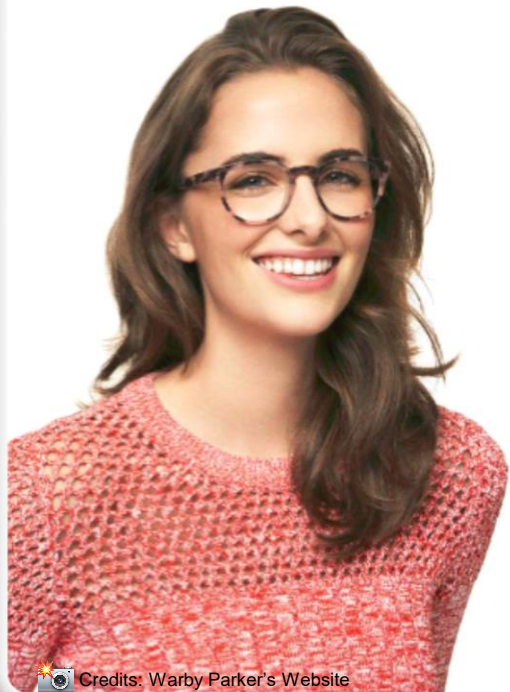


# Funnels with Warby Parker

Learn SQL from Scratch  
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Credits: Warby Parker's Website

1. Get familiar with Warby Parker

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# 1. Get Familiar with Warby Parker

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Warby Parker is an innovative eyewear brand that offers to potential costumers the possibility to take a Style Quiz and do a Home Try-On up to 5 frames

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This project aims to analyze the funnels on the Style Quiz and on the Home Try-On from Warby Parker.

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Not all users finish their Style Quiz or buy the frames from the Home Try-On, and this creates a funnel on both process.

The Style Quiz has the following questions:

1. What are you looking for?
2. What's your fit?
3. Which shapes do you like?
4. Which colors do you like?
5. When was your last eye exam?

Those 5 questions guide costumers to find the frames that are the best match based on their replies.

The information obtained from this survey is stored in a table called survey. It has 3 columns to store the information from the Style Quiz question, `user_id` and response.

## 2. What is the Quiz funnel?

- What is the number of responses for each question?
- Which question(s) of the quiz have a lower completion rates?
- What do you think is the reason?

question	num_response
1. What are you looking for?	500
2. What's your fit?	475
3. Which shapes do you like?	380
4. Which colors do you like?	361
5. When was your last eye exam?	270

```
1 --2. What is the number of responses for each
  question?
2 SELECT question,
3     COUNT(DISTINCT user_id) AS num_response
4 FROM survey
5 GROUP BY question;
```

There are different ways to find the answer to this question. I chose to do it by selecting the column question and counting the distinct user\_ids that replied them, and grouping by question.

Question	Percent Completed this Question
1	100%
2	95%
3	80%
4	95%
5	75%

Analyzing the results from query 2, it is possible to see that questions 3 and 5 have the lowest completion rates if compared with the number of users that replied the previous question.

Question 3 has a lower completion probably because people do not have sure what shapes they like or would be a better fit for their face type.

The lower completion of question 5 is probably connected to the fact that people that are searching for new frames do not necessarily had done an eye exam, although there is the option to skip this question.

# 3. A/B Testing with Home Try-On Funnel

Warby Parker's purchase funnel is:

Take the Style Quiz

Home Try-On

Purchase the Perfect Pair of Glasses

During the Home Try-On stage, we will be conducting an A/B Test:

- 50% of the users will get 3 pairs to try on
- 50% of the users will get 5 pairs to try on

Let's find out whether or not users who get more pairs to try on at home will be more likely to make a purchase.

The data is be distributed across three tables:

- quiz
- home\_try\_on
- purchase

```
1  --Examine the first five rows of each
   table. What are the column names?
2
3  SELECT *
4  FROM quiz
5  LIMIT 5;
6
7  SELECT *
8  FROM home_try_on
9  LIMIT 5;
10
11 SELECT *
12 FROM purchase
13 LIMIT 5;
```

Check the columns stored by each table by running a query for each of table limiting the rows to 5.

