

Practical Research 2

Quarter 1- Module 3

Kinds of Variables and their Uses



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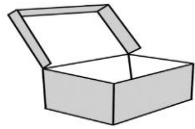
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What I Need to Know

Good day student- researchers! In this lesson, you are going to learn to:

Differentiate kinds of variables and their uses (CS_RS12-Ia-c-3)

Moreover, in this lesson, you will learn concepts and do practice activities that will help you do the following:

1. define what variables are;
2. determine the kinds of variables;
3. identify the uses of variables;
4. discuss the nature of variables and data; and
5. figure out independent and dependent variables in phenomena.



What I Know

Before you proceed to the different activities inside the module, answer first the short **pre-assessment activity** below.

Below are overviews of two experiments. The variables of the overview experiments are given. Identify whether the given variable is dependent or independent then explain why.

Experiment 1: You want to figure out which brand of microwave popcorn pops the most kernels so you can get the most value for your money. You test different brands of microwave popcorn to see which bag pops the most popcorn kernels.

Variable 1: Brand of popcorn bag

Kind of variable: _____

Explanation: _____

Variable 2: Number of kernels popped

Kind of variable: _____

Explanation: _____

Experiment 2: You want to see which type of fertilizer helps plants grow the fastest, so you add a different brand of fertilizer to each plant and see how tall they grow.



Variable 1: Type of fertilizer given to the plant

Kind of variable: _____

Explanation: _____

Variable 2: Plant height

Kind of variable: _____

Explanation: _____

Lesson 1

Kinds of Variables and their Uses



What's In

In the previous lessons, you learned the importance of quantitative research across disciplines. On the space below, say something about the importance of quantitative research across different fields based on your own understanding.



What's New

Let us start our lesson on the kinds of variables and their uses by analyzing the scenario below.

Scenario: You are a dog lover. You have a new dog. You buy your dog multiple brands of food to see which one is its favorite.

Based on the scenario, what are the variables? Which one is the dependent variable? Which one is the independent variable? Why do you say so?





What is It

The above-mentioned scenario has two variables. One of these variables is a dependent variable. The other one is the independent variable.

Variables are important in research. Variables are one of the fundamental concepts in research and you have to know how to differentiate these from among the other concepts.

The word variable comes from the Latin word “*variabilis*,” which means “vary.”

A variable is defined as anything that has a quantity or quality that varies. Variables are among the fundamental concepts of research together *with measurement, validity, reliability, cause and effect and theory.*

Bernard (1994) as cited by Prieto, et al. defines a variable as something that can take more than one value, and values can be words or numbers.

Based on what you have studied so far, you have to remember that variables are properties or characteristics of some event, object, or person that can take on different values or amounts.

The same authors mentioned above say that the common variables in social research are *age, sex, gender, education, income, marital status and occupation.*



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Furthermore, they say that all social research is based on defining variables, looking for associations among them, and trying to understand whether one variable causes another.

In an experimental research, the things that are changing in an experiment are called *variables*. A variable is *any factor, trait, or condition that can exist in differing amounts or types*.

Other experts define a variable as an entity that can take on different values. In other words, anything that can vary or change can be considered a variable.

Bear in mind that according to Creswell (2002) as cited by Prieto, et al. a variable specifically refers to a characteristic, or attribute of an individual or an organization that can be measured or observed and that varies among the people or organization being studied.

The Nature of Variables and Data

Variables are classified into four types. The types of variables are **nominal**, **ordinal**, **interval**, and **ratio**.

1. Nominal Variable

Nominal variables *represent categories that cannot be ordered in any particular way*. In other words, they are categories that cannot be arranged in a particular order. Examples of these are biological sex (male vs. female), political affiliation, basketball fan affiliation, etc.

A nominal variable is *a type of variable that is used to name, label or categorize particular attributes that are being measured*. It takes qualitative values representing different categories, and there is no intrinsic ordering of these categories.

