Newsletter

STATPREP SUMMER 2022 WORKSHOP MAY 20 & 21, 2022

Our students need to be ready for a data-driven work environment. If you are searching for class lessons and companion tools that incorporate real-world data then you are invited to explore the StatPREP website. The materials and tools have been developed by a group of educators who teach introductory statistics and are available for use free of charge.

For several years, the StatPREP Leadership Team has conducted in-person workshops at post-secondary institutions across the U.S. After a pause, the in-person StatPREP Workshops are back. Florida SouthWestern State College (FSW) in Fort Myers, Florida will host a two-day in-person workshop on Friday, May 20th, and Saturday, May 21st, 2022. The Fort Myers Campus is located within a two-hour drive from Fort Lauderdale, Miami, and Tampa.

Registration for the FSW StatPREP Workshop is now open. Select the link to access workshop information, application requirements, COVID Protocols, and instructions on how to apply. The registration portal will close on Monday, February 28th at 11:59 PM Eastern Time.

Please note that the StatPREP Leadership Team will continue to monitor the COVID situation and will update workshop information when necessary.

For more information, please contact Rona Axelrod at rona.axelrod@fsw.edu.

UPCOMING ACTIVITIES

Be sure the check out our upcoming webinar and workshop plans on page 7.

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TEMPUS FUGIT
by Donna LaLonde

Tempus fugit is usually translated as "time flies" and comes from a [poem by Virgil](). I suspect that, like me, most of the StatPrep community experiences this phenomenon as we juggle our multiple responsibilities. I want to share some tools that have helped me manage the flight of time.

For the past few months, I've been using a new app - mem.ai described by the developers as "your mind on tap" or as described in the blog introducing the app - "In 2021, we can proudly say that Mem is the fastest way to capture, connect, and make use of information." A "mem" is a container of information and I use the app to keep track of meeting notes, ideas for future projects, information discovered in searches for future use, and more. Mems can be private or shared so the app has become invaluable as a collaboration tool. The ability to tag or link mems keeps me organized. Although time still flies, using mem has helped me be more productive. Also powerful, are "flows" which support automating workflows. To learn more about mem.ai, check out the help and support here.

"We're more than a doc. Or a table." - this is the tagline used to describe Notion, another resource that has helped me manage the flight of time. I have the "Personal Pro" plan but there is also a free version. I use Notion to create project databases which allow me to organize text and videos and keep track of other related resources. The tools available make it easy to create pages that are visually appealing, and it is simple to invite collaborators or share the resource. Recently I co-taught a professional development course, and I used Notion to organize the resources for the course. Once built, it was easy to provide the participants of the course with a link. There are a lot of resources including an incredible template gallery. For many projects, I've been able to start with one of the available templates then make modifications to fit my specific project.

Although Notion has become a favorite, I still use google docs, sheets, slides, and forms. Recently, I've been exploring - Mote which is described as "Mote - fast, friendly voice messaging - With Mote, easily add voice comments and audio content to shared documents, assignments, emails and forms." There are limitations with the free version, but I find the ability to record quick audio feedback useful.

The final, and perhaps most important, resource for managing the flight of time is the StatPrep Online Community. The community allows us to ask questions and share best practices so we can all be more productive. I'll look forward to connecting with you on [the community.]()

EXPERIENCING SAMPLING VARIATION EARLY AND OFTEN IN AN INTRO STATISTICS COURSE WEBINAR REFLECTION

By Carol Howald

I hope others have found this webinar helpful. I definitely learned new things by jumping in and presenting at my first webinar. For example, we had a great suggestion to explore pulse rate during the webinar. I have a lot of health science students in my statistics classes and I thought that investigating vital signs might be interesting to them.

To kick off class introducing confidence intervals last semester, I asked if anyone knew what kind of things pulse rate might indicate in a health assessment. This got my health science students talking! When I asked the class to take their own pulse rate, I already had folks ready to give a hand to those having difficulty locating their pulse. We also had a great side-bar conversation on why it is recommended to take it for a full 60 seconds, or 30 seconds or even just 10 seconds in different settings. Accuracy in counting, rounding error, and the ability to multiply in your head are all things that came up!

