you haven't been asked to determine whether any were rejected improperly for reasons not stated by the law?
A. No.
Q. And you haven't been asked to quantify how many have been rejected incorrectly, if any?
A. No.
Q. And, I'm sorry, it's just with the limited time it's important for me to make sure I understand how big your testimony is and where it's not going.
Have you been watching any of the trial in person or otherwise on the Web?
A. No. I have not seen any of the -- any of the trial so far.
Q. Have you been provided with a summary, either orally or in writing, of the

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opening statement provided by counsel for Mr. Coleman or any testimony of witnesses?
A. I have no such information.
Q. Let's jump into Exhibit 2, if we could, and what I'd propose to do is kind of take a first pass through it just to make sure I understand what we're seeing here and then probably go back and look at some specifics, if I could. Which reminds me that I left my copy with my notes on it in the other room.
Let me start with the first page of Exhibit 2. I think you said that this appears -- or Exhibit 2 as a whole appears to be a printout of everything that was in this Excel spreadsheet that you provided to us electronically?
A. Yes, that's correct.
Q. And what it wouldn't show is the formula that you said you obtained from those formulas available within Excel that lies behind the numbers in some of the columns?
A. Yes, that's correct.
Q. But we could go into the electronic version and see what that formula was?
A. Yes, you could.
Q. So the first page of Exhibit 2 is

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labeled C-data, and let me just say I -- this is the one way I changed what you provided us, I took at the bottom of the page the tabs and I made that the header so that it would show on this so that we could tell the different tabs apart. What does C-data stand for?
A. This data is the first data that I received from the Coleman campaign up to -- up to column marked counted.
Q. So the C just means Coleman data?
A. Yes.
Q. It's not a statistical term of art?
A. No, it's not.
Q. So they gave you the columns that read county, reject rate, absentee ballots, rejected and counted; is that correct?
A. I'm going to have to double-check the counted column. I don't know if I generated that or if that was given to me by -- by the Coleman campaign. The first columns through rejected certainly I received.
Q. And counted, if you added it, it would just be subtracting the fourth column from the third column?
A. Yes, that's correct.

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Q. Then there's a column labeled 5% crit, c-r-i-t. What is that?
A. It's the critical value by which -- I mean, I estimated the minimum number of ballots that would be accepted if the rejection rate for this particular district met -- was different or was roughly the same as what was for the entire state. The state had a rejection rate of absentee ballots of 3.99 percent.
For each county, what I asked is, at the 95 percent level of confidence, what would be the least number of ballots that would be counted, understanding that there's going to be some variation due to random fluctuations.
Q. And what else besides random fluctuations might explain the variation? Did you examine that at all?
A. No, I did not.
Q. So as I understand it -- and, again, my apologies if I butcher this -- the 5 percent level, basically, means that only 5 times out of 100 would you see a number of rejections in that county in excess of 1149 due to --
A. Well --

Q. Go ahead, I'm sorry.
A. I'm sorry. Number of accepted.
Q. Okay. Number of accepted in that county above 1149?
A. 1149 would be the minimum number of ballots that would be accepted of -- of all -- of all the absentee ballots if -- I'm sorry. The 1149 would be the minimum number of absentee ballots accepted if we accepted -- if they were rejecting at the rate of the 3.99.
Q. And so in applying that statistical test, you're assuming homogeneity relevant to rejection rates in that county compared to the state and just looking for random variation?
MR. RALPH: Objection, form.
THE WITNESS: This particular test requires -- requires homogeneity of variance.
BY MR. BURMAN:
Q. And explain to me now what that means?
A. Okay.
Q. Since I was told to ask you that question, but I had no idea what it meant.
A. It means that the variance of -- the variance of rejection rates for each of the

counties is drawn from the same sample with a constant mean rate, constant variance.
Q. So but for random variations, you would expect each county to have roughly the same average rejection rate as the state as a whole?
A. Right.
Q. And if there are factors that might affect rejection rate that do vary by county, then, this particular statistical test doesn't rule that out?
A. Yes, that's correct.
Q. And even if the only variations that you would expect would be random, using the 5 percent test, basically, means that 5 times out of 100 you might get that result just due to random variation?
A. Yes, that's right.
Q. So if you had 100 counties and they were homogeneous and you rolled the dice in each one as to rejection rates, 5 of them might well be outside of the 95 percent confidence level?
A. Yes, that -- yes.
Q. And since we have 80 some counties, you'd expect to see some that would show up as significant using that test?

A. Yes.
Q. And did you do or have you done any test that looks at the state as a whole and says that the variation that is shown for the state as a whole is outside of what you would expect due to random variation?
A. No, I did not.
Q. Now, the next column is the 1% crit. Please explain that?
A. It's the same as the 5 percent, except instead of a 95 percent confidence band, it's a 99 percent confidence band. It's, therefore, a stricter test than the 95.
Q. And if you go down that column, I think the third entry has a number sign and, then, all caps N-U-M. What does that mean?
A. This method is using a routine in a Excel that sometimes generates a numerical error in the calculation. That was happening in a number of instances here.
As you work with the tail of a distribution, you can get calculation -- you can get calculation problems.
Q. What do you mean by the tail of the distribution? I'm sorry.

A. If you think about a curve that describes the distribution of the data, tail of the distribution is the part way out at the very end, because they tail to zero.
Q. So your approach to this, it sounds like, assumes that there will be some distribution just because of randomness in the data among the counties?
A. There's a distribution to the data. That distribution, because it is based -- it is binary, accept the ballot, reject the ballot, is binomial in nature. This -- this test uses a binomial model to estimate the rate -- rates of rejection or rates of acceptance, so either estimating too few accepts or too few rejects -- or too many, excuse me, too many, pardon me, too many rejects.
Q. And that, actually, jumps ahead to a question I had. You did not use a multinomial formula, correct?
A. No.
Q. And would it make a difference which you used?
A. It would.
Q. Why is that?

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A. If there was a third category, you would need to look at a trinomial distribution. My treatment of the data is to -- I have two columns. All of the ballots can be only in one of two buckets, accept bucket, reject bucket. Therefore, the binomial distribution is the appropriate distribution to use.

Q. And am I correct in roughly understanding that if there are more buckets that it makes it less likely that you would get statistically significant results with the data you're using?

A. Yes, I believe that to be correct.

Q. The next column is the 0.1% crit, and I assume that's an even stricter test?

A. Yes.

Q. And so Excel goes more nutso --

A. Correct.

Q. -- in various cells? Okay.

Then there's a column that says -- and I can't tell whether the heading reject too many is just for one column or two. Do you know offhand?