You can *code nominal variables with numbers, but the order is arbitrary and arithmetic operations cannot be performed on the numbers*. This is the case when a person's phone number, company identification number, postal code, etc. are being collected.



https://www.google.com/search?q=cliparts+of+doing+research&tbm=isch&ved=2ahUKEwiZvKfHzIjqAhWCAaYKHasuARIQ2-cCegQIABAA&oq=cliparts+of+doing+research&gs_lcp=CgNpbWcQAzoECAAQQzoHCAAQsQMqQzoFCAAQsQM6AggAOgYIABAKEBhQobUDWLmBBGCGhARoAHAAeACAA doBiAHWMJIBBzEyLjQyLjGYAQcGaqGqAQtnD3Mtd2l6LWltZ7ABAA&sclient=img&ei=qerpXtnDIoKdMAWr3YSQAQ&bih=657&biw=1366#imgsrc=OTgJJkGvdLAEAM&imgdii=xSO_RtvvQdPhWM

Characteristics of Nominal Variable

1. The responses to a nominal variable can be divided into two or more categories. For example, gender is a nominal variable that can take responses male/female, the genders being the categories the nominal variable is divided into.

2. A nominal variable is qualitative, which means numbers are used here only to categorize or identify objects. For example, the number at the back of a player's jersey is used to identify the position he/she is playing.

3. They can also take quantitative values. However, these quantitative values do not have numeric properties. That is, arithmetic operations cannot be performed on them.

Examples of Nominal Variable

• Personal Biodata: The variables included in a personal biodata is a nominal variable. This includes the name, date of birth, gender, etc.

Example:

- Full Name _____
- Gender _____
- Email address_____

• Customer Feedback: Organizations use this to get feedback about their product or service from customers.

Example:

How long have you been using our product?

- Less than 6 months
- 6 months
- 7 months+
- What do you think about our mobile app? _____

Categories of Nominal Variable

Nominal variables are of two categories. These categories are the matched category and the unmatched category.

You have to bear in mind that in a *matched category*, all the values of the nominal variable are paired up or group so that each member of a group has similar characteristics except for the variable under investigation. The



unmatched category, on the other hand, is an independent sample of unrelated group of data and unlike in the matched category, the values in a group do not necessarily have similar characteristics.

2. Ordinal Variable

The next type of variable is ordinal variable. Ordinal variables *represent categories that can be ordered from greatest to smallest*. Examples of ordinal variables include education level (e.g. Grade 10, Grade 11, Grade 12), income brackets, etc.

Always remember that *ordinal variable is a type of measurement variable that takes values with an order or rank*. It is the 2nd level of measurement and is an extension of the nominal variable.

Ordinal variables are built upon nominal scales by assigning numbers to objects to reflect a rank or ordering on an attribute. Also, there is no standard ordering in the ordinal variable scale.

In another sense, we could say the difference in the rank of an ordinal variable is not equal. It is mostly classified as one of the two types of categorical variables, while in some cases it is said to be a midpoint between categorical and numerical variables.

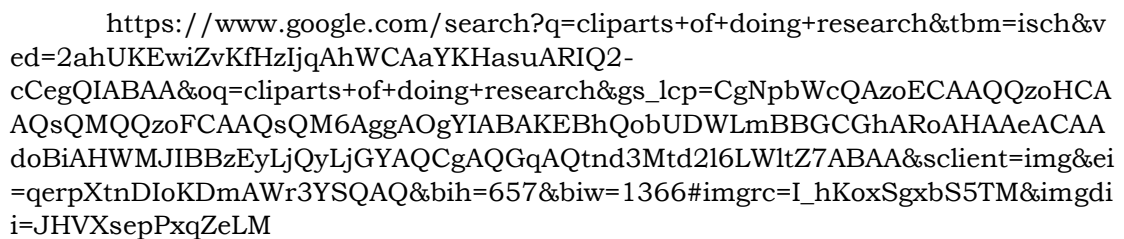
Types of Ordinal Variable

Similar to the nominal variable, there is no standard classification of ordinal variables into types. However, we can classify them according to the value assignment which are ordinal variable type based on numerical and non- numerical values.

Value Assignment

The possible values of ordinal variables do have a rank or order, and a numeric value may be assigned to each rank for respondents to better understand them. In other cases, numeric values are not assigned to the ranks.

Below are examples of ordinal variable with and without numeric value.



How satisfied are you with our service tonight?

- Observe that the variables use numbers 1-5 and are arranged from highest to lowest.

- Very satisfied
- Satisfied
- Indifferent
- Dissatisfied
- Very dissatisfied

Characteristics of Ordinal Variable

-

- It has no standardized interval scale.
- It establishes a relative rank.
- It measures qualitative traits.
- The median and mode can be analyzed.
- It has a rank or order.

Examples of Ordinal Variable

- **Likert Scale:** A Likert scale is a psychometric scale used by researchers to prepare questionnaires and get people's opinions.