Using the Little App to visualize finding the confidence interval for the mean pulse rate of a representative sample of US adults opened the conversation to a number of discussions. See below for a screenshot of the Little App used:

What did that interval tell us about potential health concerns in the US, looking at the definition of tachycardia and bradycardia? Why did our class of 16-28 year olds have a confidence interval different from what we found for the national sample? Could we decide if the difference in estimates of the mean pulse rate from our convenience sample for 16-28 years and the national sample was meaningful?

I look forward to seeing other great ideas to try in my class as we explore these visualizations together!

FOUND INSPIRATION: "DOPESICK"
By Ambika Silva

Recently I watched the "Dopesick", which takes viewers to the epicenter of America's struggle with opioid addiction and is based on the nonfiction book Dopesick: Dealers, Doctors and the Drug Company that Addicted America by Beth Macy. I found two great discussions to have with my students while watching this miniseries. Addiction is, I think, a topic that would resonate with a lot of students and although this is taken out of a miniseries, there are truths.

For a few resources of articles: "'You want a description of Hell?' Oxycotin's 12-hour Problem" and "Is 'Dopesick' a true story? Experts and the show's creators sort fact from fiction"

Discussion: Axis Scaling Matters

The show discusses Purdue Pharma's role in convincing doctors that OxyContin is not addictive. To prove the point, Purdue shared this graph, showing that the "time-release" capsules don't cause mood spikes ("fewer peaks and valleys"). The trouble, as statistics students can observe, is the Y-axis.
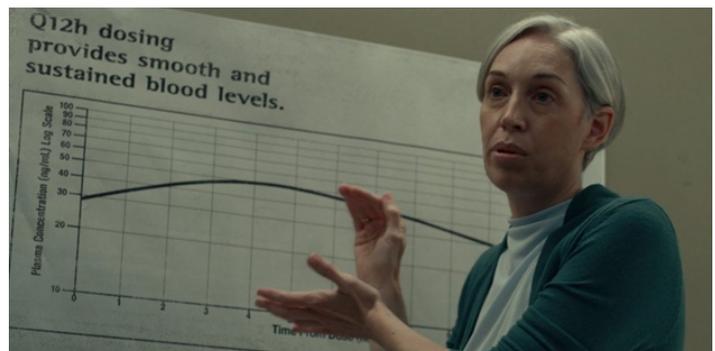
In Episode 6 (around 21 minutes), we hear the explanation: "But see what Purdue did? They dramatically compressed the scale." On the chart, we see that 30 looks to be the midpoint. If we look at a scale that is linear and not compressed, we see peaks and valleys like other opioids. You can see an article that discusses this: How Purdue Used Misleading Charts to Hide OxyContin's Addictive Power - CBS News. This can be a great discussion about misleading graphs, scaling, and how it affects marketing.

Discussion: Population and Samples, Observations and Experiments

Purdue trained its sales representatives to carry the message that the risk of addiction was "less than one percent" based on research. In addition, a commercial on OxyContin had the goal of encouraging people in pain to become prescription OxyContin users.

The truth is that the study cited wasn't an experimental study and was only a series of observations from a hospital setting. It does not apply to prescription OxyContin users which was the population targeted by the commercial. The sample consisted of patients undergoing hospitalized, regimented care – a very different environment to self-administration by prescription patients. The patients observed never took the prescription pain medications home, so we cannot infer to patients outside of a hospital setting. The wording used did not relay this information and thus was deceptive. For more information see "The Four-Sentence Letter Behind the Rise of Oxycontin"

Moreover, the report on this study was a letter to the editor from graduate student Jane Porter and Hershel Jick, M.D., and was less than six sentences long.

This can lead to great discussions about the differences between observational studies and experiments as well as on what populations and samples. It can even lead to discussions on inference.

Know someone that is struggling with opioid addiction? See below for some links for resources:
HHS Federal Resources, SAMHSA's National Helpline, and County of Los Angeles Public Health Substance Abuse Prevention and Control.

