Idaho Career and Technical Education

Data Collection Training: Data Analysis

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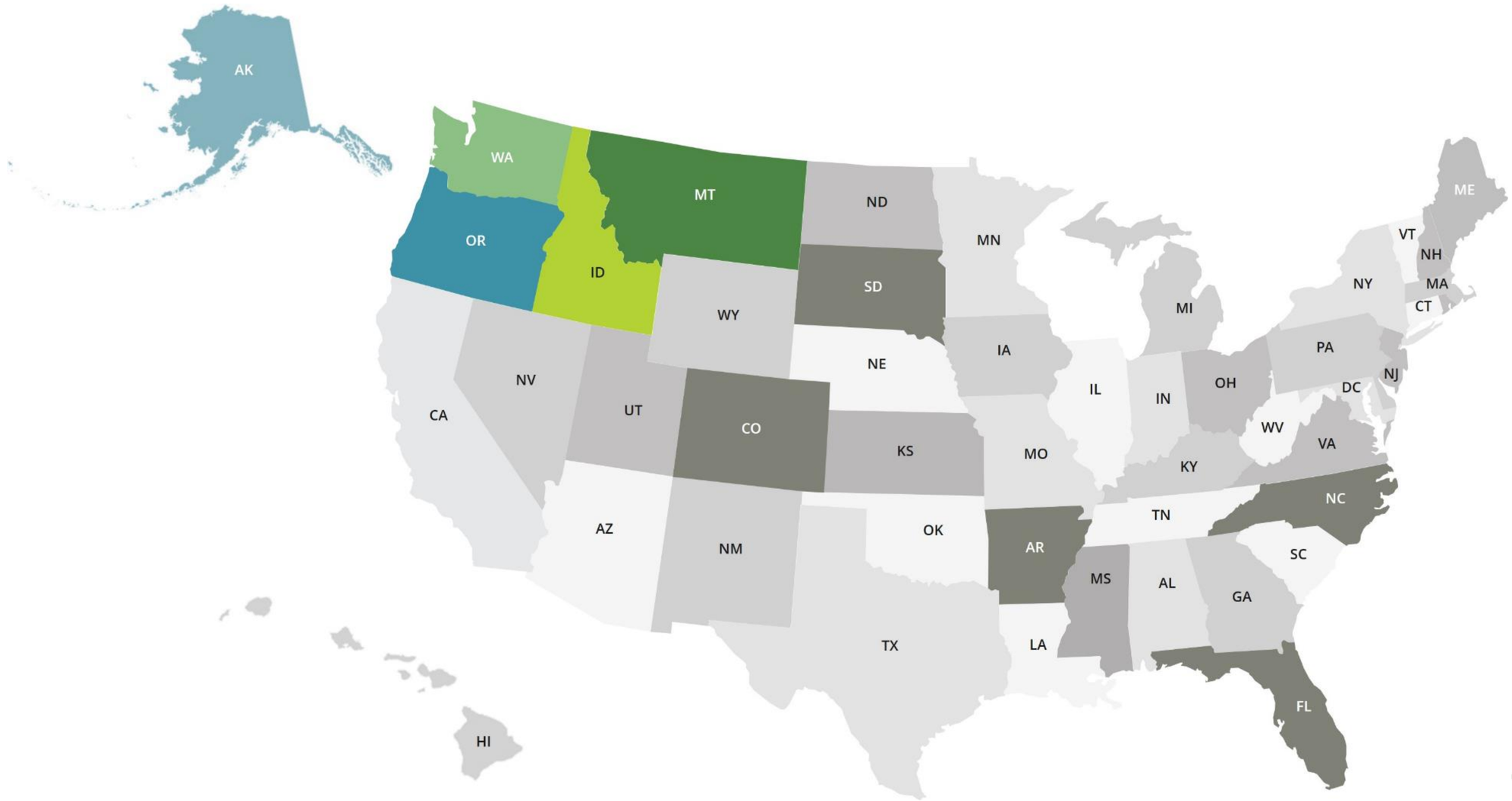
Our Region



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About REL Northwest

Regional educational laboratories (RELs) partner with practitioners and policymakers to use data and evidence to help solve educational problems that impede student success. We do this by:

- Conducting rigorous research and data analysis
- Delivering customized training, coaching, and technical support
- Providing engaging learning opportunities

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Goal and Objectives

Today's goal is to learn how to analyze data from surveys and focus groups

Objectives

- Learn the steps involved in *preparing* survey and focus group data for analysis
- Learn the steps involved in *analyzing* survey and focus group data
- Learn how to *use findings* to inform concrete next steps

