**Type I & Type II Error**

**(1) Researcher Al always uses critical z-values of +/- 1.96 for his non-directional hypothesis testing. Researcher Barbara always uses critical z-values of +/- 2.50 for her non-directional hypothesis testing.**

a) Which researcher has lower Type I error rate?

🡪 Type I Error Rate: Rejecting the null hypothesis when it is correct (sending innocent person to jail)

🡪 alpha (α) = level of risk for allowing a Type I error to occur

-Al: α = .05

-Barbara: α = .01

Who has lower risk of Type I Error Rate (i.e., who has lower α?): **Researcher Barbara**

-Higher z-values correspond to lower alpha

-Lower z-values correspond to high alpha

b) Which researcher has a lower Type II error rate?

🡪 Type II Error Rate: Failure to reject the null when it is truly false (letting guilty person go free)

🡪 beta (β) = level of risk for allowing a Type II error to occur; β = 1 - α

-Al: β = 1 - α : .95

-Barbara: β = 1 – α : .99

Who has lower risk of Type II Error Rate (i.e., who has lower β?): **Researcher Al**

-Higher z-values correspond to lower alpha

-Lower z-values correspond to high alpha

c) Which research would be described as more conservative in terms of hypothesis testing?

🡪Conservative means that you are less likely to make claims that aren’t true

-you do not send the innocent person to jail (Type I Error)

🡪 So, who has lower Type I Error risk? **Researcher Barbara**

d) Which researcher is more likely to be able to reject the null hypothesis when the null hypothesis is truly false?

🡪 Who is more likely to reject the null hypothesis when it is truly false?

*🡪 Another way: Who is more likely to accept the research hypothesis when it is correct?*

**Researcher Al**