



## Survey Data Analysis

### WEBINAR QUESTION AND ANSWER SUMMARY

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On May 25 and 26, 2011, the Safe and Supportive Schools Technical Assistance Center hosted a Webinar, entitled *Survey Data Analysis*. During the session, the presenter, Doug Grove, Associate Professor and Director of the Graduate Program in Education at Vanguard University, received several questions from the audience. Since the presenter could not answer all of the questions during the event, the Center has prepared the following Webinar Question and Answer Summary with responses to each question. For additional information, please email or call the Center ([sssta@air.org](mailto:sssta@air.org); 1-800-258-8413).

*Please note the content of this summary was prepared under a contract from the U.S. Department of Education, Office of Safe and Drug-Free Schools to the American Institutes for Research (AIR). This Q&A summary does not necessarily represent the policy or views of the U.S. Department of Education, nor does it imply endorsement by the U.S. Department of Education.*

**Q1. What are the implications for cultural competence in analyzing survey data? How do we ensure the analysis for responsiveness is representative of the population under analysis?**

**Doug Grove:** Regarding cultural competence, in order to address some of those cultural differences we are going to need to ensure we are able to get a sample size that is representative of those cultural differences.

**Q2. In your experience with school time data, is it better to impute or drop missing data?**

**Doug Grove:** I am actually probably a bigger fan of not dropping it, but code it as missing. If you are running descriptive statistics and reporting out mean scores and percentages, you can code it as missing. If you are running some higher-level statistical analysis, you might want to use an imputation method.

**Q3. When dealing with missing data, can you clarify what you meant by "eliminate the observation"?**

**Doug Grove:** Let's say a student takes a survey and all they do is fill out their name. Then the question becomes *can we take that person out of the record if they did not respond on any single item?* If we are building scales, sometimes we might have five items that make up a scale, and maybe a student only responded to one item in that scale. The question is *do we calculate that item for the student?* There are some rules to follow for that. For the most part, if the student does not respond on every single item on a scale I do not calculate that score for the student. That



would be an example of eliminating that observation. They did not respond to all of the items, so you are not creating that scale observation for them.

**Q4. How have you analyzed your data to accommodate fears the community or district may have?**

**Doug Grove:** I don't typically consider their fears; I consider what the process we went through was to collect the data and what we're going to do with that data. Many times you can eliminate people's fears if you're telling them, "We're using the data to improve, and we know some of the data may not look great, but we want to look at that to see how you want to improve in the future." When you're collecting data, you're going to find some positives. One of the things when you present the data is you need to provide positive things, but you also need to share things that don't necessarily shed good light.

**Q5. For school climate scales, does it matter if alphas are run on school level data versus data at grade level? Will the results be about the same?**

**Doug Grove:** I would run them on both. The higher the number of participants the greater likelihood we have that the alpha level will be significantly high. You want to run it at school level as well as grade level, and maybe a few aggregated groups, to see if the alpha level is consistent across the different groups. That gives you a good sense that not only is it reliable at the school-wide level, but it is also reliable at a student ethnicity level as well.

**Q6. You mentioned making sure the data get to the right cell; what do you mean by cell?**

**Doug Grove:** Make sure the data gets into the right row and column on the spreadsheet. If you think about an Excel spreadsheet, you have a number of column headers across the top of the sheet. Make sure the right data are getting into the right position for the right participants and the right column, which shows that variable so we know that it is accurate when we conduct the data analysis.

**Q7. What is the difference between Chronbach's alpha and factor analysis? Should one do one analysis versus the other or do the analyses complement each other?**

**Doug Grove:** I would follow up and ask what you are using the data for. The biggest difference is that you're telling Chronbach's Alpha *here are the items in my scale* and then it's telling you the consistency of those items together. When you do factor analysis, you are telling it the items and then it's telling you which items make up the best factor or the best scale. Chronbach's alpha is not going to eliminate items from your analysis. Factor analysis may actually tell you, *if you get rid of this item, it becomes a more consistent measure*.

**Q8. Earlier you mentioned that you can do an average score. When you are calculating scores for school climate, what is better: sum score or average score?**

**Doug Grove:** Personally, I would prefer an average score because I think an average score helps you to look at consistency. If you have scales that score consistently on a one to five range, the



average is easier to explain and your average scores are going to be consistent across your scales, as long as your scales are based on a minimum of one and maximum of five. If you are having doubts about the ability to explain a sum score, I would go with the average.

