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Professor in the audience applies NPR science correspondent Richard Harris' research to his own studies

Award-winning NPR science correspondent Richard Harris warned Thursday about scientists' inability to reproduce test results, which has shaken confidence in research and is posing problems for biomedical research.

"In science, you really want to be able to reproduce things; that's how you know they're real," Harris said. According to Harris, Janet Woodcock, a drug approver for the Food and Drug Administration, said the success rate for new drugs was at an all-time low because the underlying science turns out to be unreliable.

Harris suggested solutions that he also mentioned in his recently published book, "Rigor Mortis," such as transparency, better training in the field, and being more particular with how many times you chose to publish.

"Something as subtle as what kind of test tube you used can completely mess up your results," Harris said. "It's unclear how much this is happening."

Psychology professor Aaron S. Benjamin met with Harris before his presentation to talk about methods scientists can try to deal with these problems.

"One of the things he talks about is a process called preregistration," Benjamin said. "It's where they write a plan of what they're going to do ahead of time, and then they can look back at that plan and say, 'Oh, OK, this is what I intended to do.'"

Preregistration allows a scientist to differentiate between exploratory work and confirmatory work. Hypothesizing after results are known is a problem.

"The idea is you run the experiment to see if the hypothesis is supported by the data you collected," Harris said. "Part of the problem is that we're not asking reviewers to check preregistration along with journals," Harris said.

"You can then ask them questions such as, 'Did you preregister? Where is that registration available?' You can also ask them, 'Did you deviate from your preregistration and how?'" Harris said. "That forces them to go back and assess whether or not they've done things differently, and it does things in such a way that you don't have to burden reviewers."

Bench scientists and journal editors are looking for further solutions to make science reproducible.

"It would be great if we could find techniques to homogenize what scientists do to make it more of a reliable process, but right now it's the best we've got," Benjamin said.

