

This Practice Examination consists of 50 multiple-choice questions and assesses the five units of this course.

<b>Unit #</b>	<b>Name</b>	<b>Questions</b>	<b>% of Total</b>
<b>1</b>	<b>Introduction to Research in Psychology</b>	<b>1 – 10</b>	<b>20%</b>
<b>2</b>	<b>Theories &amp; Measurement</b>	<b>11 – 20</b>	<b>20%</b>
<b>3</b>	<b>Non-experimental Research Methods</b>	<b>21 – 30</b>	<b>20%</b>
<b>4</b>	<b>Experimental Research Methods</b>	<b>31 – 40</b>	<b>20%</b>
<b>5</b>	<b>Data Analysis &amp; Communication of Results</b>	<b>41 – 50</b>	<b>20%</b>

## Unit 1—Introduction to Research in Psychology (20%)

Read the description below to answer questions 1–9.

You and a friend are debating whether children prefer primary colours (red, yellow, blue). Your friend says kids prefer primary colours but you're not so sure. When you ask them how they know this, they say, "Everyone just knows that!" To test this idea, you find a group of 25 children (5–10 year olds) and you give each child 50 candies that are a mixture of equal numbers of purple, red, yellow, green, and orange bricks. Each child can pick 10 candies. You measure the three most common colours that they choose.

1. Which approach to knowledge is your friend using in this scenario?
  - a. common sense
  - b. appeal to authority
  - c. personal insight / faith
  - d. scientific method
  
2. What is the variable that you are measuring in this project?
  - a. The three most common candy colours chosen.
  - b. The number of children in the project.
  - c. The mixture of 60 Lego bricks.
  - d. The one brick colour that each child plays with the most.
  
3. What key characteristic makes your approach more scientific than your friend's approach?
  - a. quantification
  - b. replication
  - c. validation
  - d. observation
  
4. Why is a scientific approach generally preferable to answering questions like the one in the scenario?
  - a. It is always right.
  - b. It minimizes the limited and biased nature of personal experience.
  - c. It produces knowledge that is certain and never changing.
  - d. It is the preferred method when there are not authorities one can appeal to.

5. What kind of variable is Lego brick colour in the above scenario?
- quantitative
  - numerical
  - categorical
  - empirical
6. What can we say about the children used in the study?
- Because only a few children from one culture were used, we can't make any conclusions.
  - They are a valid population of children and their results can be reliably generalized to all children.
  - Studies like this allow you to generalize from a sample of 5–7 year olds to children ranging from 2–4 years old.
  - They are a sample of children from which we can generalize to other 5–7 year olds that are similar to them.

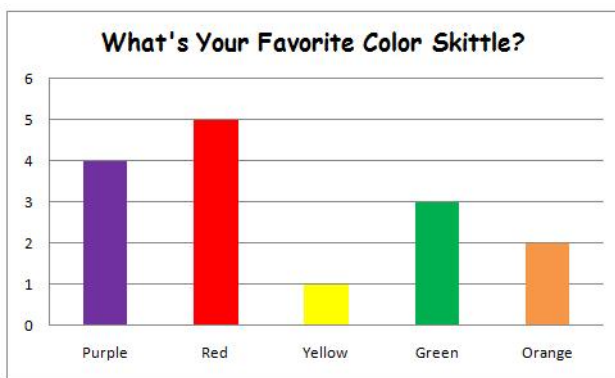


Figure 1: The average number of five differently colored candies chosen by 5–10 year old children.

Source: <http://www.psychology4a.com/psychological-research-and-scientific-method.html>

7. What kind of data graph is depicted in Figure 1 above?
- bar graph
  - scatterplot
  - positive correlation
  - inverse U-function

8. In the scenario described above, it would be a reasonable assumption that some of the children might eat some of the candies even if they had been told not to. It is also a reasonable assumption that some of those children might be allergic to ingredients in the candies or may be frustrated by not being able to eat them. Which ethical principle would be most clearly violated by a failure to let the children and their legal guardians know that they will be exposed to candies in the study?
- Respect for Confidentiality
  - Respect for Persons
  - Justice
  - Respect for Privacy
9. Imagine that the study in the scenario was actually not about color preferences but actually about how much will power children of different ages have when exposed to candy and told not to eat any. The children will be told that the study is about something other than will power because deceiving them is necessary to getting unbiased data on their will power. What procedure must you include in your study to ensure good research ethics conduct?
- You can never conduct psychological studies that involve deception of any kind.
  - About one month after the study, you should let the children and their guardians know that deception had been used. It is important to wait this long so that any harm from the deception will be minimized because the children will have mostly forgotten participating in the study.
  - Conduct a debriefing as soon as possible revealing the deception, justifying its use, and answering any questions.
  - During the informed consent procedure, tell the children and guardians that deception will be involved but that you can't say where, when, or why it will happen.
10. What kind of statistical relationship between variables describes the finding that performance on a Research Methods practice exam increases the more one studies (in hours)?
- differences between groups
  - positive correlation
  - scatterplot
  - quantitative relationship