A. It is for two.

Q. So the yes, yes for Aiken County

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means that Aiken rejected too many compared to what you expected in a random distribution?

A. Yes, that's correct.

Q. And is the first column based on the 5 percent calculation and the second on the 1 percent?

A. Yes, that's correct.

Q. And what does it mean on the second reject too many column if there's just a blank space for the county?

A. If you reject no -- if you reject -- if you answer no at 5 percent, you would necessarily answer no at 1 percent.

It's, therefore, unnecessary for us to fill that information in.

Q. And how do you calculate this reject too many yes/no answer? What drives whether it's yes or whether it's no?

A. If the number of ballots counted accepted -- okay, exceeds, exceeds -- it falls short of the amount marked in the critical, you would then see a yes. So for Aiken, yes. For -- for Anoka, the absentee ballots, the absentee ballots are -- are greater than the 13077 is greater than the 12962. That is the no, and so

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on.

Q. And, then, I am sure I'm going to get the pronunciation wrong, but Poisson?

A. Très bien. I'm sorry.

Q. Is that how it's pronounced?

A. Poisson is correct, yes.

Q. What does that mean?

A. Poisson is another type of distribution.

Q. So another way of testing the usefulness of the data?

A. It is another way of testing the quality -- excuse me. It's another way of testing the number rejected as being too many or too -- or, particularly, too few. It approximates the binomial distribution and sometimes used instead, particularly in applications in industrial operations.

Q. What do you mean by industrial operations?

A. For example, you're building a -- you're building screws that have to be a certain length, how many of them failed to meet your tolerance limits.

Q. Is this a method that you decided

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was useful or were you just trying something out here?

A. I believe this method is useful.

Q. So, for example, if you compare the first two rows, Aiken and Anoka, what do we learn from comparing the 3.16 and so on against the 1.45?

A. Well, in both of these cases, we would have had rejection rates that are -- that are too high.

I actually have not relied on this particular column for any of the results. The Poisson comes back at a later -- in a later page here.

Q. Oh, okay.

A. But this particular one I didn't rely on. I believe, in fact, this one was done incorrectly.

Q. You mentioned that this first page we have of Exhibit 2, the first four or five columns you got from the lawyers --

A. Uh-huh.

Q. -- for the contestant. When did you first get that data?

A. My first conversations were a week

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ago today. I received this data late Tuesday night, last week. It should be the 20th.

Q. So you didn't start doing any calculations or reaching any conclusions until, at the earliest, late on the 20th?

A. That is correct.

Q. When did you actually first do some number crunching and reach some conclusions?

A. Those are two different questions.

Q. Okay. Just split them up?

A. Okay.

Q. When did you first start analyzing the data?

A. I first looked at the data -- I first looked at the data on that Tuesday. I had waited for additional information and explanations and to run some additional tests that are on preceding pages before I arrived at any type of conclusion. I believe it was Thursday last week when I felt I could -- which would be the 22nd.

Q. The 22nd.

A. At that point I thought I had some results that were worth sharing.

Q. And what were the conclusions you

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reached at that time, and, as I understand it, expect to share with the court?

A. I conclude that there are many, in some cases 21 counties of the 87 that at the 95 percent confidence level appear to have rejected more ballots, absentee ballots than one would expect based on the statewide rate.

Q. Any other conclusions that you reached?

A. Different tests give you different numbers. A 99 percent test gives you fewer, obviously, than a 95 percent would.

Q. Fewer counties --

A. Fewer counties that rejected more than one would have expected.

Q. And that's more than one would have expected if the rejection rates were randomly -- variations in the rejection rates were randomly distributed among the counties?

A. Yes, that's correct.

Q. Anything else that you concluded?

A. No, I don't think so.

Q. I think you said between the 20th and the 22nd you either asked for or received more data. What additional data did you get?

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A. Well, in Exhibit 2 you will see additional pages. Those that are marked -- if I'm -- am I permitted to --

Q. Sure.

A. To look at this thing?

Q. Absolutely, whatever would be helpful.

A. Okay. I received additional data the next morning. I sought clarification of what the data was from the Coleman -- from the Coleman campaign, and the lawyers and staff.

I reproduced on the page marked jan21data that information that I received that -- so I've waited for that information before I started more carefully going through and being sure that everything was in place.

The page previously, the one I worked on the 20th is actually the C-data page, and that was more of a thought process that I was having on the evening of the 20th to figure out what strategy would I use to determine what I was being asked to determine.

Q. Who was it that gave you your assignment on the 20th, or whenever in advance of the 20th you got it?

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A. The attorneys from the Coleman campaign had contacted me, in particular, Mr. Trimble.

Q. And when did Mr. Trimble first contact you?

A. I would say noon on the 20th.

Q. And, then, the data arrived sometime after dinner, before dinner?

A. It would be before dinner, because I looked at it at my office before I went home.

Q. So approximately what time would you say?

A. Probably -- probably 5:00, I think.

Q. And it came with an e-mail from Mr. Trimble?

A. Yes, that's correct.

Q. And what did he tell you the data was?

A. I was informed at that time this data represented county level data of absentee ballots and rejection -- absentee ballots and rejections.

Q. And I think you had started to describe the pages labeled jan21data?

A. Uh-huh.

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Q. Can I assume the first four columns or so roughly, again, are the data that you obtained and, then, the others are things you did to explore that data?
A. Yes, that is correct.
Q. And is this data that you received, again, from Mr. Trimble, or did you get this directly from the secretary of state?
A. No. At this time I had received it only from Mr. Trimble.
Q. And, then, I think there's a -- if you go a little farther in, a jan21data (2)?
A. That is correct.
Q. How does that differ?
A. It only differs in that I sorted the data by the size, number of absentee ballots in each county.
Q. Why did you do that?
A. I was looking for similar sized counties that may have significantly different rejection rates, looking for examples.
Q. So that you could try to determine what might explain the variations?
A. To determine what might explain variations and to simply see where there might be

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really significant differences in a pair-wise comparison.
Q. But as I understand it, you haven't determined the reason behind any differences in variations?
A. That is correct.
Q. Then next I think we skip to January 24 data?
A. Uh-huh.
Q. Where did you get that data?
A. This is -- this is the data as I went and verified it from the secretary of state's office. So we received -- there is data by county on the Web site. One can go and obtain it, so collected an Excel spreadsheet for each county, verified the totals.
Q. And there's a note, in fact, I see under the Absentee Rejection By County it says, From SOS, 24 January 2009, 8:45 p.m.?
A. That is correct, yes.
Q. And that's when you accessed their Web site and downloaded their Excel spreadsheet?
A. Yes.
Q. When I was looking at the Web site, there were some other categories of absentee

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ballots that they referenced, federal absentee ballots and presidential. Did you explore what those meant and how those might factor in?
A. Only very generally. I came to understand, which I did not before, that one can get absentee ballots through other means other than application to the state and that some of those ballots come in in a different -- so some of the absentee ballots have a different form than the form that people in Minnesota would have used.
Q. And do you know how determinations were made on those whether to reject or accept them?
A. No, I do not.
Q. Are they mixed in with the data that you have?
A. Yes, they are.
Q. Did you attempt in any way to adjust for those?
A. No, I did not.
Q. I also understand there's something called mail ballots in some counties in Minnesota, are you aware of that?
A. No, I'm not.

