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Sampling Method | Descriptive Research

Simple Random Sampling

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Abstract

Simple random sampling is a widely utilized sampling method in quantitative studies with survey instruments. It is asserted that simple random sampling is favorable in homogeneous and uniformly selected populations. In this selection method, all the individuals have an equal opportunity to participate in the study where the selection process is entirely based on luck. The simple random sampling has benefits and drawbacks associated with it. It ensures unbiased, representative, and equal probability of the population; on the other hand, it can be cumbersome, rarely supported with readily available list of population, and challenging when population is heterogeneous and widely dispersed.

Keywords: Random, population, sample, probability sampling, pros and cons

Introduction

The population is the entire group of subjects the researcher wants information on (Stockemer, 2019); ideally, it is preferable to include whole population to investigate an issue; however, "practically, it is always not possible to study the entire population" (Acharya, 2013, p. 330). The size of the population under consideration is typically taken into account when determining an acceptable sample size. Therefore, we attempt to select a 'sample' that represents the population under study. Researchers will use sampling as a technique (procedure or device) to systematically choose a smaller group of representative objects or people (a subset) from a pre-defined population to act as subjects (data sources) for observation or experimentation in accordance with the goals of their study (Sharma, 2017). It is significantly important for the researcher to make sure that the selected sample is neither too big nor two small. Contrary to popular belief, samples should not be too small or too large in the ideal scenario (Faber & Fonseca, 2014). According to Miles & Huberman (1994), it is crucial to be specific about what you intent to study and why you are inclined to conduct that study. "Otherwise you may suffer the pitfalls of vacuum-cleaner-like

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collection of every datum. You may suffer accumulation of more data than there is time to analyze and detours into alluring associated questions that waste time, goodwill and analytic opportunity" (p. 3).

Simple random sampling requires the researcher to define carefully the population from which the sample is drawn. It is necessary to provide a framework for inclusion and exclusion of population; for instance, Cohen et al. (2018) assert that "it is little help in trying to generalize to all the males and females in a school if only males are taken as the population from which the sample is drawn" (p. 215). This article mainly focuses on defining simple random sampling and explaining its pros and cons in scientific research. The following research questions guide this study:

1. What is simple random sampling in scientific research?
2. How can researchers frame simple random sampling?
3. What are the inherent benefits and drawbacks of simple random sampling in scientific research?

Defining Simple Random Sampling in a Scientific Research

Simple random sampling is an extensively used sampling method in scientific research. Simple random sampling is selected for populations which are highly homogenous where the members of the research are randomly selected to participate in the research (Bhardwaj, 2019). Simple Random Sampling is the "simplest and most common method of selecting a sample, in which the sample is selected unit by unit, with equal probability of selection for each unit at each draw" (Singh, 2003, p. 71). According to Acharya (2013), "In this method, every individual has an equal chance of being selected in the sample from the population" (p. 330). Simple random sampling makes sure that every person in a population has an equal probability of being chosen as a response (Thomas, 2020). Moreover, in this method, researcher develops a numeric list of all sample size and by using computer program generate random numbers when they deal with large sample size (Rahi, 2017; Omair, 2014) which will provide them a list of population for the intended research project.

Due to likelihood and chance, the sample should include individuals who share traits with the general population, including some who are elderly, some who are young, tall, some who are short, fit, some who are unfit, wealthy, and some who are poor (Cohen et al., 2018). Thus, in simple random sampling, the researcher needs to specify the general common characteristics of the individuals that can participate in the study.

Framing Simple Random Sampling

Simple random sampling is often utilized in surveys and quantitative research designs (Rahi, 2017). As in simple random sampling individuals get equal opportunity to participate in the study. It is favorable in studies where the population is homogenous and population of the study are uniformly distributed.

Ansar et al. (2017) conducted a study in Gorontalo, Indonesia, where they collected data from all high school English teachers, numbering 123. The study intended to find out if there was

a direct positive influence of school culture on the performance of high school English teachers in Gorontalo province or not. The researchers opted for simple random sampling for their study where they had pre-determined criteria of having a) all high school English teachers, b) be current teachers, c) be willing to answer the survey questions.

Benefits and Drawbacks of Simple Random Sampling

As in any sampling method, there are benefits and drawback in opting for simple random sampling as well. Simple random sampling is a widely utilized sampling method in studies with large number of participants. Since in simple random sampling data selection depends on luck, it is possible that the data obtained from the research may lead to precise generalizable results. According to Best and Kahn (2016), simple random sampling is a cumbersome and rarely used procedure in research design. Moreover, it is asserted that this sampling method is efficient when the population is homogeneous and the list of the population intended for the study is readily available (Cohen et al., 2018; Barreiro & Albandoz, 2001). In addition, random selection can easily result in subsets that do not adequately cover the data in more complicated (non-uniformly distributed) datasets, which will result in a high variance in the estimation of the model error (Reitermanova', 2010). Furthermore, when the population's size in a particular demographic is not defined, then this method cannot run properly. And for this, different areas such as research on animals are in the field area; this method is not that useful (Rahman et al., 2022).

On the other hand, ideally, such randomization techniques give every individual in the population the same chance to be selected in the sample (Stockemer, 2019). It is also an unbiased and impartial selection method (Sharma, 2017; Fink, 2003); when cautiously designed, the sample can be representative of the whole population. Stockemer asserts that randomization helps to offset the confounding effects of known and unknown factors by randomly choosing cases (2019) which may lead to a more considerate sample selection process for the intended study.

Table 1

Simple Random Sampling Technique Benefits and Drawbacks

No	Benefits	Drawbacks
1	Impartial random selection are crucial (Sharma, 2017; Fink, 2003).	This procedure is cumbersome and is rarely used (Best and Kahn, 2016).
2	Representativeness of the population	A complete list of the population is needed and this is not always readily available (Cohen et al., 2018).
3	Randomization helps to offset the confounding effects of known and unknown factors (Stockemer, 2019).	Difficult to use when the population is widely dispersed and heterogeneous (Barreiro & Albandoz, 2001).
4	Each sample has an equal probability of selection (Reitermanova', 2010).	Sampling error (West, 2016).

Closing Remarks

Simple random sampling is a probability sampling method which provides researchers with an opportunity to select participants for their study randomly and without a bias. The findings of this paper proclaim that simple random sampling is favorable and supportive for quantitative studies. Simple random sampling provides impartial, representative, and offset confounding effects of known and unknown factors for the population of the study; it is also subject to sampling error, unwieldly procedure, and problematic with heterogeneous and dispersed population.

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Shagofah Noor completed her degree in Teaching English as a Second Language (TESL) from Northern Arizona University in 2018 through Fulbright scholarship. She has been teaching English major undergraduates at Herat University, Afghanistan, for last eight years. She has carried out multiple research projects, most of which were published locally. She is interested in exploring reading and speaking skills, and she is inclined towards studying pragmatics as well. Therefore, the current research project is aligned with the previous research projects.

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