

AB Testing



Which poster should be used to promote the movie?



Poster A



Poster B



Survey

Which poster stimulate your interest to view the advertised movie better? *

Poster A



- Poster A
- Poster B

Poster B



What is your gender? *

- Male
- Female

What is your age range? *

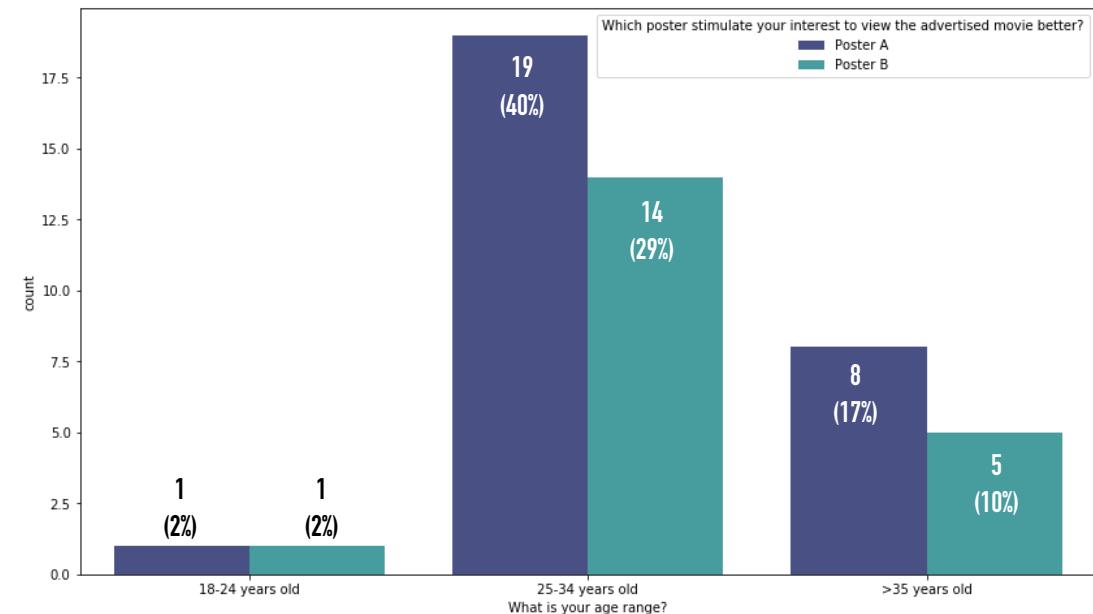
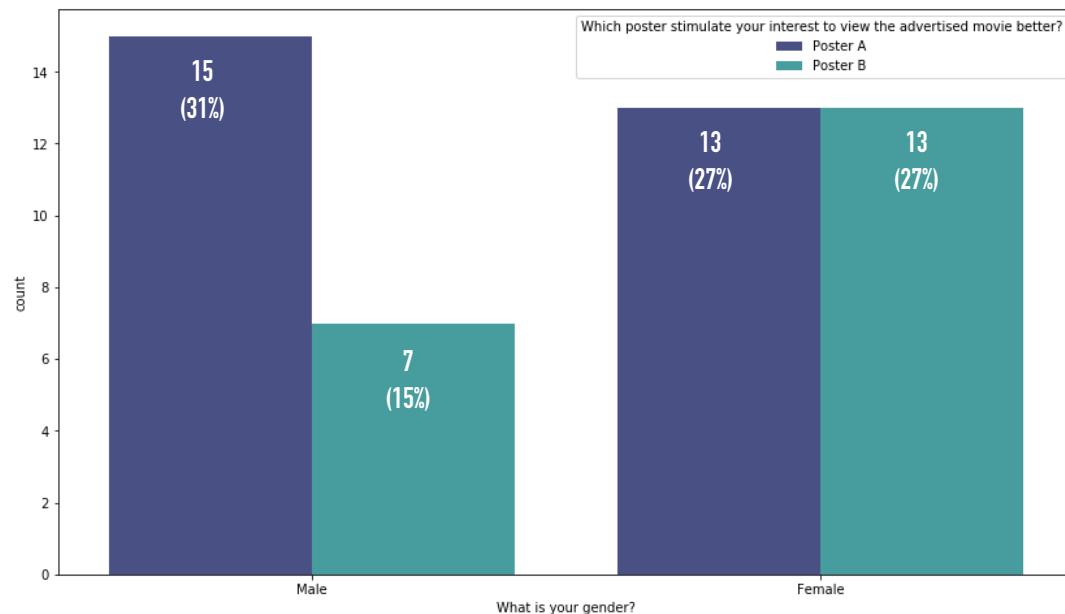
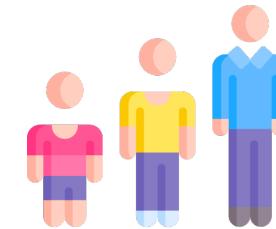
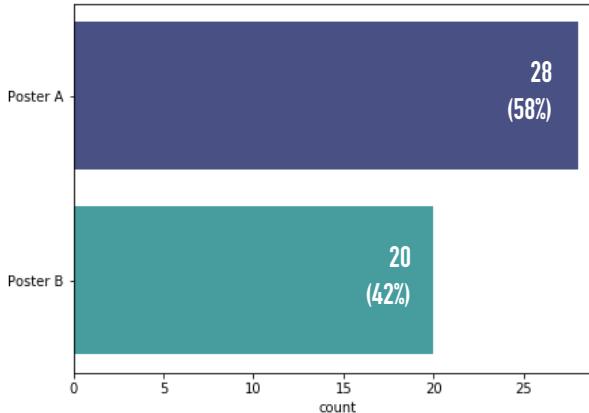
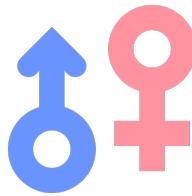
- Below 18 years old
- 18-24 years old
- 25-34 years old
- >35 years old