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Q. Do you know whether mail ballots -- mail, meaning m-a-i-l, mailed in -- are included in the data that you have?
A. I did not look at that question.
Q. Let's go back to the evening of January 20, when you were thinking about different things you might do with the data that Mr. Trimble had supplied. What were the options that you considered?
A. I considered, first of all, that the data had a binomial nature to it so that we could take advantage of binomial distributions to study the data. I looked then at Excel's statistical routines and functions and determined there were two or three that we could use to answer some of those questions. I opened my -- my old -- my old stat book and the book I had borrowed from my colleague, just saying I'm thinking of looking at this data, what should I -- you know, do you have anything I could read?
Q. Was that that same day, basically?
A. Yeah, yeah, that afternoon, even before I'd received the data. Just suppose you were looking at this kind of data, what would you look at? And we opened -- I looked at those

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books and concluded that, in fact, the binomial and the Poisson distributions fit the logic of how I wanted to proceed with the data.

At that time I contemplated other tests, as well. Those tests, in my mind, contained assumptions that I did not feel were appropriate to the data, so I put those aside.

Q. Do you remember at this point what those other tests were?

A. I -- I had looked -- I had looked at a test statistic called Tukey, or Tukey-Kramer sometimes it's called, that has a variety of names. I looked at that test and -- and there is no routine that I had available that would run the -- run that particular test.

I investigated whether we could find some other software that might run that particular test. That's when I investigated the SAS and the SPSS and STATA.

Q. And any other approach or test other than Tukey or Tukey-Kramer that you considered?

A. Not at that time, no.

Q. Since that time, anything else?

A. They're -- they're having -- having

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read about Tukey, I looked at one of the other tests in that area and am aware of other ones. They appear all to rely on the same -- the same assumptions about the nature of the data that led me to not follow through on Tukey, and, thus, I didn't follow through on those, either.

Q. And what are those assumptions that they rely on?

A. I believe the data relies on -- I believe those tests, pardon me, I believe those tests rely on an assumption of normality. I believe they come in a form that binomial data does not take.

Q. What do you mean by the assumption of normality?

A. Different data have different distributions. There's an assumption about -- many tests have assumptions of data that would require the data to be normally distributed, like a bell curve.

Q. And you did not expect the variations in rejection rates in Minnesota counties to have a bell curve-like distribution?

MR. RALPH: Objection, form and foundation.

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THE WITNESS: The data is binomial. A yes/no answer to whether a ballot is a legal vote is dichotomous. That was what I was investigating.

BY MR. BURMAN:

Q. And --

A. So --

Q. No, go ahead and finish your answer. I didn't mean to interrupt.

A. So dichotomous variables are tested with a binomial distribution.

Q. If normality wasn't the proper assumption for this data, why is that? Does normality suggest something other than normal or what -- explain that to me?

A. Normality assumes continuous variables, ones that lie all along the number scale. Choices -- choices don't lie along a number scale. They either go in one bin or another.

Q. What do you consider your areas of expertise?

A. I'm trained as an economist. I have a Ph.D. in economics. I teach Business Forecasting, I teach Macroeconomics, Money and

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Banking, and Economics in Developing Countries.

Q. Do you consider yourself an expert in statistical analysis?

A. I consider myself a practitioner of statistical analysis. Expert, I believe -- I have difficulty with that word.

Q. Why is that?

A. I have -- I have taken several courses in statistics. There are, obviously, people who have degrees in statistics, Ph.D.s even in statistics. It's fair to say that they will call themselves experts.

I -- I call myself a long-time practitioner of -- of statistical analysis. I provide data analysis for the St. Cloud community, and I teach data analysis to my students.

Q. As I understand it, as long as I picked the right test of those offered by Excel, even somebody as unschooled as myself could have, basically, replicated what you've done in Exhibit 2?

A. If you picked the right test.

Q. And the binomial approach is about the most basic of statistical tests, is it not?

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A. Am I being asked my opinion?
Q. Yes.
A. In my opinion, most people by default go to the normal distribution. The bell curve is the most well-known distribution in statistics.
Q. But measuring confidence intervals using binomial is a fairly basic statistical approach, is it not?
MR. RALPH: Objection to form.
BY MR. BURMAN:
Q. You can answer.
A. Yes. It's -- it's something that I -- when I -- when I've taught statistics, I've taught the binomial distribution even in the first introductory class.
Q. And I think you said the book that you referred to that first night is the basic text that you learned out of when you were an undergraduate?
A. That is correct.
Q. The same book that you just kept in your library all that time?
A. That is correct.
Q. I didn't mean to suggest that it's

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a long, long time, but since your days as an undergrad?
A. Yes, that's correct.
MR. BURMAN: Can we take about a five-minute break and I'll go get my notes, and if you need to use the restroom or anything, get some more to drink.
THE WITNESS: Get some water.
MR. BURMAN: Great.
(Break from 6:06 to 6:15.)
BY MR. BURMAN:
Q. If we could turn back to page 1 of Exhibit 2, just to finish up on that page. I wanted to make sure I understand, if you go to the reject too many columns again?
A. Uh-huh.
Q. You, basically, set the cell, each cell that's in those two columns up so that if the number rejected was such that the number accepted fell below, say, the 1149 for Aiken --
A. Yes.
Q. -- under the 5 percent standard, then it would say yes?
MR. RALPH: Objection, form.
THE WITNESS: It's set so that it

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will say yes if -- if the number in the 5 percent critical is greater than the number under absentee ballots.
MR. BURMAN: That was so much more artful than my question. Thank you.
BY MR. BURMAN:
Q. And the same for the next column, as well, except using the 0.1 percent level?
A. Yes.
Q. Now, if you could turn to the third page in, which is the last page of the C-data page, there's just a couple of things there that are a little different. There appears to be totals at the ends of columns three and four. Am I correct in interpreting that?
A. Yes.
Q. So at least as of the data you got on the evening of the 20th, there were 11439 rejected absentee ballots statewide?
A. That was the data I received.
Q. And dividing that by the 292,535 gets you something very close to 4 percent, I take it?
A. I believe so.
Q. And, then, if you go farther to the

