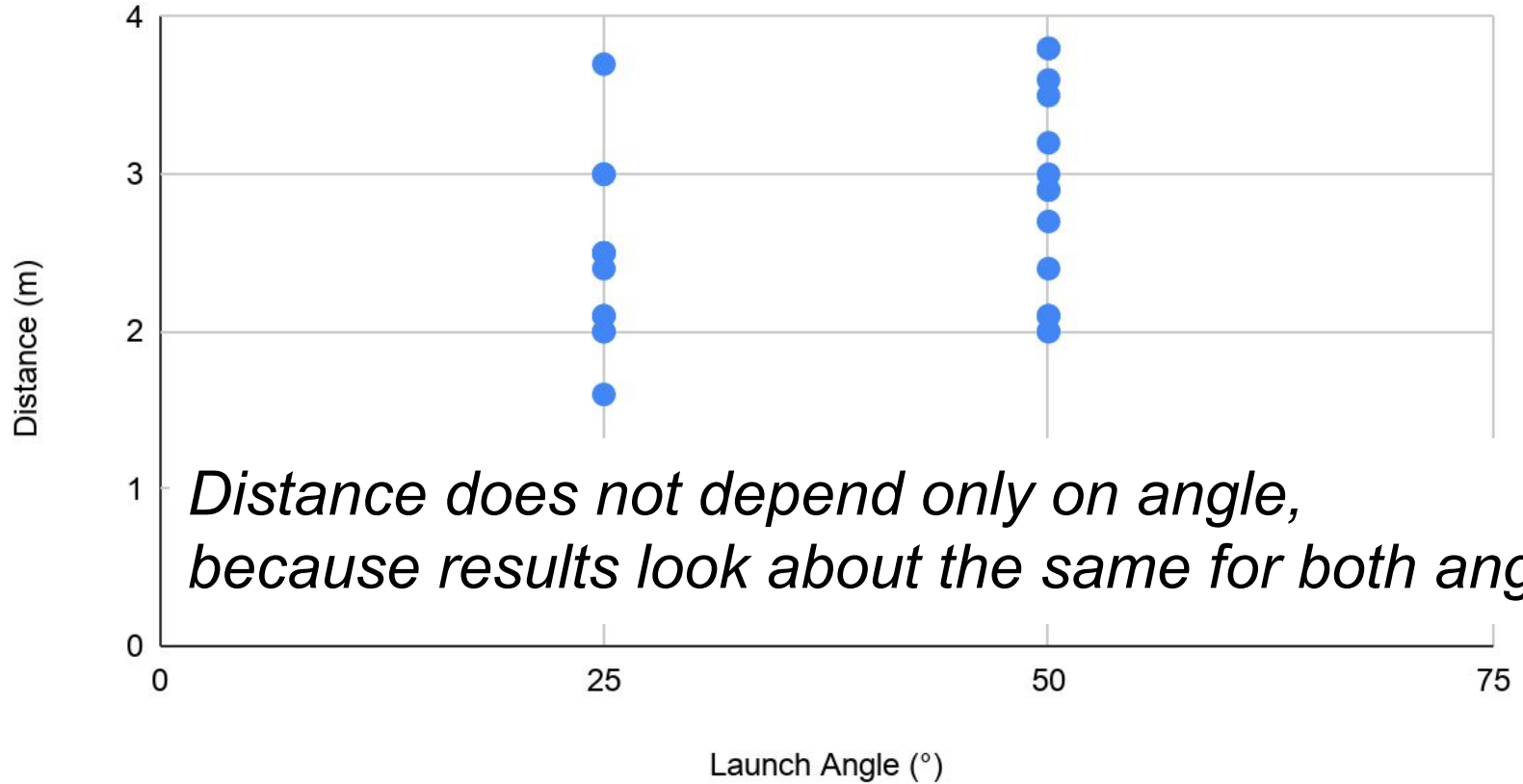# What factors might help us get the most distance?