Below is the result, where is clearly seeing that the three table could be joined ON the column user\_id.

user_id	style	fit	shape	color
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	Women's Styles	Medium	Rectangular	Tortoise
291f1cca-e507-48be-b063-002b14906468	Women's Styles	Narrow	Round	Black
75122300-0736-4087-b6d8-c0c5373a1a04	Women's Styles	Wide	Rectangular	Two-Tone
75bc6ebd-40cd-4e1d-a301-27dd93b12e2	Women's Styles	Narrow	Square	Two-Tone
ce965c4d-7a2b-4db6-9847-601747fa7812	Women's Styles	Wide	Rectangular	Black

user_id	number_of_pairs	address
d8add87-3217-4429-9a01-d56d6811da7	5 pairs	145 New York 9a
f52b07c8-abe4-4fa9-9d39-ba9fc9a184cc	5 pairs	383 Madison Ave
8ba0d2d5-1a31-403e-9fa5-79540f8477f9	5 pairs	287 Pell St
4e71850e-8bbf-4e6b-acc4-49a7bb46c586	3 pairs	347 Madison Square N
3bc8f97f-2336-4dab-bd86-e391609dab97	5 pairs	182 Cornelia St

user_id	product_id	style	model_name	color	price
00a9dd17-36c8-430c-9d76-df49d4197dcf	8	Women's Styles	Lucy	Jet Black	150
00e15fe0-c86f-4818-9c63-3422211baa97	7	Women's Styles	Lucy	Elderflower Crystal	150
017506f7-aba1-4b9d-8b7b-f4426e71b8ca	4	Men's Styles	Dawes	Jet Black	150
01766fb3-9c51-4b1c-b593-87edab3c54cb	10	Women's Styles	Eugene Narrow	Rosewood Tortoise	95
01fdf106-f73c-4d3f-a036-2f3e2ab1ce06	8	Women's Styles	Lucy	Jet Black	150



# 3. A/B Testing with Home Try-On Funnel

To make easier the analyze of the information from quiz, home\_try\_on and purchase together is recommended to join them, and select the needed information from each table. Since we need all the information from the tables, even if the cell is empty, is needed to do a LEFT JOIN.

SELECT DISTINCT q.user\_id will bring the unique users from the table quiz. Select the user\_ids from home\_try\_on and purchase will show which users tried or purchased the glasses.

The tables were stored with short names to make easier to write the code and renamed to make the tables easy to read.

```
1 --5. Use a LEFT JOIN to combine the three tables,
  starting with the top of the funnel (browse) and
  ending with the bottom of the funnel (purchase).
2 --Select only the first 10 rows from this table.
3 SELECT DISTINCT q.user_id,
4     h.user_id IS NOT NULL AS 'is_home_try_on',
5     h.number_of_pairs,
6     p.user_id IS NOT NULL AS 'is_purchase'
7 FROM quiz AS 'q'
8 LEFT JOIN home_try_on AS 'h'
9     ON h.user_id = q.user_id
10 LEFT JOIN purchase AS 'p'
11     ON p.user_id = q.user_id
12 LIMIT 10;
```

user_id	is_home_try_on	number_of_pairs	is_purchase
4e8118dc-l	1	3 pairs	0
291f1cca-e	1	3 pairs	1
75122300-l	0	0	0
75bc6ebd-l	1	5 pairs	0
ce965c4d-l	1	3 pairs	1
28867d12-l	1	5 pairs	1
5a7a7e13-l	0	0	0
0143cb8b-l	0	0	0
a4ccc1b3-c	1	5 pairs	0
b1dded76-l	1	3 pairs	0

Once we have the data in this format, we can analyze it in several ways:

- **What is the overall conversion rate?**

The conversion rate is 49.5% ( $495/1000 = 49.5\%$ )

```
1 --6 Data Analysis
2 --6.1 Calculate overall conversion rates
3 -- 1.Create temporary table to store funnel information by user_id
4 WITH funnels AS (
5     SELECT DISTINCT q.user_id,
6         h.user_id IS NOT NULL AS 'is_home_try_on',
7         h.number_of_pairs,
8         p.user_id IS NOT NULL AS 'is_purchase'
9     FROM quiz AS 'q'
10    LEFT JOIN home_try_on AS 'h'
11        ON h.user_id = q.user_id
12    LEFT JOIN purchase AS 'p'
13        ON p.user_id = q.user_id)
14 -- 2.Create table with overall conversion numbers from funnels
15 SELECT COUNT(user_id) AS 'num_user_id',
16        SUM(is_home_try_on) AS 'num_home_try_on',
17        SUM(is_purchase) AS 'num_purchase',
18 -- 3.Calculate overall conversion rates
19        1.0 * SUM(is_purchase) / COUNT(user_id) AS '%overall_conversion'
20 FROM funnels;
```

