

Descriptive Statistics Worksheet

using MINITAB 14



Measures from a Psychology Student Survey

Introduction

The data in this worksheet are from completed questionnaires which gathered the following information about a cohort of 422 students:

- their background and characteristics, such as their GCSE Maths grade, gender and whether they were an only child;
- their beliefs, e.g. do they believe in UFOs, are they religious?;
- scores on various psychology tests such as the Eysenck Personality Inventory on extraversion and neuroticism;
- times taken to perform various tasks.

Reporting of results in almost any study involves summarising all the data. Here we will investigate the typical statistics of the measured variables (quantitative) and count information for the categorical variables (qualitative). Descriptive statistics and frequency tables will first be used to investigate the characteristics of all the students.

Getting started

The data are supplied in Excel format in the file *Measures.xls*.

- Start MINITAB and from the main menu select **File > Open Worksheet**;
- In the dialog box that appears choose to view **Files of type**: Excel (*.xls);
- In the **Look in** box navigate to the folder containing *Measures.xls*;
- Click on this file and then **Open**.

The worksheet contains 41 columns of data (more detail about the data can be found in the scenario for this worksheet):

C1	<i>studno</i>	Student ID code
C2	<i>faculty</i>	1 = Social Science, 2 = Humanities, 3 = Science, 4 = Medicine
C3	<i>gender</i>	1 = male, 2 = female
C4	<i>gcse_math</i>	1 = A, 2 = B, 3 = C, 4 = D, 5 = none
C5	<i>alevel_math</i>	1 = A, 2 = B, 3 = C, 4 = D, 5 = E, 6 = none
C6	<i>hand</i>	1 = left, 2 = right
C7	<i>onlychld</i>	1 = yes, 2 = no
C8-C14	Life-style questions, requiring answers of 1 = yes or 2 = no (<i>veggie, vegan, smoker, alcohol, typist, homecomp, compstud</i>)	
C15-C18	Life-style questions, requiring answers on a scale of 1-5 (<i>exercise, fit, compgame, gamble</i>)	
C19-C29	Questions on beliefs, scored 1 = very strongly disbelieve to 5 = very strongly believe (<i>astrol, esp, telekin, paranorm, reincarn, stud_par, ufo, alt_med, an_right, religiou, grapholo</i>)	
C30-C38	Psychology tests (<i>loc, epie, epin, epil, get_nfac, get_nfau, get_loc, get_cten, get_crt</i>)	
C39-C41	Timed activities(<i>rt_tot, mt, reactime</i>)	

You may find it easier to interpret your output if you first recode some of the variables.

- From the main menu choose **Data > Code > Numeric to Text**;
- Enter **gender** in **Code data from columns:** and **Into columns:** ;
- Enter **1** and **2** under **Original values:** with **male** and **female** respectively under **New**;
- Click on **OK**.

You can recode some of the other variables similarly – here it would be useful to recode *veggie* and *faculty*.

Eysenck Personality Inventory scores

The students are scored on three of these – for extraversion (*epie*), neuroticism (*epin*) and a “lie” scale (*epil*).

For *epie* a low score indicates being more introvert and a high score being more extravert.

For *epin* a low score indicates being more stable and a high score more neurotic.

For *epil* a low score indicates less inclination to give socially desirable responses whilst a high score indicates a greater inclination to give socially desirable responses.

Descriptive statistics for these variables may be reported in a single table.

- From the main menu choose **Stat > Basic Statistics > Display Descriptive Statistics**;
- Select *epie*, *epin* and *epil* in the **Variables:** box;
- Click on **OK** to obtain the following output.

Descriptive Statistics: epie, epin, epil

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3
epie	410	12	14.937	0.213	4.303	1.000	12.000	16.000	18.000
epin	410	12	13.359	0.262	5.301	0.000	10.000	14.000	17.250
epil	409	13	5.477	0.175	3.533	0.000	3.000	5.000	8.000

Variable	Maximum
epie	24.000
epin	24.000
epil	22.000

Q1. How would you describe the characteristics of the students in terms of their extraversion, neuroticism and inclination to give socially desirable responses?

Obtain the descriptive statistics for the General Entrepreneurial Tendency to have creative tendency (*get_cten*). Here, a higher score indicates a higher creative tendency, with a maximum possible score of 12.

Q2. Are these students creative?

Investigation of students' gender and faculty

Here we look at the breakdown of males and females in this study and the faculty in which they are based.

First the variables *gender* and *faculty* can be tabulated individually.

- From the main menu choose **Stat > Tables > Tally Individual Variables**;
- Select *gender* and *faculty* in the **Variables:** box, and under **Display:** tick **Counts** and **Percents**;
- Click on **OK** to obtain the following output.

Tally for Discrete Variables: gender, faculty

gender	Count	Percent	faculty	Count	Percent
female	305	72.27	Humanities	151	35.78
male	117	27.73	Medicine	38	9.00
N=	422		Science	188	44.55
			Social Science	45	10.66
			N=	422	

Q3. Are the genders equally represented in this module?

Q4. What is the breakdown by faculty?

We can also look at the breakdown of gender within faculties.

- From the main menu choose **Stat > Tables > Cross Tabulation and Chi-Square**;
- Under **Categorical variables**: select *gender* in the **For rows**: box and *faculty* in the **For columns**: box ;
- Under **Display**: tick **Counts** and **Column percents**;
- Click on **OK** to obtain the following output.

Tabulated statistics: gender, faculty

Rows: gender Columns: faculty

	Humanities	Medicine	Science	Social Science	All
female	123 81.46	30 78.95	112 59.57	40 88.89	305 72.27
male	28 18.54	8 21.05	76 40.43	5 11.11	117 27.73
All	151 100.00	38 100.00	188 100.00	45 100.00	422 100.00

Cell Contents: Count
% of Column

Q5. What is the gender breakdown within faculties?

In the same way look at the proportions of vegetarians (*veggie*) overall and within the four faculties.

Q6. What proportion of these students is vegetarian? Is this the same in all faculties?

Comparing the Eysenck Personality Inventory scores for genders and faculties

Now that we have looked at the breakdown of gender and faculty within this student group, we can compare the *epie*, *epin* or *epil* scores within these variables.

- From the main menu choose **Stat > Basic Statistics > Display Descriptive Statistics**;
- Select *epie*, *epin*, and *epil* in the **Variables**: box;
- Select *gender* in the **By variables(optional)**: box;
- Click on **OK** to produce the following output.

Descriptive Statistics	Measures / MINITAB
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Descriptive Statistics: epie, epin, epil

Variable	gender	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median
epie	female	294	11	15.048	0.252	4.328	1.000	13.000	16.000
	male	116	1	14.655	0.394	4.245	2.000	11.250	15.000
epin	female	294	11	13.949	0.301	5.157	2.000	10.000	14.000
	male	116	1	11.862	0.500	5.389	0.000	8.000	12.000
epil	female	293	12	5.785	0.207	3.548	0.000	3.000	5.000
	male	116	1	4.698	0.314	3.386	0.000	2.000	4.500

Variable	gender	Q3	Maximum
epie	female	18.000	24.000
	male	18.000	21.000
epin	female	18.000	24.000
	male	15.000	23.000
epil	female	8.000	17.000
	male	6.750	22.000

Q7. Are the scores for *epie*, *epin* and *epil* similar for males and females?

Repeat this approach to look at the scores in the different faculties.

Q8. Are there any differences in the scores in the four faculties?



Further investigation

There are many other variables to look at here. You may want to consider the scores on the other General Entrepreneurial Tests and whether these vary between genders or faculties.