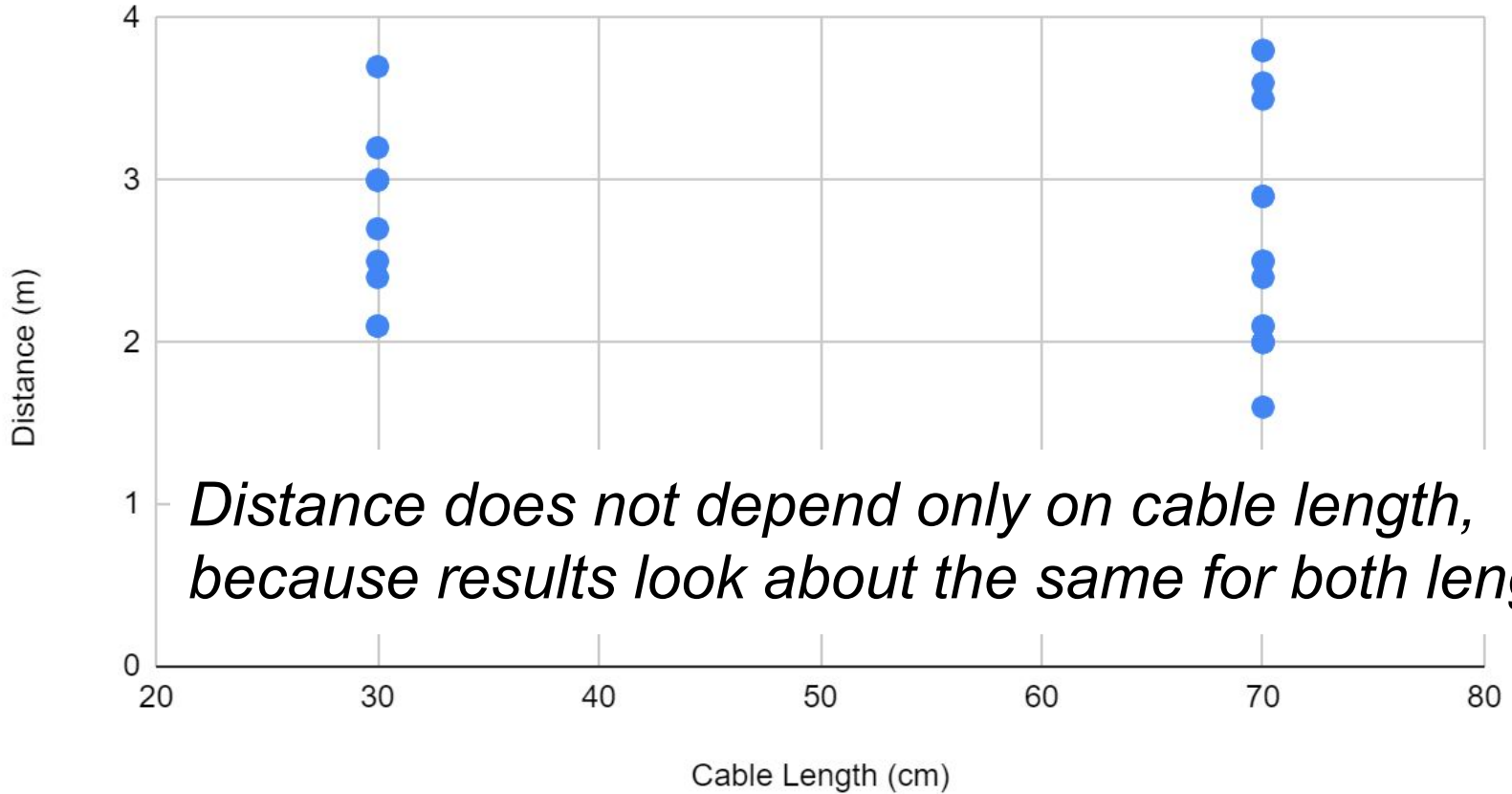
A Graphical Look at the Data So Far