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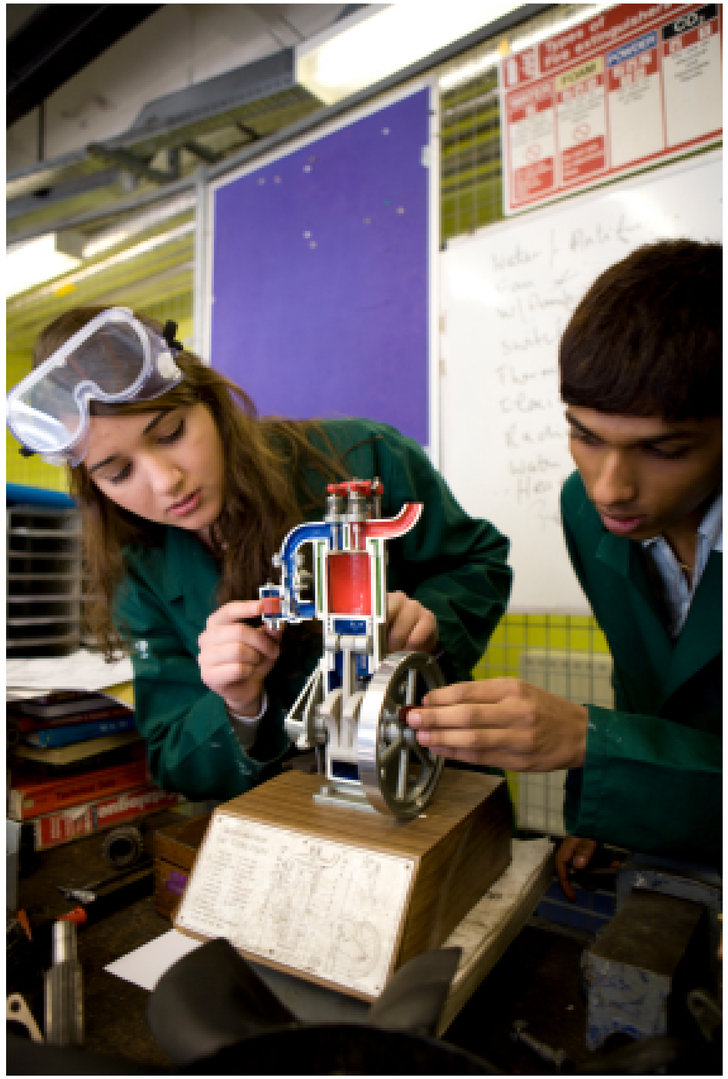

Agenda

1. Purpose
2. Survey data analysis
3. Focus group data analysis
4. Closing and next steps

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Survey Data Analysis

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Steps

1. Response rates
2. Analysis plan
3. Data preparation
4. Calculations
5. Data analysis
6. Data interpretation
7. Data use

Sources: Bocala, Henry, Mundry, & Morgan, 2014; Creswell, 2014; Kekahio & Baker, 2013; Pazzaglia, Stafford, & Rodriguez, 2016

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Step 1: Response Rates

- It is customary to calculate response rates
  - With a goal to generalize survey findings from a sample to a population
  - To assess and address bias
- We did not attempt to represent a population but still want some degree of representation
    - E.g., regional, urban/rural, respondent roles
- Calculating response rates for individual items can help interpret some items or suggest excluding them
- There are checks that can be conducted to assess bias especially if the survey had not closed yet

See guidance in reference slides 26-31

Source: Creswell, 2014 Pazzaglia et al., 2016

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Step 2: Analysis Plan

After the prior training session on data collection, you were planning to calculate a number of statistics, which you summarized in a template that is reproduced in Handout 1.

- Do you want to make any changes to this list?
- Are there items to exclude from the survey (e.g., due to low response rates or responses that do not make sense)?
- Possible additional statistics are described in reference slides 32-34

Sources: Creswell, 2014; Pazzaglia et al., 2016

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Step 3: Preparing the Data

- Make sure everyone on the team who will access the data is aware of procedures for handling data securely
- There are also considerations if you wanted to merge the survey data with other data
- The next steps are:
  - Checking for data entry errors
  - Coding variables
- Guidance is provided in reference slides 35-37

Source: Pazzaglia et al., 2016

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Step 4: Calculations

Once the data are ready, it is time to calculate agreed-upon statistics. You can take the following steps:

- Start from analysis plan you were going to draft after the data collection training and which is referenced on slide 9 “Step 2: Analysis Plan”
- Review reference slides at the end of this slide deck on additional statistics and statistical tests for inferences
- Use Handout 2 if helpful
- Calculate statistics

- Check results as you would when checking the data

Source: Creswell, 2014

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Step 5: Analyzing the Data

Guiding questions

- What do you observe?
- What patterns do you notice?
- What points can you make?
- Is anything you see surprising?