How satisfied are you with our service?

1. Very satisfied
2. Satisfied
3. Indifferent
4. Dissatisfied
5. Very dissatisfied

- **Interval Scale:** In an interval scale, each response is an interval on its own.

How old are you?

- 13 – 19 years
- 20 – 30 years
- 31- 50 years

Categories of Ordinal Variable

Just like the nominal variable, ordinal variable has two main categories and these are same as that of the nominal variable. These are the matched and unmatched category.

In the matched category, each member of a data sample is paired with similar members of every other sample concerning all other variables, aside from the one under consideration. This is done to obtain a better estimation of differences.

The unmatched category which is also known as the independent category contains randomly selected samples with variables that do not depend on the values of other ordinal variables. Here, you base your analysis on the assumption that the samples are independent, except in a few cases.

Differences Between Nominal and Ordinal Variable

- The ordinal variable has an intrinsic order while nominal variables do not have an order.



- It is only the mode of a nominal variable that can be analyzed while analysis like the median, mode, quartile, percentile, etc. can be performed on ordinal variables.
- The tests carried on nominal and ordinal variables are different.

Similarities Between Nominal and Ordinal Variable

- They are both types of categorical variables.
- They both have an inconclusive mean and a mode.
- They are both visualized using bar charts and pie charts.

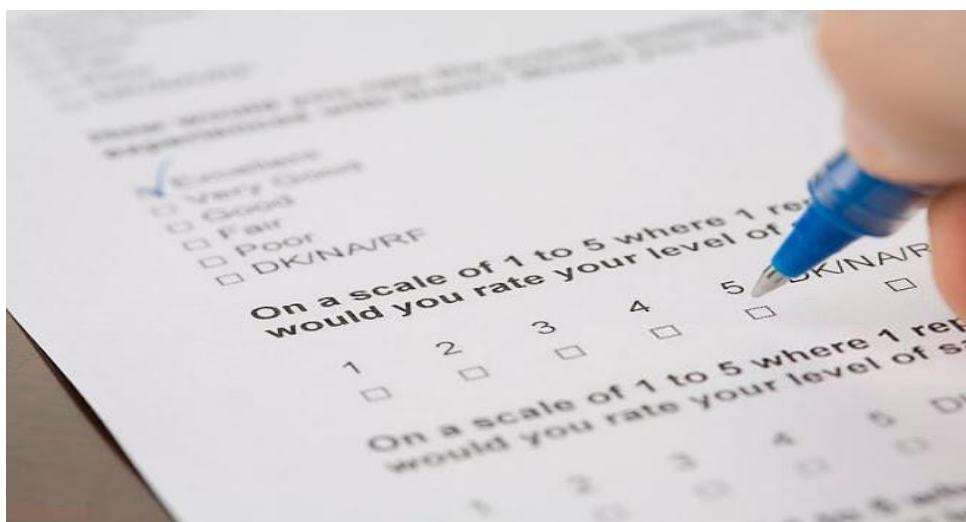
3. Interval Variable

Interval variables *have values that lie along an evenly dispersed range of numbers*. Examples of interval data include *temperature, a person's net worth* (how much money you have when you subtract your debt from your asset) etc.

According to Formplus Blog, the *interval variable is a measurement variable that is used to define values measured along a scale, with each point placed at an equal distance from one another*. It is one of the two types of numerical variables and is an extension of the ordinal variable.

You have to put in mind that unlike ordinal variables that take values with no standardized scale, every point in the interval scale is equidistant. Furthermore, Arithmetic operations can also be performed on the numerical values of the interval variable.

There are a number of Arithmetic operations that you know. But in interval variable, these arithmetic operations are, however, just limited to addition and subtraction. Examples of interval variables include; temperature measured in Celsius or Fahrenheit, time, generation age range, etc.



<https://www.formpl.us/blog/nominal-ordinal-interval-ratio-variable-example#:~:text=A%20nominal%20variable%20is%20a,intrinsic%20ordering%20of%20thes e%20categories.&text=Some%20examples%20of%20nominal%20variables,%2C%20Name% 2C%20phone%2C%20etc.>

There are a number of Arithmetic operations that you know. But in interval variable, these arithmetic operations are, however, *just limited to addition and subtraction*. Examples of interval variables include: *temperature measured in Celsius or Fahrenheit, time, generation age range, etc.*

Characteristics of Interval Variable

The following are the characteristics of interval variable according to Formplus Blog:

- It is one of the 2 types of quantitative variables. It takes numeric values and may be classified as a continuous variable type.
- Arithmetic operations can be performed on interval variables. However, these operations are restricted to only addition and subtraction.
- The interval variable is an extension of the ordinal variable. In other words, we could say interval variables are built upon ordinary variables.
- The intervals on the scale are equal in an interval variable. The scale is equidistant.
- The variables are measured using an interval scale, which not only shows the order but also shows the exact difference in the value.
- It has no zero value.

