The Way to a Woman's Heart Is ... MATH!

NEW DELHI An Indian bride walked out of her wedding ceremony after the groom failed to solve a simple math problem, police said Friday. The bride tested the groom on his math skills and when he got the sum wrong, she walked out. The question she asked: How much is 15 plus six? His reply: 17. The incident took place late Wednesday near the industrial town of Kanpur in northern Uttar Pradesh state, police officer Rakesh Kumar said Friday. The groom's family tried persuading the bride to return, but she refused. She said the groom had misled them about his education.

-AP Report 3/14/15

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The biggest difference between controlled experiments and observational studies, such as cohort and case-referent studies, that attempt to show cause-effect, is the idea of **control**: the ability of the experimenter to assign treatments to experimental units. It is the control in controlled experiments that validates cause-effect conclusions and the lack of control in observational studies that casts doubt on cause-effect conclusions.

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However, there is nothing in the conduct of such studies that requires such sampling: even if the units used in the study are not selected from the target population in an appropriate way, the results of the study can still be valid for the units in the study.

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Sampling Studies

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- Use a sample of sampling units obtained from a population to obtain information about the whole population.
- Have as their primary goals description of various aspects of the population from which the sample is obtained, or comparison of subgroups from that population (not establishment of association).

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Sample Surveys

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Another is the Current Population Survey, conducted monthly by the US Census Bureau. The CPS questions about 100,000 people in some 60,000 households nationwide, and uses the results to estimate measures of the state of the nation such as income, unemployment, and schooling.

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- Election monitors take samples of election ballots to evalulate the fairness of elections.

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Non-sampling Errors in Studies of Human Populations

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Unless a study obtains responses from the entire target population (in which case it is called a census), sampling error is certain to occur. Selection bias may also occur.

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Studies of human populations in which individuals are asked to respond to questions, verbally or in writing, are subject to other nonsampling errors, such as

- **Nonresponse bias:** Bias due to failure to obtain responses from some subjects.
- **Response bias:** Bias due to erroneous responses from some subjects.

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Example 4, Continued

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- **Nonresponse bias** might occur if certain individuals refuse to supply their medical histories.
- **Response bias** might occur if the subject doesn't tell the truth about his or her health history because of concerns that giving information about poor health will adversely affect future insurability.

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