Questions to Ponder:

1. Was the advertising campaign effective? Did additional consumers convert as a result of the ad campaign?
    a. Yes. The campaign was effective. The ROI of the campaign was about 245% generating $319,500 in revenue after considering the $130,500 in ad spending.
    b. Yes. Additional consumers did convert as a result of the ad campaign. 15,000 conversions were made as a result of the campaign.

2. Was the campaign profitable?

    a. How much more money did TaskaBella make by running the campaign (excluding advertising costs)?

        1. Handbags sold from campaign/conversions: 15,000
        2. Earnings per handbag: $40
        3. Cost of campaign: 14.5 million impressions x $10/1000 impressions = $130,500

    b. What was the cost of the campaign?

        1. About $130,500

    c. Calculate the Return-on-Investment (ROI) of the campaign. Was the campaign profitable?

        1. Number of handbags sold/conversions: 15,000
        2. Amount earned per handbag: about $40 - $10 per conversion from advertising = $30
        3. $30 earned per handbag x 15,000 conversions = $450,000 - $130,500 = $319,500 total earnings.
            1. $319,500/$130,500 = 245% ROI

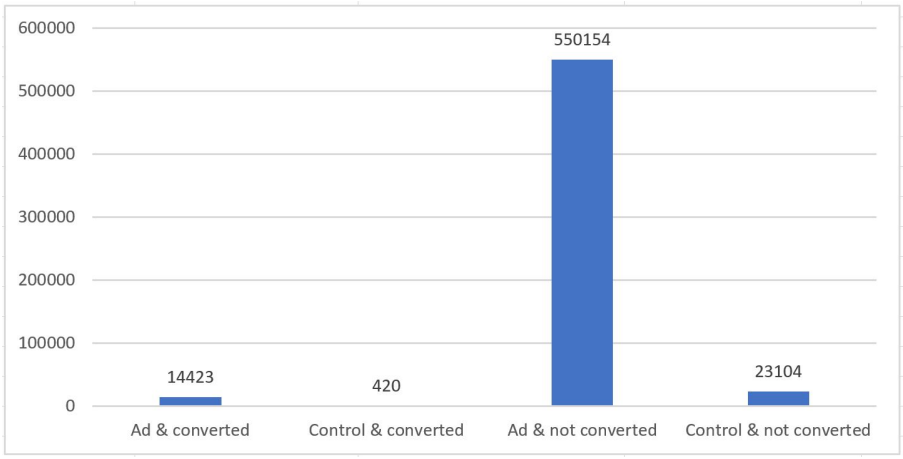
    d. What was the Opportunity Cost of including a control group? How much more could have TaskaBella made with a smaller control group or not having a control group at all?

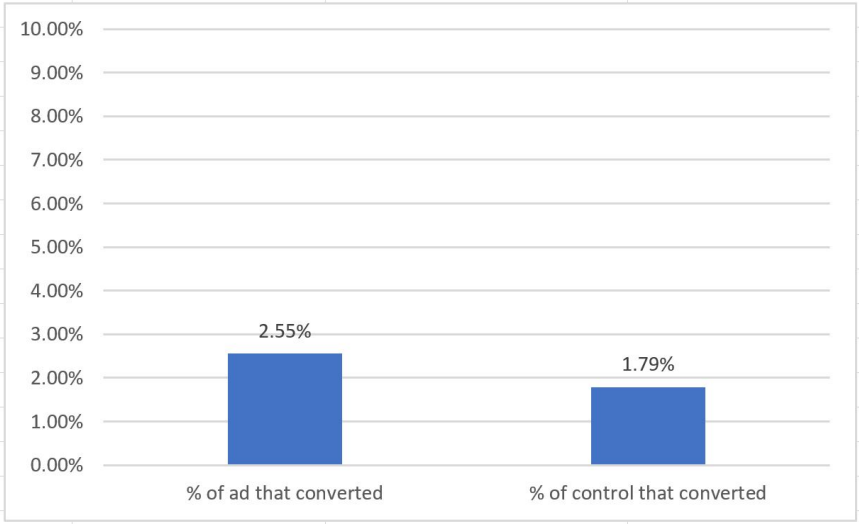
        1. 4% control group * 588,000 people = 23,520 people in control group
        2. 420 people in control group converted * $30 = $12,600 total cost using a control group
        3. $319,500 + $12,600 = $332,100 total potential earnings without using a control group.

3. How did the number of impressions seen by each user influence the effectiveness of the advertising?

    a. Create a chart of conversion rates as a function of the number of ads displayed to users. Plot conversion rates for those who were in the control group and for those exposed to

the ad. Group together the number of impressions as necessary to obtain a meaningful plot (conversion rate means the percentage of unique users who made a purchase).