Now that you know the characteristics of interval variable, let us have some examples for you to better understand the topic.

Examples of Interval Variable

- Temperature: Temperature, when measured in Celsius or Fahrenheit is considered as an interval variable.
- Mark Grading: When grading test scores like the UPCAT, the PUPCET, the periodical exams, for example, we use numbers as a reference point.
- Time: Time, if measured using a 12-hour clock, or it is measured during the day is an example of interval data.
- IQ Test: An individual cannot have a zero IQ, therefore satisfying the no zero property of an interval variable. The level of an individual's IQ will be determined, depending on which interval the score falls in.

Categories of Interval Variable



There are two main categories of interval variables, namely; *normal distribution* and *non-normal distributions*.

What is normal distribution?

Normal Distribution is also called **Gaussian distribution** and is used to represent *real-valued random variables with unknown distribution*. This can be further *divided into matched and unmatched samples*

The normal distribution is also called *Non-Gaussian distribution*, and is used to represent real-valued random variables with known distribution. Like the normal distribution, it can also be further divided into matched and unmatched samples.

4. Ratio Variable

Ratio variables have *values that lie along an evenly dispersed range of numbers when there is an absolute zero*, as opposed to net worth, which can have negative debt-to-income ratio-level variable. What does this mean? This means that you cannot have an income or some positive amount of income. Most score stemming from response to survey items are ratio-level values because they typically cannot go below zero.

To explain further, let us have the explanation of Formplus Blog of this type of variable as it is more comprehensive.

Accordingly, the *ratio variable is one of the two types of continuous variables*, where the interval variable is the 2nd. It is an extension of the interval variable and is also the peak of the measurement variable types.

Bear in mind that the *only difference between the ratio variable and interval variable is that the ratio variable already has a zero value*. For example, *temperature, when measured in Kelvin is an example of ratio variables*.

The presence of a zero-point accommodates the measurement in Kelvin. Also, unlike the interval variable multiplication and division operations can be performed on the values of a ratio variable.

Characteristics of Ratio Variable

Ratio variables have absolute zero characteristics. The zero point makes it possible to measure multiple values and perform multiplication and division operations. Therefore, we can say that an object is twice as big or as long as another.

- It has an intrinsic order with an equidistant scale. That is, all the levels in the ratio scale has an equal distance.
- Due to the absolute point characteristics of a ratio variable, it doesn't have a negative number like an interval variable.



Therefore, before measuring any object on a ratio scale, researchers need to study first if it satisfies all the properties of an interval variable and also the zero point characteristic.

- Ratio variable is the peak type of measurement variable in statistical analysis. It allows for the addition, interaction, multiplication, and division of variables.

Do not forget that all statistical analysis including mean, mode, median, etc. can also be calculated on the ratio scale.

Let us then have some examples for better understanding of this concept.

Examples of Ratio Variable

Here are some examples of ratio variables according to their uses according to Formplus Blog:

- **Multiple Choice Questions**

Multiple choice questions are mostly used for academic testing and ratio variables are sometimes used in this case. Especially for mathematics tests, or word problems we see many examples of ratio variables.

Let us illustrate this with this example:

If Frank is 20 years old and Paul is twice as old as Frank. How old will Paul be in the next 10 years?

- 20
- 30
- 40
- 50
- 60

- **Surveys/Questionnaires**

Organizations use this tool whenever they want to get feedback about their product or service, perform market research, and competitive analysis. They use ratio variables to collect relevant data from respondents.

To illustrate:

How much time do you spend on the internet daily?

- Less than 2 hours
- 3-4 hours
- 5-6 hours
- More than 6 hours

- **Measurement**



When registering for national passport, national ID card, etc. there is always a need to profile applicants. As part of this profiling, a record of the applicant's height, weight, etc. is usually taken.

What is your height in feet and inches?