Tip

Data visualizations can be helpful here – see guidance in reference slides 38-41

Suggested future team activity

- Answer these questions individually
- Discuss as a group
- Come to a consensus

Sources: Bocala et al., 2014; Kekahio & Baker, 2013

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Step 6: Interpreting the Data

Guiding questions

- What can you infer about practices in the field?
  - Strengths?
  - Challenges?
  - Needs?
- What explanations do you have?
- What questions does this raise?
- What additional data would be helpful?
- What preliminary conclusions can you draw?

Suggested future team activity

- Answer these questions individually
- Discuss as a group
- Come to a consensus
- Consider additional questions in the references slides 42-43

Sources: Bocala et al., 2014

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Step 7: Using the Data

Guiding questions for future team brainstorm activity

- What key findings can inform an application form for potential pilot sites? How?
- What have you learned regarding the design of focus groups? How can this inform the design of focus groups on career development in grades 7 and 8?
  - What additional focus group questions does this suggest?
- What should be kept in mind when designing the August training for pilot participants?
- Do survey findings raise unexpected challenges that need to be addressed?
  - When? By whom?

Source: Bocala et al., 2014

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Focus Group Data Analysis

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Steps

1. Immediately after each focus group
2. After the first round of focus groups
3. After the second round of focus groups
4. Putting it all together

Sources: Creswell, 2014; Powell & Single, 1996; Walston et al., 2017

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Step 1 – Immediately After Each Focus Group

- Save focus group notes in an electronic file and store in a secure folder
  - Consider encryption, password protection, coding identifying information
- Review notes and add impressions and general themes
- The note-taker will have recorded
  - ✓ Quotations
  - ✓ Key phrases (word for word)
  - ✓ Other relevant observations (e.g., notable body language or tension between participants)
  - ✓ Major themes
  - ✓ Areas of agreement and disagreement
- Discuss the information to check for understanding, surface possible themes, and identify expected and surprising findings
- Consider whether to use a software package

Sources: Creswell, 2014; Walston et al., 2017

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Step 2 – After the First Round of Focus Groups

- Have multiple people review all focus group notes
- Code the data
  - Leverage the organization around focus group questions within topics, which will be consistent across focus groups, and adapt as needed
  - Identify and use labels derived from each question
  - Revise categories based on responses, cluster them into similar ones, and draft category names
    - ✓ Note how many groups mentioned a topic, how often the topic was mentioned within the groups, and the agreement by group members
    - ✓ Note differences in themes among subgroups and record quotes that give evidence of each theme
- Compare analyzed and original data and revise analyzed data as needed

Sources: Creswell, 2014; Powell & Single, 1996; Walston et al., 2017

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Step 3 – After the Second Round of Focus Groups

- Review all focus group notes
- Code remaining focus groups similarly and add or modify topics and categories as appropriate
- Compare analyzed data and original data from both rounds and revise analyzed data as needed
- Use the coding process to generate a description of promising practices for career development in grades 7 and 8 and things to consider

Sources: Creswell, 2014; Powell & Single, 1996; Walston et al., 2017

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Step 4 – Putting It All Together

Create an output you can use when planning the training and pilot

- Create a narrative and talking points
- Describe the purpose of the project
- Consider the audience
- Strive for clarity
- Share common themes and note differences for different respondent types/regions
- Avoid making statements that claim to represent a broader population (Not: “Seventy percent of stakeholders feel …” but “Seven of 10 participants mentioned …”)
- Link to decisions that are informed by the findings
- Return to individual focus group files to select key quotations and additional detail
- Do not attribute quotes to individuals by name or include any other unique identifying feature

Sources: Creswell, 2014; Walston et al., 2017

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Tip

After each focus group and when putting it all together, it may be useful to consider the questions we employed to analyze and interpret survey data and check responses

- Step 5 – Slide 12
- Step 6 – Slide 13

Source: Bocala et al., 2014; Kekahio & Baker, 2013

Next Steps

- What have we accomplished?
- What do you still need to do?
- How can REL Northwest support you?
- What is our timeline?