Difference in conversion rate = 0.76%

b. What can you infer from the charts? In what region is advertising most effective?

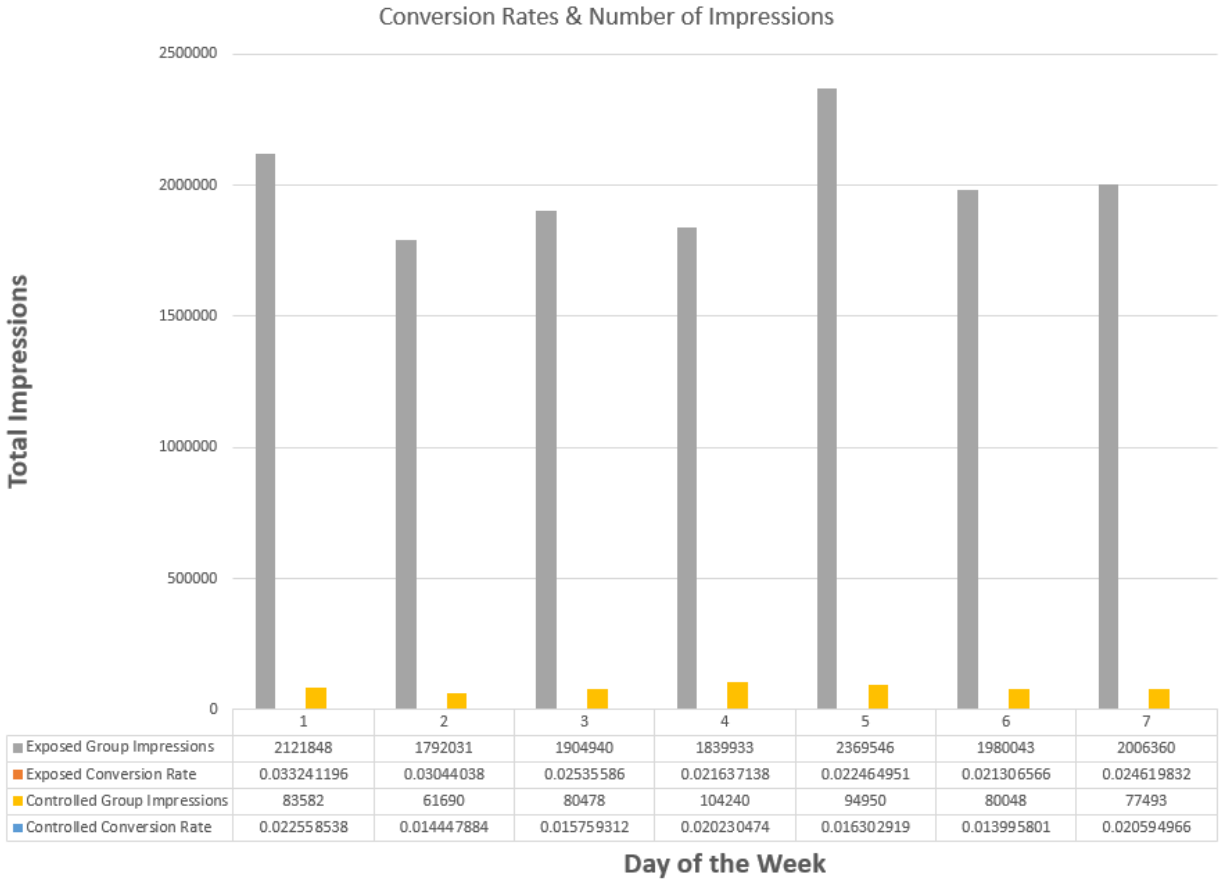
1. There is less than 1% increase in conversation rate between the control and exposed group. This shows that the ad only made a difference of about 0.76% between those that saw the ad and those that saw the PSA. The region most effective was those that saw the ad because of those that saw it, 2.55% converted whereas those that didn't, only 1.79% converted.

c. What do the above figures imply for the design of the next campaign assuming that consumer response would be similar?

