

How to Use Qualtrics and Measuring Margin of Error

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Agenda

- Time to build your survey: a brief how-to on Qualtrics
- What is margin of error?
- In-class activity

Time to build your survey: a brief tutorial on Qualtrics

Qualtrics is a platform well-designed for fielding academic surveys.

Features include: extensive flexibility for question logic and exporting collected data.

Harvard students have **free** access to this [platform](#).

Time to build your survey: a brief tutorial on Qualtrics

XM ≡ Home



Welcome to XM



Recently visited

[See all projects](#)



Climate Pipeline Fall 2021 ...

103 Responses

Active

...

You're currently previewing the new Home and Projects page experience. [Switch back](#) or [Leave Feedback](#)



Use the survey flow to customize participant experiences

Learn how to get more out of your surveys through our free, self-paced basecamp course.

[Learn more](#)

[Watch Video](#)

X

My active surveys

Climate Pipeline Fall 2021 Registration



103 responses

-56% WoW

[Create a new project](#)

Time to build your survey: a brief tutorial on Qualtrics

Create a project

 Search the catalog

All

CoreXM & DesignXM

CustomerXM

ProductXM

BrandXM

From scratch



Survey

Guided projects

Start building using a pre-built solution with step-by-step guidance



Product Concept Testing

Evaluate the strength of potential ideas



Pricing Study (Van Westendorp)

Identify optimal product pricing



Product Naming

Find the best name for your next product



Brand Awareness & Performance

Assess the current state of your

Time to build your survey: a brief tutorial on Qualtrics

Create a new project

Survey

Name

Test Project

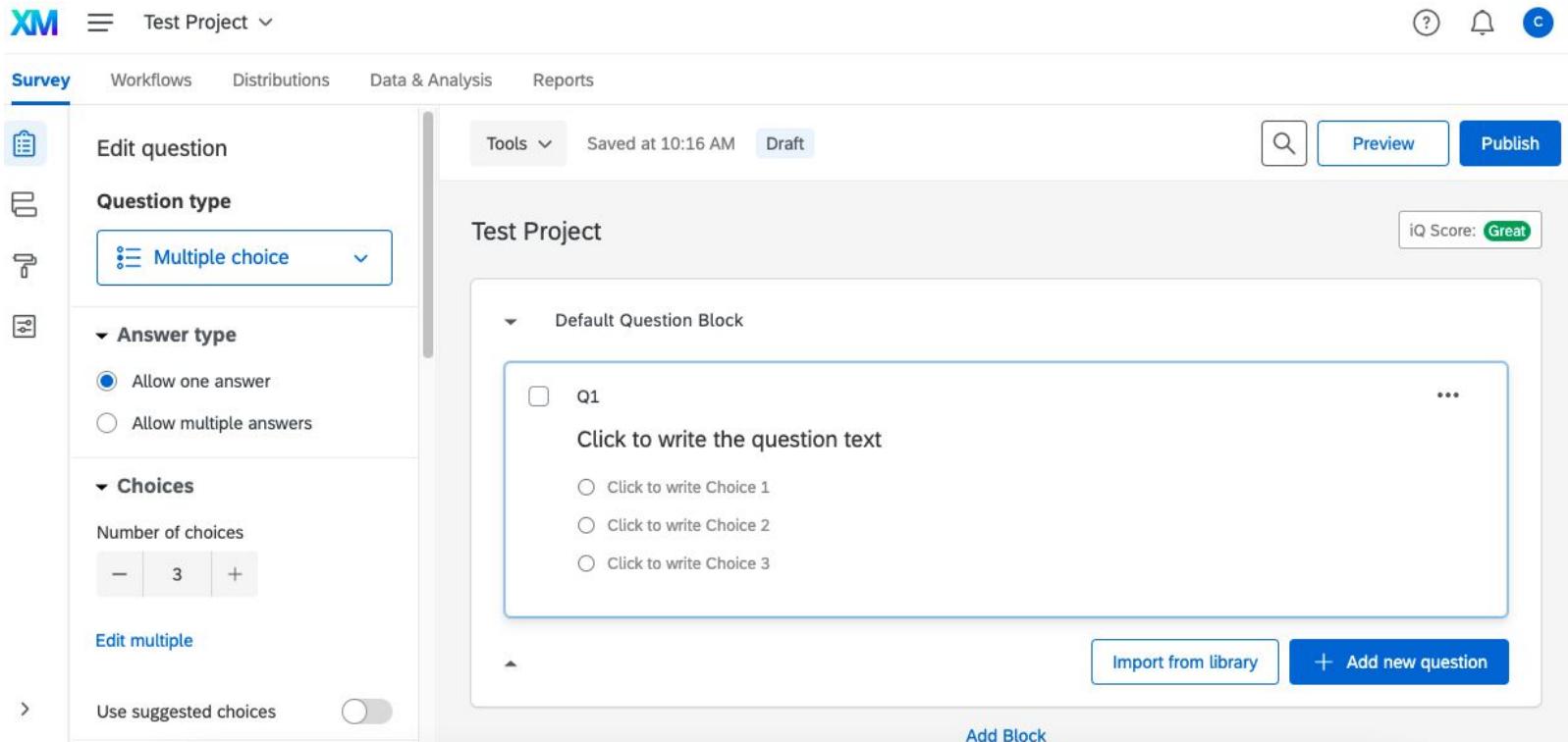
How do you want to start your survey?