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Slides for Future Reference

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Reference Slides - Step 1: Response Rates

- The following slides can be used to consider and calculate response rates, especially when generalizing survey findings from a sample to a population is relevant

Step 1: Response Rates – Why?

- The survey is in … Now what?
  - It is customary to calculate response rates
- Why?
  - Response rates are important to calculate when we want to **generalize survey findings from a sample to a population**
- What if we did not attempt to represent a population?
  - What if we wanted some degree of representation?
    - Six Idaho regions
    - What else?
      - ✓ Rural/urban representation
      - ✓ Roles in schools or districts
      - ✓ What else?

Source: Pazzaglia et al., 2016

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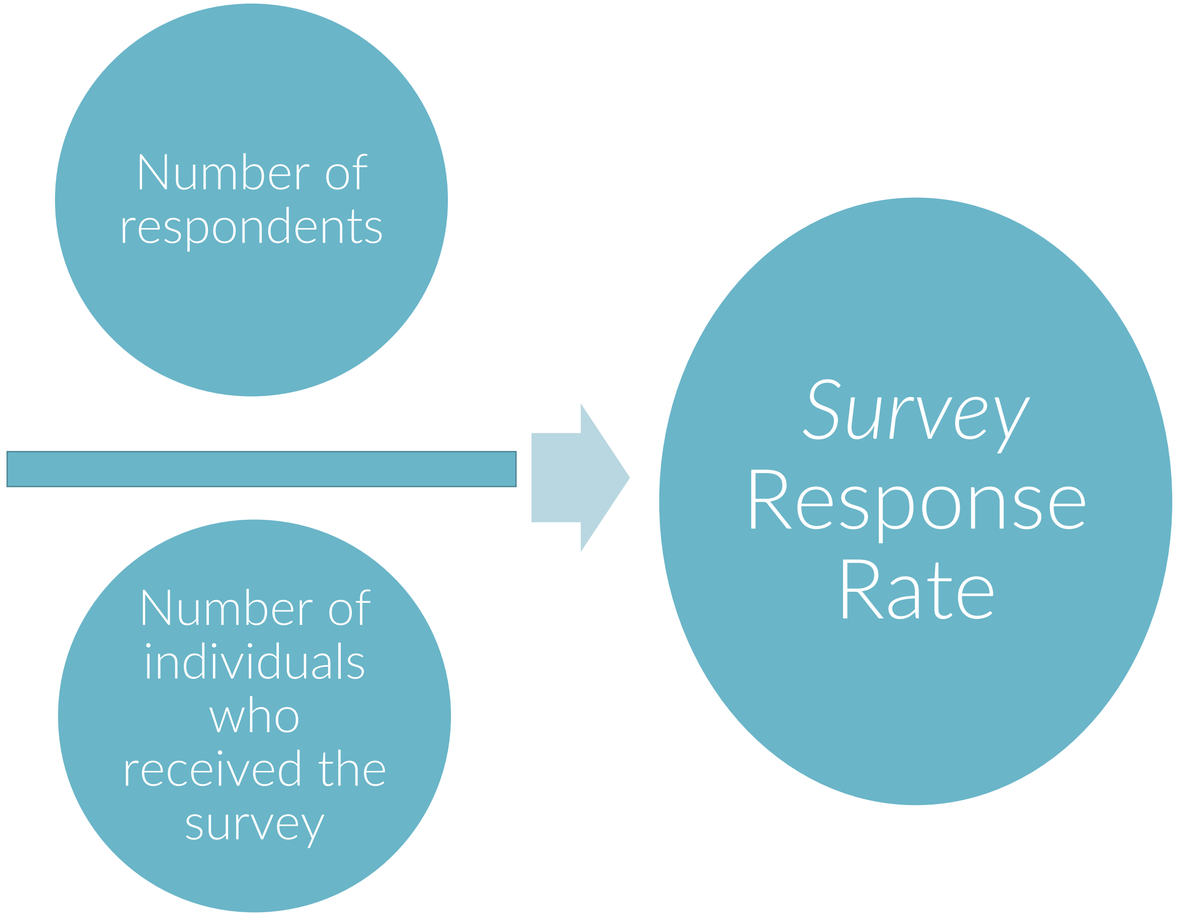
Step 1: Response Rates – What?



- Do you have a way to track who received the survey since it was possible for survey recipients to share the survey with others?