## Unit 2—Theories & Measurement (20%)

Read the description below to answer questions 11–13.

Prospect theory describes decision making under conditions of uncertainty and risk. The theory predicts that people tend to avoid risks when things are going well and they tend to seek risks when things are going badly. The theory has consistently revealed that people's decisions are driven more by emotion than reason and these counter-intuitive findings overturned the dominant economic model of how humans make financial decisions. In one study, it was shown that the pain felt by people who have \$50 taken away is greater than the joy felt by those same people who win \$50.

11. What makes Prospect theory a good scientific theory of human behaviour?
  - a. It clearly organizes a set of observations; it allows for specific predictions to be made; and it generates new hypotheses.
  - b. It describes a set of outcomes with precision; it allows us to predict human behaviour independent of context; it is counter-intuitive.
  - c. Because it has been verified by many experiments it cannot be falsified now; it makes statistical predictions that apply across many different people and situations.
  - d. There are no good scientific theories of human behaviour; there are only the results of good or bad experiments.
  
12. Good scientific theories can be falsified. How could we begin to falsify prospect theory?
  - a. Argue that comparing wins to losses is illogical.
  - b. Repeat the study using very different participants and a different set-up. If the same finding does not happen, then the theory is false.
  - c. The theory is false if a different theory exists that accounts for people's risky decisions and if that theory is more widely believed by experts.
  - d. Repeat the study in exactly the same way and show that the joy felt by people who win \$50 is greater than the sorrow of people who lose \$50.
  
13. Prospect theory has been supported by many experiments in both psychology and economics. The theory explains many findings, some of which were quite puzzling. What property of good scientific theories is described by the ability of a theory to explain many findings?
  - a. falsifiability
  - b. precision
  - c. parsimony
  - d. predictability

**Read the description below to answer questions 14–20.**

The hormone melatonin is produced in the brain's pineal gland. Production increases in the darkness of night and helps prepare the body for sleep. Researchers want to test the theory that the blue component of light in TVs, cell phones, and other devices reduces melatonin production and, therefore, disrupt sleep. You design a study involving 100 volunteers. All the volunteers will be given laptops and told to watch a 2 hour movie in bed from 10pm to midnight after which they will go to sleep. The laptops given to half of the volunteers (Experimental Group) will be modified so that they do not emit any blue light. The other half (Control Group) has unmodified laptops. All participants are instructed to set an alarm for 6am and, immediately upon waking, they will rate the quality of their sleep using the following rating scale:

Quality of Sleep Rating Scale

1 = poor    2 = below average    3 = average    4 = above average    5 = excellent

One hour later, they will complete the Thurstone Test of Mental Alertness, which uses 126 items to measure a person's ability to acquire new knowledge and skills, understand relationships, and then apply to them to problem solving situations of varying complexity.

14. What psychological construct is being measured in the above experiment?
  - a. sleep quality
  - b. quantity of melatonin produced
  - c. number of hours slept
  - d. amount of blue light emitted
  
15. What prediction are the researchers making?
  - a. The experimental group will have worse sleep quality but higher mental alertness scores than the control group.
  - b. Whichever group sleeps longer will perform better on the mental alertness test.
  - c. Those people who are naturally sensitive to blue light will be most affected on both the quality of sleep and mental alertness measurements.
  - d. The experimental group will have worse sleep quality and lower mental alertness scores than the control group.

16. Which of the following would be an operational definition of mental alertness?
  - a. The participants' self-assessed sleep quality ratings.
  - b. Score on the mental alertness test.
  - c. The type of mental errors made throughout the experiment.
  - d. The difference in intelligence levels between the experimental and control groups.
  