Create a blank survey project

Create project

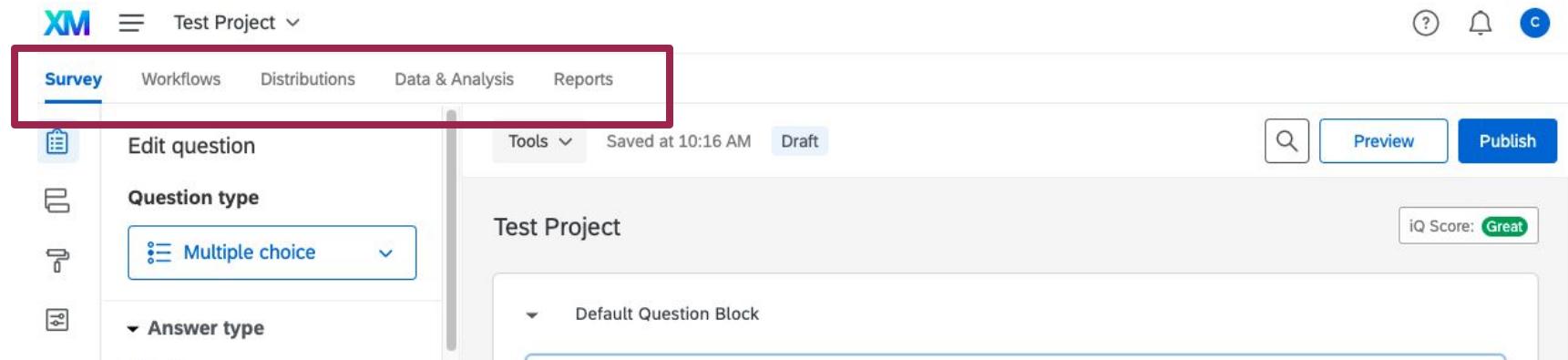
Cancel

Time to build your survey: a brief tutorial on Qualtrics



The screenshot shows the Qualtrics Survey builder interface. The top navigation bar includes the XM logo, a project dropdown for "Test Project", and user icons for help, notifications, and account. The main menu tabs are Survey (selected), Workflows, Distributions, Data & Analysis, and Reports. On the left, a sidebar for "Edit question" shows the "Question type" set to "Multiple choice". Under "Answer type", "Allow one answer" is selected. The "Choices" section shows a count of 3, with buttons to increase or decrease the number. The "Use suggested choices" toggle is off. The main workspace is titled "Test Project" and contains a "Default Question Block" for a "Multiple choice" question. The question is labeled "Q1" with a checkbox. The text "Click to write the question text" is present, along with three choice options: "Click to write Choice 1", "Click to write Choice 2", and "Click to write Choice 3". At the bottom of the workspace are buttons for "Import from library", "+ Add new question", and "Add Block". The bottom right corner of the slide features a red and pink geometric design.