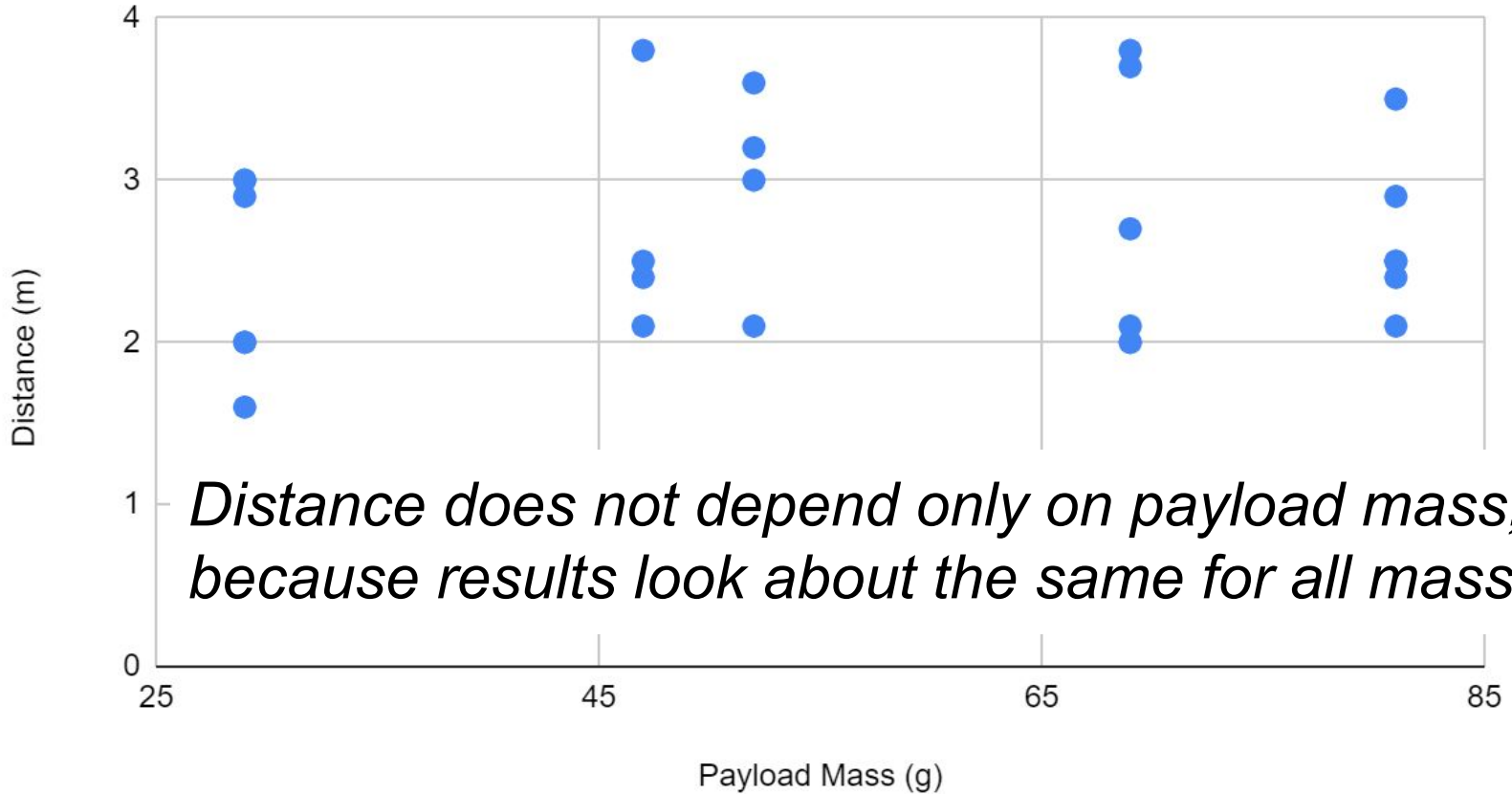
Distance (m) vs. Launch Angle (°)