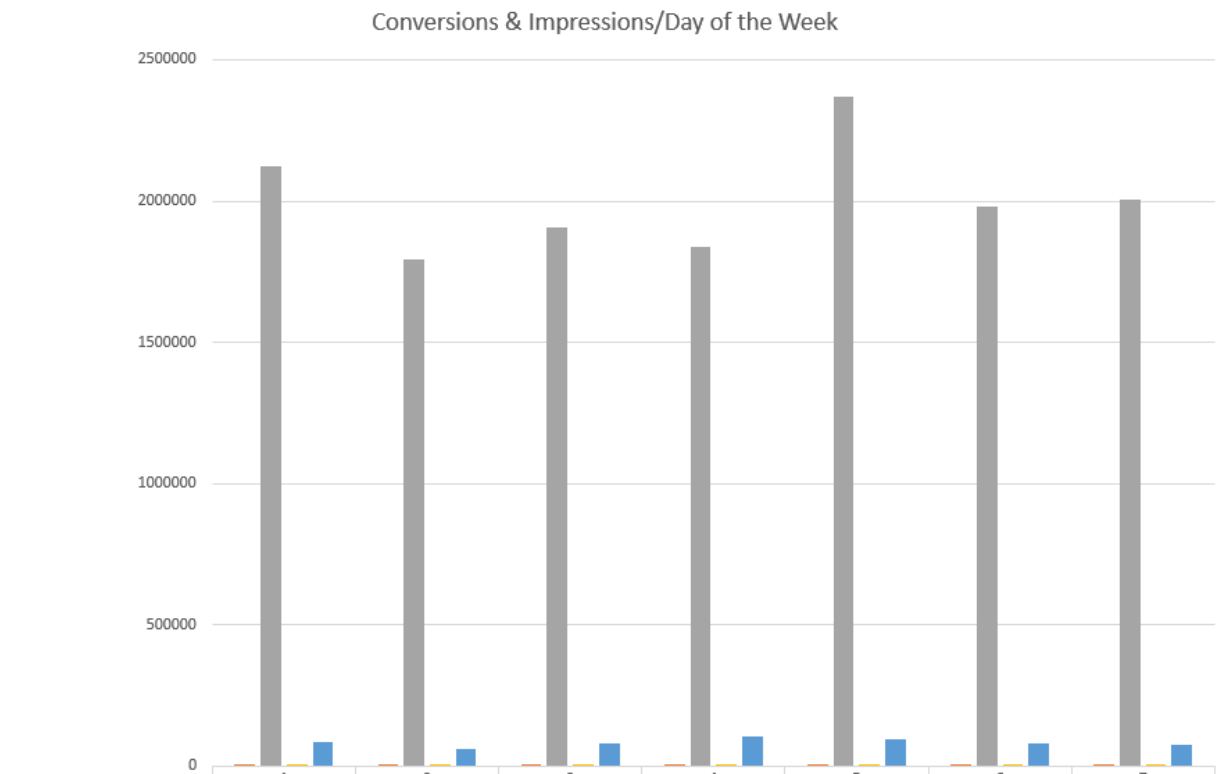
1. There will not be much of a difference in conversions between those that see the ad and those that don't therefore they need to carefully watch how much they're investing.

4. How does consumer response to advertising vary on different days of the week and at different times of the day?

a. Create a chart with the conversion rates for the *control group and the exposed group* as a function of the day of the week when they were shown the most impressions.

