

Effect of Exclamation Points on Rental Market Outcomes

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w241 Final Project



Research Question

Do exclamation points signal sincerity and friendliness in an email to a prospective landlord? Operationalized, does including an exclamation point (or more) make you more likely to receive a positive response when applying to an apartment?



Experimental Design

- Multi-factor audit study
- Two treatment levels (! and !!!!)
- Gender variation
- Drafted stock emails for each treatment level, varied only punctuation
- Record response rates to each treatment level

Data Collection

- Scraped apartment listings from Craigslist in four cities
- First 100 results of search queries for 1 and 2 bedroom apartments in \$500 price buckets from \$1,000 per month to \$4,000 per month
- Randomly selected 180 listings from each city
- Randomly assigned 30 selected listings from each city to each treatment / control group

Data Issues

- Multiple emails sent to same listing agents
- All emails not sent at same time of day / week
- Multiple listings for the same property

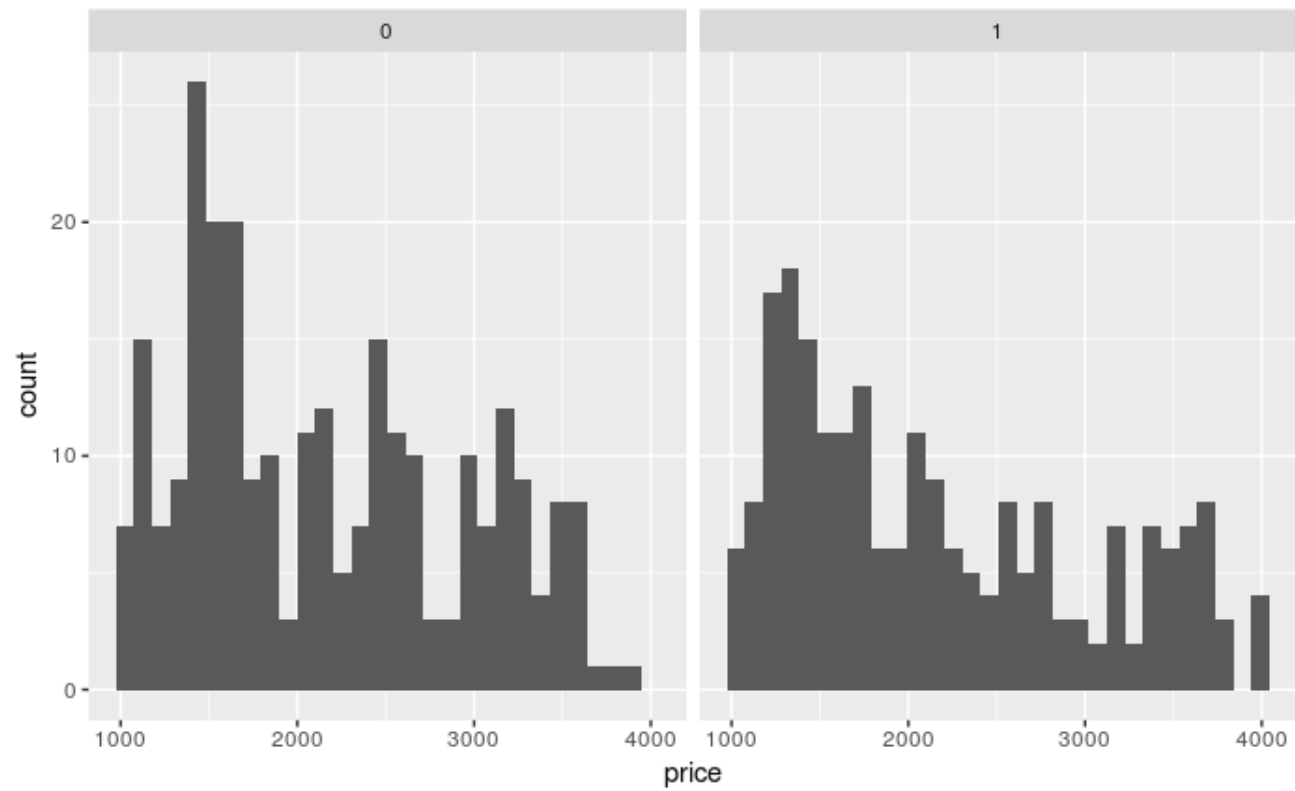
Analysis



Data Validation

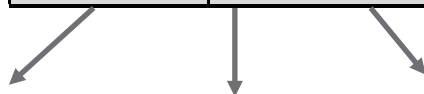
- Administrative Errors
 - Verified the number of treatments and outcomes recorded
 - Checked for differences across treatments – important due to our multifactor design
- Measured for covariate imbalance
- Validity of randomization

