Analysis Report

This report is structured as follows.

Contents

Cross-Tabulations

This test is used when you wish to explore the relationship between two categorical variables. Each of these variables can have two or more categories. This test compares the observed frequencies or proportions of cases that occur in each of the categories, with the values that would be expected if there was no association between the two variables being measured. It is based on a cross-tabulation table, with cases classified according to the categories in each variable (e.g. male/female; smoker/non-smoker) (Pallant, 2010).

In cross-tabulated data, each cell contains the values for a specific row–column combination (e.g., sales of a specific product in a specific age group). Thus, the chi-square value is a measure of association between the row and column categories. Higher levels of association, just like higher levels of similarity, should be represented as closer together in the perceptual map than those with lower levels of association (Hair et al., 2014).

The following tables display the results of the correspondence analysis for the distribution of gender compared to several variables. In each table of the sections below, the percentage of female workers are shown for each category level. The chi-square test evaluates if the differences in these proportions of responses are significantly different for each group under analysis (column λ^2). If the corresponding p-value (column p) is less than 0.05, this means that the gender distribution is significantly related to the category being tested (e.g. sector, region etc.), at least in a bivariate perspective. Thus, the differences on the gender proportions between each level are considered statistically significant.

Academic Data

			Gender		χ^2	p
			Male	Female		
Field of Study	STEM		66.2%a	33.8%a	6.519	0.011
	Humanities-SS		68.3%b	31.7%b		
Sector	Public		69.9%a	30.1%a	79.574	0.000
	Private		62.1%b	37.9%b		
Field of Study	STEM	Medicine	73.5%a	26.5%a	370.993	0.000
		Engineering	75.1%a	24.9%a		
		Dentistry	53.4%b	46.6%b		
		Pharmacy	47.3%b	52.7%b		
		Nursing	48.5%b	51.5%b		
		Agriculture + Veterinary	74.1%a	25.9%a		
		IT/ICT	71.7%a	28.3%a		
		Architecture + Design	50.7%b	49.3%b		
		Science	72.3%a	27.7%a		
		Applied Medical Science	57.2%b	42.8%b		
	Humanities-SS	Arts + Humanities + SS	63.4%a	36.6%a	55.708	0.000
		Business	74.9%b	25.1%b		
		Sharia	68.5%a.b	31.5%a.b		
		Educational Sciences	68.5%a.b	31.5%a.b		
		Law	67.6%a	32.4%a		
		Sport Science	72.3%a.b	27.7%a.b		
		Arts and Design	67.1%a.b	32.9%a.b		
		International Studies	65.8%a	34.2%a		
		Archaeology, Tourism, Hospitality	68.6%a.b	31.4%a.b		
		Media, Journalism	54.9%a	45.1%a		
Region	Center		64.9%a	35.1%a	28.135	0.000
	North		68.5%b	31.5%b		
	South		71.5%b	28.5%b		
	East (Zarqa)		68.8%a.b	31.2%a.b		
Position	Assistant		66.7%a	33.3%a	964.755	0.000

Associate	75.1%b	24.9%b
Chair/Acting Chair	65.4%a	34.6%a
Dean	50.8%c.e	49.2%c.e
Instructor/Lecturer	46.0%c	54.0%c
Professor	84.8%d	15.2%d
Vice Dean/Acting VD/Assistant	55.0%e	45.0%e

Note: Values in the same row and subtable not sharing the same subscript are significantly different at p< 0,05 in the two-sided test of equality for column proportions. Cells with no subscript are not included in the test. Tests assume equal variances.[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

The different proportions were also compared using SPSS's post-hoc Z-test, which evaluates each answer category separately, while the Chi-Square only evaluates the distribution of answers across all categories of a single question. The result of the Z-test is shown as subscript letters next to the count lines. If the letters diverge within a unique column, that means that the gender distribution is significantly different between that pair of categories. Taking the distributions of gender on different specializations of STEM as an example, we can see that the proportion of women in Medicine (26.5%) is not statistically different from the proportion of women in Engineering, Agriculture, IT/ICT or Science (they share the a subscript), but it is statistically different from Dentistry, Pharmacy, Nursing and Architecture (their subscript letters are not the same – a and b).