- Less than 5ft
- 5ft 1inch – 5ft 4inches
- 5ft 5inches – 5ft 9inches
- 6ft and above

What is your weight in kilograms?

- Less than 50 kgs
- 51 – 70 kgs
- 71 – 90 kgs
- 91 – 110 kgs
- More than 110 kgs

Categories of Ratio Variable

Bear in mind that the *categories of ratio variables are the same as that of interval variables*. Ratio variables are also *classified into Gaussian and Non-Gaussian distributions*. Also, they are both *further divided into matched and unmatched samples*.

To conclude this part of the module, put in mind that the classification of variables according to their measurement type is very useful for you in concluding which analytical procedure should be used. It helps you to determine the kind of data to be collected, how to collect it and which method of analysis should be used.

Remember that for a nominal variable, it is quite easy to collect data through open-ended or closed-ended questions. However, there is also a lot of downsides to this, as nominal data is the simplest data type and as such has limited capabilities.

Ratio variable, on the other hand, is the most complex of the measurement variables and as such can be used to perform the most complex analysis. Even at that, it may be unnecessarily complex times and one of the other variable types will be a better option.

Our next very important and interesting topic is kind of variables. The major kinds of variables are **independent, dependent, intervening or mediating, control, and compounding variables**.

1. Independent Variable



Independent variables are *those that probably cause, influence, or affect outcomes*. They are invariably called *treatment, manipulated, antecedent or predictor* variables.

An independent variable is exactly what it sounds like. *It is a variable that stands alone and isn't changed by the other variables you are trying to measure*. For example, someone's age might be an independent variable.

Other factors (such as what they eat, how much they go to school, how much television they watch) aren't going to change a person's age. In fact, when you are looking for some kind of relationship between variables you are trying to see if the independent variable causes some kind of change in the other variables, or dependent variables.

Independent Variable Examples

- ❖ A scientist is testing the effect of light and dark on the behavior of moths by turning a light on and off. The *independent variable is the amount of light* and the moth's reaction is the dependent variable.
- ❖ In a study to determine the effect of temperature on plant pigmentation, *the independent variable (cause) is the temperature*, while the amount of pigment or color is the dependent variable (the effect).

2. Dependent Variable

Dependent variables are those that depend on the independent variables. They are the outcomes or results of the influence of the independent variable.

Just like an independent variable, a dependent variable is exactly what it sounds like. *It is something that depends on other factors*. For example, a test score could be a dependent variable because it could change depending on several factors such as how much you studied, how much sleep you got the night before you took the test, or even how hungry you were when you took it. Usually when you are looking for a relationship between two things you are trying to find out what makes the dependent variable change the way it does.

Dependent Variable Examples

Let us use the same example that we have for the independent variable. As you can see, in the given examples, the independent and dependent variables are clearly given.

- ❖ A scientist is testing the effect of light and dark on the behavior of moths by turning a light on and off. The independent variable is the amount of light and *the moth's reaction is the dependent variable*.



- ❖ In a study to determine the effect of temperature on plant pigmentation, the independent variable (cause) is the temperature, while *the amount of pigment or color is the dependent variable (the effect)*.

3. Intervening/Mediating Variables

Intervening or mediating variables “stand between” the independent and dependent variables. They show the effects of the independent variable on the dependent variable.

An intervening variable is *a hypothetical variable used to explain causal links between other variables*. Intervening variables cannot be observed in an experiment (that’s why they are hypothetical). For example, *there is an association between being poor and having a shorter life span*. Just because someone is poor doesn’t mean that will lead to an early death, so other hypothetical variables are used to explain the phenomenon. These intervening variables could include: lack of access to healthcare or poor nutrition.

There are limitations on intervening or mediating variables. **Intervening variables** are *hypothetical constructs like personality, intelligence or attitude*. As they are not “real” variables, *one major limitation is that they cannot be measured*. It is therefore impossible to quantify how much of the experimental results are due to the independent variables, and how much are due to each of the intervening variables.

For example, there is an observed positive correlation between level of education and level of income, such that people with higher levels of education tend to earn higher levels of income. This observable trend, however, is not directly causal in nature. *Occupation serves as the intervening variable* between the two, since education level (the independent variable) influences what kind of occupation one will have (the dependent variable), and therefore how much money one will earn. In other words, more schooling tends to mean a higher status job, which in turn tends to bring a higher income.

