

MuscleHub

A/B Testing for the Effectiveness of the
Fitness Test w.r.t. Membership Purchase

Riccardo Toscano, July 16, 2018

Abstract

An A/B test has been performed from 07/01/2017 to 10/10/2017 on 5004 visitors in order to evaluate whether the current policy of giving would-be applicants a fitness test (F) increases the visitor-to-customer conversion rate. A customer is defined as a person who completed at least one purchase. Group A took the F, Group B did not. Group B was more likely to apply for membership (13% vs. 10%; $P=0.096\%$) and overall to complete a purchase (10% vs. 8.0%, $P=1.5\%$). Though, neither group was more likely to complete a purchase once they applied (Group B = 77%, Group A = 80%, $P=43\%$). Likely, omitting the F would increase the visitor-to-applicant conversion rate and then the visitor-to-customer conversion rate.

4 interviews were collected. The interview sample is unreliable but highlights that omitting the F should at least make a share of the potential customers prefer MuscleHub over the competitors who give the F.

There is no reason to assume that the revenue generated by Group A and Group B customers should be different. However, a follow-up analysis of their purchase history on a yearly basis is advised.

A MuscleHub subscription is recommended.

The current iter for signing up for MuscleHub currently entails:

- Visiting MuscleHub
- Taking a fitness test
- Filling out an application
- Paying for the first month ('purchase')

Definitions

V: visitor

F: fitness test

A: applicant

C: customer (paid at least a month)

A/V: applicants per visitor, or visitor to applicant conversion rate

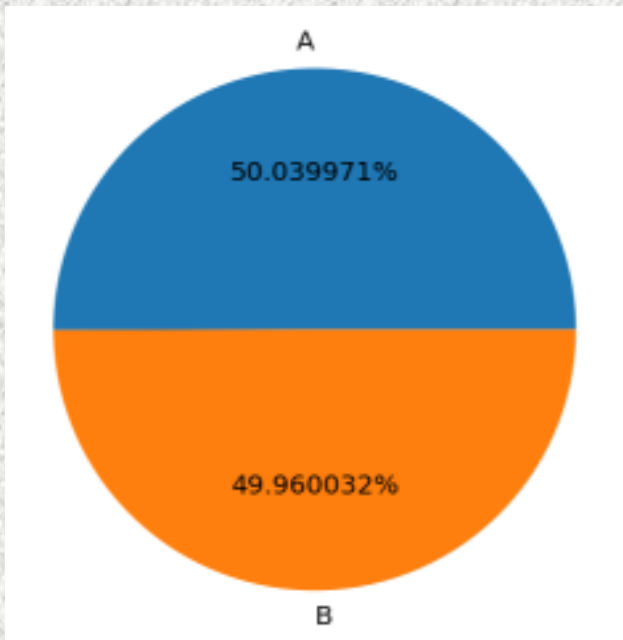
C/A, C/V: analogous to previous definition

The purpose of this analysis was evaluating the effect of taking the fitness test on the C/V, in order to evaluate whether to reconsider the current policy.

The test has been run this way:

- Group A was subject to the current policy;
- Group B skipped the fitness test.

The test (07/01/2017–10/10/2017) has been run on a sample of 5004 people (group A = 2504, group B = 2500).



The interviews of 2 people of group A and 2 people of group B have been collected.

Among 5004 visitors, group A had a C/V of 8.0% and group B of 10%. The difference has been tested with the chi squared test because it's a confrontation of two categorical variables (the A/B test group and purchasing or not).

The difference resulted significant ($P=1,5\%$), i.e. there is an effect of taking the fitness test on becoming a customer[1].

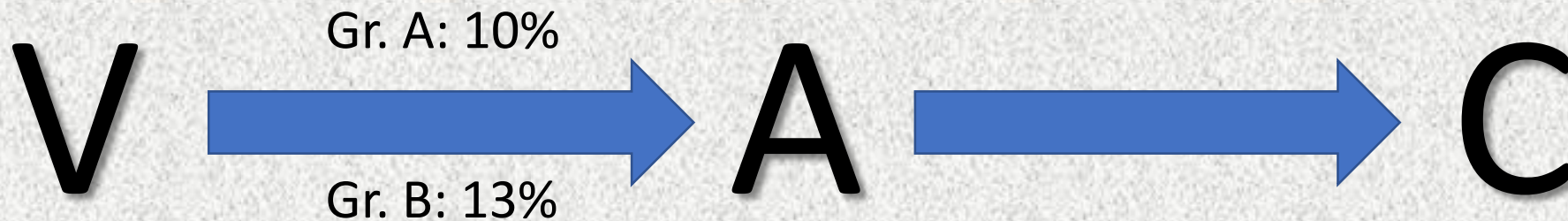
The effect is negative. Removing the fitness test should increase the C/V.

The purchasing funnel has been broken down and further analysed in order to gain insight on the effect of the fitness test.

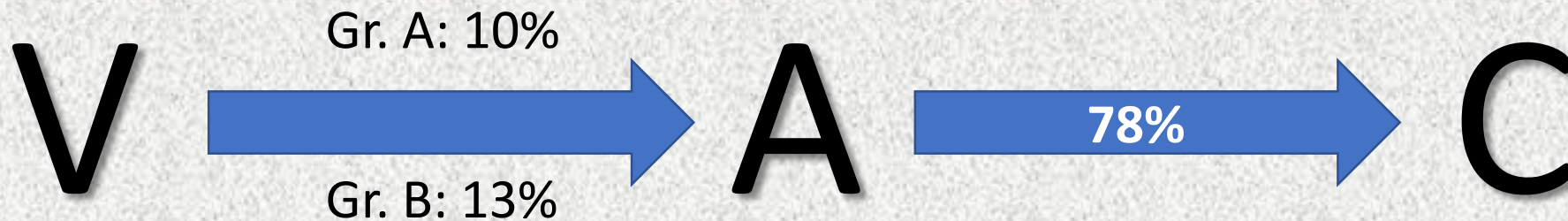
The A/V and the P/A have been analyzed in the same way as the C/V.