The following table breaks down each category by position, so that the gender distributions can be compared among different positions separately by categories. The chi-square tests reveal that the distributions are significantly different among position for all the tested categories.

				Gender		χ^2	p
				Male	Female		
Field of Study	STEM	Position	Assistant	65.4%a	34.6%a	638.894	0.000
			Associate	75.3%b	24.7%b		
			Chair/Acting Chair	65.0%a	35.0%a		
			Dean	50.0%c.e	50.0%c.e		
			Instructor/Lecturer	40.1%c	59.9%c		
			Professor	84.2%d	15.8%d		
			Vice Dean/Acting VD/Assistant	54.8%e	45.2%e		
	Humanities-SS	Position	Assistant	68.2%a	31.8%a	355.351	0.000
			Associate	74.8%b	25.2%b		
			Chair/Acting Chair	65.8%a	34.2%a		
			Dean	51.6%c	48.4%c		
			Instructor/Lecturer	52.7%c	47.3%c		
			Professor	85.5%d	14.5%d		
			Vice Dean/Acting VD/Assistant	55.3%c	44.7%c		
Sector	Public	Position	Assistant	64.7%a.e	35.3%a.e	791.798	0.000
			Associate	76.2%b	23.8%b		
			Chair/Acting Chair	68.6%a	31.4%a		
			Dean	51.6%c.f	48.4%c.f		
			Instructor/Lecturer	45.7%c	54.3%c		
			Professor	87.5%d	12.5%d		
			Vice Dean/Acting VD/Assistant	58.2%e.f	41.8%e.f		
	Private	Position	Assistant	68.6%a	31.4%a	182.668	0.000
			Associate	72.0%a	28.0%a		
			Chair/Acting Chair	61.2%b	38.8%b		
			Dean	50.0%b.c	50.0%b.c		
			Instructor/Lecturer	46.6%c	53.4%c		
			Professor	71.6%a	28.4%a		
			Vice Dean/Acting VD/Assistant	51.0%c.d	49.0%c.d		
Region	Center	Position	Assistant	65.8%a	34.2%a	296.201	0.000
			Associate	69.7%a	30.3%a		
			Chair/Acting Chair	64.4%a.d	35.6%a.d		
			Dean	51.7%b.e	48.3%b.e		
			Instructor/Lecturer	46.4%b	53.6%b		
			Professor	80.8%c	19.2%c		

		Vice Dean/Acting VD/Assistant	55.9%d.e	44.1%d.e		
North	Position	Assistant	65.0%a	35.0%a		
		Associate	77.4%b	22.6%b		
		Chair/Acting Chair	65.1%a	34.9%a		
		Dean	50.0%c.e	50.0%c.e	523.231	0.000
		Instructor/Lecturer	44.3%c	55.7%c		
		Professor	88.0%d	12.0%d		
		Vice Dean/Acting VD/Assistant	54.3%e	45.8%e		
South	Position	Assistant	74.9%a.d	25.1%a.d		
		Associate	83.1%a.d	16.9%a.d		
		Chair/Acting Chair	70.9%a.b	29.1%a.b		
		Dean	50.0%b	50.0%b	85.2112	0.000
		Instructor/Lecturer	55.4%b.c	44.6%b.c		
		Professor	85.3%d	14.7%d		
		Vice Dean/Acting VD/Assistant	51.6%b.e	48.4%b.e		
East (Zarqa)	Position	Assistant	68.8%a	31.2%a		
		Associate	84.0%b	16.0%b		
		Chair/Acting Chair	65.6%a	34.4%a		
		Dean	50.0%a.c	50.0%a.c	111.659	0.000
		Instructor/Lecturer	40.8%c	59.2%c		
		Professor	87.5%b	12.5%b		
		Vice Dean/Acting VD/Assistant	58.7%a.c	41.3%a.c		

Note: Values in the same row and subtable not sharing the same subscript are significantly different at p< 0,05 in the two-sided test of equality for column proportions. Cells with no subscript are not included in the test. Tests assume equal variances.[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

The next table follows the same scheme, but the approach is inverted. Here, the gender proportions are compared between fields, regions, etc. for each different position.

