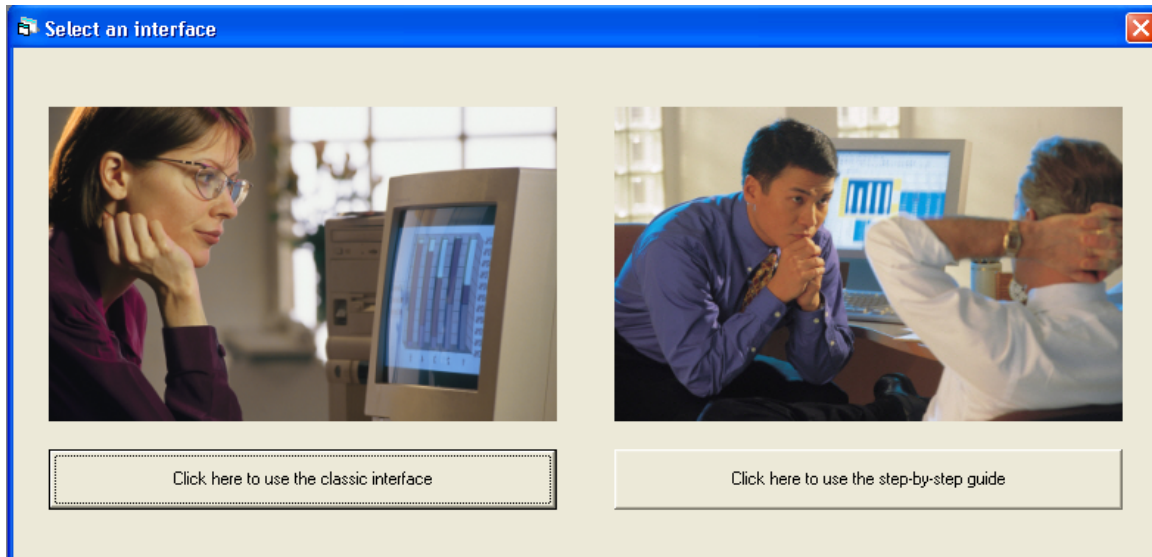


SELECT AN INTERFACE

When the program opens, select one of these options



The option at the left takes you to the classic interface.

- This is intended for people who are familiar with power analysis
- It includes a wide variety of procedures, including tests for means, proportions, correlations, survival studies, among others
- It includes the new module for cluster randomized trials

The option at the right takes you to the new, “easy” interface

- This is intended for people who are new to power analysis
- It will find sample size for six of the most common statistical tests
- It will walk you through the analysis step-by-step

THE NEW INTERFACE – A 30 SECOND GUIDE

1. FINDING THE RIGHT PROCEDURE

The program will ask you two questions, which it will use to select the correct procedure.

2. A WORKED EXAMPLE

Once inside the procedure, select “Show a worked example”. The program will let you select from one of several examples, and will use this example to explain the process of finding the appropriate sample size.

3. HELP ME SET UP MY OWN STUDY

Select “Help me set up my own study”

The program will walk you through the following –

- Set up the screen to match the study
- Enter the data
- Find the sample size
- Generate a detailed report

THAT’S IT!

FINDING THE RIGHT PROCEDURE

The program asks two questions, which it uses to locate the correct procedure

QUESTION 1: ONE GROUP OR TWO?

One group or two?

Do you want to report a value for the whole sample? Or, do you want to compare values in two groups?


When you click an option, the program will show detail for that option at the bottom of the screen.

I want to report a mean or proportion in one group

I want to compare means or proportions in two groups

I want to compare means or proportions in three or more groups

I'm not sure



< Back Next >

One group

Your goal is to estimate a value in one group. For example, you want to estimate the proportion of people who support a candidate, or the mean rating assigned to a movie, or the mean score on a test.

Two groups

Your goal is to compare values in two groups. For example you want to see if men are more likely (or less likely) than women to support a specific candidate, to see if men rate a movie as being better (or worse) than women, or to see if men score higher (or lower) than women on a test.