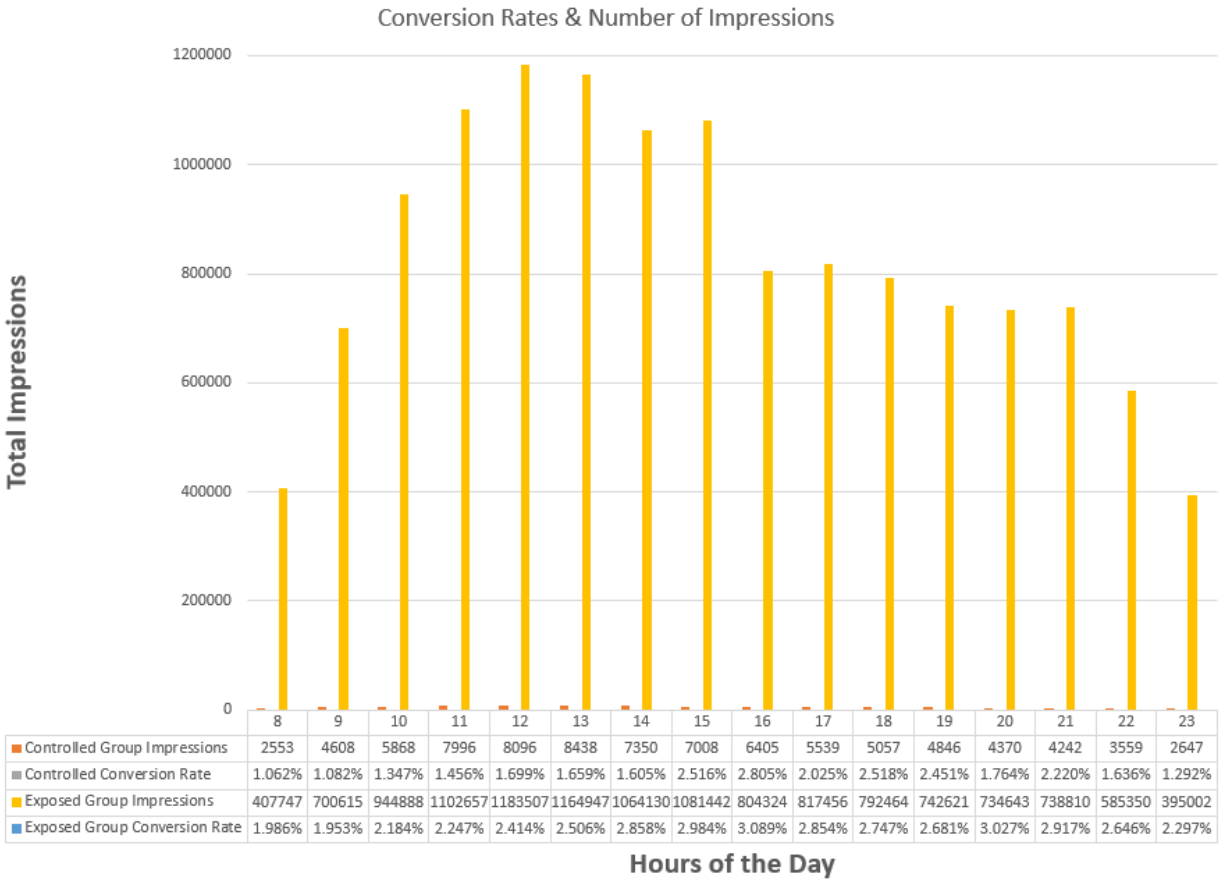


	1	2	3	4	5	6	7
Exposed Group Impressions	2121848	1792031	1904940	1839933	2369546	1980043	2006360
Exposed Conversion Rate	0.033241196	0.03044038	0.02535586	0.021637138	0.022464951	0.021306566	0.024619832
Controlled Group Impressions	83582	61690	80478	104240	94950	80048	77493
Controlled Conversion Rate	0.022558538	0.014447884	0.015759312	0.020230474	0.016302919	0.013995801	0.020594966

