



**IRRATIONALLABS**  
IRRATIONALITY FOR GOOD

# THIS **IS A BRIEF GUIDE TO** **DESIGNING EXPERIMENTS**

Designing Experiments 101





# WARNING

*Be sure to fill in all the blanks before proceeding to the next step.*

*Skipping this step will prevent you from getting the most out of this guide.*

**Now with loss aversion in mind  
let's proceed to the next step...**

# IDENTIFY KEY BEHAVIOR

01

1

Identify  
Key  
Behavior

**What is the **key behavior** that you want your users to do?**

---

*(eg. adopt negative keywords)*

1

# Identify Key Behavior

**Key Behavior = Measured Variable**

(what you will measure to see the effect of your test)

## EXPERT TIP



Ask around, does everyone involved with your project agree that this is the most important behavior to measure?

# IDENTIFY BEHAVIORAL BARRIERS

02

# 2

## Identify Behavioral Barriers

### Behavioral Barriers

---

*any factor that decreases willingness to act on the key behavior*

There are **2 types** of behavioral barriers:



#### HEADWINDS

*factors that make it difficult for a user to engage in the key behavior*

#### TAILWINDS

*factors that make the key behavior not sufficiently motivating*

# 2

## Identify Behavioral Barriers

**What are the **barriers** preventing people from doing the key behavior that you want them to do?**

---

*(list as many as you can think of, both **tailwinds** and **headwinds**)*

# 2

## Identify Behavioral Barriers

HEADWIND 

**friction**

---

*takes too much time, complex sign up*

TAILWIND 

**no perceived benefit**

---

*don't believe the benefit, there is no benefit, benefit is too far in the future*

# 2

## Identify Behavioral Barriers

### EXPERT TIP

---



*When thinking about tailwinds, think about enhancing current benefits and creating new ones*

*If you don't know behavioral barriers and benefits, check out our [workbooks](#)*

# CHOOSE A BARRIER

03

# 3

## Choose A Barrier

**Choose the behavioral barrier that you think **detracts most** from people not exhibiting the key behavior, and explain it in the following format...**

# 3

## Choose A Barrier

**The reason people are not  
currently partaking in**

 **KEY  
BEHAVIOR**

---

**is because they**

---

 **BEHAVIORAL  
BARRIER**

# 3

## Choose A Barrier

**The reason people are not  
currently partaking in**

**overpaying on their loans**

**is because they**

**stick with the default minimum payment**

 **KEY  
BEHAVIOR**

 **BEHAVIORAL  
BARRIER**

# IDENTIFY BE PRINCIPLES

# 4

## Identify BE Principles

### EXPERT TIP

---



If you don't know *BE* principles, check out our [workbooks](#)

# 4

## Identify BE Principles

**Using BE principles, what are some ways that you can **remove** this barrier?**

---

*(list as many as you can think of)*

# 4

## Identify BE Principles

B.E.  
PRINCIPLE 

**pre-commitment**

---

*put it on their calendar*

B.E.  
PRINCIPLE 

**in-your-way instructions**

---

*have a pop-up at login*

B.E.  
PRINCIPLE 

**urgency**

---

*provide a deadline*

# CHOOSE A PRINCIPLE

05

5

Choose A  
Principle

**Choose the behavioral economic principle that you think is **most likely** to remove the barrier**

5

Choose A  
Principle

By using \_\_\_\_\_  
we can increase the number  
of people who  
\_\_\_\_\_

 B.E.  
PRINCIPLE

 KEY  
BEHAVIOR

5

Choose A  
Principle

By using psychologically satisfying numbers

 B.E.  
PRINCIPLE

we can increase the number  
of people who

overpay on their loans

 KEY  
BEHAVIOR

# WRITE A HYPOTHESIS

06

# 6

## Write A Hypothesis

**If we do this...**  
**then this will happen...**  
**because...**

---

# 6

## Write A Hypothesis

**If we add a prompt to round up loan repayments then people will be more likely to take action to overpay on their loans, because people prefer psychologically satisfying numbers.**

# CREATE TEST CONDITIONS

07

# 7

## Create Test Conditions

**Design your test below.**  
**Start with **two conditions:****

CONTROL

TEST

---

What will each group of participants see?