Distance does not depend only on angle, because results look about the same for both angles.

Distance (m) vs. Cable Length (cm)

Distance does not depend only on cable length, because results look about the same for both lengths.

Distance (m) vs. Payload Mass (g)

Distance does not depend only on payload mass, because results look about the same for all masses.

Distance (m) vs. Maximum Speed (m/s)

Distance (m)   Trendline for Distance (m)

There DOES seem to be a correlation between distance and maximum speed.

Maybe we can find a reason why some launches go farther when maximum speed is the same...
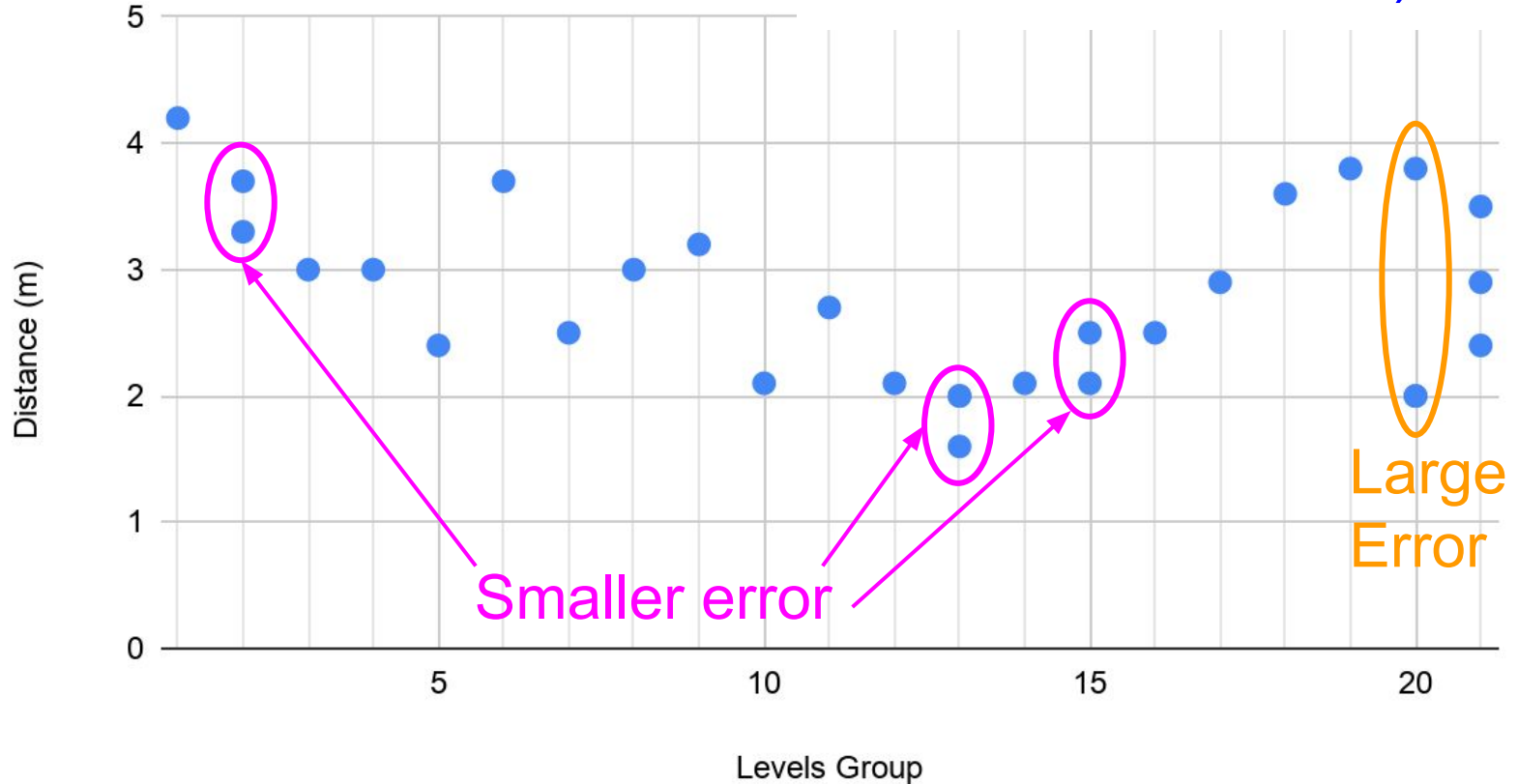
Distance (m)