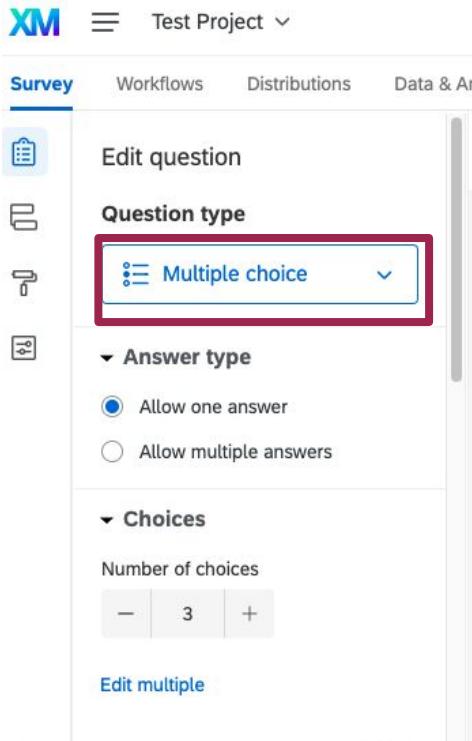
Time to build your survey: a brief tutorial on Qualtrics



The screenshot shows the Qualtrics interface with the 'Survey' tab selected. The main workspace is titled 'Test Project' and contains a 'Default Question Block'. On the left, a sidebar shows options for 'Edit question', 'Question type' (set to 'Multiple choice'), and 'Answer type'. The top navigation bar includes tabs for 'Survey', 'Workflows', 'Distributions', 'Data & Analysis', and 'Reports'. A red box highlights the 'Survey' tab. The top right corner shows a search icon, a 'Preview' button, and a 'Publish' button. The status bar at the top indicates the project was 'Saved at 10:16 AM' and is currently in 'Draft' mode.

- "Survey": edit your survey.
- "Workflows": manage various tasks associated with your project.
- "Distributions": distribute your survey.
- "Data & Analysis": view responses, conduct initial analyses, and download your collected responses for analysis with stronger tools outside of the platform.
- "Reports": View your survey results and create custom reports.

Time to build your survey: a brief tutorial on Qualtrics



The image shows the Qualtrics Survey builder interface. The top navigation bar includes the XM logo, a menu icon, and the text 'Test Project'. Below this, a secondary navigation bar has 'Survey' selected, with other options like 'Workflows', 'Distributions', and 'Data & An' visible. The main content area on the left has a sidebar with icons for 'Edit question', 'Question type', 'Answer type', and 'Choices'. The 'Question type' section is expanded, showing a dropdown menu with 'Multiple choice' selected, which is highlighted with a red box. Below this, the 'Answer type' section is expanded, showing two radio buttons: 'Allow one answer' (selected) and 'Allow multiple answers'. The 'Choices' section is also expanded, showing a 'Number of choices' input field with the value '3' and a set of minus, plus, and edit buttons. At the bottom of the sidebar, there is a link 'Edit multiple'.

Back to editing your survey!

- Qualtrics includes a variety of question types that you can include.
- Click the question type box to select your preferred question type and the options below to customize even further.

Some examples include:

Multiple choice

Survey

Workflows

Distributions

Data & Analysis

Reports



Edit question



Question type



Multiple choice



Answer type

Allow one answer

Allow multiple answers

Choices

Number of choices

- 3 +

Edit multiple

Tools

Saved at 10:16 AM

Draft



Preview

Publish

Test Project

iQ Score: Great

Default Question Block

Q1

Click to write the question text

Click to write Choice 1

Click to write Choice 2

Click to write Choice 3

...

Import from library

+ Add new question

Text entry

Edit question

Question type

Text entry

▼ Text type

Single line

Autocomplete



▼ Response requirements

Add requirements



Add validation



Tools ▾

Saved at 10:56 AM

Draft



Preview

Publish



Click to write the question text

...

Import from library

+ Add new question

Add Block

End of Survey

We thank you for your time spent taking this survey.