**Write out the exact text.**

Will you use images?

**If so, add the exact images.**

# 7

## Create Test Conditions

**Test Condition = Control Condition  
+ **One Key Variable** you are testing**

---

Payment is \$1297.  
Add \$3 to your  
transaction

Pay off **8 months  
earlier** and save an  
average of **\$3,216!**

Add \$3

**CONTROL  
CONDITION**

Payment is \$1297.  
RoundUp to \$1300

Pay off **8 months  
earlier** and save an  
average of **\$3,216!**

RoundUp

**TEST  
CONDITION**

# 7

## Create Test Conditions

### EXPERT TIP

---



Restrict to only **one** variable in the test condition.

Imagine you include **two** variables in the test condition (e.g., urgency and amount of incentive) and the test condition works twice as well as the control condition.

**Why did it happen?** YOU DON'T KNOW (it could have been urgency, OR the amount of the incentive, OR a combination of both)

# 7

## Create Test Conditions

### **GURU TIPS** \*use at your own risk!

---

You can have more than two conditions:

STATUS QUO

CONTROL

TEST  
CONDITION 1

TEST  
CONDITION 2

The status quo is **never** the control.

You can have **more than one variable** between test conditions if they are testing the **same principle**.

If this is the last experiment you are ever running, then you have our permission to test different concepts and multiple key variables.



# Quick Review

Do I have a **control condition**?

---

Do I have only **one key variable** between conditions?

---

Do participants understand the **key behavior** that I want them to do?

---

Do participants understand **how** to do the key behavior?

---

Are my instructions clear?

---

# SELECT PARTICIPANTS

08

# 8

## Select Participants

**Let's do a quick Q&A...**

# 8

## Select Participants

# Who will take part in your experiment?

---

*All of your customers? Some of your customers?*

Make sure participants are **representative of your entire customer base**. If you only test your most/least loyal customers, the results may not generalize to other customers.

# 8

## Select Participants

# How will you decide which participant is in which condition?

---

Participants should be **randomly assigned**. There should not be a special reason why someone is in your control or test condition.

# 8

## Select Participants

### 12 Participants



 = Control Condition (6)

 = Test Condition (6)

## EXPERT TIP



Use spreadsheets to randomize your participants. Create as many random numbers as you have participants. Then assign each participant a number and list the participants in ascending or descending order.

# 8

## Select Participants

# How many participants will take part in your experiment?

Think about the **number** of people who are going to do the key behavior.

Think about what **relevant funnels** might **shrink** your sample size.

You should target **250+ per condition**.

**IMPRESSIONS > CLICKS >  = **

# 8

## Select Participants

# How many participants in each condition?

---

Each condition should have the **same number** of participants.

**REFLECT**

**09**

# 9

## Reflect

# Take some time to **reflect** on your experiment (before & after)

### BEFORE

What do you expect will happen? Write down your predictions and try to plot the data. Make sure you know how to analyze the data.

*Do you believe this experiment will prove your hypothesis?*

### AFTER

Plot your data. Compare results to your prediction.

*Did the experiment support your hypothesis?*

*Do you need further experimentation?*

# Final Review

Identify Behavioral Barriers

Identify BE Principles

Write a Hypothesis

Select Participants



Identify Key Behavior

Choose a Barrier

Choose a Principle

Create Test Conditions

Reflect

POP QUIZ!

Q1

# What's wrong with this experiment?

I want to increase fitness activity among my employees.  
I predict that giving people 20% off their gym membership will get them to be more active. I create the conditions below.  
Half of my employees are randomly assigned to each condition.  
I measure how many of them sign up for the gym membership.