QUESTION 2: WHAT IS THE DATA TYPE?

What is the data type?

What kind of data will you collect from each subject?


When you click an option, the program will show detail for that option at the bottom of the screen.

The data are categorical

The data are ordinal

The data are continuous

I'm not sure



< Back Go !

Categorical

People will be choosing from a limited number of responses that *do not* follow a natural sequence. For example, Which candidate do you support?. (We *cannot* say that Smith is more than Jones)

Ordinal

People will be choosing from a limited number of responses that do follow a natural sequence. For example, Rate a movie on a scale of 1 to 4. (We *can* say that 4 is a higher rating than 2)

Continuous

Use this when people will be assigned a score (such as a test score) that follows a natural sequence.

ONE GROUP – CATEGORICAL DATA

Suppose we are planning a study where people will be asked which candidate they support. Possible responses are Smith, Jones, and Undecided. Our goal is to report the proportion who say that they support Smith, and we want to report this proportion with an error margin of plus/minus 3 percentage points. What sample size do we need?

Select “One group” and “Categorical” to navigate to this screen

The screenshot shows a software interface with a menu bar (File, Design, Labels, Increment, Help) and a toolbar (Open, New, Save, Report, Help - Select a help mode). The main area contains a horizontal bar chart titled "Whom do you support?" with three categories: Smith (40%), Jones (40%), and Undecided (20%). To the right, there are three stacked boxes for "Percent missing" (0), "Sample size" (1,025), and "Margin of error (points)" (3). A "Show a worked example" dialog box is open, explaining the sample size calculation.

Show a worked example

Program shows the required sample size

At the upper right the program shows that we need a sample size of 1,025 to yield an error margin of plus/minus 3 percentage points.

This means that in most cases (95 in 100) the estimated percentage will fall in the range of the true percentage plus or minus 3 percentage points.

This assumes that the true percentage for 'Smith' is 40%. It also assumes a missing data rate of 0%.

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1. Click “Design” to set the number of categories
2. Enter the proportion expected to support each candidate
3. Select the response that we want to focus on in the analysis (Smith)
4. Enter the percent missing data (0%)
5. Enter the desired margin of error (3%)
6. The program shows the required sample size as 1,025
7. Click “Report” to generate a detailed report