➔ What we can do with response rates will depend on this

Source: Pazzaglia et al., 2016

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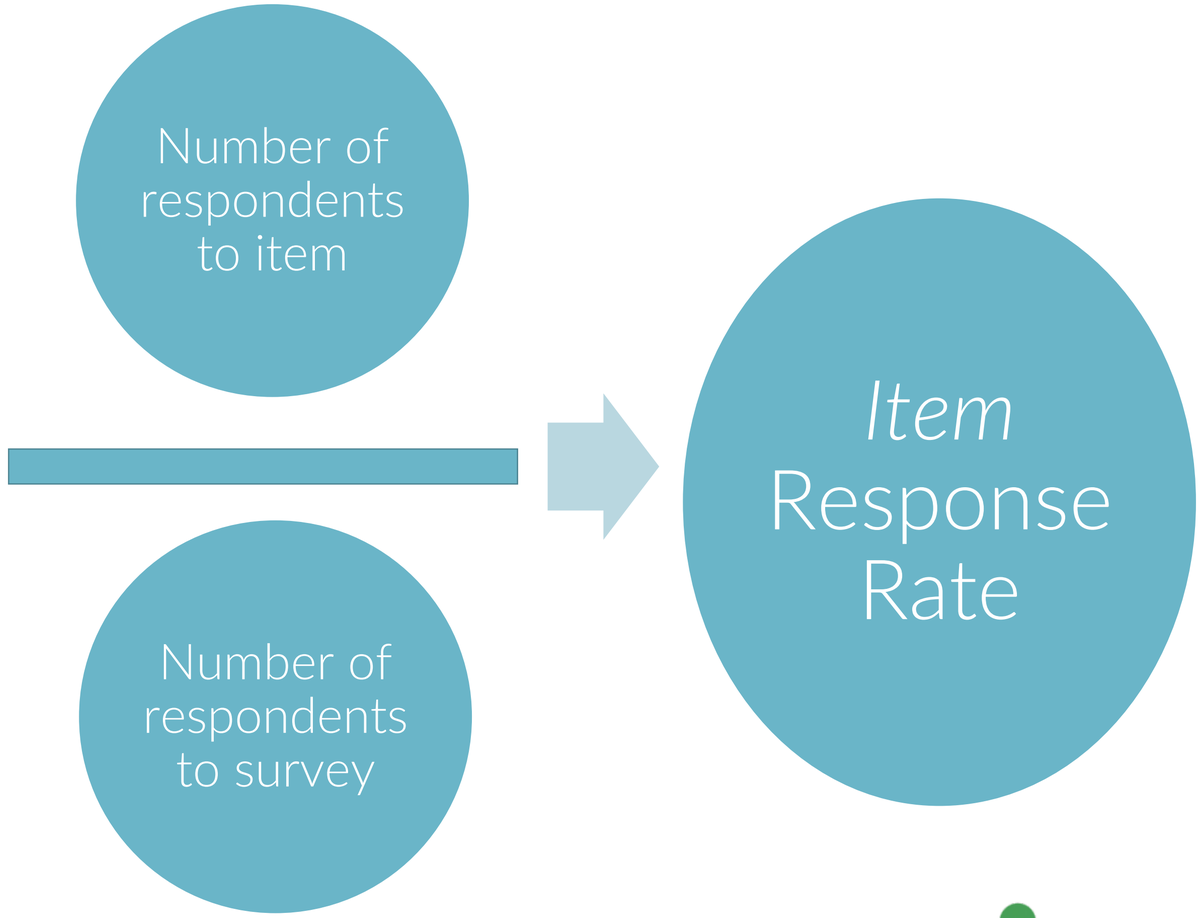
Step 1: Response Rates – What?

- It may be helpful to calculate response rates for each item
  - If the response rates are significantly different, we will want to understand why, and we will need to interpret some items carefully or even exclude them



Source: Pazzaglia et al., 2016

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Step 1: Response Rates – How?

- Report how many members of the sample did and did not return the survey
- A table with numbers and percentages is a useful tool for presenting this information

Characteristic	Respondents	Nonrespondents
• All	• # | %	• # | %
• Region 1	• # | %	• # | %
• …	• …	• …
• Region 6	• # | %	• # | %
• Superintendent	• # | %	• # | %
• …	• …	• …
• Middle school administrator	• # | %	• # | %
• Other?	• # | %	• # | %

Source: Creswell, 2014

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Step 1: Response Rates – Is There Bias?