LITTLE APP ACTIVITY: SHAPES AND DISTRIBUTIONS

By Kathryn Kozak

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When introducing concepts in your introductory statistics class, it helps to have a visual to aid student understanding of the concepts. The Little Apps that are available on the StatPREP website provide visualizations of data. The Little App activities can be used for active learning in your classes.

A Little App that I find useful when introducing distributions and the terms such as skew, bi-modal, and

Orientation

As you've probably figured out already, the columns of data frames are called *variables* because the values in the column are not all the same, that is, they vary.

In the early 1800s, it was discovered that many different variables have a pattern in common: the most common values are near the mean and values become less common the further they are from the mean. Not all variables have this pattern, but many do and so the pattern came to be called the *normal distribution*.

In this lesson, you're going to look at several different variables and compare them to the normal distribution. Based on this comparison, you'll be able to make an appropriate description in words of the distribution.

Here are three rules of thumb, each of which can be used to estimate the mean and standard deviation of a distribution:

1. Mark off the interval containing the center *two-thirds* of the data. That interval will run from one standard deviation below the mean to one standard deviation above the mean. So the mean is in the very center, and the standard deviation is *half the length of the interval*. It may take some practice to be able to judge where the center two-thirds of the

normal is the Shapes of Distribution Little App. The Little App starts off with an orientation for the students.

This orientation explains how a student can estimate the center and spread from a violin plot. To understand what a violin plot is, first you need to know what a density plot is. A density plot is basically a smooth histogram and is a great way to display the shape of a distribution.
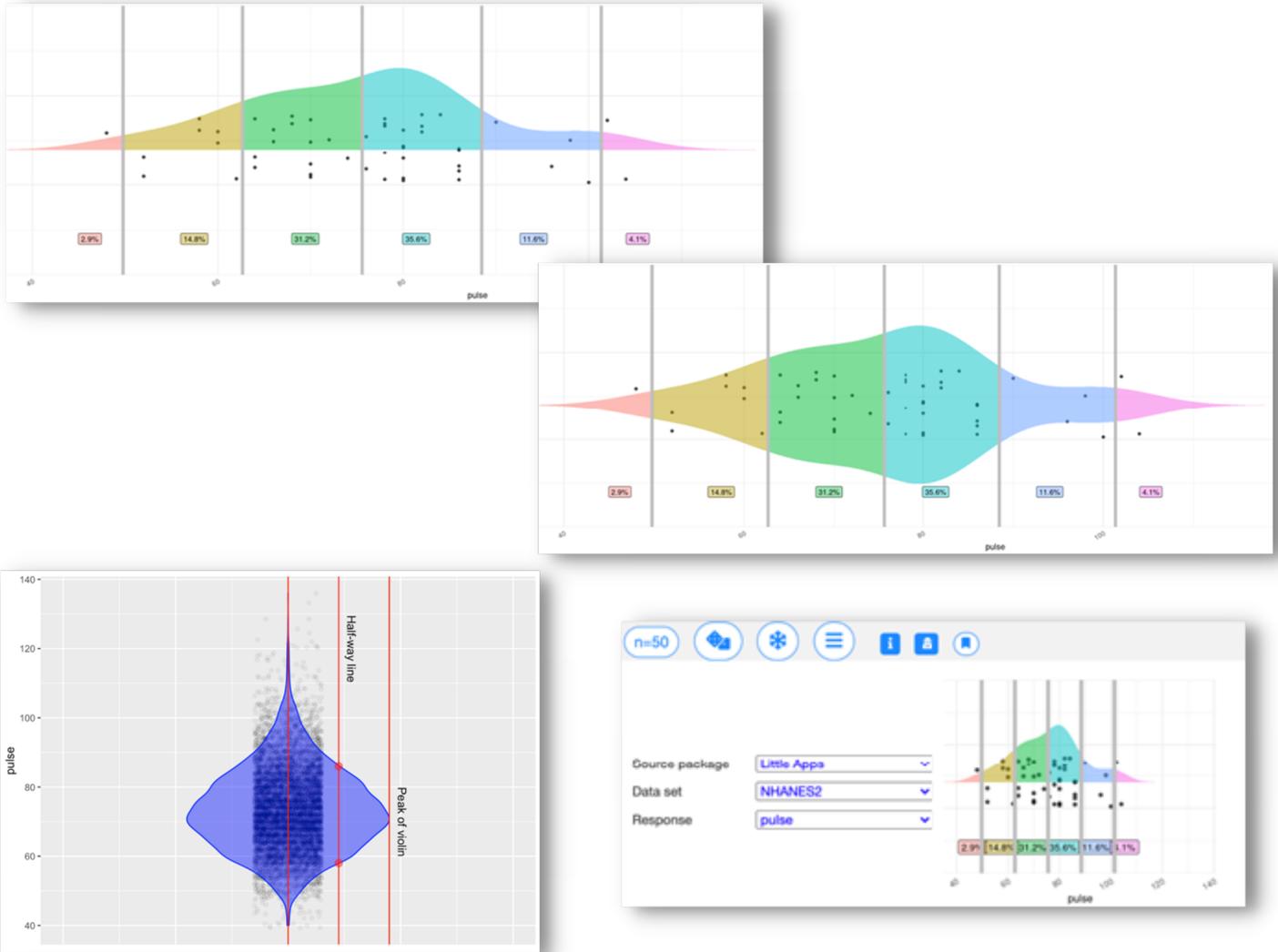
A violin plot is where the density plot is reflected about the horizontal axis. Have the students read the orientation so they can be exposed to the process for estimating the center and spread from the violin plot.