Maximum Speed (m/s)
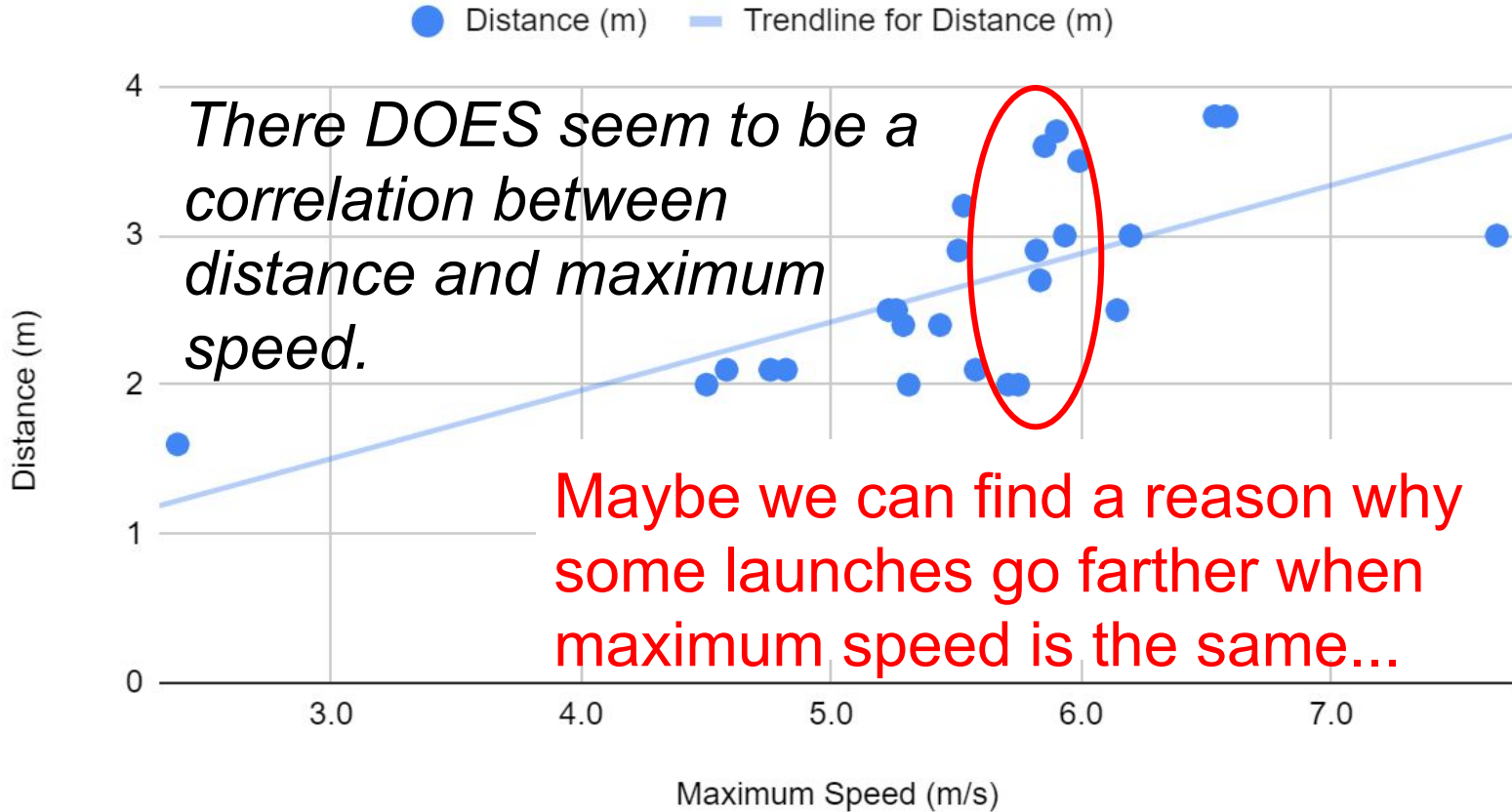
A critical question:
How much error is there in our data?