				Gender		χ^2	p
				Male	Female		
Position	Assistant	Field of Study	STEM	65.4%a	34.6%a	2.163	0.141
			Humanities-SS	68.2%a	31.8%a		
	Associate	Field of Study	STEM	75.3%a	24.7%a	0.114	0.736
			Humanities-SS	74.8%a	25.2%a		
	Chair/Acting Chair	Field of Study	STEM	65.0%a	35.0%a	0.082	0.775
			Humanities-SS	65.8%a	34.2%a		
	Dean	Field of Study	STEM	50.0%a	50.0%a	0.111	0.739
			Humanities-SS	51.6%a	48.4%a		
	Instructor/Lecturer	Field of Study	STEM	40.1%a	59.9%a	31.881	0.000
			Humanities-SS	52.7%b	47.3%b		
	Professor	Field of Study	STEM	84.2%a	15.8%a	0.891	0.345
			Humanities-SS	85.5%a	14.5%a		
	Vice Dean/Acting VD/Assistant	Field of Study	STEM	54.8%a	45.2%a	0.029	0.865
			Humanities-SS	55.3%a	44.7%a		
Position	Assistant	Sector	Public	64.7%a	35.3%a	4.425	0.035
			Private	68.6%b	31.4%b		
	Associate	Sector	Public	76.2%a	23.8%a	4.977	0.026
			Private	72.0%b	28.0%b		
	Chair/Acting Chair	Sector	Public	68.6%a	31.4%a	8.491	0.004
			Private	61.2%b	38.8%b		
	Dean	Sector	Public	51.6%a	48.4%a	0.111	0.739
			Private	50.0%a	50.0%a		
	Instructor/Lecturer	Sector	Public	45.7%a	54.3%a	0.138	0.710
			Private	46.6%a	53.4%a		
	Professor	Sector	Public	87.5%a	12.5%a	70.961	0.000
			Private	71.6%b	28.4%b		
	Vice Dean/Acting VD/Assistant	Sector	Public	58.2%a	41.8%a	5.374	0.020
			Private	51.0%b	49.0%b		
Position	Assistant	Region	Center	65.8%a	34.2%a	9.323	0.025
			North	65.0%a	35.0%a		
			South	74.9%b	25.1%b		
			East (Zarqa)	68.8%a.b	31.2%a.b		
	Associate	Region	Center	69.7%a	30.3%a	37.007	0.000
			North	77.4%b	22.6%b		
			South	83.1%b	16.9%b		
			East (Zarqa)	84.0%b	16.0%b		

Chair/Acting Chair	Region	Center	64.4%a	35.6%a		
		North	65.1%a	34.9%a	2.324	0.508
		South	70.9%a	29.1%a		
		East (Zarqa)	65.6%a	34.4%a		
Dean	Region	Center	51.7%a	48.3%a		
		North	50.0%a	50.0%a	0.131	0.988
		South	50.0%a	50.0%a		
		East (Zarqa)	50.0%a	50.0%a		
Instructor/Lecturer	Region	Center	46.4%a.c.d	53.6%a.c.d		
		North	44.3%a.b	55.7%a.b	9.594	0.022
		South	55.4%c	44.6%c		
		East (Zarqa)	40.8%b.d	59.2%b.d		
Professor	Region	Center	80.8%a	19.2%a		
		North	88.0%b	12.0%b	23.483	0.000
		South	85.3%a.b	14.7%a.b		
		East (Zarqa)	87.5%a.b	12.5%a.b		
Vice Dean/Acting VD/Assistant	Region	Center	55.9%a	44.1%a		
		North	54.3%a	45.8%a	1.007	0.800
		South	51.6%a	48.4%a		
		East (Zarqa)	58.7%a	41.3%a		

