Reading Quiz 3

April 2026

Based on the paper "Science and Statistics" please indicate if George Box, the author, would agree (**TRUE**) or disagree (**FALSE**) with the following statements

1. **TRUE** or **FALSE**: Discrepancies between observed reality and theory requires us to create new theories.

2. **TRUE** or **FALSE**: A correct model can be fit using a simple model.

3. **TRUE** or **FALSE**: All models are wrong but a scientist must recognize what is importantly wrong.

4. **TRUE** or **FALSE**: Having an extremely firm understand of the theory is all one needs to become a great statistician

5. **TRUE** or **FALSE**: R. A. Fisher in his textbook "Statistical Methods for Research Workers" takes time to show how to plot data, using his infant son's weight.

6. **TRUE** or **FALSE**: Researchers should work to solve problems they encounter and not work on hypothetical/theoretical problems.

7. **TRUE** or **FALSE**: Students of statistics should balance theory and application while striving to work with real data from scientific studies.

8. **TRUE** or **FALSE**: A good statistician requires an understanding of the science behind the data.

9. **TRUE** or **FALSE**: The scientific method is a feedback loop where a researcher tests a theory, modifies it as needed, and runs another test of the (possibly modified or new) theory

10. **TRUE** or **FALSE**: Some assumptions (such as independence) are questioned so little they eventually are treated like natural law or "rules of the game".

11. **TRUE** or **FALSE**: A statistician's role begins once other's work has ended; we curate data as it comes to us similar to a historian.

12. **TRUE** or **FALSE**: *Cookbookery* is when a statistician or researcher routinely applies the same statistical technique without thought or consideration

13. **TRUE** or **FALSE**: *Mathematistry* is the development of theory for theory's sake; often this redefines problems rather than answer the one asked

14. **TRUE** or **FALSE**: Through his close work with agriculture Fisher understood that two plots of land next to each other could not, generally, be considered independent.

15. **TRUE** or **FALSE**: The validity of crop study results relies on the physical act of randomly assigning treatments to experimental units.

16. **TRUE** or **FALSE**: Statisticians must first sponsor a model we believe works followed by then criticizing it and seeking out faults with the model

17. **Bonus Point** Why must statisticians and researchers avoid acting like Pygmalion?

1. FALSE, modifying theories is common (subtle hint given in question 9)
2. FALSE, correct models don't exist in any definitive way, simple or not. But yes, a parsimonious model is generally preferred and it's believed that it can approximate reality well, just not "correctly".
3. TRUE
4. FALSE
5. TRUE, even Fisher appreciated graphed data
6. TRUE, this ties into mathostrophy. Okay if you justified your postiion using question 7 although I always assumed Box was indicating understanding the theory behind your tests/statistics rather than blind application
7. TRUE
8. TRUE, and critical
9. TRUE
10. TRUE. Please note that Box is being *descriptive* in that this is what is happening and he is NOT saying this is what *shoul* happen. I think a few people mixed up the descriptive with the prescriptive
11. FALSE, ideally we are working wit the researchers at stage 1
12. TRUE
13. TRUE
14. TRUE
15. TRUE
16. TRUE
17. Pigmalion created a model that he thought was perfect and saw humans as imperfect. Because of this, he fell inlove with his own model. Statisticians should be open to criticism and be able to see the faults with their models. All models are wrong but it's important to find out what is wrong in a meaningful way. This requires us to be honest with outselves.