Distance (m) vs. Test Group

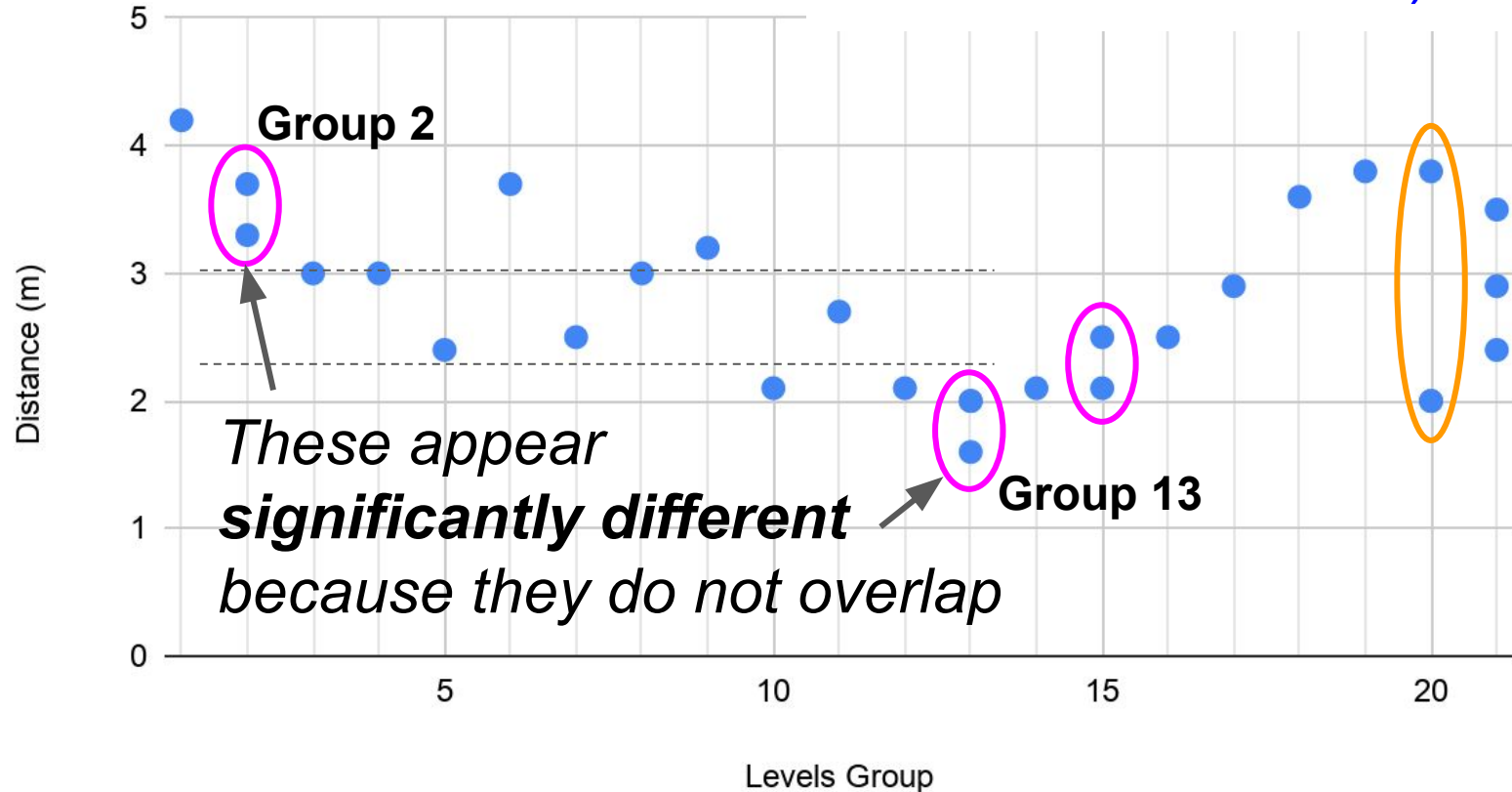(Each group is a unique combination of levels)

Smaller error

Large Error

Distance (m) vs. Test Group

(Each group is a unique combination of levels)

We don't know how much error these have

Distance (m) vs. Test Group

(Each group is a unique combination of levels)