## CONTROL

Start being active today! Sign up for the Hard Body Gym today!

## TEST

Start being active today! Sign up for the Hard Body Gym today and get 20% off your membership

Q1

# What's wrong with this experiment?

## Measuring the wrong key behavior

*Gym membership  $\neq$  increased fitness activity*

### CONTROL

Start being active today! Sign up for the Hard Body Gym today!

### TEST

Start being active today! Sign up for the Hard Body Gym today and get 20% off your membership

Q2

# What's wrong with this experiment?

I'm curious to see which plea will get people to donate more money. I create the two conditions below. I randomize my 4,000 participants, and send 2,000 one version and the other 2,000 the other version. I measure the number of people who donate, and how much they donate.

## CONTROL

Donate today and  
get a tax write off

## TEST

Donate today and  
save a life



Q2

# What's wrong with this experiment?

## More than one key variable

---

*“Save a life” + Picture*

### CONTROL

Donate today and  
get a tax write off

### TEST

Donate today and  
save a life



## Q3

# What's wrong with this experiment?

I run an enterprise software company, and want to see which type of pricing will get more companies to sign up for my product. I predict that having 3 options instead of just 2 will increase my revenue. I send one version to my customers in Burlington, VT and the other to my customers in Los Angeles, CA.

### CONTROL

Base Package:  
\$200

Premium Package:  
\$350

### TEST

Base Package:  
\$200

Premium Package:  
\$350

Premium Plus  
Package:  
\$400

Q3

# What's wrong with this experiment?

## Conditions $\neq$ randomly assigned

*Customers in different areas may have different preferences*

### CONTROL

Base Package:  
\$200

Premium Package:  
\$350

### TEST

Base Package:  
\$200

Premium Package:  
\$350

Premium Plus  
Package:  
\$400

Q4

# What's wrong with this experiment?

*I run a financial management company and want to see if people sign up more when they know how much time it will actually take them to sign up. Here are my conditions:*

## CONTROL

*Without rebalancing quarterly, you may be missing out on potential money*

## TEST

*Get more money from rebalancing in just 15 minutes each quarter*

Q4

# What's wrong with this experiment?

## More than one key variable

---

“Get more money” + “15 minutes”

