

Statistics

[Science](#), [Statistics](#)



A study on compromised results of bias sampling The study which the result were biased in regard to sampling and data gathering sleep habits and obesity. The study mainly focused on the sleep habits and obesity.

The source of the bias was utilization of the simple random sample from the underlying patient population in constructing sampling frame of the corresponding eligible patient.

The bias did not take into account data gathering costs, underlying sample sizes and corresponding statistical power in the analysis. Compromises were realized in the identification of the patients to be recruited for certain cost in order to achieve specified sample size.

The flawed findings resulted to unscheduled drop in patients every day and corresponding occurrence of no-shows thus compromising the prevailing list that were mainly based on the patients scheduled on the past days.

The process could be eradicated by utilization of the combination of the simple random, stratified and systematic sampling or corresponding multistage cluster sampling in the analysis process.

Robert Harris's article [http://www. virtualsalt. com/evalu8it. htm](http://www.virtualsalt.com/evalu8it.htm)

a. Why print material is considered more credible than Internet material?

Print material is more credible than internet material because they normally offer accurate source of information based on comprehensive reasoning.

Print material is also more credible since internet sources are generally easier to circulate material on the internet than to print within a book.

Moreover, print material is timeliness thus making it more credible than internet material.

b. According to Robert Harris what kind of information exists on the internet?

Internet mainly contains information that have been edited and manipulated thus making the information to be inaccurate.

b. What tip does Robert Harris offer to determine if a source is reliable/credible?

Credibility of a source is determined by the author and the publisher.

Renowned publishers particularly associated with reputable universities are considered to be reliable sources. This is because reputable authors and publishers are considered to be having better credentials thus making the source more credible.

c. Summarize the CARS checklist. Include important questions you must ask yourself and indicators of poor information when evaluating an Internet set for each of the topics.

CARS in full means Credibility, Accuracy, Reasonableness, Support

Credibility mainly depends on the author's background information that ought to display evidence of being credible, truthful and knowledgeable.

Poor credibility is determined by the tone, style and competence of the under writing that lack anonymity, lack of quality control, negative metainformation, and poor grammar.

Accuracy mainly relies on the date of the prevailing information. It ought to be timeliness, comprehensiveness and audience focused. Lack of accuracy on the internet information is depicted by lack of date of the underlying document, vagueness, very old date information that swiftly changes and single sided perception of ideas.

Reasonableness mainly entails analyzing the information in regard to

fairness, objectivity, moderateness, and consistency of the information in the underlying source. Lack of reasonableness is depicted by unbalanced tone, over claims, presence of massive sweeping statements in regard to unnecessary significance and corresponding conflicts of interest.

Support is depicted by statistics and corresponding claim of facts of the underlying source. Poor support sources is one that have presentation of statistics devoid of the identification of the source, lack of the source documentation in cases where documentations are vital and lack of supportive sources that have similar information.

d. How can you tell the motivation and source of a document from the Internet address?

The motivation and the corresponding source of any document from an internet address are mainly determine by the reputation of the author, the place of publication and the date of publication. The above details normally aids in determining the degree of motivation of the source.

Question 1

A committee of 5 people is to be chosen from a group of 8 women and 10 men.

1. How many different committees are possible?

$$\text{a) } {}_{18}P_5 = 18 \times 17 \times 16 \times 15 \times 14$$

$$= 1,028,160$$

Thus, the number of different committees that are possible

$$= \frac{18 \times 17 \times 16 \times 15 \times 14}{5!}$$

$$= 8568$$

b) The committee must feature both men and women?

$$= 8 \times 10 \times 16 \times 15 \times 14$$

$$= 268,800$$

c) The committee must feature 3 women and two men?

$$= 8 \times 7 \times 6 \times 10 \times 9$$

$$= 30,240$$

d) The committee must have more women than men?

$$= (8 \times 7 \times 6 \times 10 \times 9) + (8 \times 7 \times 6 \times 5 \times 10) + (8 \times 7 \times 6 \times 5 \times 4)$$

$$= 30,240 + 16,800 + 6,720$$

$$= 53,760$$

b. A baseball team has 14 players.