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right, there's the numeral 23. What does that mean?
A. Twenty-three represents the number of -- the number of yeses in that -- in that column that's shifted to the left.
Q. So that would be the 5 percent?
A. The 5 percent, yes, that's correct.
Q. And a few less in the 0.1 percent?
A. Yes.
Q. Now, let's turn to the next document, and I just printed these out in the order the tabs were in what we got electronically.
A. Uh-huh.
Q. This one is labeled examples. Tell us what that is.
A. I pulled three county pairs just as illustrations here, so -- and the decision on which ones to pull were to look for counties with similar numbers for absentee ballots only.
Q. And why was that an important factor or a possibly important factor?
A. It's possibly important because the size of the -- the number of rejected ballots determines the size of the variation that one

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gets in the binomial distribution.
Q. So it wasn't that you thought that the number of absentee ballots that a county had to deal with might affect the rejection rate in any way?
A. No.
Q. And once you compared the numbers of accepted absentee ballots, how did you pick which two counties to pair up? I assume there was more than two that had around forty-seven to 5,000 accepted absentee ballots?
A. This takes us to the question of one of the pages you asked about before, if you'll look at the jan21data (2).
Q. Okay.
A. I had -- I had -- it was after forming that particular page that I picked off the pairs, and I looked for, tracing my fingers down the reject rate, where did I all of a sudden see numbers jump up, and then I would look back to see are these counties similar in size to the previous ones?
Q. So they're adjoining at least as measured by the total number of absentee ballots counted when you rank by that factor?

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A. Yes.
Q. And going back to the examples page, what conclusions do you reach from the information on this page, if any?
A. I wanted to investigate two items. One, to establish in my own mind that I had correctly -- correctly calculated the standard error of the binomial distribution to my own satisfaction, that is the column marked stat std; and, then, to demonstrate that those three pairs, those differences were, in fact, significant.
Q. And how did you demonstrate that?
A. That's the next column. The z-score column is a simple test of in -- independence of two samples of unev -- even size. I calculated that based on the -- on the rate of rejection for these two counties, and, then, consulting in this case the normal distribution, the Pr, where you see Pr(r1=r2).
Q. Yes.
A. That is the probability that the rejection rate of row one is equal to the rejection rate of row two of that pair; and so in each case you can see it reject -- it's zero percent chance even out to five digits, five

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decimal places.
Q. I mean, I could tell from the third column that the rejected rates weren't the same. How does that test improve on my eyesight?
A. Your eyes are not lying to you.
Q. Okay.
A. The -- the issue is, as you get to smaller counties, the degree of variation is larger. You're drawing fewer -- you're drawing fewer balls out of the bag, to think of that old example from statistics. So variation is greater with smaller samples than it is with greater ones when you're sampling, in sampling theory.
So I wanted a demonstration in my own mind that I was getting the statistics on the standard errors correct; and, indeed, here the 0.56 percent for the two smallest -- for the smallest pair is larger than the 0.34 percent standard error for the largest pair, the Olmsted, St. Louis pair; and so it was giving me in some way the answer I was looking for.
This was an attempt to confirm my intuition, or, as you say, your eyesight.
Q. And what none of these tests do is tell us what caused the variation, correct?

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A. That is correct.
Q. So there may be factors that explain the variation, but at least for these pairs, random selection is not a likely explanation?
A. For these pairs, the difference in the rejection rate is significant. What causes it I can say nothing about.
Q. And there's a column labeled Variance. What does that column tell us?
A. A binomial distribution has a variance. It has a mean -- a mean proportion and a variance. The variance is a simple calculation, and that calculation is performed in that column.
Q. Let's turn to -- I think the next page is labeled proportions?
A. Correct.
Q. What does this tell us?
A. In using the data, this is the -- this is, again, the January 21 data. This -- this chart gives me the rejection rate, a standard error of the rejection and -- I'm trying to make sure I have this right, and this gives me, as well, the ninety -- how likely it is at

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95 percent confidence that the rate for this particular county is above the -- the -- above the state rate.

Q. How likely as a matter of random distribution?

A. Right, right, right.

Q. So let me just work my way through.

A. Sure.

Q. I understand the counties are arranged here in order of counted absentee ballots, correct?

A. Yes.

Q. From high to low?

A. Uh-huh.

Q. And, then, we get -- I think I understand absentees reject. What is the expected column?

A. Ah, very good. Expected -- expected represents the number of absentee ballots one would have expected had the rejection rate been equivalent to that state rate of approximately 4 percent. It just takes the total number of ballots received, both counted and rejected, and multiplies it by that -- that nearly 4 percent.

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Q. So it takes the statewide percentage, applies it to the total absentee ballots the county dealt with and predicts, if everything was totally homogeneous, what they would have rejected?

A. If they all rejected at the same rate as that state average, yes.

Q. And, then, the 3.11 percent for Hennepin, what is that?

A. That's their actual rejection rate, the same numbers we've seen in previous pages.

Q. And, then, the next column, which for Hennepin is 0.06 percent?

A. That's a statement of the standard error of that -- of the distribution, assuming -- assuming there's a separate distribution for each state -- for each county.

Q. And is that actually six one-hundredths of a percent, or is it six percent, or should it not --

A. Six one-hundredths of a percent.

Q. And what does that tell us, to know that that's six one-hundredths of a percent?

A. In this case, what that number tells us is the tightness of the binomial

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distribution around that value -- that number -- that rejection rate for that county.

So for the largest county, Hennepin, we have a very tight expected distribution. As you go to smaller counties, you're going to get a widening of that distribution.

Q. You would get that even if everything was done identically in those counties just due to random variation?

A. Correct. You can perform a simple experiment of flipping a coin. If you flipped a coin ten times, you might end up having seven heads, but you would still believe it's a fair coin. If you flip it 100,000 times, you'd be surprised if you got something very different from 50,000 heads.

Q. And, then, the next to last column, what is that? It's 0.00096 for Hennepin.

A. The -- that particular column describes the -- okay, I am reasonably certain, not having looked at the spread -- this particular sheet for a little bit, so this is going to be the variance. This is, basically, the -- this should represent something like the

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square of that -- of the previous number.

I really need to go back and look at that to be sure. I'm going to have to say I'm not sure of that one.

Q. Okay. And can I assume from that that you don't expect to use this particular chart or rely on this for your testimony?

A. No, I do not. It's -- the instruction I received was to give you the full book.

Q. Oh, I understand.

A. Okay, and so some pages, you will have to understand, are thinking through problems.

Q. And it probably would have been smart of me to ask you in advance which those were.

A. Okay.

Q. Just to finish this one, there's a column that has some excessives in it. What does that mean?

A. Excessive would represent that based on this particular test the rate of rejection was excessive relative to the 3.9 statewide rate.