17. What level of measurement is used by the Sleep Rating Scale?
  - a. nominal
  - b. ordinal
  - c. interval
  - d. ratio
  
18. The researchers who first developed the Thurstone Test of Mental Alertness (TTMA) found a correlation of  $+0.80$  between people who had been given the test and then given the same test a month later. What does this finding mean?
  - a. The TTMA has high test-retest reliability.
  - b. The TTMA has good split-half consistency.
  - c. The TTMA has good inter-rater reliability.
  - d. The TTMA has good face validity but not good content validity.
  
19. Quality of sleep can be assessed in a number of ways. In this study, the researchers chose to use two different operational definitions of sleep quality. Which two of the three categories did they use?
  - a. self-report; physiological
  - b. self-report; behavioural
  - c. behavioural; physiological
  - d. converging; behavioural
  
20. If the scores on the quality of sleep rating scale do not correlate with performance on the TTMA, then which form of validity has been compromised?
  - a. discriminant
  - b. face
  - c. content
  - d. convergent

## Unit 3—Non-experimental Research Methods (20%)

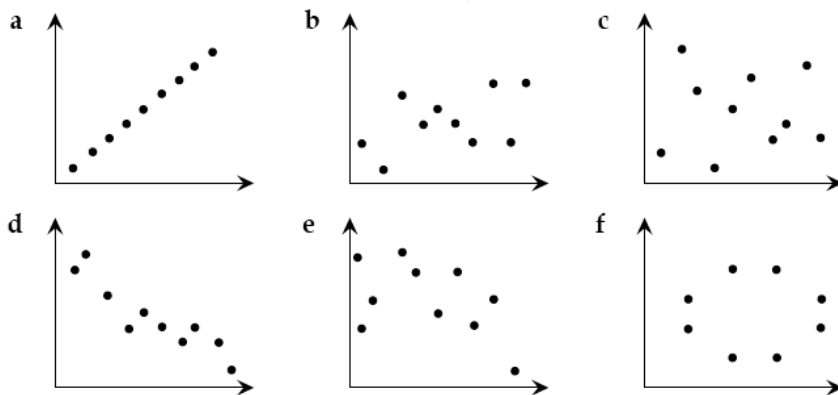


Figure 2. Six Different Scatterplots

21. Which of the six scatterplots in Figure 2 above indicate the following relationships:  
 $r = +1.0$ ;  $r = -0.4$ ;  $r = 0$
- A; B; C
  - A; E; F
  - D; B; F
  - A; C; D
22. Kim Peek was a man with incredible mental talents and was the inspiration for the film *Rain Man*. He could read a book in 1 hour and remember 98% of it. He could accurately recall the details of some 12,000 books. He would simultaneously read the left page with his left eye and the right page with his right eye. What research method would psychologists use if they wanted to study Kim's specific abilities in great depth?
- naturalistic observation
  - archival research
  - case study
  - quasi-experimental



23. Researchers were interested in the relationship between self-esteem and depression. They recruited 50 people currently experiencing depression and 50 people without symptoms of depression. They then assessed levels of self-esteem in both groups. Why is this a quasi-experimental research method?
- The researchers couldn't control who was and wasn't depressed.
  - It is unethical to measure people's levels of self-esteem when they are already depressed.
  - Low self-esteem causes depression.
  - The relationship between self-esteem and depression is too complicated for this to be a naturalistic study.

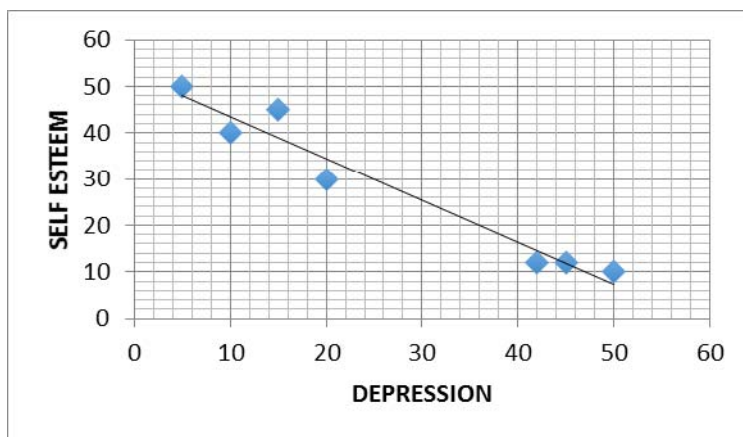


Figure 3. Correlation between Self-Esteem and Depression

24. Figure 3 above shows the relationship between Self-Esteem scores and Depression scores based on questionnaire data. What can we conclude about this relationship?
- High levels of depression cause low levels of self-esteem.
  - Low levels of self-esteem cause high levels of depression.
  - Self-esteem and Depression are positively correlated.
  - Self-esteem and Depression are negatively correlated.

