[Mobile] UI Feature X A/B Experiment Analysis

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Context

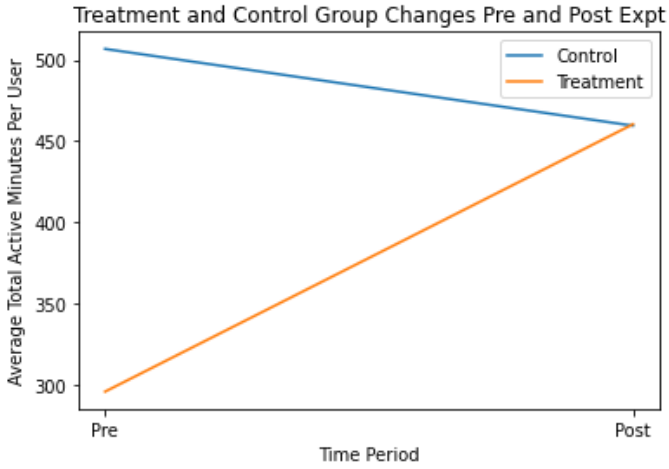
The Mobile team is exploring the potential impact of feature X. The primary metric of interest is engagement, defined as total active minutes per user. 12 subgroups were analyzed - a combination of gender (male, female, unknown) and user type (new user, reader, non-reader, contributor).

Findings

Treatment assignment was imbalanced on

- user type: treated users are more likely to be non-readers and new users and less likely to be readers and contributors[2]
- engagement: pre-treatment, the mean engagement of the treated group is about half that of the control group[1]

These may be correlated - readers and contributors may signal more highly engaged users. No gender imbalance was observed.



We observe

- statistically significant (95% confidence) increases in engagement in all subgroups except male new users and unknown new users[2]
- no statistically significant decreases in engagement in any subgroups[2]

Average Treatment Effect of the Treated (ATT) by Subgroup				
Gender	**User Type**	**t value**	**CI Lower**	**CI Upper**
Male	Non-reader	9.659	61.20	92.37
	Reader	11.17	740	1055
	New User	1.93	-0.43	56.7
	Contributor	3.60	923	3138
Female	Non-reader	9.34	49.2	75.381
	Reader	6.07	461	900.0
	New User	2.30	3.24	40.5
	Contributor	2.37	335	3661
Unknown	Non-reader	4.88	28.4	66.50
	Reader	5.75	545	1111
	New User	1.37	-10.0	56.5
	Contributor	2.53	629	5210

See appendix for detailed distributions by subgroup[1].

Recommendations

Because treatment assignment was imbalanced on user type and pre-treatment engagement, preliminary results are inconclusive although promising.
I recommend re-running the experiment with modification to the treatment assignment process to ensure covariate balance on pre-treatment engagement and user type.

Appendix

[1] Python notebook
[2] R script

Active Minutes Before and After Test: Distribution Close Look