After the orientation, there is an activity for the students to work through, which has them use the Point and Density Little App.

Here the students can pick different response variables and look at the shapes of the graph. Following that, the students look for variables that have shapes that are normally distributed, and estimate the center and spread of those variables.

The activity also instructs students to look for variables that are skewed right, skewed left, and bimodal. This activity lets students explore different variables and internalize the shapes of graphs. This really helps students learn the shapes instead of just being shown the shapes. This becomes important when students need to assess if a distribution is normal or not.

Each Little App activity has a word version or a pdf version. The word version is available in case you wish to modify the activity. To share with your students, you can print out the activity and hand it out copies to your students in class. During the pandemic, I found that I could upload the activity to my google drive, and then create copies of the google doc to share with each of my groups. Each group then could work on their google doc either in person, in breakout groups in a virtual class, or in groups in an online class. This Little App activity is a great way to introduce graphical descriptions of data and I usually use it in the first few weeks of the course. Please see the Little App activities page for more activities that you can use. Previous newsletters highlight several of the activities. Please look over previous Newsletters for more information about these.

Upcoming Webinar

VISUALIZATION WITH RSTUDIO USING GGPLOT2

Presented by Joe Roith and Kathryn Kozak

Tuesday, February 8th
11:00am ET

This webinar will demonstrate using the ggplot2 package for data visualization. The fundamentals of ggplot2 and creating graphs such as bar plots, histograms, density plots, scatter plots, and time series graphs will be the emphasis of the webinar.

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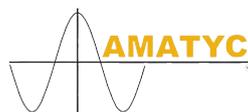
LEADERSHIP TEAM

Mike Brilleslyper, Florida Polytechnic University

Jenna Carpenter, Campbell University

Danny Kaplan, Macalester College

Kathryn Kozak, Coconino Community College

Donna LaLonde, ASA

Ambika Silva, College of the Canyons

Deirdre Longacher Smeltzer, MAA

HUB LEADERS

Joe Roith, St. Olaf College, Northfield, MN (2017-18)

Ambika Silva, College of the Canyons, Santa Clarita, CA (2017-18)

Helen Burn, Highline College, Seattle, WA (2018-19)

Hwayeon Ryu, Elon University, Elon, NC (2018-19)

Carol Howald, Howard Community College, Columbia, MD (2019-2020)

Thomas Kinzeler, Tarrant County College, Fort Worth, TX (2019-2010)

Rona Axelrod, Florida SW State College, Fort Myers, FL (2020-2021)