Module 1 - Logic of hypothesis testing, errors of inference, power, interpretation of statistical significance, and confidence intervals

Review 1 - This Review illustrates how to correctly use the term “effect.”

Research is often characterized as examining whether or not some factor affects some outcome. An example would be comparing the benefits of a new drug to the benefits of an old one. If there is a greater benefit of the new drug, then that is sometimes called "the effect of the new drug". But that is not exactly correct. The "effect" isn't just the benefit of the new drug, because both drugs may have some benefit. What matters is if there is a difference between those benefits. The difference could be that the new drug is better, or that the new drug is worse. Of course, in this case, the researchers would probably want to see an advantage for the new drug. That is, they would want to see the new drug providing more benefit compared to the old drug. But regardless of whether the new drug is better or worse, because it is the difference that matters, that difference should be called the "effect of the type of drug." Then, if you need to refer to the new drug being better, you could refer to "the beneficial effect of the new drug, compared to the old drug."

**EXPERIMENTAL CONDITION**

**The review disappears and the example with blanks appears**

Please fill in the blanks in this example. It illustrates how to correctly use the term “effect.”

A group of researchers wanted to determine whether practicing playing scales on a real piano is better than practicing on an electronic keyboard. They recruited a group of 80 music students who were just beginning to learn to play the piano for the study. The subjects were randomly divided into equal size groups. One group of 40 subjects practiced scales for 15 minutes a day for 2 weeks on a real piano. The aother group of 40 subjects practiced scales for 15 minutes a day for 2 weeks on an electronic keyboard. The researchers had an expert music teacher rate each subject on the quality of their playing after the 2 weeks of practicing scales on their instruments. Then they used the ratings to get two averages. If they find that the real piano is better, they should call it the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Then the filled in example also appears.**

Here is feedback, so that you can check your answers above, and correct them if necessary.

A group of researchers wanted to determine whether practicing playing scales on a real piano is better than practicing on an electronic keyboard. They recruited a group of 80 music students who were just beginning to learn to play the piano for the study. The subjects were randomly divided into equal size groups. One group of 40 subjects practiced scales for 15 minutes a day for 2 weeks on a real piano.The other group of 40 subjects practiced scales for 15 minutes a day for 2 weeks on an electronic keyboard. The researchers had an expert music teacher rate each subject on the quality of their playing after the 2 weeks of practicing scales on their instruments. Then they used the ratings to get two averages. If they find that the real piano is better, they should call it the beneficial effect of the piano compared to the electronic keyboard. In this study, the researchers were examining the effect of the type of instrument.

**CONTROL CONDITION**

**The review disappears and the example appears**

Read this example. It illustrates how to correctly use the term “effect.”

A group of researchers wanted to determine whether practicing playing scales on a real piano is better than practicing on an electronic keyboard. They recruited a group of 80 music students who were just beginning to learn to play the piano for the study. The subjects were randomly divided into equal size groups. One group of 40 subjects practiced scales for 15 minutes a day for 2 weeks on a real piano. The other group of 40 subjects practiced scales for 15 minutes a day for 2 weeks on an electronic keyboard. The researchers had an expert music teacher rate each subject on the quality of their playing after the 2 weeks of practicing scales on their instruments. Then they used the ratings to get two averages. If they find that the real piano is better, they should call it the beneficial effect of the piano compared to the electronic keyboard. In this study, the researchers were examining the effect of the type of instrument.

**Then the example with blanks also appears.**

To focus on the key concepts, please fill in the blanks using the example above.

A group of researchers wanted to determine whether practicing playing scales on a real piano is better than practicing on an electronic keyboard. They recruited a group of 80 music students who were just beginning to learn to play the piano for the study. The subjects were randomly divided into equal size groups. One group of 40 subjects practiced scales for 15 minutes a day for 2 weeks on a real piano. The other group of 40 subjects practiced scales for 15 minutes a day for 2 weeks on an electronic keyboard. The researchers had an expert music teacher rate each subject on the quality of their playing after the 2 weeks of practicing scales on their instruments. Then they used the ratings to get two averages. If they find that the real piano is better, they should call it the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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