



AP Statistics 2000 Student Samples

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5. High cholesterol level in people can be reduced by exercise or by drug treatment. A pharmaceutical company has developed a new cholesterol-reducing drug. Researchers would like to compare its effects to the effects of the cholesterol-reducing drug that is currently available on the market. Volunteers who have a history of high cholesterol and who are currently not on medication will be recruited to participate in a study.

(a) Explain how you would carry out a completely randomized experiment for the study.

From a random number table, give each volunteer a number. Those with even numbers receive the new drug. Odd numbers receive the old drug. Equal doses of each should be administered, and the mean differences in cholesterol level after the use of each drug should be measured.

(b) Describe an experimental design that would improve the design in (a) by incorporating blocking.

Before assigning a drug to each volunteer, separate the volunteers into 3 blocks: 1 with average high cholesterol, 1 with extremely high cholesterol, and 1 with those with lower high cholesterol. In each block half receive the old drug and half receive the new, each half being randomly chosen.

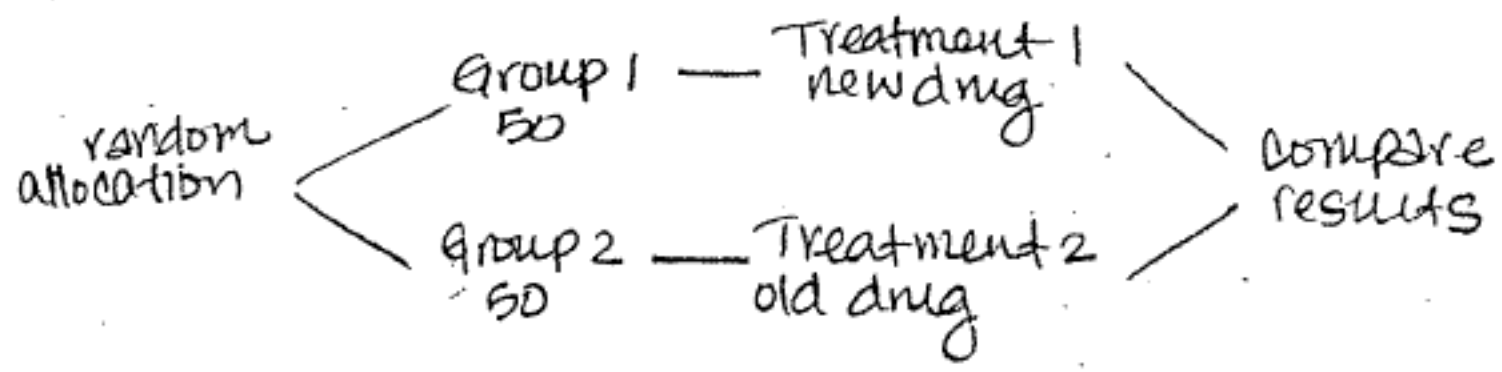
(c) Can the experimental design in (b) be carried out in a double blind manner? Explain.

Yes. If the person who gives them the drug does not know which one it is, and the volunteer does not either, the experiment is double blind. Although the drugs must be sorted out by 1 worker, another, who cannot tell the difference between the drugs, may administer them.

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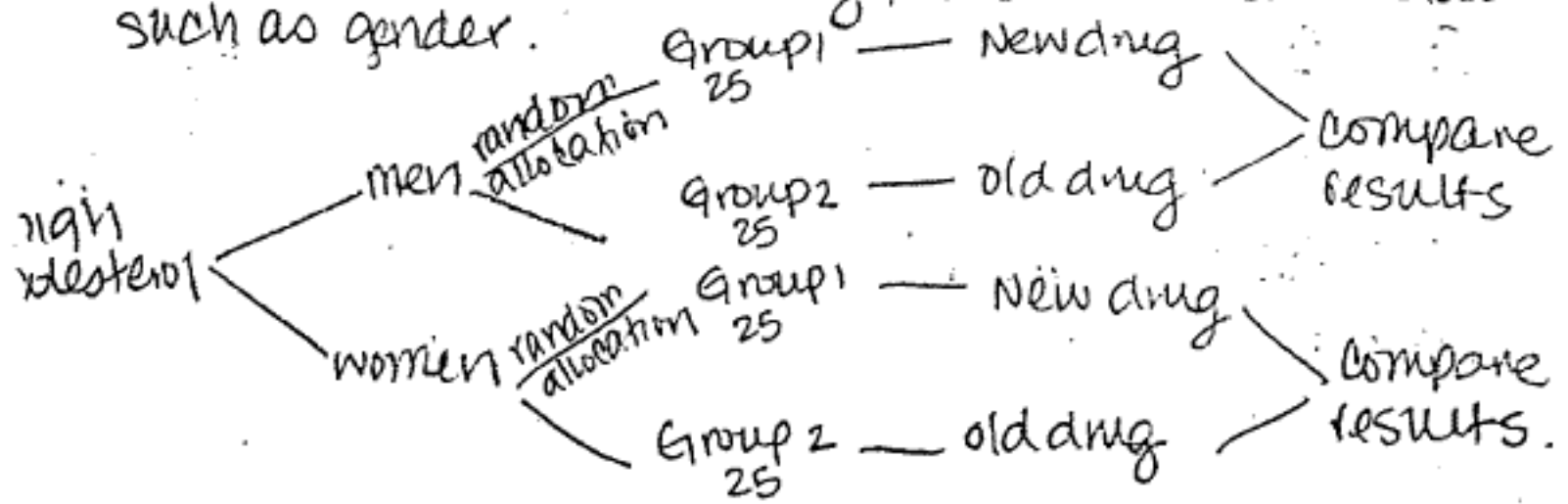
(a) Explain how you would carry out a completely randomized experiment for the study.

I would use a simple random sample of 100 people in the population who are currently not on medication, to participate.



(b) Describe an experimental design that would improve the design in (a) by incorporating blocking.

To incorporate blocking, I can reduce outside variables such as gender.



(c) Can the experimental design in (b) be carried out in a double blind manner? Explain.

The experimental design can be carried out in a double blind manner to reduce bias by randomly assigning the new drug or old drug to each subject without the experimenter or the subject knowing who has what drug.

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(a) Explain how you would carry out a completely randomized experiment for the study.

Volunteers will be randomly placed into two equal groups. One will take the new drug, while the other takes the drug on the market. After the drugs are tested on the subjects as assigned, each group will be compared to determine which is better.

(b) Describe an experimental design that would improve the design in (a) by incorporating blocking.

Volunteers will be put into categories based on their cholesterol level. Volunteers will be randomly assigned to take each drug. As in part (a) except an equal number from each category will take one drug or the other. After the drugs are tested on the subjects as assigned, each group will be compared to determine which drug is better.

(c) Can the experimental design in (b) be carried out in a double blind manner? Explain.

Yes, numbers could be assigned to each volunteer and using the numbers (unknown to the researchers) the subjects could be randomly assigned to each drug.

This would reduce researcher bias.