### CONTROL

Without rebalancing quarterly, you may be missing out on potential money

### TEST

Get more money from rebalancing in just 15 minutes each quarter

# Congratulations!

*You have passed  
designing experiments 101*

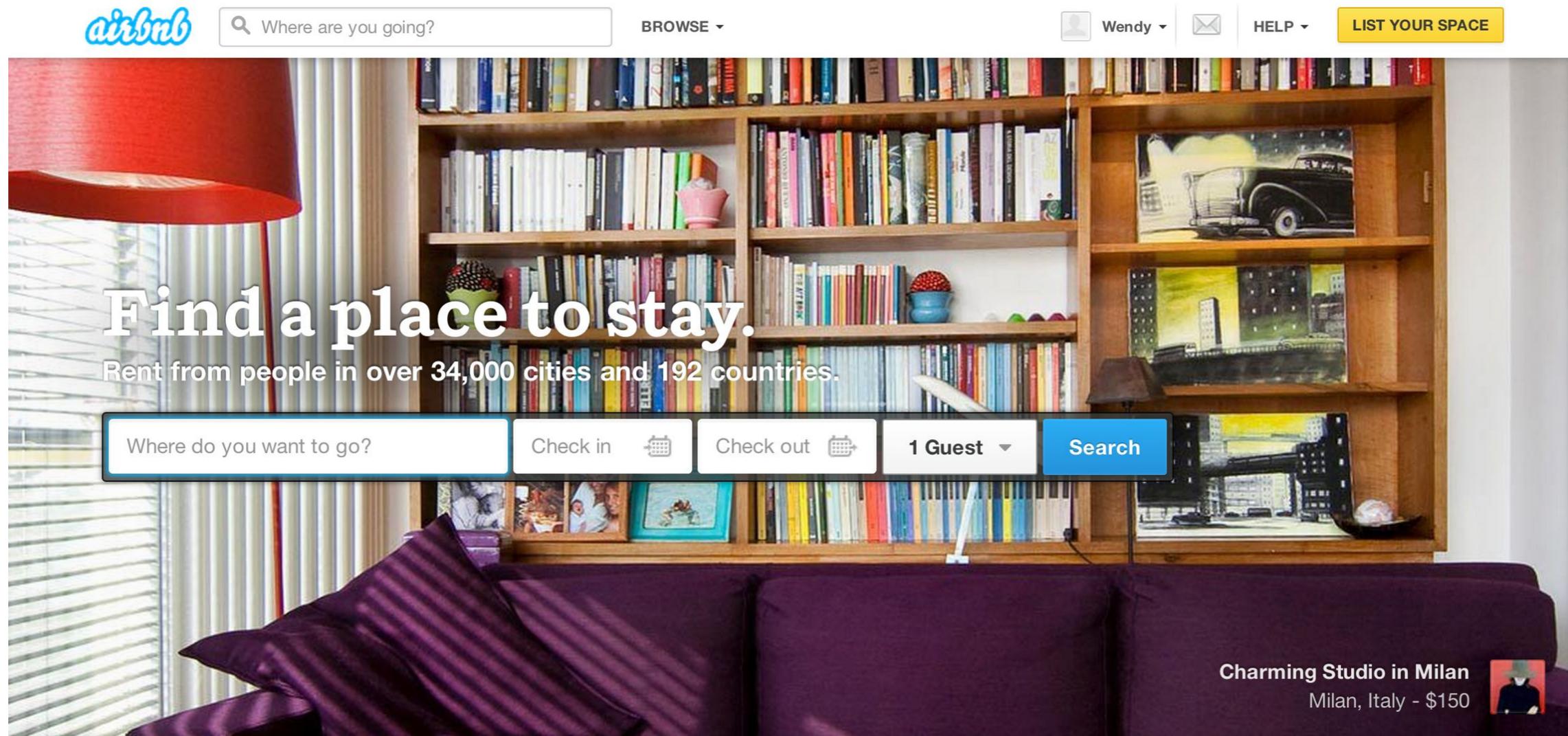
**To become an expert contact:**



**IRRATIONALLABS**  
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# GURU QUESTIONS

# We notice Airbnb guests really value a **quiet environment**. How do we get hosts to **decrease noisiness**?



# Let's follow the steps



1

Identify  
Key  
Behavior

What is the **key behavior** that you want your users to do?

 KEY  
BEHAVIOR

---

1

Identify  
Key  
Behavior

What is the **key behavior** that you want your users to do?

**Decrease noisiness**

---

 KEY  
BEHAVIOR

# 2

## Identify Behavioral Barriers

**What are the **barriers** preventing people from doing the key behavior that you want them to do?**

---

*(list as many as you can think of, both tailwinds and headwinds)*

# 2

## Identify Behavioral Barriers

### BEHAVIORAL BARRIERS

**don't want to be quiet**

---

**are not actively thinking about it**

---

**no incentive to be quiet**

---

3

## Choose A Barrier

**The reason people are not  
currently partaking in**

 **KEY  
BEHAVIOR**

---

**is because they**

---

 **BEHAVIORAL  
BARRIER**

# 3

## Choose A Barrier

The reason people are not  
currently partaking in  
decreased noisiness

 KEY  
BEHAVIOR

is because they

have no incentive to be quiet

 BEHAVIORAL  
BARRIER

# 4

## Identify BE Principles

**Using BE principles, what are some ways that you can **remove** this barrier?**

---

*(list as many as you can think of)*

# 4

## Identify BE Principles

B.E.  
PRINCIPLE 

### **concreteness**

---

*email reminders explaining the importance of providing a quiet environment*

B.E.  
PRINCIPLE 

### **incentives**

---

*providing star rating on noisiness*

5

Choose A  
Principle

**Choose the behavioral economic principle that you think is **most likely** to remove the barrier**

5

Choose A  
Principle

 B.E. PRINCIPLES

**By using \_\_\_\_\_ we can  
increase the number of hosts  
who \_\_\_\_\_**

 KEY BEHAVIOR

# 5

## Choose A Principle

 B.E. PRINCIPLES

By using incentives we can  
increase the number of hosts  
who decrease noisiness