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Q. As I, again, eyeball these two pages that are the proportions pages, it appears to me that the excessive labels are somewhat bunched at the top of the array, the counties with more absentee ballots to deal with. Is it proper for me to read anything into that?

MR. RALPH: Objection to form.

THE WITNESS: The -- all one can conclude is that larger counties will have smaller variations, so they're less likely to differ from the state average than small counties.

BY MR. BURMAN:

Q. So other than that question of the amount of data or the amount of instances in which your reject/accept dichotomy occurs, you can't from any of these tests determine anything about causation of the differences; is that correct?

A. Yes.

Q. And you haven't been asked to try to determine what caused the variations?

A. No, I have not.

Q. And based on the generally accepted standards of the social sciences, from the data

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you have, it would not be possible to reach any conclusions as to the causes of the differences?

MR. RALPH: Objection, form.

BY MR. BURMAN:

Q. Is that correct?

A. I -- that's correct.

Q. And, in particular, nothing that you've done would help us determine whether differences in the standards applied by different counties explain the differences in rejection rates; is that correct?

MR. RALPH: Objection, form and foundation.

THE WITNESS: I'm going to ask you to repeat the question?

MR. BURMAN: Sure.

BY MR. BURMAN:

Q. Nothing in the various analyses that you've done reflected in Exhibit 2 or otherwise allows us to reach any conclusions as to whether differences in the standards applied by different counties, if any, to the question of rejecting or accepting absentee ballots is the cause of the different rejection rates that are shown in the data?

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MR. RALPH: Same objections.

THE WITNESS: There is only data on acceptance and rejection. There we -- the purpose of all the tests is to identify whether or not there are significant differences in the rates. That is -- that is what I've tested, and those are the results I show.

BY MR. BURMAN:

Q. And based upon the standards of using statistics in the social sciences, you can't reach any conclusions from this data as to whether those variations result from counties applying different standards from one another, correct?

MR. RALPH: Objection, form.

THE WITNESS: I -- I cannot tell -- there's no evidence in this on causation.

BY MR. BURMAN:

Q. And --

A. There --

Q. Go ahead.

A. I apologize.

There -- nothing could be said toward a particular cause or against a particular cause based on the results provided here.

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Q. And have you given some thought to possible causes of the variation other than random distribution? And I should say as part of your expert analysis as opposed to what you might do in your spare time?

A. In the course of this particular investigation, I have not investigated at any time what might be the cause of these variations.

Q. And sitting here today, we both could speculate about different factors that might explain the variations, but you haven't tried to determine which of those factors are responsible?

MR. RALPH: Objection, asked and answered.

THE WITNESS: We may speculate on any number of things, but there's nothing here in this analysis that would allow us to make any determination among those. They would be only speculative.

BY MR. BURMAN:

Q. If you could turn to the next three pages or the ones labeled January 21 data?

A. Uh-huh.

Q. And I think you told me that this

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is also data -- the first four columns or so is also data that you got from Mr. Trimble?

A. Yes.

Q. Did you know Mr. Trimble before this effort the last week or so?

A. No. I've never met him before.

Q. Did he contact you about doing this?

A. Yes. He -- somebody -- another gentleman contacted me first, who said, are you -- do you know something about statistics? And I said, well, of course, in my job I do. And then he said, I'd like to put somebody in contact with you, and the next thing I know I'm speaking with Mr. Trimble.

Q. Who is the first person?

A. Pat Shortridge is a -- somebody I've known -- I've known in other places.

Q. How do you know Mr. Shortridge?

A. A friend of a friend. We've spoken a couple of events together, we've worked together on -- on a project.

Q. And do you know why he thought that this might be something that you'd be interested in?

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A. No, I don't, except my -- my reputation as an economist.

Q. If you could look at the January 21 data, is there anything new here from the C-data pages?

A. This particular page contains a good amount of the materials seen on the C-data page, with the updated data. I believe you will see that there's differences in the totals at the bottom for number of ballots counted and -- and rejected. So this reflects some -- some updating of the data.

Again, at this point it's what I'm receiving from -- from them. This data comes to me from -- from them. But this was the main page on which I was working my -- working on on the determination of whether or not these rates were different.

Q. And did the Coleman campaign tell you why this data was different from the data you'd gotten the day before?

A. My memory is that they told me that some of the data had been cleaned up.

Q. There's a column near the right margin --

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A. Uh-huh.

Q. -- which I'm guessing may stand for cumulative probability, c-u-m, p-r-o-b?

A. That is correct.

Q. Explain how that is done or what you learned from that?

A. This column represents the Poisson distribution, testing for whether or not the number of absentee ballots is more than we'd expect based on the statewide rate.

Q. And what makes it cumulative?

A. Poisson distribution, if you think of a large curve that has two tails, that distribution -- the cumulative is it's the area under the curve all the way out to the tail, where you've truncated it at the point where the Poisson statistic is.

Q. So, for example, on Aiken, 0.999997 means there was very little outside of the distribution --

A. That --

Q. -- curve?

A. That is correct.

Q. And next to that, just to the left of that column there's a column -- it doesn't

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appear to have a label, but it has, for Aiken, the number 23.69. Do you know what that column is?

A. Yes. This column -- this column represents an attempt to calculate a chi squire test, which runs all the way down to the bottom of the jan21data sheet, which is three pages long. This was another test that one could run simply to ask, are all the proportions the same? It is -- it is a most simple test to say, are all these proportions the same?

So it calculates, as you can see, a difference between the -- the observed and expected and corrects for the number of observations in that particular county, the number of ballots in that county.

Q. So would a rough way of understanding the 23.69 for Aiken be that there were roughly 24 more rejections than you would expect?

A. No, no.

Q. Oh, okay.

A. Not exactly. You would -- you would have -- you'd take the -- you're going to take the difference between the two, you're going

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to square it, you're going to then divide it by the square root of the number of ballots.
Q. The total number of absentee ballots?
A. No -- yes, in that state.
Q. In that county?
A. Pardon me, in that county. I keep doing that. I'm sorry.
Q. And, then, when you get to the total for the chi square on page 3 of 2,438 --
A. That's a summation.
Q. A summation, what does that tell us? Can we conclude anything from that?
A. The chi square statistic tells us that it is tested against the distribution for chi square, which, unfortunately, our -- the column is not wide enough so you don't see the number for signif underneath. That column -- that tells you the -- that gives you a test of the null hypothesis that all of the proportions are the same, done by suggesting whether or not you had the right number of absentee ballots out of those you observed -- I mean, to those -- pardon me, to those you expected based, again, on the 3.99 assumption.

