

DESIGN AND DATA ANALYSIS IN PSYCHOLOGY I  
PARTIAL 1, APRIL 2015, TYPE B

EXERCISE 1

X	f <sub>i</sub>	X	f <sub>i</sub> · X	F <sub>i</sub>
1-5	2	3	6	2
6-10	9	8	56	9
→ 11-15	5	13	65	14
16-20	6	18	108	20
	20		235	

$$a) \bar{X} = \frac{\sum f_i \cdot X_i}{n} = \frac{235}{20} = 11.75$$

$$b) \text{Mdn} = L_i + \frac{1}{f_i} \left( \frac{n}{2} - F_i \right) = 10.5 + \frac{5}{5} (10 - 9) = 10.5 + 1 = 11.5$$

$$\frac{n}{2} = \frac{20}{2} = 10$$

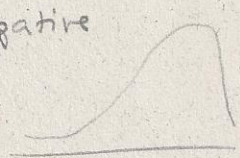
$$i = 11.5 - 10.5 = 1$$

EXERCISE 2

X	f <sub>i</sub>	f <sub>i</sub> · X <sub>i</sub>	X <sub>i</sub> <sup>2</sup>	f <sub>i</sub> · X <sub>i</sub> <sup>2</sup>	X <sub>i</sub> - $\bar{X}$	(X <sub>i</sub> - $\bar{X}$ ) <sup>2</sup>	f <sub>i</sub> (X <sub>i</sub> - $\bar{X}$ ) <sup>2</sup>
1	41	41	1	41	-2.22	24.29	995.89
2	30	60	4	120	-1.22	2.21	66.3
3	27	81	9	243	-0.22	0.002	0.05
4	47	188	16	752	0.78	0.37	17.39
5	55	275	25	1375	1.78	10.04	552.2
	200	645		2531			1631.83

a) Bar chart (ordinal vble) or cumulative bar chart

$$b) A_s = \frac{\bar{X} - M_o}{S_x} = \frac{3.22 - 5}{1.51} = \frac{-1.78}{1.51} = -1.18 \rightarrow \text{Asymmetric negative}$$



$$\bar{X} = \frac{\sum f_i \cdot X_i}{n} = \frac{645}{200} = 3.22$$

$$S_x = \sqrt{\frac{\sum f_i \cdot X_i^2}{n} - \bar{X}^2} = \sqrt{\frac{2531}{200} - 3.22^2} = \sqrt{12.66 - 10.37} = \sqrt{2.29} = 1.51$$

$$c) k_r = \frac{\sum f_i (x_i - \bar{x})^4 / n}{s_x^4} - 3 = \frac{1631.83/200}{1.51^4} - 3 = \frac{8.16}{5.2} - 3 = 1.57 - 3 = -1.43$$

$k_r < 0$  — Platykurtic



### EXERCISE 3

z	f <sub>i</sub>	∑ f <sub>i</sub> z <sub>i</sub>	f <sub>i</sub>
-1.538	2	-3.076	2
-0.86	3	-2.58	5
-0.192	2	-0.384	7
→ 0.48	3? x	0.48x	10
1.15	4	4.6	14
	14	-1.44 + 0.48x	

a)  $\sum f_i z_i = 0$

$$-1.44 + 0.48x = 0$$

$$0.48x = 1.44$$

$$x = \frac{1.44}{0.48} = 3$$

b)

POSITION

$$\frac{i(n+1)}{k} = \frac{60(14+1)}{100} = \frac{900}{100} = 9$$

$$P_{60} = 0.48$$

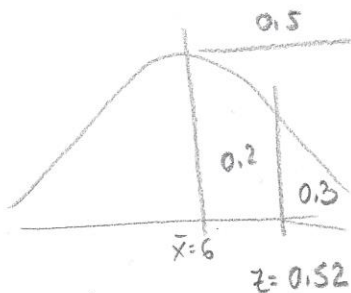
### EXERCISE 4

$$n = 400$$

$$\bar{x} = 6$$

$$s_x^2 = 2$$

$$s_x = \sqrt{2} = 1.41$$



$$z = \frac{x - \bar{x}}{s_x}$$

$$0.52 = \frac{x - 6}{1.41}$$

$$0.73 = x - 6$$

$$6.73 = x$$