

BE 602

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1. Are there any stores where males and females are different in their commitment to the brand? Explain via analysis

Null Hypothesis - Males and Females **have the same** brand commitment for all brands

$$H_0 = \mu_1 - \mu_2 = 0$$

Alternate Hypothesis: males and females **do not have the same** brand commitment for all brands

$$H_a = \mu_1 - \mu_2 \neq 0$$

Assuming the Two-Tailed test.

T-Test

Group Statistics					
Are you...	N	Mean	Std. Deviation	Std. Error Mean	
Brand X Male	1287	2.98	1.140	.032	
Brand X Female	3044	3.06	1.146	.021	
JC Penney Male	21	2.67	.966	.211	
JC Penney Female	77	2.99	1.006	.115	
Kohl's Male	493	2.86	1.065	.048	
Kohl's Female	1117	2.97	1.183	.035	
Nordstrom Male	425	3.06	1.148	.056	
Nordstrom Female	1165	3.04	1.192	.035	
Amazon Male	468	2.11	.789	.036	
Amazon Female	1140	2.26	.822	.024	
TJ Maxx Male	370	3.29	1.083	.056	
TJ Maxx Female	1233	3.15	1.129	.032	

We performed a T-Test for S1 group (genders) - male and female (Question 11 brand commitment)

The result is attached below.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Brand X	Equal variances assumed	3.718	.054	-2.022	4329	.043	-.077	.038	-.152	-.002
	Equal variances not assumed			-2.027	2432.065	.043	-.077	.038	-.151	-.002
JC Penney	Equal variances assumed	.622	.432	-1.304	96	.195	-.320	.246	-.808	.167
	Equal variances not assumed			-1.335	32.835	.191	-.320	.240	-.809	.168
Kohl's	Equal variances assumed	3.356	.067	-1.742	1608	.082	-.108	.062	-.230	.014
	Equal variances not assumed			-1.814	1038.285	.070	-.108	.060	-.225	.009
Nordstrom	Equal variances assumed	.896	.344	.215	1588	.829	.014	.067	-.117	.146
	Equal variances not assumed			.219	779.528	.827	.014	.066	-.115	.143
Amazon	Equal variances assumed	9.608	.002	-3.203	1606	.001	-.143	.045	-.230	-.055
	Equal variances not assumed			-3.258	901.812	.001	-.143	.044	-.229	-.057
TJ Maxx	Equal variances assumed	.596	.440	2.164	1601	.031	.143	.066	.013	.273
	Equal variances not assumed			2.214	628.995	.027	.143	.065	.016	.271

From the T-Test result, we can observe that the two-sided p-value for Amazon is very low and hence we can say that for **Amazon** the brand commitment differs between males and females.

2. Are Kohl's customers equally likely to purchase a product within the next 9 months as compared to TJ Maxx's customers?

As we are checking for within the next 9 months, we will consider each brand's cumulative percent

Kohl's:

Cumulative Percent: 77.1

Sample Size: 1610

TJ Maxx's

Cumulative Percent: 71.2

Sample Size: 1603

Frequencies

Statistics			
		Kohl's	TJ Maxx
N	Valid	1610	1603
	Missing	2721	2728

Frequency Table

Kohl's					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Within the next month	471	10.9	29.3	29.3
	Within next 1-3 months	384	8.9	23.9	53.1
	With next 3-6 months	259	6.0	16.1	69.2
	Within next 6-9 months	127	2.9	7.9	77.1
	Within 9 months - 1 year	105	2.4	6.5	83.6
	Longer than 1 year	51	1.2	3.2	86.8
	I'm not sure when I will shop there again	213	4.9	13.2	100.0
	Total	1610	37.2	100.0	
Missing	System	2721	62.8		
Total		4331	100.0		

TJ Maxx					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Within the next month	384	8.9	24.0	24.0
	Within next 1-3 months	396	9.1	24.7	48.7
	With next 3-6 months	218	5.0	13.6	62.3
	Within next 6-9 months	143	3.3	8.9	71.2
	Within 9 months - 1 year	100	2.3	6.2	77.4
	Longer than 1 year	75	1.7	4.7	82.1
	I'm not sure when I will shop there again	287	6.6	17.9	100.0
	Total	1603	37.0	100.0	
Missing	System	2728	63.0		
Total		4331	100.0		

Now, to check the P-value, we did a Z-test and found significant evidence against our assumption that Kohl's customers are equally likely to purchase a product within 9 months as TJ Maxx's customers i.e., highly significant evidence against the Null hypothesis.