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Q. And, then, the last two columns have the significant or not significant at the 95 and 99 percent levels?
A. Uh-huh.
Q. And am I interpreting it correctly that if, for example, Becker is not significant measured by either of those that we can't rule out the possibility that the difference between the number of rejected absentee ballots in Becker and the proportion rejected statewide, we can't rule out the possibility that's just random differences?
A. Yes, that's correct.
Q. So at least using this data there were between 15 and 23 counties where there seemed to be differences that couldn't be explained by random variation?
A. That's correct.
Q. But we don't know what caused those?
A. Yes, that's correct.
Q. Might be that they had a disproportionate number of people who were blind or didn't see very well and didn't sign in the right place?

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MR. RALPH: Objection, form.
BY MR. BURMAN:
Q. That's a possible explanation for those counties?
A. It's possible, yes.
Q. And nothing that you've done tells us whether or not the excess rejections were contrary to law or incorrect in any way?
A. No.
Q. Let's turn to sheet 2, the single page -- well, it is single page, but it doesn't seem to have all the counties on it, so I might -- maybe I didn't --
A. This -- this page is -- was data that -- that's similar to some of the jan21data, January 21 data. It was the start of copying over something, and, frankly, it's -- it's really -- I should have deleted it before I sent it over. It's not useful.
Q. We can safely ignore it?
A. You may -- you may ignore that. There's nothing useful on that page.
Q. At quarter to 7:00, I'm happy to ignore a page.
A. I bet you are.

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Q. Let's turn to January 21 data (2), and as I understand it, that's just arraying the earlier data by the size of the absentee ballot count in a county?
A. That is correct.
Q. And so we still -- we have the same, I think, 21 and 13 counties that have something that might be strange?
A. Right. There's two differences between those. One of them has the Poisson, the one we just looked at before, this one does not. This one is sorted by the size of the -- size of the counties by the number of absentee ballots counted, the other one is alphabetical. Otherwise they should be identical pages.
Q. Have you totaled up the number of, quote unquote, excess absentee ballot rejections in the counties where you had a statistically significant variation?
A. No.
Q. Let's turn to January 24 data, which is probably where I should have started. Is this, basically, what you intend to use for your testimony at trial, if any?
A. No.

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Q. Okay.
A. If you -- if you return to the January 21 data, the only difference between the January 21 and 24 sheets are noted in the very last column on the jan24data. You can see that there were 3 more ballots in Aiken, and there were 36 fewer ballots in Dakota. Otherwise all of the numbers checked.
Q. So this was just testing the difference between the January 21 and January 24 data?
A. It was largely to go back and be sure that I had the data right.
Q. So your approach is based on the January 21 data as confirmed by what was on the secretary of state's Web site as of the 24th?
A. That is correct.
Q. And there's in small print old on the right-hand side. That just means the old data is the January 21?
A. Yes, that is correct.
Q. Is it reasonable to assume that there are some variations by county in the composition of the consumers of the privilege of using absentee ballots?

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MR. RALPH: Objection, foundation.
THE WITNESS: I don't have any way to know that.
BY MR. BURMAN:
Q. I mean, there are variations among humans in their ability to follow instructions, wouldn't you agree?
MR. RALPH: Objection, foundation.
THE WITNESS: As a professor, I've observed that.
BY MR. BURMAN:
Q. Mr. Friedberg in his opening suggested that the average IQ in every county in Minnesota is the same from county to county. Would you expect that to be the case?
MR. RALPH: Objection, foundation, form.
THE WITNESS: I have never looked at IQ data from county to county. I have no way to form an opinion on that.
BY MR. BURMAN:
Q. Have you had any reason to study other demographic or socioeconomic differences from county to county that might relate to success in meeting the standards necessary to get

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your absentee ballot accepted?
A. I have experience in working with county level data looking at socioeconomic factors, not taking any time to consider what they might imply for the ability of someone to fill out an absentee ballot.
Q. If your thesis or your hypothesis that you wanted to test was whether differences in rejection rate were due to different standards applied by election officials as opposed to differences in attributes of those voting absentee, is that something you could test with data?
MR. RALPH: Objection, form.
THE WITNESS: If one had enough data and time, you might be able to do something along that line. It -- once one decides to start down that road, there are any number of potential factors one might bring in.
BY MR. BURMAN:
Q. And until or unless you go down that road, there's no way to exclude the possibility that these variations in rejection rate are due to differences in how well voters did in complying with the absentee ballot

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statute?
MR. RALPH: Objection to form, foundation.
THE WITNESS: I'm not sure I really understood your question. I apologize.
BY MR. BURMAN:
Q. Until you start looking at those factors that might explain the variation between counties in rejection rates, there is no way, is there, to rule out the possibility that the variation is explained, at least in part, by variation in the composition of voters from county to county who take advantage of the absentee ballot privilege?
MR. RALPH: Same objections.
THE WITNESS: As best -- as best I can tell, I have no data on the socioeconomic quali -- characteristics of people who fill out absentee ballots. I, therefore, wouldn't know how to test your hypothesis.
BY MR. BURMAN:
Q. One factor, for example, might be how many people were using absentee ballots for the first time, that might explain a higher level of rejection of their ballots, correct?

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MR. RALPH: Objection, form and foundation.
THE WITNESS: I could -- I could only speculate about that.
BY MR. BURMAN:
Q. I mean, the fact is without doing more than you've been able to do, attributing any cause to this variation would be speculation, correct?
MR. RALPH: Objection, form and foundation.
THE WITNESS: There are a variety of potential sources of variation, one of which could be election officials. We are not saying here that that's the only one.
BY MR. BURMAN:
Q. And, in fact, you haven't done anything that would determine whether that was even a factor that helps explain this, correct?
MR. RALPH: Objection, form, and asked and answered.
THE WITNESS: I -- I believe that what we have established with this test is simply the differences in rejection rates. We have not made any attempt to say where that comes from.

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BY MR. BURMAN:
Q. And could not on this data that we have for this purpose today, correct?
A. On the basis of this spreadsheet, no.
Q. No, you could not?
A. No, I could not. Yeah.
Q. Let me try to move quickly through the rest of this.
THE WITNESS: Could I have just a minute to get some water?
MR. BURMAN: Oh, absolutely.
THE WITNESS: Thank you.
BY MR. BURMAN:
Q. Let me show you Deposition Exhibit 3. This is a copy of the cover of a book that I understand that you sometimes use in your teaching; is that correct?
A. Yes. This book has been used in a classroom that -- in a class that I've taught.
Q. And do you accept it as authoritative in the field of statistics in the social sciences?
MR. RALPH: Objection, calls for a legal conclusion.