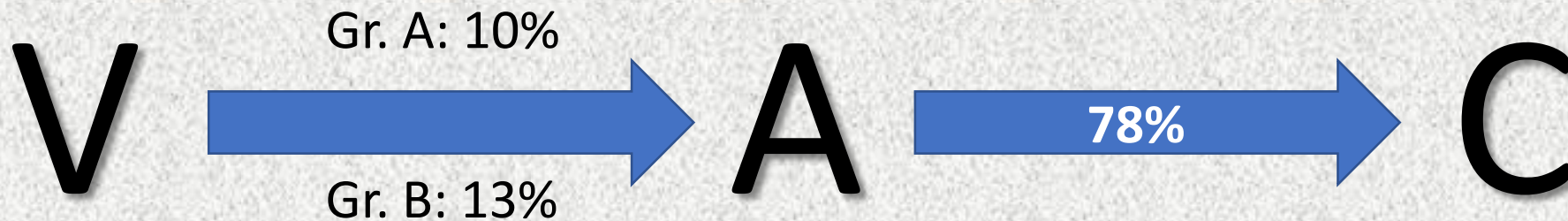
Group A's A/V was of 10% and Group B's A/V was of 13%. The difference was very significant ($P=0.096\%$).



Group A's C/A was of 80% and Group B's C/A was of 77%. The difference was not significant ($P=43\%$). Thus, the C/A of the whole sample is reported (78%)



The breakdown highlights that the fitness test decreases the A/V but leaves the C/A unaffected. The C/V is decreased because of the A/V's decrease.



To gain further insight the 4 interviews have been analyzed. The responses have been summarized in the following table.

Person	Reason for visiting	Took F?	Applied?	Customer?	Comments highlights
Cora, 23	Social influence	Yes	Yes	Yes	Happy about F
Sonny, 26	Unknown	Yes	?	?	Unhappy about F
Jesse, 35	Coworker	No	No	No	Happy of not F
Shirley, 22	BookFace	No	Yes	?	Happy of not F

Person	Reason for visiting	Took F?	Applied?	Customer?	Comments highlights
Cora, 23	Social influence	Yes	Yes	Yes	Happy about F
Sonny, 26	Unknown	Yes	?	?	Unhappy about F
Jesse, 35	Coworker	No	No	No	Happy of not F
Shirley, 22	BookFace	No	Yes	?	Happy of not F

The interview analysis shouldn't bear much consequence on the choice of policy because of both its limited sample and the possible self-selection of interviewees. Nonetheless the interviews could help shed some light on the policies' strenghts and limitations.

Person	Reason for visiting	Took F?	Applied?	Customer?	Comments highlights
Cora, 23	Social influence	Yes	Yes	Yes	Happy about F
Sonny, 26	Coworker	Yes	?	?	Unhappy about F
Jesse, 35	Unknown	No	No	No	Happy of not F
Shirley, 22	BookFace	No	Yes	?	Happy of not F

3 interviewees out of 4 claimed dislike for the F, or the possible F. Both interviewees who did not take the F mentioned how LiftCity has applicants take an F. Worth of notice is that at least one of them did not complete a purchase

Person	Reason for visiting	Took F?	Applied?	Customer?	Comments highlights
Cora, 23	Social influence	Yes	Yes	Yes	Happy about F
Sonny, 26	Coworker	Yes	?	?	Unhappy about F
Jesse, 35	Unknown	No	No	No	Happy of not F
Shirley, 22	BookFace	No	Yes	?	Happy of not F

Worth of notice is that at least one of the people who claimed being happy about not taking the F ended up not purchasing, notwithstanding her declared reasons and preferences.

Person	Reason for visiting	Took F?	Applied?	Customer?	Comments highlights
Cora, 23	Social influence	Yes	Yes	Yes	Happy about F
Sonny, 26	Coworker	Yes	?	?	Unhappy about F
Jesse, 35	Unknown	No	No	No	Happy of not F
Shirley, 22	BookFace	No	Yes	?	Happy of not F

The interviews suggest *at worst* that omitting the F could give MuscleHub appeal to a different share of possible customers, *at best* that not giving the F is an advantage *tout court* over the competitors who do.

Limits of this analysis and further developments

A purchase has been considered a success without regards for subsequent developments. I.e., this analysis didn't take into account whether group A or B tended to generate more revenue for MuscleHub, e.g. by renewing their subscription.

Arguably there is no reason to assume such an effect and the F omission would increase both C/V and revenue. In any case a follow-up study is advisable and would come at low costs. For instance, the revenue generated by group A's and group B's members could be analyzed for differences on a yearly basis.

MuscleHub

I recommend MuscleHub both for amateurs and fitness enthusiasts.

For as much as the copyrights and intellectual property belong to me I allow any use (comprehensive of commercial) of this material notwithstanding copyright and intellectual property laws. If you modify it, citing me is appreciated, but please remove anything that suggests me as the author.

Notes

[1] This is a simplification. For more details, see **RL Wasserstein & NA Lazar, *The ASA's Statement on p-Values: Context, Process, and Purpose*, The American Statistician, 70:2, 129-133**