Data Profiling



Outcomes

No Response	Positive Response
264	219



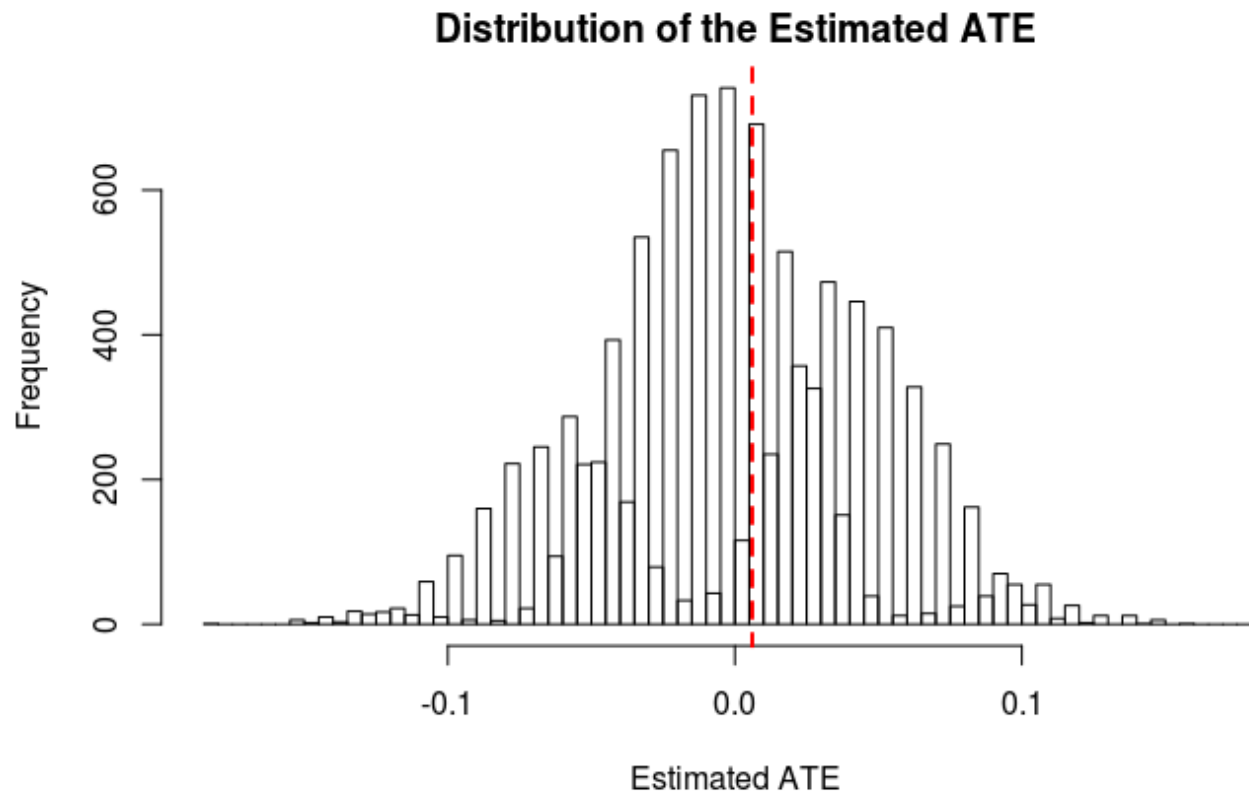
	Jane_Control	Jane_Treat_High	Jane_Treat_Low	John_Control	John_Treat_High	John_Treat_Low
No Response	39	41	49	49	46	40
Positive Responses	39	40	36	33	35	36

ATE

	outcome
low_treatment	-0.003 (0.056)
high_treatment	0.013 (0.056)
Constant	0.450*** (0.039)
Observations	483
R2	0.0002
Adjusted R2	-0.004
Residual Std. Error	0.499 (df = 480)
F Statistic	0.046 (df = 2; 480)
Note: *p<0.1; **p<0.05; ***p<0.01	

	outcome
low_treatment	-0.004 (0.056)
high_treatment	0.014 (0.055)
gender	0.035 (0.045)
factor(city)houston	-0.154** (0.064)
factor(city)sandiego	-0.046 (0.064)
factor(city)seattle	0.048 (0.064)
factor(bedrooms)2	0.031 (0.049)
price	-0.00001 (0.00003)
Constant	0.466*** (0.084)
Observations	483
R2	0.025
Adjusted R2	0.008
Residual Std. Error	0.496 (df = 474)
F Statistic	1.497 (df = 8; 474)
Note: *p<0.1; **p<0.05; ***p<0.01	

Randomization Inference



CACE (One-sided Noncompliance)

```
```{r}
itt <- d[, mean(outcome[assigned == 1]) - mean(outcome[assigned == 0])]

prop_treated <- d[, mean(compliers/assigned, na.rm = T)]
prop_treated <- d[assigned == 1, mean(compliers)]

sprintf("%.10f", itt / prop_treated)

[1] "-0.0207707708"
```

# Conclusions and Next Steps



# Discussion of Results

- No significant effects of gender or exclamation point treatment on response rates.
- Perhaps due to high prevalence of professional management companies
- Management companies have incentive to respond no matter what
- We also observed same individual listing agents receiving multiple emails

# Next Steps

- Could have been appropriate use-case for adaptive sampling where we may have wanted to collect additional data on private party postings
- Try the same experiment in a different market without so many professionally managed listings (e.g. cars for sale by owner)
- Determine whether postings are by same individual or for same property