 KEY BEHAVIOR

# 6

## Write A Hypothesis

**If we do this...**  
**then this will happen...**  
**because...**

---

# 6

## Write A Hypothesis

If we add **incentives**,  
then hosts will be more likely to  
**take action to decrease noisiness**,  
because incentives nudge people  
to complete an action in order to  
get the incentive.

7

# Create Test Conditions

## Design your test below

---

CONTROL

TEST  
CONDITION 1

TEST  
CONDITION 2

# 7

## Create Test Conditions

### Control - rate noise level

Reviews (51) Other Property Reviews (37) Friends (1)

Overall Guest Satisfaction ★★★★★

Accuracy	★★★★★	Communication	★★★★★
Cleanliness	★★★★★	Location	★★★★★
Check In	★★★★★	Value	★★★★★

Noise level ★★★★★

Provide a quiet environment!

Airbnb

Provide a quiet environment!

Hosts,

We have learned that our clients really value a quiet environment. Thus, we are creating a new rating on "Noise Level", where 5 stars is a quiet environment and 1 star is a very loud environment.

Thanks for helping us provide the best experience possible!

-Airbnb |

# 7

## Create Test Conditions

### Condition 1 - rate noise level + gift incentive (mug)

Reviews (51) Other Property Reviews (37) Friends (1)

Overall Guest Satisfaction ★★★★★

Accuracy	★★★★★	Communication	★★★★★
Cleanliness	★★★★★	Location	★★★★★
Check In	★★★★★	Value	★★★★★

Noise level ★★★★★

Provide a quiet environment and receive an Airbnb mug!

Airbnb

Provide a quiet environment and receive an Airbnb mug!

Hosts,

We have learned that our clients really value a quiet environment. Thus, we are creating a new rating on "Noise Level", where 5 stars is a quiet environment and 1 star is a very loud environment.

Get a 5 star rating on Noise Level and receive an Airbnb mug!

Thanks for helping us provide the best experience possible!

-Airbnb

# 7

## Create Test Conditions

### Condition 2 - rate noise level + financial incentive (\$10)

Reviews (51) Other Property Reviews (37) Friends (1)

Overall Guest Satisfaction ★★★★★

Accuracy	★★★★★	Communication	★★★★★
Cleanliness	★★★★★	Location	★★★★★
Check In	★★★★★	Value	★★★★★

Noise level ★★★★★

Provide a quiet environment and receive \$10!

Airbnb

Provide a quiet environment and receive \$10!

Hosts,

We have learned that our clients really value a quiet environment. Thus, we are creating a new rating on "Noise Level", where 5 stars is a quiet environment and 1 star is a very loud environment.

Get a 5 star rating on Noise Level and receive \$10!

Thanks for helping us provide the best experience possible!

-Airbnb

# 7

## Create Test Conditions

**What is wrong with these conditions?**

---

# 8

## Select Participants

 **Select 1,200 randomly  
generated hosts in the US**

---

 **400 hosts per condition**

---

# 9

## Reflect

# Take some time to **reflect** on your experiment (before & after)

### BEFORE

What do you expect will happen? Write down your predictions and try to plot the data. Make sure you know how to analyze the data.

*Do you believe this experiment will prove your hypothesis?*

### AFTER

Plot your data. Compare results to your prediction.

*Did the experiment support your hypothesis?*

*Do you need further experimentation?*