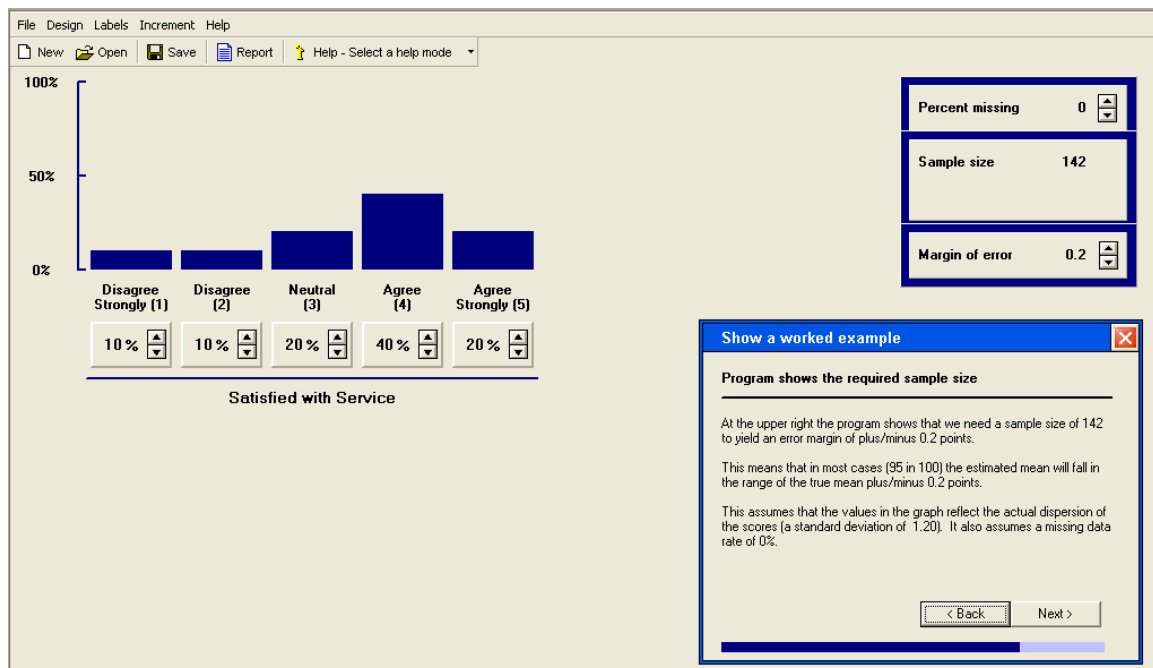
ONE GROUP – ORDINAL DATA

Suppose we are planning a study where people will be asked to report their agreement with the statement that they are satisfied with your company's service. Possible responses are "Disagree strongly", "Disagree", "Neutral", "Agree", and "Agree strongly".

These responses will be assigned scores of 1 to 5, and we will compute the mean response. For example, a mean of 4.0 would correspond to a mean of "Agree" while a mean of 3.5 would correspond to a mean midway between "Neutral" and "Agree".

Our goal is to report the mean with an error margin of plus/minus 2 percentage points. If the mean is 4.0, we want to be able to say that the true mean falls in the range of 3.8 to 4.2. What sample size do we need?

Select "One group" and "Ordinal" to navigate to this screen



1. Click "Design" to set the number of categories
2. Enter the proportion expected to give each response
3. Enter the percent missing data (0%)
4. Enter the desired margin of error (2%)
5. The program shows the required sample size as 142
6. Click "Report" to generate a detailed report

ONE GROUP – CONTINUOUS DATA

Suppose we are planning a study where students will be scored on a test, where possible scores range from 200 to 800. The test is expected to have a standard deviation of 100 points in this population.

Our goal is to report the mean with an error margin of plus/minus 10 points. If the sample mean is 500, we want to be able to say that the true mean falls in the range of 490 to 510. What sample size do we need?

The screenshot shows a software application window with a menu bar (File, Design, Labels, Increment, Help) and a toolbar (New, Open, Save, Report, Help - Select a help mode). The main area displays a histogram of test scores ranging from 200 to 800. To the right, a control panel contains the following fields:

- Mean: 500
- Margin of error: 10
- Standard deviation: 100
- Percent missing: 0
- Sample size: 387

A dialog box titled "Show a worked example" is open, with the following content:

Select an example

Select one of these examples. Then, click <Next>

- Estimate the mean survey response
- Estimate the mean score
- Estimate the mean satisfaction

< Back Next >

1. Click "Design" to set the range for the scale
2. Enter the expected mean (500)
3. Enter the expected standard deviation (100)
4. Enter the percent missing data (0%)
5. Enter the desired margin of error (10 points)
6. The program shows the required sample size as 387
7. Click "Report" to generate a detailed report

TWO GROUPS – CATEGORICAL DATA

Suppose we are planning a study where a sample of men and sample of women will be asked which candidate they support. Possible responses are Smith, Jones, and Undecided. Our goal is to report if men are more likely (or less likely) than women to support Smith. What sample size do we need?

Select “Two groups” and “Categorical” to navigate to this screen

The screenshot shows a software interface for calculating sample size for categorical data in two groups. The interface includes a menu bar (File, Design, Labels, Increment, Help) and a toolbar with buttons for Open, New, Save, Find sample size for 80% power, Report, and Help - Select a help mode. The main area is divided into two sections: "Whom do you support? (Men)" and "Whom do you support? (Women)". Each section has three horizontal bars representing the proportion of respondents for each candidate: Smith (blue), Jones (dark blue), and Undecided (light blue). The proportions for men are 40% for Smith, 40% for Jones, and 20% for Undecided. The proportions for women are 50% for Smith, 35% for Jones, and 15% for Undecided. A "Percent missing" box shows 0. A "Show a worked example" dialog box is open, showing three examples: "Compare candidate preference for Men vs. Women" (selected), "Compare purchase history for Men vs. Women", and "Compare regions for two groups". The dialog box has "Back" and "Next" buttons. A summary box in the top right corner shows "N per group" as 388 and "Power" as 0.80.