25. Researchers want to study how self-esteem changes in children from kindergarten to Grade 12. They decide to recruit a sample of 500 kindergarten kids of both genders and from 12 schools across the country. Self-esteem will be assessed by having the kids rate their own self-esteem using age-appropriate assessments and by having their teachers assess their self-esteem. What kind of research design is being used?
- longitudinal
  - cross-sectional
  - multiple case-study
  - quasi-experimental
26. In the study on children's self-esteem described above, 3 of the schools were private schools with expensive tuitions and 9 were publically funded schools. Which threat to internal validity is most likely present because of this situation?
- maturation
  - regression to the mean
  - selection by maturation interaction
  - instrumentation
27. Which of the following is **NOT** a limitation of survey research?
- Survey results can describe relationships that help to confirm or reject theories.
  - Responses can be biased by the nature of the question.
  - Respondents may not understand a question.
  - Responses are sensitive to the method in which the survey was collected (e.g., phone vs. online).
28. Researchers wanted to know how many students check their cell phones during lectures. They asked a student to work with them and sit in the back of the classroom and record all instances of cellphone use during a 1 hour lecture. What is an advantage of this research method?
- Cause and effect relationships can be determined if the students do not realize that they are being observed.
  - This method is particularly good at study rare phenomena.
  - This method is more ethical than video-recording the students because one of their own is obtaining the data.
  - The data are not collected in an artificial lab but in the real world environment in which they occur.

29. Researchers want to know if a dietary supplement might improve short-term memory in adults over 70 years old. They give the supplement followed by the memory test a day later and then the same memory test 3 days later. Which threat to internal validity is most likely present because of this situation?
- maturation
  - selection
  - history
  - testing
30. In order of highest to lowest, which research methods have the highest internal validity?
- correlational, case studies, quasi-experimental
  - experimental, quasi-experimental, correlational
  - case studies, archival, experimental
  - naturalistic, case study, correlational

## Unit 4—Experimental Research Methods (20%)

Read the description below to answer questions 31–40.

**Hypothesis:** Does expressive writing therapy help first year university students who are experiencing relationship turmoil?

**Participants:** Sixty university students (19–22 years old) volunteer. Participants are told that this study is about how writing about relationship difficulties affects memory so as to not reveal the real purpose of the study. They will be told the real purpose during the debriefing.

### Method

Participants are randomly assigned into either an expressive writing group (30 students) or a journal-writing group (30 students).

- a) Expressive Writing Group: Write about your relationship difficulties using very personal and emotional language.
- b) Journal-Writing Group: Write about your day focusing on what you did, whom you met, and where you went. Be as objective as possible.
- c) Write for 20–25 minutes per day for four consecutive days.
- d) Do not worry about punctuation, grammar or spelling.

**Assessment:** Participants will complete a short-term memory test and The Relationship Assessment Scale (RAS), a seven-item measure of an individual's satisfaction with their relationship before and after the writing phase of the study.

31. What is the most important dependent variable in this study?
  - a. expressive writing
  - b. journal-writing
  - c. relationship satisfaction as measured by the RAS
  - d. the 100 multiple-choice questions
  
32. Name the type of selection and the type of assignment of the participants to the study's conditions.
  - a. random selection and random assignment
  - b. random selection and non-random assignment
  - c. non-random selection and non-random assignment
  - d. non-random selection and random assignment

33. This study uses a single-blind procedure. What does this mean?
- Neither the participants nor the researchers know who is in what condition.
  - The participants do not know what condition they are in.
  - The treatment is administered only once.
  - Mild deception is being used.
34. What is the independent variable?
- scores on the Relationship Assessment Scale
  - first year university students
  - performance on the memory test
  - the type of writing (expressive vs. journal)
35. Which of the following could be a confounding variable in this study?
- Writing expressively about relationship difficulties may lead participants to talk to their friends about their difficulties. Talking may have more therapeutic effect than the writing.
  - People with relationship difficulties are different than people who do not have relationship difficulties. Perhaps such people are generally more apt to have difficulties in all kinds of relationships.
  - The memory test may cause people to remember other traumas and these traumas could interfere with the treatment.
  - People who are illiterate and cannot write will not be represented in this study.
36. The participants in this study were first year university students (19–22 years old). One criticism of this study is that the results cannot be generalized to other people, for example, 40–50 year old people. What kind of validity is this problem highlighting?
- internal validity
  - construct validity
  - external validity
  - criterion validity