4. Control Variable

Control variables are *special types of independent variables that are measured in a study because they potentially influence the dependent variable*. You use statistical procedures (e.g. analysis of variance) to control these variables. They may be demographic or personal variables that need to be “controlled” so that the true influence of the independent variable on the dependent can be determined.



An experiment has several types of variables, including a control variable (sometimes called a controlled variable). Variables are just values that can change; **a good experiment only has two changing variables: the independent variable and dependent variable.** *Let's say you are testing to see how the amount of light received affects plant growth:*

- The **independent variable**, in this case the **amount of light**, is changed by you, the researcher.
- As you change the independent variable, you watch what happens to the **dependent variable**. In this case you see how much the **plants grow**.
- A **control variable** is another factor in an experiment; it must be held constant. In the plant growth experiment, this may be factors like **water** and **fertilizer levels**.

5. Confounding Variable

The last kind of variable in this lesson is the confounding variable. **Confounding variables** are *those that are not actually measured or observed in a study*. They exist but their influence cannot be directly detected in a study. Researchers, like you, comment on the influence of confounding variables after the study has been completed, because these variables may have operated to explain the relationship between the independent variable and dependent variable, but they were not or could not be easily assessed.

In an article, statisticshow.com says that a *confounding variable is an "extra" variable that you didn't account for*. They can ruin an experiment and give you useless results. They can suggest there is correlation when in fact there isn't. They can even introduce bias. That's why it's important to know what one is, and how to avoid getting them into your experiment in the first place.

The same site furthers illustrates:

In an experiment, the independent variable typically has an effect on your dependent variable. For example, if you are researching whether lack of exercise leads to weight gain, lack of exercise is your independent variable and weight gain is your dependent variable. *Confounding variables are any other variable that also has an effect on your dependent variable*. They are like extra independent variables that are having a hidden effect on your dependent variables. Confounding variables can cause **two major problems**:

- Increase variance
- Introduce bias

Let's say you test 200 volunteers (100 men and 100 women). You find that lack of exercise leads to weight gain. One problem with your experiment



is that it lacks any control variables. *For example*, the use of placebos, or random assignment to groups. So you really can't say for sure whether lack of exercise leads to weight gain. *One confounding variable is how much people eat*. It's also possible that men eat more than women; this could also make sex a confounding variable. Nothing was mentioned about starting weight, occupation or age either. A poor study design like this could lead to bias. *For example*, if all of the women in the study were middle-aged, and all of the men were aged 16, age would have a direct effect on weight gain. That makes age a confounding variable.

Independent and Dependent Variables

We have previously discussed on independent and dependent variables. Do you still remember them?

Independent variables stand alone and they are not changed by the other variables you are trying to measure.

Examples of independent variables are age, gender, what people eat, how much time they spend using gadgets, how much television they watch or how much time youngsters spend on computer games.

Dependent variables are what researchers are interested in. they depend on other factors. For example, a test score could be a dependent variable because it could change depending on several factors such as how much you studied, how much sleep you got the night before you took the test, or even how hungry you were when you took it. In sum, the changes in the dependent variables are what the researcher is trying to measure with varied scientific techniques.

Let us have this example phenomenon given by Patrick Regoniel as cited by Prieto, et al:

Phenomenon A: Climate Change

Examples of variables related to climate change:

1. sea level
2. temperature
3. the amount of carbon emission
4. the amount of rainfall

Let us explain according to Prieto, et al:

In the *above phenomenon on climate change*, **temperature** is the *independent* variable which may influence **sea level** which is our *dependent variable*. Increased temperature will cause expansion of water in the sea. Thus, sea level rise on a global scale may occur.

Let us have another phenomenon:



Phenomenon B: Crime and Violence on Streets

Examples of variables related to crime and violence in streets:

1. number of robberies
2. number of attempted murders
3. number of prisoners
4. number of crime victims
5. number of law enforcers
6. number of convictions
7. number of carnapping incidents

In the second phenomenon, crime and violence on streets, the **independent variable** may be the *number of law enforcers* and **dependent variable** is the *number of robberies*.

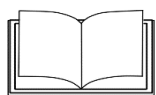
Usually, when you are looking for some kind of relationship between variables, you are trying to see if the independent variable causes some kind of change in the other variables, or dependent variables.

Let us have another example from the same authors we are citing in this lesson. If you are studying the impact of a new enrolment procedure on the school personnel and the students, the **new enrolment procedure** is the *independent variable* and the **impact of the new enrolment procedure** is the *dependent variable*.