Z Score Calculator for 2 Population Proportions

Success!

You'll find the values for z and p below. Blue means your result is significant, red means it's not.

Sample 1 Proportion (or total number)

0.771

Sample 1 Size (N_1)

1610

Sample 2 Proportion (or total number)

0.712

Sample 2 Size (N_2)

1603

Significance Level:

☐ 0.01

☒ 0.05

☐ 0.10

One-tailed or two-tailed hypothesis?:

☐ One-tailed

☒ Two-tailed

The value of z is 3.8197. The value of p is .00014. The result is significant at $p < .05$.

Calculate Z

Reset

Therefore, compared to TJ Maxx customers, Kohl's customers are **less** likely (not equally likely) to make a purchase during the next nine months.

3. As compared to Amazon's NPS score which retailer must work hardest to compete?

The results of our NPS calculations for each brand are as follows:

Range 0-6 as detractors

Range 7-8 as passives

Range 9-10 as Promoters

→ Frequencies

Statistics						
	NPSBrandX	NPSJCPenney	NPSKohls	NPSNordstorm	NPSAmazon	NPSTJMaxx
N	4331	98	1610	1590	1608	1603
Valid	4331	98	1610	1590	1608	1603
Missing	0	4233	2721	2741	2723	2728

Frequency Table

NPSBrandX				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Detractors	1639	37.8	37.8	37.8
Valid Passives	1494	34.5	34.5	72.3
Valid Promoters	1198	27.7	27.7	100.0
Total	4331	100.0	100.0	

NPSJCPenney				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Detractors	36	.8	36.7	36.7
Valid Passives	33	.8	33.7	70.4
Valid Promoters	29	.7	29.6	100.0
Total	98	2.3	100.0	
Missing System	4233	97.7		
Total	4331	100.0		

NPSKohls				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Detractors	529	12.2	32.9	32.9
Valid Passives	564	13.0	35.0	67.9
Valid Promoters	517	11.9	32.1	100.0
Total	1610	37.2	100.0	
Missing System	2721	62.8		
Total	4331	100.0		

NPSNordstorm

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Detractors	540	12.5	34.0	34.0
Valid Passives	542	12.5	34.1	68.1
Valid Promoters	508	11.7	31.9	100.0
Total	1590	36.7	100.0	
Missing System	2741	63.3		
Total	4331	100.0		

NPSAmazon

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Detractors	142	3.3	8.8	8.8
Valid Passives	410	9.5	25.5	34.3
Valid Promoters	1056	24.4	65.7	100.0
Total	1608	37.1	100.0	
Missing System	2723	62.9		
Total	4331	100.0		

NPSTJMaxx

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Detractors	619	14.3	38.6	38.6
Valid Passives	507	11.7	31.6	70.2
Valid Promoters	477	11.0	29.8	100.0
Total	1603	37.0	100.0	
Missing System	2728	63.0		
Total	4331	100.0		

NPS scores for all the brands :

Amazon – 65.7 – 8.8 = 56.9

Nordstorm – 31.9 – 34.0 = -2.1

BrandX = 27.7 – 37.8 = -10.1

JCPenney = 29.6 – 36.7 = -7.1

Kohls = 32.1 – 32.9 = -0.8

TJMaxx = 29.8 – 38.6 = -8.8

Based on the NPS numbers mentioned above, **Brand X** is the retailer that needs to put in the most effort relative to Amazon.