37. What question will a pilot test **NOT** be able to answer?
- Does expressive writing lead to a statistically significant increase in relationship satisfaction?
  - Does it appear that the participants are guessing the question or hypothesis?
  - How long does the procedure take per participant and is there evidence they are become either bored or frustrated?
  - Do participants understand the instructions and, if not, what kind of misunderstandings do they have?
38. It has been theorized that expressive writing increases relationship satisfaction by providing deeper cognitive and emotional processing of the problem, which helps bring perspective, diminish recurrent negative thoughts, and find solutions. To confirm that this is the mechanism of action, the researchers could have used assessments that, for example, measured reductions in recurrent negative thoughts. What is such a confirmation procedure called?
- the confirmation bias
  - a manipulation check
  - statistical validation
  - variable confirmation
39. What type of research design did the researchers use?
- waitlist control design with double-blinding
  - randomized clinical trial
  - randomized, between-subjects design
  - non-randomized, within-subjects design
40. A within-subjects design might have improved this study in what way is superior to a between-subjects design in this regard?
- The within-subjects design is much easier to run.
  - The within-subjects design is less susceptible to carryover effects.
  - The within-subjects design better detects statistical relationships by controlling extraneous variables.
  - The within-subjects design usually avoids the need for counterbalancing.

**Unit 5—Data Analysis & Communication of Results (20%)**

PRACTICE EXAM SCORE	FREQUENCY
50	1
48	1
45	2
42	7
40	5
38	2
35	2

41. The frequency table above shows hypothetical data from a study looking at the scores of students completing a Practice Exam in an online Research Methods course. What is the most frequent score?
- 50
  - 45
  - 42
  - 7
42. In addition to p-values, it is good practice to report effect sizes. What do measures of effect size, like Cohen's  $d$ , assess?
- Whether or not an experimental treatment was effective.
  - The central tendency of a data set.
  - The height of a distribution divided by its width.
  - The strength of a statistical relationship.

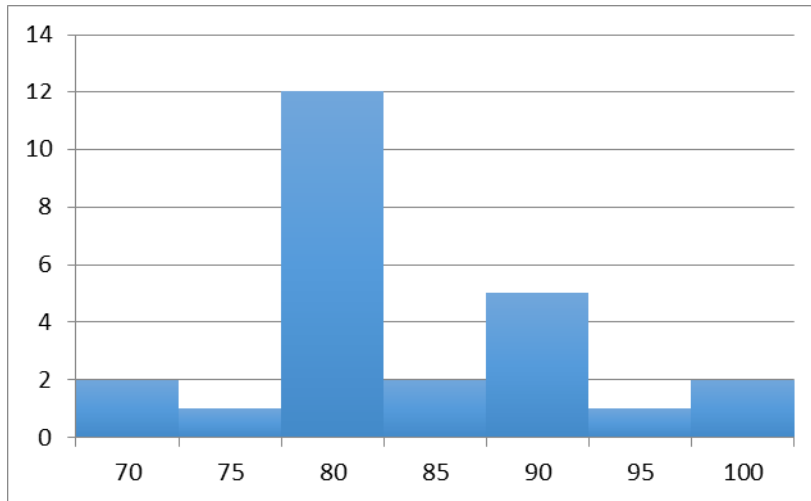


Figure 4. Histogram of Practice Exam Scores

43. Examine the histogram above (Figure 4) that plots the frequency of Practice Exam Scores (in percentages) from 25 students. What is the median score?
- 70
  - 80
  - 90
  - 100
44. For the histogram of Practice Exam Scores, what measure of “average” is least likely to be distorted by extreme scores?
- the mean
  - the mode
  - the median
  - the standard deviation
45. The top five students received the following scores (%): 90, 90, 95, 100, 100. What is the mean score?
- 90
  - 92
  - 95
  - 99



46. What do measures of effect size, like Cohen's  $d$ , assess?
- The strength of a statistical relationship.
  - The central tendency of a data set.
  - The height of a distribution divided by its width.
  - Whether or not an experimental treatment was effective.
47. For participants in the expressive writing and relationship quality study, the expressive writing group had a mean relationship satisfaction score of 30.50 with a standard deviation of 2.00, while the journal-writing group had a mean relationship satisfaction score of 25.20 with a standard deviation of 1.90. Describe these results using the APA style guidelines.
- Participants in the expressive writing condition experienced greater relationship satisfaction scores ( $M = 30.50, SD = 2.00$ ) than those in the journal-writing group ( $M = 25.20, SD = 1.90$ ).
  - Expressive writing participants were more satisfied with their relationships than journal writing participants: Mean = 30.50 vs. 25.20; Standard Deviation = 2.00 vs. 1.90).
  - Among the experimental participants, those expressing themselves had higher RAS scores (mean= 30.50, standard deviation = 2.00) than those in the control group (mean= 25.20, standard deviation = 1.90).
  - Experimental participants had higher RAS scores than Control participants:  $M = 31$  vs. 25;  $SD = 2.0$  vs. 1.9).

