**A/B Testing –Group 2**

**YouTube**

**Submitted To:**

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# M6.1 Quantitative Approaches to Management - Gruppe A- SoSe2023

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**Hypothesis**

**H0**: percentage increase in daily average subscribers of top 100 YouTube channels in experiment group ≤ that of controlled group

And,

**H1**: percentage increase in daily average subscribers of top 100 YouTube channels in experiment group > that of controlled group

**Random Variable**: Assuming Controlled Group = Variant A; Experiment Group = Variant B,

Then Pa and Pb are desired percentage increases of populations respectively.

Table 1: Data from dataset 2023-youtube.csv

|  |  |  |
| --- | --- | --- |
|  | **Variant A** | **Variant B** |
| Sample Size(N) | 5000 | 5000 |
| Conversion (X) | 258 | 366 |

P’b-P’a = difference in the percentage increase of Control and Experiment group conversions respectively

H0: Pb ≤ Pa 🡺 H0: Pb-Pa ≤ 0

H1: Pb > Pa 🡺 H1: Pb-Pa > 0

The symbol ">" tells you the test is right-tailed.

**Distribution for the test**: Since this is a test of two population proportions, the distribution is normal

*Pc* = = 0.0624

0.9376

Therefore,

*P’b – P’a* ~

*P’b – P’a* follows an approximate normal distribution.

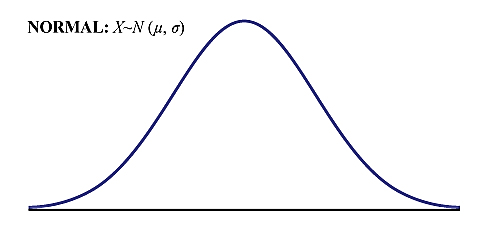
**Calculate the *p*-value using normal distribution:**

Estimated proportion of Experiment group conversions (*P’b*) = 0.0732

Estimated proportion of Control group conversions (*P’a*) = 0.0516

Therefore, *p-*value = 0.000004003207272 (2)*\*for calculation of p-value refer -* [*Excel File*](https://docs.google.com/spreadsheets/d/1Epc9dra4_wE9qsKTXKw_80s6KbqC1E-y/edit?usp=sharing&ouid=110769055396210827659&rtpof=true&sd=true)

**Graph:**



**P’b-P’a = 0.0216**

***p*-value = 0.0000040032**

Figure 1 : Graphical Representation of p-value

**Statistical Decision:** Since α = 0.05 => α > p-value, hence Reject H0; given the assumed constraints, sample size (N = 5000 each for A and B), MDE = 20% relative, β = 7.11%

**Conclusion:** At the 5% level of significance, from the sample data, there is sufficient evidence to conclude that the percentage increase in daily average subscribers of top 100 YouTube Channels experiment group is greater than that of controlled group.

(BARBARA ILLOWSKY, 2013 )

**Business Decision:** With the help of A/B testing we can conclude that, if it is justified by the financial viability of deployment of the feature, YouTube should deploy the feature to explicitly prompt the users to subscribe to a YouTube Channel, who have watched 3 consecutive videos of the said YouTube Channel. Through the Statistical testing we are 95% confident from the sample data collected for controlled and experiment groups that such a new feature would help YouTube to increase the percentage increase in daily subscribers of top 100 YouTube channels. However, YouTube, must carry on a cost benefit analysis of the relative benefit from this new feature and the cost of developing hours which would be needed to deploy such feature.

# **References**

2, M. -G. (n.d.). *Excel File.* Retrieved from https://docs.google.com/spreadsheets/d/1Epc9dra4\_wE9qsKTXKw\_80s6KbqC1E-y/edit?usp=sharing&ouid=110769055396210827659&rtpof=true&sd=true

BARBARA ILLOWSKY, S. D. (2013 ). *Introductory Statistics.* Texas: OpenStax , Rice University, 6100 Main Street MS-375, Houston, Texas 77005 .