The following is one of the best ways to distinguish an independent variable from a dependent variable.

Independent variable causes a change in dependent variable and it is not possible that dependent variable could cause a change in independent variable.

Remember: Time spent studying causes a change but it is not possible that test score could cause a change in time spent studying.



What's More

Answer the activities that will follow to practice your knowledge and skill about the topic of kinds of variables and their uses.

Activity 1

Differentiate the kinds of variables by writing about their characteristics based on your own understanding. Put your answer in the table below.



Kinds of Variables	
Variable	Characteristics
1. Independent variable	
2. Dependent variable	
3. Intervening variable	
4. Control variable	
5. Confounding variable	

Activity 2

Discuss the nature of variables and data in your own words. Write a paragraph explaining your answer containing of at least 150 words. Use the rubric below as your guide in writing your answer.

Criteria	Outstanding 10 points	Very Satisfactory 8 points	Satisfactory 6 points	Needs Improvement 4 points
Content	Topics is well discussed. Work includes the types of variables and examples are provided.	Topic is satisfactorily discussed. Some types of variables and examples are included.	Topic is somehow discussed with lesser inclusions of some types of variables and examples.	Topic is not discussed properly and types of variables and examples are not given.

Write your answer here:



dependent variables. It is simply a summary of the relationships observed between independent and dependent variables.

_____ 4. It is being measured or tested in an experiment or research. Without it there will be no results.

_____ 5. It is manipulated to determine the value of another variable. It is what is being measured in an experiment or evaluated in a mathematical equation.



What I Have Learned

In this lesson, we focused on the kinds of variables and its uses.

What are variables? Why are they important? _____

How is dependent variable different from independent variable? Give an example. _____

What are the four types of variables? Explain each. _____

What are the kinds of variables? Explain each. _____



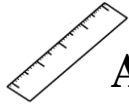
What I Can Do

Apply what you have learned on the importance of quantitative research across disciplines by doing the activity that will follow.

Figure out independent and dependent variables in the following phenomena or situations. Underline the dependent variable once; the independent variable twice.

1. A health psychologist wants to learn more about how stress influences memory.
2. A psychologist is interested in studying how a therapeutic technique influences the symptoms of psychological disorders.
3. A researcher is interested in studying how the amount of time spent studying influences test scores.
4. In a psychology experiment, researchers want to discover if listening to classical music helps students earn better grades on a math exam.
5. Researchers are interested in seeing how long it takes people to respond to different sounds.





Assessment

Showcase the knowledge and skills you have learned in this lesson by answering the assessment activity.

A. Fill in the blank with the correct answer.

1. A variable is any factor, trait, or condition that can exist in _____ amounts or types.

A. absolute

C. exact

B. differing

D. precise

2. _____ variables exist but their influence cannot be directly detected in a study.

A. Confounding

C. Dependent

B. Control

D. Intervening

3. _____ variable is the most complex of the measurement variables and as such can be used to perform the most complex analysis.

A. Interval

C. Ordinal

B. Nominal

D. Ratio

4. The most common variables in social research are age, sex, _____, education, income, marital status and occupation.

A. address

C. height

B. gender

D. weight

5. The interval variable is a measurement variable that is used to define _____ measured along a scale, with each point placed at an equal distance from one another.

A. attributes

C. perceptions

B. generalizations

D. values

6. In a matched category, all the values of the nominal variable are paired up or group so that each member of a group has similar characteristics except for the variable under _____.



- A. causation
B. inclusion
C. interrogation
D. investigation
7. A Likert scale is a psychometric scale used by researchers to prepare _____ and get people's opinions.
- A. concepts
B. interviews
C. questionnaires
D. theories
8. The variables included in a personal biodata is a _____ variable.
- A. interval
B. nominal
C. ordinal
D. rational
9. Ordinal variables are built upon nominal scales by assigning _____ to objects to reflect a rank or ordering on an attribute.
- A. categories
B. explanations
C. numbers
D. values
10. An independent variable is a variable that stands alone and isn't _____ by the other variables you are trying to measure.
- A. changed
B. measured
C. qualified
D. studied

B. Differentiate the kinds of variables and their uses. (10pts)

Use another sheet of paper for your answer.



Additional Activities

Using the table below, provide a concrete example of an independent variable and dependent variable. Write in a complete sentence.

Independent Variable	Dependent Variable

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