Note: Values in the same row and subtable not sharing the same subscript are significantly different at p< 0,05 in the two-sided test of equality for column proportions. Cells with no subscript are not included in the test. Tests assume equal variances.[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

Some interesting conclusions arise from table above. For example, the proportion of women and men working as instructors or lecturers are not significantly different between sectors ($p = 0.710$), but it is different when comparing regions ($p = 0.022$) or field of study ($p < 0.001$).

Leadership Data

This section shows the same analysis conducted for the leadership data. The first table shows that distributions of gender are not different across sectors or regions, but they are different across positions.

		Gender		χ^2	p
		Male	Female		
Sector	Public	77.6%a	22.4%a	0.230	0.632
	Private	76.4%a	23.6%a		
Region	Center	75.6%a	24.4%a	1.059	0.787
	North	78.2%a	21.8%a		
	South	77.6%a	22.4%a		
	East (Zarqa)	78.5%a	21.5%a		
Rank	Assistant Deans	62.3%a.c	37.7%a.c	96.425	0.000
	BoT/BoD	86.4%b	13.6%b		
	Chair of BoT	50.0%a	50.0%a		
	Deans	87.0%b	13.0%b		
	President	50.0%a	50.0%a		
	Vice Deans	75.9%c	24.1%c		
	VP	70.6%a.c	29.4%a.c		

Note: Values in the same row and subtable not sharing the same subscript are significantly different at p< 0,05 in the two-sided test of equality for column proportions. Cells with no subscript are not included in the test. Tests assume equal variances.1

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

The next table shows that there are no significant differences on the gender distributions between sectors or regions for any specific rank (position).

				Gender		χ^2	p
				Male	Female		
Rank	Assistant Deans	Sector	Public	63.1%a	36.9%a	0.215	0.643
			Private	58.8%a	41.2%a		
	BoT/BoD	Sector	Public	87.5%a	12.5%a	0.227	0.634
			Private	85.5%a	14.5%a		
	Chair of BoT	Sector	Public	50.0%a	50.0%a	0.000	1.000
			Private	50.0%a	50.0%a		
	Deans	Sector	Public	87.2%a	12.8%a	0.020	0.889
			Private	86.7%a	13.3%a		
	President	Sector	Public	50.0%a	50.0%a	0.000	1.000
			Private	50.0%a	50.0%a		
	Vice Deans	Sector	Public	78.6%a	21.4%a	2.488	0.115
			Private	68.8%a	31.3%a		
	VP	Sector	Public	78.3%a	21.7%a	2.843	0.092
			Private	61.5%a	38.5%a		
Rank	Assistant Deans	Region	Center	56.0%a	44.0%a	2.462	0.482
			North	62.5%a	37.5%a		
			South	60.0%a	40.0%a		
			East (Zarqa)	74.1%a	25.9%a		
	BoT/BoD	Region	Center	83.0%a	17.0%a	3.802	0.284
			North	90.7%a	9.3%a		
			South	86.8%a	13.2%a		
			East (Zarqa)	76.9%a	23.1%a		
	Chair of BoT	Region	Center	50.0%a	50.0%a	0.000	1.000a.b
			North	50.0%a	50.0%a		
			South	50.0%a	50.0%a		
			East (Zarqa)	50.0%a	50.0%a		
	Deans	Region	Center	87.7%a	12.3%a	0.860	0.835
			North	88.0%a	12.0%a		
			South	83.7%a	16.3%a		
			East (Zarqa)	83.3%a	16.7%a		
	President	Region	Center	50.0%a	50.0%a	0.000	1.000a.b
			North	50.0%a	50.0%a		
			South	50.0%a	50.0%a		