Rank order

Edit question

Tools  Saved at 10:55 AM Draft   

Question type 

 Rank order 

Choices 

Number of choices   

Click to write the question text

Click to write Item 1 

Click to write Item 2 

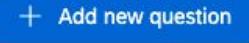
Click to write Item 3 

Edit multiple

Use suggested choices 

Format 

Drag and drop 

Add Block



Slider

Edit question

Question type

 Slider

Slider type

Sliders

Statements

Number of statements

 3 

Edit multiple

Use suggested statements 

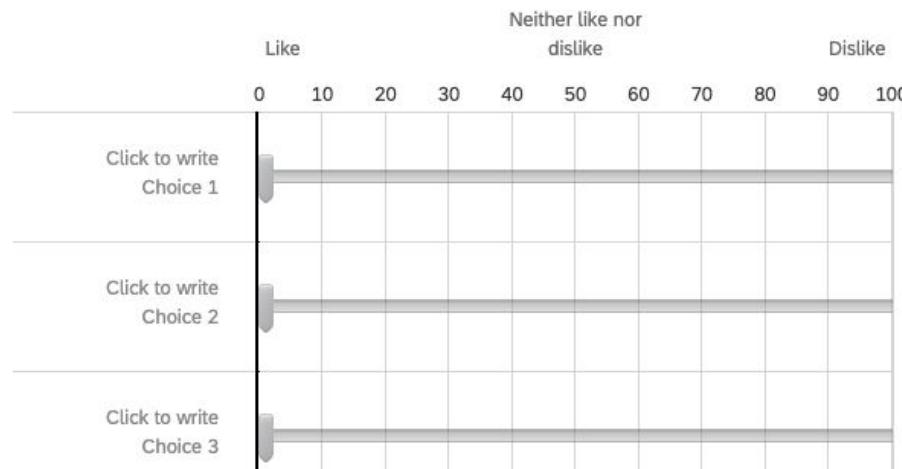
Tools  Saved at 10:57 AM Draft



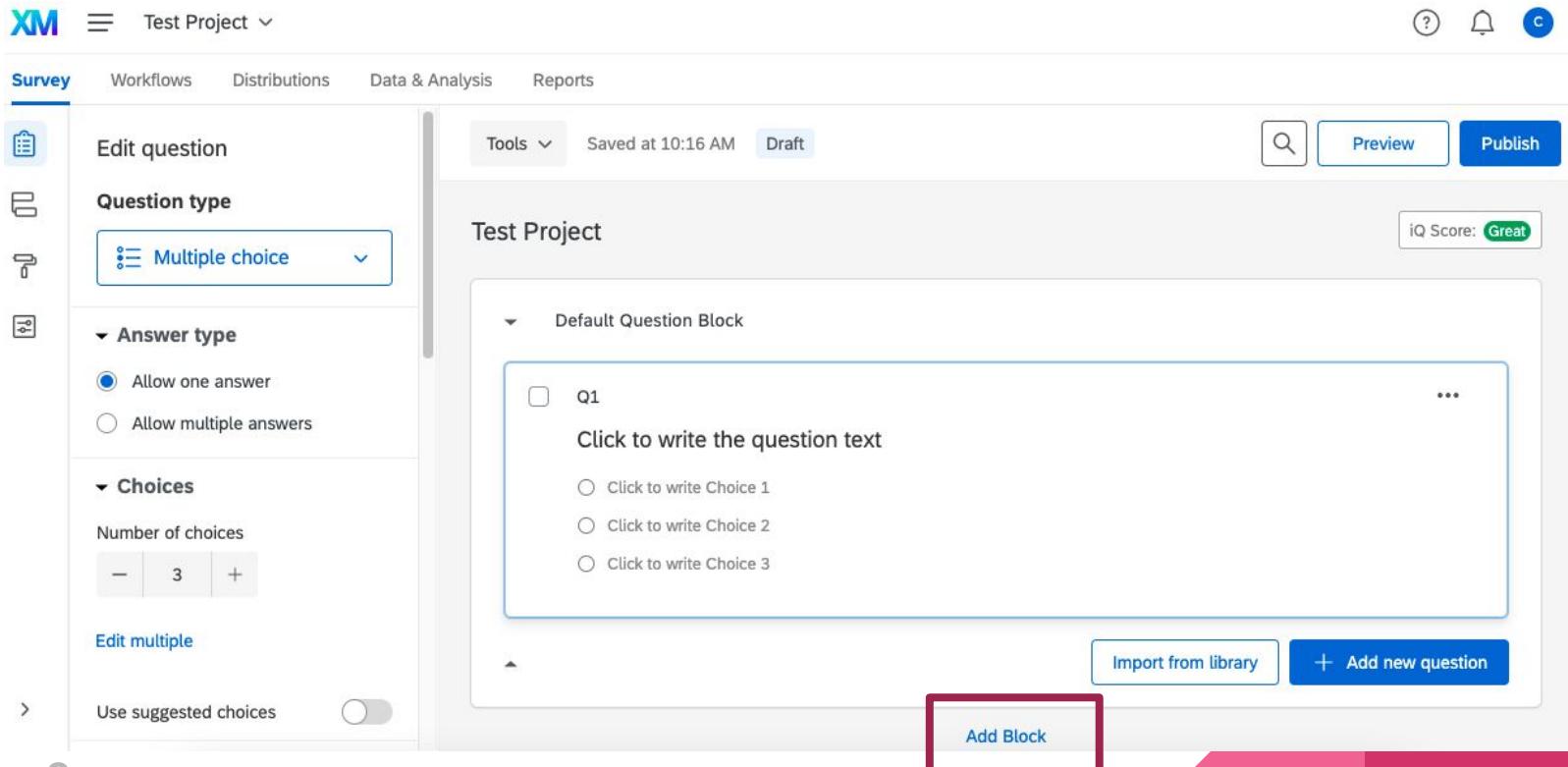
Preview

Publish

Click to write the question text



Additional features: Block options



The screenshot shows the XM Survey interface for a 'Test Project'. The left sidebar is titled 'Survey' and includes 'Edit question', 'Question type' (set to 'Multiple choice'), 'Answer type' (set to 'Allow one answer'), 'Choices' (set to 3), 'Edit multiple', and 'Use suggested choices'. The main workspace shows a 'Test Project' with a 'Default Question Block' containing a question 'Q1' with three choices: 'Click to write the question text' (checkbox), 'Click to write Choice 1' (radio button), 'Click to write Choice 2' (radio button), and 'Click to write Choice 3' (radio button). The workspace also features a search bar, 'Preview' and 'Publish' buttons, an 'iQ Score: Great' badge, and buttons for 'Import from library', '+ Add new question', and 'Add Block' (which is highlighted with a red box).

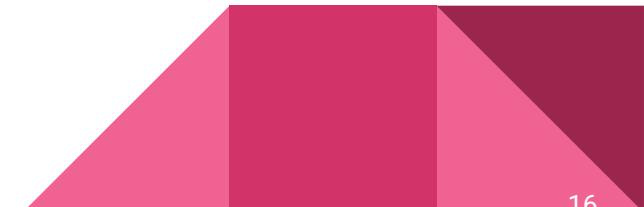
What are block options?

- Blocks are sets of questions within your survey. Check out [this](#) page for more details.
- Blocks can also be useful for organizing your questions, particularly should you decide to field a longer survey.
- If you're concerned about question ordering effects, you may also choose to randomize questions *within* blocks.

What are block options?

- Depending on your audience, you may choose to present some respondents with certain blocks and not others.