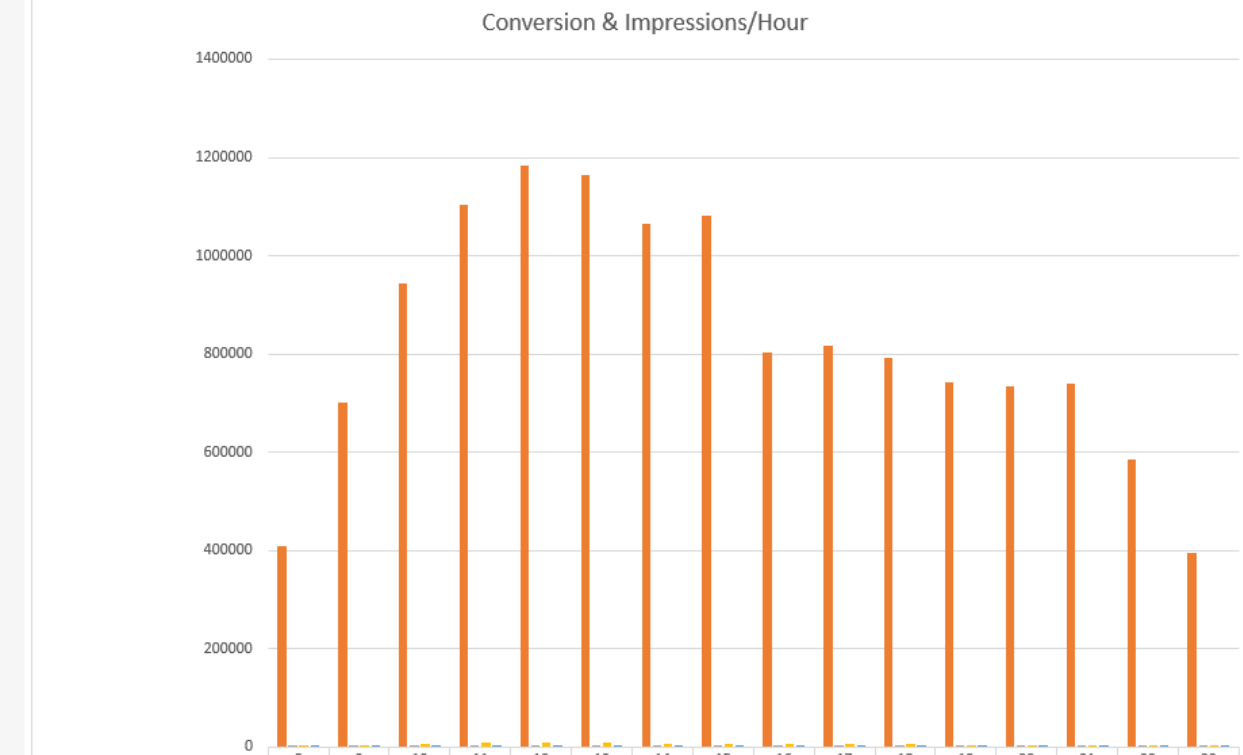


	1	2	3	4	5	6	7
Exposed Group Conversion	2778	2270	1963	1711	1995	1679	2027
Exposed Group Impression	2121848	1792031	1904940	1839933	2369546	1980043	2006360
Control Group Conversion	79	42	55	79	62	40	63
Control Group Impression	83582	61690	80478	104240	94950	80048	77493

b. Create the same chart for hours within a day (excluding the period between midnight and 8 a.m.)



	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Controlled Group Impressions	2553	4608	5868	7996	8096	8438	7350	7008	6405	5539	5057	4846	4370	4242	3559	2647
Controlled Conversion Rate	1.062%	1.082%	1.347%	1.456%	1.699%	1.659%	1.605%	2.516%	2.805%	2.025%	2.518%	2.451%	1.764%	2.220%	1.636%	1.292%
Exposed Group Impressions	407747	700615	944888	1102657	1183507	1164947	1064130	1081442	804324	817456	792464	742621	734643	738810	585350	395002
Exposed Group Conversion Rate	1.986%	1.953%	2.184%	2.247%	2.414%	2.506%	2.858%	2.984%	3.089%	2.854%	2.747%	2.681%	3.027%	2.917%	2.646%	2.297%



	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Exposed Group Impressions	407747	700615	944888	1102657	1183507	1164947	1064130	1081442	804324	817456	792464	742621	734643	738810	585350	395002
Exposed Group Conversion	337	582	818	992	1092	1140	1251	1279	1111	959	853	782	843	843	675	449
Control Group Impressions	2553	4608	5868	7996	8096	8438	7350	7008	6405	5539	5057	4846	4370	4242	3559	2647
Control Group Conversion	7	13	20	30	35	36	30	46	45	28	32	29	19	24	15	8

c. What days/hours is advertising most / least effective?

	Efficacy of Advertisements (Entirety of Data) - According to Impressions
Most Effective Day/Hour	Friday/13 Hours (1:00 PM)
Least Effective Day/Hour	Tuesday/4 Hours (4:00 AM) (Excluding 0-7: 8 Hours)

Impression Day Totals:		Time Totals	
Monday	87073	0	5536

Tuesday	77479	1	4802
Wednesday	80908	2	5333
Thursday	82982	3	2679
Friday	92608	4	722
Saturday	81660	5	765
Sunday	85391	6	2068
		7	6405
		8	17627
		9	31004
		10	38939
		11	46210
		12	47298
		13	47655
		14	45648
		15	44683
		16	37567
		17	34988
		18	32323
		19	30352
		20	28923
		21	29976
		22	26432
		23	20166

Test O - According to

Impressions

Most Effective Day/Hour - Thursday/13 Hours

Least Effective Day/Hour - Friday/ 5 Hours (Excluding 0-7: 23 Hours)

Hour	Identification #	Day	Identification #
0	227	1	3502
1	187	2	2907
2	181	3	3490
3	89	4	3905
4	28	5	3803
5	23	6	2858
6	83	7	3059
7	237		23524
8	659		
9	1202		
10	1485		
11	2061		
12	2060		
13	2170		
14	1869		
15	1828		
16	1604		
17	1383		

18	1271
19	1183
20	1077
21	1081
22	917
23	619
	23524

Test 1 - According to Impressions

Most Effective Day/Hour - Friday/13 Hours

Least Effective Day/Hour - Tuesday/ 4 Hours (Excluding 0-7: 8 Hours)

Hour		Day	
0	5309	1	83571
1	4615	2	74572
2	5152	3	77418
3	2590	4	79077
4	694	5	88805
5	742	6	78802
6	1985	7	82332
7	6168		564577
8	16968		
9	29802		

10	37454
11	44149
12	45238
13	45485
14	43779
15	42855
16	35963
17	33605
18	31052
19	29169
20	27846
21	28895
22	25515
23	19547
	564577