		East (Zarqa)	50.0%a	50.0%a		
Vice Deans	Region	Center	74.1%a	25.9%a		
		North	76.5%a	23.5%a		
		South	75.0%a	25.0%a	1.582	0.664a
		East (Zarqa)	90.9%a	9.1%a		
VP	Region	Center	64.5%a	35.5%a		
		North	75.0%a	25.0%a		
		South	66.7%a	33.3%a	1.446	0.695a
		East (Zarqa)	83.3%a	16.7%a		

Note: Values in the same row and subtable not sharing the same subscript are significantly different at p< 0,05 in the two-sided test of equality for column proportions. Cells with no subscript are not included in the test. Tests assume equal variances.1

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

a. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b. The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

However, when it comes to comparing distributions across ranks in different sectors or regions, some quite large differences arise (next table).

				Gender		χ^2	p
				Male	Female		
Sector	Public	Rank	Assistant Deans	63.1%a	36.9%a	50.957	0.000
			BoT/BoD	87.5%b	12.5%b		
			Chair of BoT	50.0%a	50.0%a		
			Deans	87.2%b	12.8%b		
			President	50.0%a	50.0%a		
			Vice Deans	78.6%a.b	21.4%a.b		
			VP	78.3%a.b	21.7%a.b		
	Private	Rank	Assistant Deans	58.8%a	41.2%a	51.338	0.000
			BoT/BoD	85.5%b.c	14.5%b.c		
			Chair of BoT	50.0%a	50.0%a		
			Deans	86.7%b	13.3%b		
			President	50.0%a	50.0%a		
			Vice Deans	68.8%a.c	31.3%a.c		
			VP	61.5%a	38.5%a		
Region	Center	Rank	Assistant Deans	56.0%a	44.0%a	41.065	0.000
			BoT/BoD	83.0%b.c	17.0%b.c		
			Chair of BoT	50.0%a	50.0%a		
			Deans	87.7%b	12.3%b		
			President	50.0%a	50.0%a		
			Vice Deans	74.1%a.b	25.9%a.b		
			VP	64.5%a.c	35.5%a.c		
	North	Rank	Assistant Deans	62.5%a	37.5%a	47.235	0.000
			BoT/BoD	90.7%b	9.3%b		
			Chair of BoT	50.0%a	50.0%a		
			Deans	88.0%b	12.0%b		
			President	50.0%a	50.0%a		
			Vice Deans	76.5%a.b	23.5%a.b		
			VP	75.0%a.b	25.0%a.b		
	South	Rank	Assistant Deans	60.0%a	40.0%a	13.282	0.039.b
			BoT/BoD	86.8%a	13.2%a		
			Chair of BoT	50.0%a	50.0%a		
			Deans	83.7%a	16.3%a		
			President	50.0%a	50.0%a		

		Vice Deans	75.0%a	25.0%a		
		VP	66.7%a	33.3%a		
East (Zarqa)	Rank	Assistant Deans	74.1%a	25.9%a		
		BoT/BoD	76.9%a	23.1%a		
		Chair of BoT	50.0%a	50.0%a		
		Deans	83.3%a	16.7%a	3.591	0.732b.c
		President	50.0%a	50.0%a		
		Vice Deans	90.9%a	9.1%a		
		VP	83.3%a	16.7%a		

Note: Values in the same row and subtable not sharing the same subscript are significantly different at p< 0,05 in the two-sided test of equality for column proportions. Cells with no subscript are not included in the test. Tests assume equal variances.1

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

b. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

c. The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

References

Hair, J.F., Black, W., Babin, B., Anderson, R., 2014. Multivariate data analysis, Seventh. ed. Pearson Education, Inc., Edinburgh.

Pallant, J., 2010. SPSS Survival Manual, 4th ed. McGraw-Hill, Berkshire, England.