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THE WITNESS: I do not know either author, so I can't say anything about them. The book is one of many books on this -- in this field, but is useful to my students.
BY MR. BURMAN:
Q. You selected it for your students, correct?
A. That course was actually taught between myself and another faculty member, and so we both -- we both made the decision to use this book. That was, in fact, at first his suggestion, which I accepted.
Q. Who was the other faculty member?
A. Professor Kenneth Rebeck.
Q. And what's his discipline?
A. He's another economist, like myself.
Q. But do you accept this as a useful authority on statistical analysis?
MR. RALPH: Objection, calls for a legal conclusion.
THE WITNESS: Let me ask you to -- that I'm not sure what you mean by the word authority. Okay?
I consider this book to be useful

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in teaching. It provides accurate information to my students, which my students find helpful in completing the course. That's the only way in which I know this book.
BY MR. BURMAN:
Q. And what authorities beyond the two that you referred to the night of the 20th do you find useful authorities with respect to statistical analysis?
A. I use several books that, in fact, are called econometrics. That is -- that is the application of statistics to economic data, and that is the field in which I do most of my work.
In that way, William Greene's Econometric Analysis, now in its Fifth Edition, would be considered by many people to be authoritative.
Judge, Hill, Lütkepohl and Lee, L-u-k-t-e-p-o-h-l [sic], is considered authority. In fact, they have the nicknames -- there are two such books. They have the nicknames Papa Judge and Baby Judge. Baby Judge is what we give to grad students, Papa Judge is for the practitioners.
Q. And outside of the econometric

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field, more general statistics, are there any that you'd consider useful authorities?

A. I -- I have to say that my work is in economics and econometrics. Economists spend a lot of time thinking about statistics, but very few economists as practitioners, as I am, would -- would refer to a statistics textbook unless they found that there was something particularly that was referred to out of an econometrics book.

For that reason, I don't own any statistics books of my own. I use them from the library, from the Web, as directed by the books that are -- that are common and accepted as authorities in my field, which is economics.

Q. And as a practitioner of statistics within one of the social sciences, is it fair to say that other social scientists at your college, for example, probably have comparable levels of statistical expertise?

MR. RALPH: Objection, form and foundation.

THE WITNESS: I'm chairman of the department. I'm very capable of evaluating statistical knowledge of the people in my

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department. I know people in other departments, some of whom have statistical backgrounds. I'm not able to assess how much, how good their -- their statistics are.

BY MR. BURMAN:

Q. Is there a statistics department, as such, at the college?

A. Yes, there is.

Q. Let me show you Exhibit 4. I think this was also an authority that was used in that same class that you taught; is that correct?

MR. RALPH: Objection, form.

THE WITNESS: Yes. That would -- that was -- I believe that book was also used.

BY MR. BURMAN:

Q. And both of those are from a series called Quantitative Applications in the Social Sciences. Is that a series that you found useful from time to time over the years?

A. I've not used any of the books in the series that I recall except these two.

Q. Let me show you two others, Exhibits 5 and 6, and see if you have used either of those. Exhibit 5 is called Data Analysis, and Exhibit 6 is called Understanding Significance

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Testing. Are those authorities that you've used?

A. I do not recognize either book. I do recognize the name of -- of Michael Lewis-Beck, the author of Exhibit 5.

Q. Why do you recognize him?

A. He does research in political science, and I've read some of his work.

Q. And have you found him to be a reliable authority in the use of statistics in political science?

MR. RALPH: Objection, calls for a legal conclusion.

THE WITNESS: I recall reading his work. I do not recall what I thought of his statistics. I'm only going on the fact that the name is recognizable to me.

BY MR. BURMAN:

Q. There was a link on your Web page to statistical sources at the University of Michigan. Does that sound familiar?

A. Off my Web page? Um, oh, sure. This is -- would have been from one of my previous courses, yeah.

Q. And the link, actually, doesn't work now or it doesn't work for me. I was

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curious what it had been linked to?

A. It is meant to access data from -- as I recall that link -- and again, this is a page for a class that I have not used -- I have not taught for a few years, due to other duties, that would have gone to a Web site that gave you information on survey data that -- from my CPSR. I believe the depository we were using at that time was from the University of Michigan. I believe it's removed.

Q. When was the last time you taught a class that had a heavy component of teaching how to use statistical methods?

MR. RALPH: Objection to form.

THE WITNESS: I'm currently teaching Business Forecasting, just started -- the course just started two weeks ago.

BY MR. BURMAN:

Q. And before that, how long had it been?

A. Been probably three years.

Q. Is there a statistics authority or text that you're using for the Business Forecasting class?

A. I'm using a textbook for the class,

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yes, which has some statistics within it. A book by Barry Keating, with an "a," and -- I forget his first name, last name is Wilson.

Q. Do you happen to remember the name or close to the name of the text?

A. I believe it's called Understanding Business Forecasting.

Q. The description of the course that you taught that included Exhibits 4 and 3 as recommended for the students says that it's designed to give the student experience in the empirical methodology of economics. The lectures will provide you with the tools to conduct quantitative measurement and analysis of actual economic and business phenomena.

Do you know whether you wrote that or your colleague wrote that?

A. I'm pretty certain I wrote that.

Q. And did you find that the two texts, Exhibits 3 and 4, were useful authorities in teaching your students how to do empirical methodology?

A. I do not recall that we asked students specifically about the books. We did several lectures between Professor Rebeck and

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myself on the class on statistics, now, in particular, the use of regression analysis.

In that -- in that setting, I then have an opportunity to visit individually with students. I was satisfied at the end of that class that each of those students had received sufficient training to fulfill the mission of the class.

Q. Did you think about using regression analysis for the current assignment?

A. No.

Q. Might regression analysis have helped determine what factors contributed to the variation in rejection rates that you observed?

A. I could imagine that possibility. I would -- I would wonder how a person would do it.

Q. And why do you think it would be a challenge to do it? I assume that's what you mean by your last answer.

A. I think you would have to make a number of inferences and assumptions about the data and about the people who use absentee ballots. Each of those would provide a potential challenge.

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Q. If the decisions to reject absentee ballots among the various counties were reviewed centrally on a statewide basis, would that tell you anything about what we might conclude from the variation in rejection rates?

MR. RALPH: Objection to form and foundation.

THE WITNESS: If you had data that you -- on absentee ballots that you knew all came from a single source but you had samples that had differences, you would have to conclude that the -- that the source of the differences did not come from the counting process.