- You also may choose to **randomly assign** respondents with certain blocks of questions. This can be particularly useful for running survey experiments to test hypotheses!

Eg. Do **social environmental norms** (A) or **financial motivations** (B) better incentivize people to drive less?



Example: using blocks for experiments

Block A contains a question about participants' driving intentions, worded like this:

Our data indicates that individuals from similar backgrounds to yours drive less because they are concerned about the environment. How many hours per week do you intend to spend driving this fall? (enter # of hours)

Block B contains a question about participants' driving intentions, worded slightly differently:

Studies show that driving less saves individuals between \$20 to \$100 per month. How many hours per week do you intend to spend driving this fall? (enter # of hours)

Time to build your survey: a brief tutorial on Qualtrics

Additional features include:

- Requiring responses to certain questions
- Implementing "validation checks" to make sure that individuals taking your survey actually qualify for participation or are paying attention.

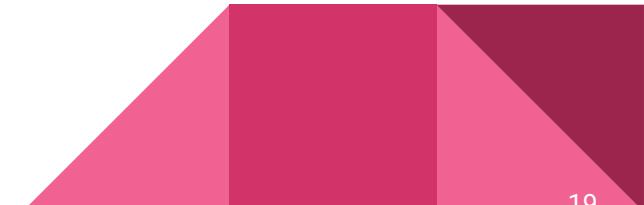
Eg. Are you over the age of 18? If the answer is yes, the condition is met and the respondent will be able to proceed through the survey. If the answer is no, you can create a customized message that notifies the individual they are not eligible to participate in your survey.

What is margin of error?

There is a 95% chance that your sample mean is expected to vary this much from the population mean. (Assuming 95% for this presentation, because that's the standard across social science.)

Margin of error is the amount you expect your sample mean to vary from the true population mean.

Eg. There is a 95% chance that 67% of Harvard students believe that climate change is highly concerning, **with a margin of error of $\pm 4\%$.** (this is not actually true - just a pedagogical example!)