Group	Smith	Jones	Undecided
Men	40%	40%	20%
Women	50%	35%	15%

Percent missing	0
N per group	388
Power	0.80

1. Click “Design” to set the number of categories
2. For men, enter the proportion expected to support each candidate
3. For women, enter the proportion expected to support each candidate
4. Select the response that we want to focus on in the analysis (Smith)
5. Enter the percent missing data
6. The program shows the required sample size as 388 per group
7. Click “Report” to generate a detailed report

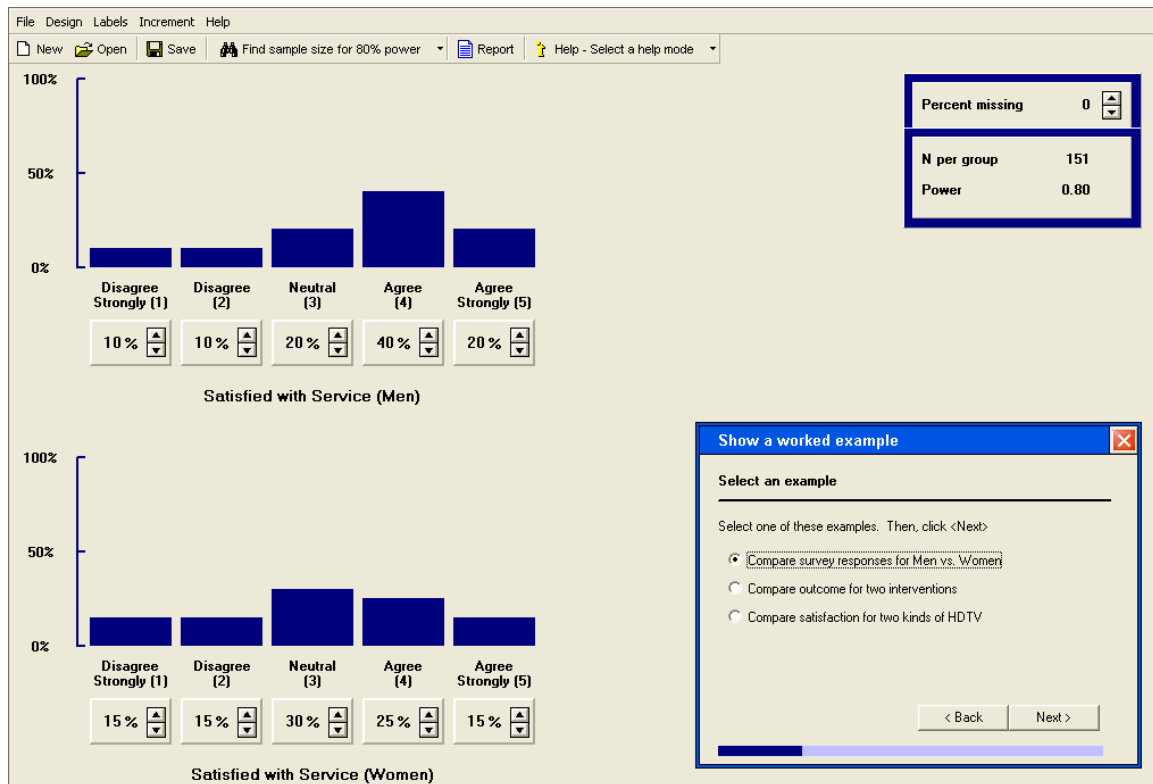
TWO GROUPS – ORDINAL DATA

Suppose we are planning a study where a sample of men and sample of women will be asked to report their agreement with the statement that they are satisfied with your company's service. Possible responses are "Disagree strongly", "Disagree", "Neutral", "Agree", and "Agree strongly".