Concepts

- Bias is the “effect of nonresponses on survey estimates”
- “Bias means that if nonrespondents had responded, their responses would have substantially changed the overall results”

Checks

- Often, “those who return surveys in the final weeks of the response period are nearly all nonrespondents”
  - Do you find that more recent responses are different from prior ones?
- Can you “contact a few nonrespondents by phone and determine if their responses (would) differ substantially from respondents’”?

Source: Creswell, 2014 (quotes from page 209)

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Reference Slides - Step 2: Analysis Plan

- The following slides can be used to consider revising the list of statistics you will calculate using survey data

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Step 2: Analysis Plan – Additional Statistics

Possible additional statistics

- Review Handout 2: Table 2: Summary statistics, calculations, and considerations (Pazzaglia, Stafford, & Rodriguez, 2016, p. 11)
- If there are enough respondents:
  - Option to combine items into scales for scale analysis
  - Identify a statistical procedure (e.g. factor analysis, correlations)
  - Identify reliability checks for the internal consistency of the scales (e.g., Cronbach alpha, Raykov's rho)

Sources: Boateng, Neilands, Frongillo, Melgar-Quinonez, & Young, 2018; Creswell, 2014; Pazzaglia et al., 2016

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Step 2: Analysis Plan – Statistical Tests for Inferences

- Inferential questions or hypotheses relate variables or compare groups in terms of variables so that inferences can be drawn from the sample to a population
- Is this useful/relevant?
  - No ➔ Move on
  - Yes ➔ Handout 3: Table 8.3: Criteria for Choosing Select Statistical Tests from (Creswell, 2014, p. 211)
    - ✓ Include testing results in reporting along with a description of findings (e.g., significance testing results, confidence intervals, effect sizes)

Source: Creswell, 2014

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Reference Slides - Step 3: Preparing the Data

- The following slides can be used when preparing survey data for analysis

Step 3: Preparing the Data

- You are collecting identifying information
  - Do you have secure data storage?
  - Who will have access to the data?
  - Do they know how to access and transfer the data securely?
  - Should you code identifying information and use passwords/encryption?

Do not email the data

- Are you merging data (e.g., with information on respondents' district or school)?
  - What is (are) the linking variable(s)?
  - How will you check that merging was correct?

Source: Pazzaglia et al., 2016

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Step 3: Preparing the Data

- Checking for data entry errors e.g.,
  - Examine frequencies
  - Check minima and maxima and identify outliers
    - Does anything in this review suggest a possible data entry error?
- Coding variables
  - Review each variable to identify alternative coding
  - For example, for items with multiple response options, should we group some together?
  - Discuss coding of open-response options

Source: Pazzaglia et al., 2016

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Reference Slides - Step 5: Analyzing the Data - Visualization

- The following slides can be used when considering data visualizations to support data analysis and interpretation

Step 5: Analyzing the Data - Visualization

- What data visualizations would help ***you*** use the data more effectively? (Handout 4)
- Now or later: What data visualizations would help ***others*** use the data more effectively?
  - Are key findings different for different audiences (including yourself)?
  - Which visualizations would be useful to share with focus group participants? Pilot participants? Other audiences (e.g., legislators)?

Source: Pazzaglia et al., 2016

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Step 5: Analyzing the Data - Visualization

Research question	Survey items	Table	Bar graph	Line graph	Pie chart	Histogram	Other
What are current practices in self-evaluation?	1-2						
What are current practices in career exploration?	3-4						
What are current practices in future planning?	5-6						
What are current practices and challenges in career development?	7-12						
What should the role of career development be in grades 7 and 8?	13-15						

Sources: Creswell, 2014; Pazzaglia et al., 2016

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Step 5: Analyzing the Data – Visualization

Tips

- Include enough information for the visual to be understood on its own
  - Include a title; label the axes and data point values; spell out acronyms; include definitions and date/date range; use consistent scales where comparisons are needed
- Include only what is necessary to make your point
  - Exclude distracting elements such as grid lines
- For visuals that will go to audiences other than the internal team, run them by others for feedback

Sources: Bocala et al., 2014; Pazzaglia et al., 2016

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Reference Slide - Step 6: Interpreting the Data

- The following slide suggests a set of questions to use after an initial brainstorm top check preliminary answers

Step 6: Interpreting the Data

Check your answers

- Did you look at all the data?
- Are you taking into account the strengths and limitations of the data (e.g., item response rates)?
- Are you surfacing assumptions, biases, expectations?
- Should anyone else be at the table? Are perspectives missing?

Source: Bocala et al., 2014

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