AP Statistics

The Idea of a Confidence Interval (ch. 8)

Let’s go fishing.

*You are trying to capture a fish that hangs out in Lake Parameter. It is a very special fish. (so special it has a name, Mu) ☺*

*The good news: Mu just hangs on in the lake somewhere. Mu does not move. (Not sure what/how he eats) You do not know what part of the lake he hangs out.*

*The Bad news: you only get one chance to capture Mu. You must capture him using a net, meaning you will drop a net from a boat and hope that the net will capture Mu. Now some good news though, there are some old fisherman who think they have an educated guess of where Mu is. Some of the fisherman are more reliable than others. You can talk to them.*

What are some things that you can do to increase your chances of capturing Mu?

Lake Parameter.

Ideas to increase the chances or confidence that you will capture the fish on the first try.

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Someone probably said *“park the boat in a likely area of where the fish is”*

In Statistics this is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Quick review, what are the unbiased point estimates for

: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ p: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I will also bet that someone said *make the net big enough so that it covers a good space of the lake”*

In statistics this is called a \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Where you park the boat and the net is essentially what a *confidence interval* is in Statistics.**

**In statistical words a confidence interval is:**

**Point Estimate  margin of error**

(where you park boat)  (size of net)

The more your margin of error (net) the higher your confidence is that you catch the fish. ()

Now suppose that the netting costs money, you pay by the size of the net. At some point will making the net bigger not be worth it?

So we want to increase the chances catching the fish, but we need to keep the margin of error smaller; in other words we want to increase our confidence of capturing the fish but can’t just make the net ultra-huge. So, in the context of our fishing story how can we make this happen?

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Did someone say *“talk to more fisherman”* and maybe even park the boat at the “average” of their guesses. This is increasing the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This is all a confidence interval is. If you are 90% confident, that means that 90% of the time you “go fishing” you actually catch the fish.

So in Statistics, **a 90% confidence interval for means that the procedure you are using will capture the true population parameter 90% of the time.**

To increase confidence you can make you net bigger (higher margin of error, not recommended) or increase the projected accuracy of the point estimate by GETTING MORE DATA. (increasing sample size.)

This is the general idea of what a confidence interval is………rest assured there is lots of math coming. ☺