**Q9. If I run an analysis, like factor analysis, what do I do with the findings if they are inconsistent with the original tool designed? How do I treat the data generated from the current survey that may not be organized and in ideal scale structures?**

**Doug Grove:** If it's piloting, it gives you a chance to revise the survey and factor analysis can help you with that. You can report out the information the way that you developed it and then you can go back and run a factor analysis and report out the information the way that it factored. In factoring it you may build more reliable scales in your instruments. You have to be honest in your data analysis. You can factor analyze it and see how those items do load to scales and see how those scales report out. You went in maybe thinking, "All these items measure this idea," but after factor analysis you find something different. You could analyze the data a little differently and say, if we analyze it using factor analysis, we find that maybe this is a scale or measure that is a little bit more consistent or more reliable. I would have to look at the data to really give you a great response on how to do that. For the first time, look at some items with the caveat that you are trying to create the items in the scales that will perform better in the future.

**Q10. Should certain variables in a school safety score be weighted and what factors should we consider when determining what should be weighted and by how much?**

**Doug Grove:** Yes, I think they can be weighted. When we think about a school safety score, we have to consider what we will do with it. What is going to compose that school safety score and what in our location or district makes the most sense to put into the school safety score? Then when we define it, we need to ask if some things should really be worth more than other things. I think those have very important ramifications and they also have very local meanings, given your schools and context. It is all about how we define it and it is important to consider.

**Q11. You said that too many items can lead to confusion by the user. How many is too many?**

**Doug Grove:** I think it is related to your time. It is related to what you want to have them do with the data. If you are going to have them look at items or look at scale scores and come up with some planning or have some really good dialogue and discussions, you may only want to have four or five scales for them to look at in a course of an hour, especially if you have got or are looking at a number of different disaggregated groups. If you give them 25 items and say, "I want you to analyze these items and come up with goals in one hour," you're giving them two minutes per item and very little discussion time. The number of items is really directly related to how much time you're going to spend, what kind of outcome, and what you want them to do with the data at the end of the discussion.



**Q12. Can you share an example of a problem that might come up related to making decisions based on a single item in a scale?**

**Doug Grove:** Let's say we we're looking at a scale of school liking. Say that we got really low scores on the item, "I find myself bored in the school." So we decide to focus on decreasing boredom in school. That may be an overplayed example, but that is an example of why we want to look at all five items versus just looking at one item. The truth is all middle school students might be bored during some part of a school day, so should that really be our focus? Looking at a single item from a scale is a less valid way to consider the results for making decisions.

**Q13. How are safe versus unsafe schools determined? Can safety scores undergo significance testing to test between schools? Or across time, is any change considered significant?**

**Doug Grove:** Yes, you can look at them across time. You could look at an analysis of discipline data related to school safety measures. One way to do that would be to consider if you can do across-groups analysis and is there some kind of relationship between school safety scores and referrals or discipline measures. I think that is the one way to try to take a multiple-method or multiple-variable approach to looking at safe schools. There are issues with discipline data because they are not the cleanest data in the world, but that is what we have to deal with. If you distinguish between using data, you might want to start there to see how student-by-student data safety measures relate positively or negatively to referral data.

**Q14. Where can I learn more about methodology related to procedures such as school safety scores, across-time analysis, imputation, IRT, or Rasch modeling?**

**Doug Grove:** There are a couple of references in the references section of the presentation. Look at number three, it provides quite a bit of information. I like the way they lay out the book because it answers most of the questions that you have.

**Q15. Should the results of an already tested instrument be rechecked for reliability and factor structure each time it is implemented?**

**Doug Grove:** I don't think it needs to be rechecked for structure. I would recheck it when using someone else's instrument. I would report the reliability that was previously done in studies; then, I would run my own reliability to see if it holds up with my population. That just gives me a better sense of how the instrument works with the participants that I am surveying.

**Q16. When presenting data when would you start a scale of zero versus one?**

**Doug Grove:** If you have "not at all" you might call that zero. If you had a question that was not at all, once a week, twice a week, three times a week, you may code that starting from zero. Sometimes scales are coded negatively, and some scales start at 1 and end at 5 or start at 1 and end at 10. It just depends on the scale structure.