Is there a difference between margin of error and confidence interval?

A very slight one, but they are extremely closely related. Let's take our example again: There is a 95% chance that 67% of Harvard students believe that climate change is highly concerning, **with a margin of error of $\pm 4\%$.**

Margin of error: $\pm 4\%$.

Confidence interval: $67\% \pm 4\%$, often written as $(63\%, 71\%)$.

Confidence level: 95%.

What is margin of error?

The size of your margin of error is a function of your sample size, confidence interval, and sample error.

This is why when creating your own surveys, you want to start by estimating the sample size you need based on the margin of error you're okay with.

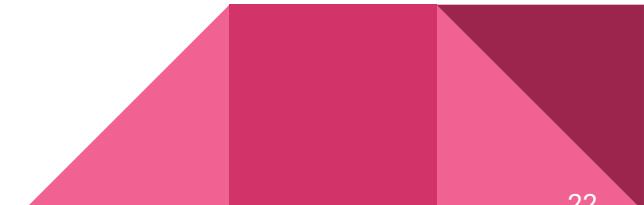
Otherwise, you're selecting a sample size and hoping that margin of error will be low enough for your audience to respect it!

When do we care about calculating margin of error?

When you're stuck with a particular sample size (you only have access to a certain number of people) and want to know what margin of error you should expect to see.

Eg. I survey a representative sample of 100 Harvard students. Then, I find in my sample that 67% of Harvard students consider climate change to be highly concerning. What's my margin of error?

There is a 95% chance that 67% of Harvard students believe that climate change is highly concerning, **with a margin of error of \pm ____%.**



When do we care about calculating margin of error?

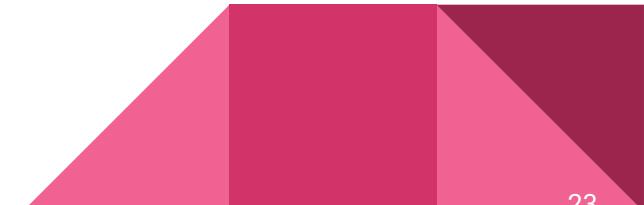
Let's assume that we are sampling less than 10% of the total population (so we can use the simpler formula, without finite population correction or sampling without replacement correction).

There is a 95% chance that 67% of Harvard students believe that climate change is highly concerning, **with a margin of error of \pm ____ %.**

n = sample size

$I_{95\%}$ = margin of error (the interval we are trying to find!)

p = sample proportion



When do we care about calculating margin of error?

Here is the formula for finding the margin of error for a sample proportion:

$$I_{95\%} = 1.96 \sqrt{\frac{p(1-p)}{n}}$$

margin of error z-score standard error

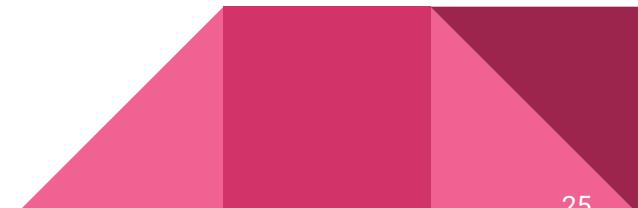
In our case, the z-score is 1.96 because we care about calculating the margin of error with a 95% confidence level.

When do we care about calculating margin of error?

Here is the formula for finding the margin of error for a sample proportion:

$$I_{95\%} = 1.96 \sqrt{\frac{p(1-p)}{n}}$$

Since we've already run the survey and collected the data, let's plug in the sample proportion we found (67%, or .67) into the formula for p.



When do we care about calculating margin of error?

Done! We know that we sampled 100 people, so let's plug into into our n:

$$I_{95\%} = 1.96 \sqrt{\frac{.67(1 - .67)}{n}}$$

When do we care about calculating margin of error?

Perfect. Now, let's crunch the numbers and we get...

$$I_{95\%} = 1.96 \sqrt{\frac{.67(1 - .67)}{100}}$$

When do we care about calculating margin of error?

Perfect. Now, let's crunch the numbers and we get...

$$I_{95\%} = .09216$$

Now we can officially say: There is a 95% chance that 67% of Harvard students believe that climate change is highly concerning, **with a margin of error of ± 9.216%.**



In-class activity

Start creating your surveys! Work with your group to navigate the Qualtrics website, sharing your tips and tricks as you begin crafting survey questions for your research topics.