

Answers to additional business exercises

Chapter 16 Non-parametric statistics

1. Chi-square

Use a Chi square for independence to compare the proportion of permanent versus casual staff (*employstatus*) that indicate that they would recommend the organization as a good place to work (*recommend*).

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
recommend * employstatus employment status	521	97.2%	15	2.8%	536	100.0%

recommend * employstatus employment status Crosstabulation

			employstatus employment status		Total
			1 permanent	2 casual	
recommend	0 no	Count	34	22	56
		% within recommend	60.7%	39.3%	100.0%
		% within employstatus employment status	10.4%	11.4%	10.7%
		% of Total	6.5%	4.2%	10.7%
	1 yes	Count	294	171	465
		% within recommend	63.2%	36.8%	100.0%
		% within employstatus employment status	89.6%	88.6%	89.3%
		% of Total	56.4%	32.8%	89.3%
Total	Count	328	193	521	
	% within recommend	63.0%	37.0%	100.0%	
	% within employstatus employment status	100.0%	100.0%	100.0%	
	% of Total	63.0%	37.0%	100.0%	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.135 ^b	1	.713	.770	.409
Continuity Correction ^a	.049	1	.825		
Likelihood Ratio	.134	1	.714		
Fisher's Exact Test					
Linear-by-Linear Association	.135	1	.713		
N of Valid Cases	521				

^a. Computed only for a 2x2 table

^b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.74.

The assumption concerning a minimum cell frequency of 5 was not violated (see footnote b in the Chi-Square Tests table.

This research question involves a 2 x 2 design so we need to use the Continuity Correction value supplied on the second line of the Chi-square Tests table. The value in the Asymp. Sig. column indicates that there is no significant association between employment status and likelihood of recommendation. An inspection of the Cross tabulation table indicates that 89.6% of permanent staff and 88.6% of casual staff would recommend the organization to others as a good place to work.

2. Mann-Whitney Test

Compare the staff satisfaction scores (*totsatis*) for permanent and casual staff (*employstatus*).

Ranks				
	employstatus employment status	N	Mean Rank	Sum of Ranks
totsatis	1 permanent	303	236.71	71724.50
	2 casual	176	245.66	43235.50
	Total	479		

Test Statistics ^a	
	totsatis
Mann-Whitney U	25668.500
Wilcoxon W	71724.500
Z	-.682
Asymp. Sig. (2-tailed)	.495

^a. Grouping Variable: employstatus employment status

The results of the Mann-Whitney U test indicate that there is no statistically significant difference in staff satisfaction scores between permanent and casual staff.

3. Kruskal-Wallis Test

Conduct a Kruskal-Wallis Test to compare staff satisfaction scores (*totsatis*) across each of the length of service categories (use the *servicegp3* variable).

Ranks

	servicegp3 length	N	Mean Rank
totsatis	1 <= 2	172	243.16
	2 3 - 5	127	203.25
	3 6+	136	199.95
	Total	435	

Test Statistics ^{a,b}

	totsatis
Chi-Square	11.466
df	2
Asymp. Sig.	.003

a. Kruskal Wallis Test

b. Grouping Variable: servicegp3 length of service grp 3

The results of this analysis indicate that there is a significant difference ($p=.003$) in staff satisfaction scores for workers with different length of service. The highest satisfaction levels were observed for people with 2 or less years of service.