<https://forms.gle/UsL7pvEL6X9onmaR7>



Survey Results

- Number of samples : 48 samples





Is poster A preferred over poster B?

- H_0 : Proportion of customer preference Poster A : Poster B is 50 : 50 (equal/no preference)
- H_1 : Not H_0

Poster	Observed	Expected	$(O-E)^2/E$
Poster A	28	24	0.667
Poster B	20	24	0.667
		χ^2	1.333

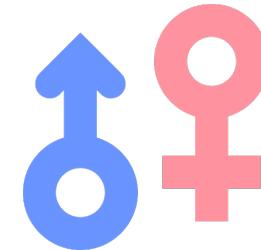
$$df = 2-1 = 1$$

$$p_val = 0.2482 (=1-CHISQ.DIST(1.6208, 1, TRUE))$$

$p_val > \alpha$ (0.05) therefore we do NOT reject null hypothesis, thus the proportion of customer preference Poster A and Poster B is 50:50 at 0.05 level of significance.

Action/Inference: There is no difference in poster A and Poster B preference

Does gender affect poster preference?



- H_0 : Gender and poster preference are independent
- H_1 : Gender and poster and NOT independent

OBSERVED			
	Poster A	Poster B	
Male	15	7	22
Female	13	13	26
	28	20	48

(O-E) ² /E			
	Poster A	Poster B	
Male	0.36580087	0.51212121	
Female	0.30952381	0.43333333	
		χ^2	1.62077922

$$df = (2-1) * (2-1) = 1$$

$p_val = 0.20$ (=1-CHISQ.DIST(1.6208, 1, TRUE)

$p_val > \alpha$ (0.05) therefore we do NOT reject null hypothesis, therefore gender and poster preference are INDEPENDENT at 0.05 level of significance.

Action/Inference: There is no difference in poster preference between males and females

EXPECTED			
	Poster A	Poster B	
Male	12.8333333	9.1666667	22
Female	15.1666667	10.8333333	26
	28	20	



Does age range affect poster preference?

- H_0 : Age range and poster preference are independent
- H_1 : Age range and poster and NOT independent

OBSERVED			
	Poster A	Poster B	
18-24 yrs old	1	1	2
25-34 yrs old	19	14	33
>35 yrs old	8	5	13
	28	20	48

EXPECTED			
	Poster A	Poster B	
18-24 yrs old	1.16666667	0.83333333	2
25-34 yrs old	19.25	13.75	33
>35 yrs old	7.58333333	5.41666667	13
	28	20	48



*because one cell contains $E < 5$, we must combine

OBSERVED			
	Poster A	Poster B	
18-34 yrs old	20	15	35
>35 yrs old	8	5	13
	28	20	48

EXPECTED			
	Poster A	Poster B	
18-34 yrs old	20.4166667	14.5833333	35
>35 yrs old	7.58333333	5.41666667	13
	28	20	48

$(O-E)^2/E$			
	Poster A	Poster B	
18-34 yrs old	0.0085034	0.01190476	
>35 yrs old	0.02289377	0.03205128	
		χ^2	0.07535322



Does age range affect poster preference?

- H_0 : Age range and poster preference are independent
- H_1 : Age range and poster and NOT independent

$$df = (2-1) * (2-1) = 1$$

critical val = 3.84145882 (=CHISQ.INV.RT(0.05, 2))

p_val = 0.78370 (=1-CHISQ.DIST(1.6208, 1, TRUE))

p_val > alpha (0.05) therefore **we do NOT reject null hypothesis**, therefore age range and poster preference are INDEPENDENT at 0.05 level of significance.

Action/Inference: age ranges --> **There is no difference in poster preference between different age range**



Conclusion

- Either poster A or B can be used to advertised for the movie for all genders and all age ranges