These responses will be assigned scores of 1 to 5, and we will compute the mean response. For example, a mean of 4.0 would correspond to a mean of "Agree" while a mean of 3.5 would correspond to a mean midway between "Neutral" and "Agree".

Our goal is to report if men are more satisfied with the service (or less satisfied) than women. What sample size do we need?

Select "Two groups" and "Ordinal" to navigate to this screen



1. Click "Design" to set the number of categories
2. For men, enter the proportion expected to give each response
3. For women, enter the proportion expected to give each response
4. Enter the percent missing data
5. The program shows the required sample size as 151 per group
6. Click "Report" to generate a detailed report

TWO GROUPS – CONTINUOUS DATA

Suppose we are planning a study where people will be assigned at random to one of two training conditions (“Control” and “Tutored”), and then asked to take a test. Our goal is to report that one group did better than the other (that the difference is statistically significant).

We expect that the mean scores for the two groups will be 500 vs. 550, with a standard deviation of 100 for each group. What sample size do we need?

Select “Two groups” and “Continuous” to navigate to this screen

The screenshot displays a software interface for calculating sample size for two groups with continuous data. The main window features two histograms: "Test score (Tutored)" and "Test score (Control)". The x-axis for both histograms ranges from 200 to 800. The "Tutored" histogram is centered at 550, and the "Control" histogram is centered at 500. To the right of the histograms is a control panel with the following settings:

- Mean (Tutored): 550
- Mean (Control): 500
- Standard deviation: 100
- Percent missing: 0

Below the control panel, a box indicates "N per group" as 64. A dialog box titled "Show a worked example" is open in the bottom right corner, with the option "Assess impact on intervention on test scores" selected. The dialog box has "Back" and "Next" buttons.

1. Click “Design” to set the range for the scale
2. Enter the expected mean for the tutored group (550)
3. Enter the expected mean for the control group (500)
4. Enter the common standard deviation (100)
5. Enter the percent missing data (0%)
6. The program shows the required sample size as 64 per group
7. Click “Report” to generate a detailed report

MISSING DATA

When we are dealing with ordinal or continuous data, those who fail to respond are always included in the percent missing (which is entered at the upper right of the screen).

When we are working with categorical data, by contrast, we need to consider several options. In particular, we need to be clear about the difference between “Undecided” and “Missing”.

Suppose we expect that for every 100 people surveyed, we expect the following –

- Smith – 40
- Jones – 40
- Undecided – 15
- No response (hang up the phone) – 5

Case 1

One question we might ask is “Of the people who responded, what proportion support Smith?” In this case, the relevant proportion would be

$$\frac{\text{Smith}}{\text{Smith+Jones+Undecided}} = \frac{40}{40+40+15}$$

In this case, “Undecided” would be listed as one of the categories. Missing would be captured under percent missing.

Case 2

Another question we might ask is “Of the people who have selected a candidate, what proportion support Smith?” In this case, the relevant proportion would be

$$\frac{\text{Smith}}{\text{Smith+Jones}} = \frac{40}{40+40}$$

In this case, the relevant sample includes only those who have selected a candidate. Therefore, both “No response” and “Undecided” should be included under percent missing (which would be 20%).

Case 3

Another question we might ask is “Of all the people approached for the survey what proportion support Smith?” In this case, the relevant proportion would be

$$\frac{\text{Smith}}{\text{Smith+Jones+Undecided+No response}} = \frac{40}{40+40+15+5}$$

In this case, the relevant sample includes everyone who was approached for the survey. Therefore, both “No response” and “Undecided” should be included as valid categories, and percent missing is zero.

Case 4

In some cases, we might be more interested in the Undecided than in Smith, since we want to know what proportion of the votes are in play. If the question is “Of those who responded, what proportion is Undecided?” the relevant proportion would be

$$\frac{\text{Undecided}}{\text{Smith+Jones+Undecided}} = \frac{15}{40+40+15}$$

In this case (as in Case 1), “Undecided” would be listed as one of the categories. Missing would be captured under percent missing.