BY MR. BURMAN:

Q. At the county level?

A. Correct. Wait, go back.

Q. I'm sorry.

A. Okay, because I thought the question was -- was at a state level when you initially asked it.

Q. I'm sorry. So the differences would not come from the counting but might come from differences between the counties?

Maybe you should just explain it and I'll --

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A. Maybe -- yeah, I think, yeah, I need to -- let me be sure I understand what you want to know here with this question, so I'm going to ask you to try to ask it again.

Q. Let me posit a situation.

A. Okay.

Q. Not using your data, but where you have ten counties' worth of data and there's some significant variations between those counties in rejection rates on the face of the data, but you know that all of the decisions were reviewed at a central level against a standard, what might you conclude from that?

MR. RALPH: Just to clarify, by decisions reviewed in a central standard, so I understand, you're talking about the criteria for determining whether to accept or reject absentee ballots?

BY MR. BURMAN:

Q. The application of those criteria across all ten counties was reviewed centrally?

A. Reviewed centrally? I can't conclude anything from that. The review -- the reviewer is only observing it at some -- removed from the actual counting process. I -- I

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can't -- I couldn't conclude anything on that basis.

Q. If the reviewer had the ability to do something more than that, to question whether the decision satisfied the criteria for decision, could you conclude anything?

A. I cannot. I -- I -- I feel -- I don't -- I don't feel that I can make a determination on -- on that -- on the information you're giving me.

Q. What does the term confounding mean in statistical analysis?

A. In statistical analysis, confounding means that there's some third fact, some extra factor that is interfering with the relationship between two variables.

Q. And how would that be applied to this situation, if at all?

A. If there was -- if there was a third factor somewhere that led us to see differences in rejection rates, you might conclude that, in fact, it -- once correcting for the confounding factor, that the differences no longer appear.

Q. Or at least would no longer be as

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large?

A. Would not be -- not be as large, may not even be -- it may not even meet standard significance levels.

Q. Have you been told when to expect to testify at trial?

A. I have -- I have some reason to believe you might -- they might be thinking of Thursday. I haven't been given a time and date yet.

Q. And were you aware that we had hoped to take your deposition last Friday?

A. No.

Q. Would you have been available last Friday?

A. I'm just trying to think. I was unavailable in the morning last Friday. I would be -- I would have been available in the afternoon.

Q. Were you available over the weekend if we had wanted to take the deposition then?

A. I -- I do some work down here on Saturdays. I probably would have been unavailable until after 6:00 o'clock in the evening.

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Q. On Saturday?

A. On Saturday. Sunday -- Sunday, frankly, I would prefer to be in church in the morning.

Q. And what about Monday morning, would you have been available?

A. No.

MR. BURMAN: If I can have a few minutes to look at my notes, I think I'm either done or very close to done.

THE WITNESS: Very good.

(Break from 7:13 to 7:18.)

BY MR. BURMAN:

Q. Professor Banaian, have you written any articles, scholarly expert-type articles that relate to questions about absentee ballot rejection or election administration, more broadly?

A. No, I have not.

Q. Did you consider whether to use data from the precinct level for your analysis?

A. Yes, I did. I thought about that and then decided since all the ballots from the precincts had a common source in terms of who was deciding whether they were acceptable as absentee

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ballots, I decided that it was not necessary to -- to go to that level.

Q. And how did you know they had a common decision making?

A. Based on my reading of newspaper counts, as much as anything, that county level officials were making decisions on -- on acceptance and rejection of an absentee ballot.

Q. At least ultimate decisions?

A. Ultimately, yes.

Q. Do you know in some jurisdictions whether it was city level or something below the county level that was making the ultimate decisions?

A. I was told, but did not verify independently, that Hennepin County uses city level officials to make those determinations.

Q. And did you consider or did you look at city level data in Hennepin County?

A. I did, yes, but I did not see very much there that was significant.

Q. Where did you --

A. We moved on quickly.

Q. Where did you get that data?

A. That data also, in fact, came

from -- from the -- from the Coleman people. They had me look at it, and I looked at it briefly and said there really is nothing interesting in here.

Q. Did they also have you look at the precinct level data?

A. No, they did not.

Q. Is there any other data that you either looked at and determined wasn't useful or thought about getting and chose not to get that we haven't discussed?

A. I've looked at data on my own to see what types of information there were. So in the process of doing the verification of the January 24 data page, I had to go pull down information from each county. That actually gives precinct level information. I didn't spend any time looking at it and making any determination of -- of whether or not it provided any additional information. I was only interested in the totals at the bottom of the page.

Q. Were there any conclusions that the Coleman campaign representatives discussed with you that you ended up deciding you could not

reach?

A. No. I was given data, given the -- the eyeball test of the various rejection rates and asked to look and say could you say these are statistically significantly different from each other? That is the question I focused on.

Q. Did they ever ask you, can you help us show that there are different standards applied in some counties compared to others?

A. I don't remember them asking the question in that way.

Q. Did they ask a question like that that I haven't quite captured?

A. Oh, I'm not trying to be evasive, I'm sorry.

I don't think the question came up in that way. We talked about -- we talked about just focusing on differences in the rates and limited to that.

I -- we had conversations similar -- we had a conversation -- in our conversation all we had to talk about was -- was that there are differences in the rates. Someone asked why, I don't recall who, and I said we don't know that.

MR. BURMAN: That's all I have.

MR. RALPH: I have no questions. We'll read and sign.

THE COURT REPORTER: And you both want copies?

MR. RALPH: Yes, please.

MR. BURMAN: Yes.

(Whereupon, the deposition of KING BANAIAN was concluded at 7:23 p.m.)

I, KING BANAIAN, do hereby certify that I have read the foregoing deposition and found the same to be true and correct except as follows, (noting the page and line number of the change or addition as desired and the reason why):

Page	Line	Correction
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Date: KING BANAIAN

STATE OF MINNESOTA)
)ss. CERTIFICATE
COUNTY OF DAKOTA)

BE IT KNOWN that I, Jean F. Soule, took the foregoing deposition of KING BANAIAN;

That the witness, before testifying, was by me first duly sworn to testify the whole truth and nothing but the truth relative to said cause;

That the testimony of said witness was recorded in shorthand by me and was reduced to typewriting under my direction;

That the foregoing deposition is a true record of the testimony given by said witness;

That the reading and signing of the foregoing deposition by the said witness were not waived by the witness and respective counsel;

That I am not related to any of the parties hereto, nor an employee of them, nor interested in the outcome of the action;

That the cost of the original has been charged to the party who noticed the deposition, and that all parties who ordered copies have been charged at the same rate for such copies;

WITNESS MY HAND AND SEAL this 28th day of January, 2009.

JEAN F. SOULE, Notary Public, RPR

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