Group 2

*These appear **significantly different** because they do not overlap*

Group 13
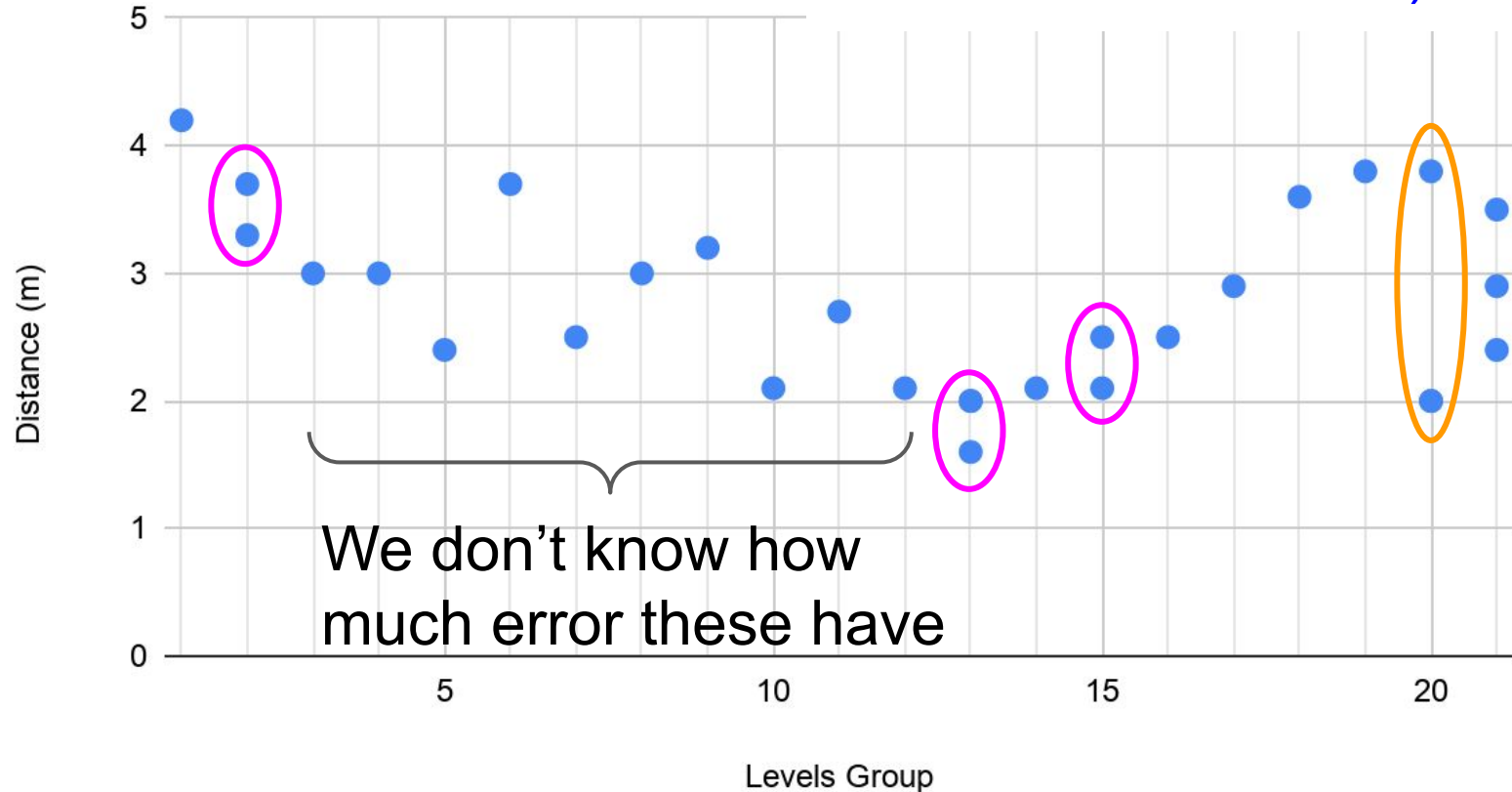
Let's Compare:

Test Group	Bottle	Cable Length (cm)	Launch Angle (°)	Payload Shape	Payload Mass (g)
2	Small	70	50	With fins	81
13	XSmall	70	25	cone	29

➢ Only Cable Length is the same.

➢ Bottle, Angle, Shape, and Mass are all different.
Is one of these most important for distance?
Or is it a combination?

Breakout Discussion / Homework:

- Can you find more clues (evidence) in the data to help decide if bottle, angle, or mass are important?

- Which combination of levels would you want run again to get more data?

➢ *Discuss these in the time available now.*
   Be prepared to give a response tomorrow.

A good response would sound like:

"I notice in the data that…

This makes me think maybe…

I think we should test this by…"