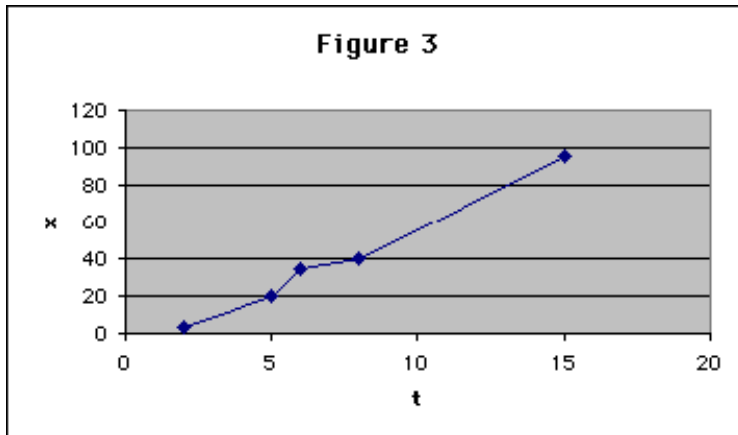


Figure 5. Line graph

48. Name two APA-style violations of graph design in the above graph (Figure 5).
- The y-axis should have stopped at 100; the x-axis should have stopped at 15.
  - There are no units; the “x” and “t” should have been capitalized.
  - The graph background should be white; the data points do not cover the range of the graph.
  - The x-axis and y-axis have no labels; the graph lacks an informative title.

**Correlation: BP, Age, Weight, BSA, Dur, Pulse, Stress**

	BP	Age	Weight	BSA	Dur	Pulse
Age	0.659					
Weight	0.950	0.407				
BSA	0.866	0.378	0.875			
Dur	0.293	0.344	0.201	0.131		
Pulse	0.721	0.619	0.659	0.465	0.402	
Stress	0.164	0.368	0.034	0.018	0.312	0.506

Figure 6. Correlation Matrix of Blood Pressure (BP), Age, Weight, Body Surface Area (BSA), Duration, Pulse, and Stress

49. Using the Correlation Matrix in Figure 6 above, determine the correlation between (i) Weight and Blood Pressure (BP) and (ii) Pulse and Weight.
- 0.659; 0.721
  - 0.407; 0.721
  - 0.659; 0.402
  - 0.950; 0.659

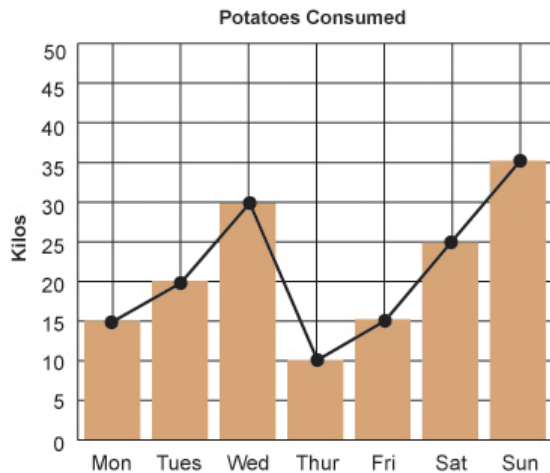


Figure 7. Daily Potato consumption for a 1 week period

50. Figure 7 shows daily potato consumption (kg) over a week period. The data are graphed both as a line graph and a bar graph. Which one is more appropriate?
- Generally, line graphs depict continuous variables that change over time; bar graphs depict categorical variables where quick comparisons are useful.
  - Both are equally good; whether you use a line graph or a bar graph is just a matter of preference.
  - A line graph can only be used for continuous data and a bar graph can only be used for categorical data.
  - Line graphs should always be used for large data sets where you need to show trends; bar graphs should always be used for small data sets where you want to highlight differences.

**END OF PRACTICE EXAM**