How many 9-person batting orders are possible?

$${}_{14}P_9 = 14 \times 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6$$

$$= 726,485,760$$

Thus, number of 9-person batting orders is

$$= 726,485,760 / 9!$$

$$= 2002$$

a) How many batting orders are possible if Schierholtz is always in the starting line-up and always bats fourth?

$$= 13 \times 12 \times 11 \times 1 \times 10 \times 9 \times 8 \times 7 \times 6 / 8!$$

$$= 51,891,840 / 8!$$

$$= 1,287$$

c. Consider the word MATHEMATICS.

a) How many arrangements are there of the word MATHEMATICS?

$$= 11! / 2! \times 2! \times 2!$$

$$= 39,916,800 / 8$$

$$= 4,989,600$$

b) How many of these start with the letter M?

$$= 2 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$= 7,257,600$$

c) How many of the arrangements in part a have the T's together?

$$= 3!/2!$$

$$= 3$$

4. We have looked at situations in which we need to determine the number of possible routes between two places. We can look at the situation below as 9 steps, six of which must be East and three of which must be South.

a) The computation is 9C_3 (or 9C_6) = $9! / (3! 6!)$

$$= 362,880 / (6 \times 720)$$

$$= 362,880 / 4320$$

$$= 84$$

b) Explain clearly why you could solve this question using combinations, and why this is equivalent to considering permutations with repeated items.

The solution of this question is solved via application of combinations because the order in which an individual travel does not matter.

Permutations with repeated items could be utilized because it entail multiple steps to the south and multiple steps east. Combination in this case does not take into account the number travelled and we eliminate repeated combinations.

5. There are 8 parents and 43 students going on a school trip. Two groups are made, a large one with thirty students and five parents, and a small group with 13 students and three parents.

a) How many different ways can the parents be chosen for the small group?

$${}^8C_3 = 56$$

b) How many ways can the students be chosen for the large group if Stefan and Dylan must be in the small group?

$${}^{41}C_{30} = 3, 159, 461, 968$$

$$= 3.16 \times 10^9$$

c) How many ways can the groups be arranged if Reena and both her parents must be in the small group?

$${}^{42}C_{12} = 1.1058 \times 10^9$$

6. Simplify each expression and write it without using factorial notation.

a) $(n + 4)!$

$$= nP_{n+4}$$

$$= n+4 \times n+3 \times n+2 \times n+1$$

b) $(n + 4)!$

$$= nP_{n+2}$$

$$= n+2 \times n+1$$

c) $(n - r + 1)!$

$$= nP_{n-r+1}$$

$$= n+(-r+1) \times n-r$$

$$= n-r \times n + n-r$$

$$= n-r \times n-r + n-r$$

$$= n-r(n-r+1) + n-r$$

$$= n(1-r) - r(n-r+1)$$

$$(n - r - 2)!$$

$$= nP_n + (-r-2)$$

$$= n + (-r-2) n^{x-r}$$

$$= n + (-rnx-2nx)-r$$

$$= n-rnx-2nx-r$$

$$= n-2nx-rnx-r$$

$$= n(1-2x) -r(nx+r)$$

Question 7

A lottery is one of the gambling games with the largest jackpot that is commonly known as lotto. It mainly entails picking of the correct six numbers from the underlying set of balls with every ball numbered from number 1 to 50. Nevertheless, some of the numbers are normally more or less than fifty.

An individual need to have enough money and participate regularly to increases chances of winning. The least prize an individual is winning a ticket for participation.

The probability of winning every prize is $1/50$ since there are 50 possibilities. Federal government normally takes particular percentage of the amount that an individual win in a lottery.

The cost of taking part in the lottery is massive and the prizes that are won are fair since they are normally higher than the corresponding amount of the amount an individual put within the lottery. Individual normally continue to play because they want to win and the more you play the more you gain experience that can assist you in subsequent play.

Work Cited

Wheeler, Ed, & Jim Brawner. Discrete Mathematics for Teachers. Charlotte, N. C: Information Age Publishing, 2010. Print.