Here the previous query was stored as a temporary table funnels. With funnels table's information, it is possible to calculate overall conversion rate dividing SUM(is\_purchase) by COUNT(user\_id).

num_user_id	num_home_try_on	num_purchase	%_overall_conversion
1000	750	495	0.495

- How is the conversion rates from quiz  $\rightarrow$  home\_try\_on and home\_try\_on  $\rightarrow$  purchase?

The conversion rate from quiz  $\rightarrow$  home\_try\_on is 75% ( $750/1000 = 75\%$ )

The conversion rate from home\_try\_on  $\rightarrow$  purchase is 66% ( $495/750 = 66\%$ )

```
1 --6 Data Analysis
2 --6.2 Calculate conversion rate quiz->home_try_on and home_try_on->purchase.
3 --Repeat two first steps of exercise 6.1
4 -- 1.Create temporay table to store funnel information by user_id
5 WITH funnels AS (
6     SELECT DISTINCT q.user_id,
7         h.user_id IS NOT NULL AS 'is_home_try_on',
8         h.number_of_pairs,
9         p.user_id IS NOT NULL AS 'is_purchase'
10    FROM quiz AS 'q'
11   LEFT JOIN home_try_on AS 'h'
12     ON h.user_id = q.user_id
13   LEFT JOIN purchase AS 'p'
14     ON p.user_id = q.user_id)
15 -- 2.Create table with overall conversion numbers from funnels
16 SELECT COUNT(user_id) AS 'num_user_id',
17        SUM(is_home_try_on) AS 'num_home_try_on',
18        SUM(is_purchase) AS 'num_purchase',
19 --3.Calculate conversion rate quiz->home_try_on and home_try_on->purchase.
20    1.0 * SUM(is_home_try_on) / COUNT(user_id) AS '%_home_try_on',
21    1.0 * SUM(is_purchase) / SUM(is_home_try_on) as '%_purchase'
22 FROM funnels;
```

Using the temporary table funnels, it is possible to calculate the conversions rates from quiz  $\rightarrow$  home\_try\_on and home\_try\_on  $\rightarrow$  purchase.

Dividing respectively  $SUM(is\_home\_try\_on)$  by  $COUNT(user\_id)$

and

$SUM(is\_purchase)$  by  $SUM(is\_home\_try\_on)$

num_user_id	num_home_try_on	num_purchase	_%_home_try_on	_%_purchase
1000	750	495	0.75	0.66

# 3. A/B Testing with Home Try-On Funnel

- What is the difference in purchase rates between customers who had 3 number\_of\_pairs and the ones who had 5?

The purchase rate for 3 number\_of\_pairs is 53% ( $201/379 = 53\%$ )

The purchase rate for 5 number\_of\_pairs is 79% ( $294/371 = 79\%$ )

Which shows that have more options to do the Home Try-On increases the purchase rate in 26 p.p.

```

1 --6.3 Calculate the difference in purchase rates between customers
  who had 3 number_of_pairs with ones who had 5.
2 --1.Create temporary table to store funnel information by user_id
3 WITH funnels AS (
4   SELECT DISTINCT q.user_id,
5     h.user_id IS NOT NULL AS 'is_home_try_on',
6     h.number_of_pairs,
7     p.user_id IS NOT NULL AS 'is_purchase'
8   FROM quiz AS 'q'
9   LEFT JOIN home_try_on AS 'h'
10    ON h.user_id = q.user_id
11   LEFT JOIN purchase AS 'p'
12    ON p.user_id = q.user_id)
13 --2.Create table for 3 pairs conversion numbers from funnels
14 SELECT COUNT(user_id) AS 'num_user_id_3',
15        SUM(is_home_try_on) AS 'num_home_try_on_3',
16        SUM(is_purchase) AS 'num_purchase_3',
17 --3.Calculate conversion rate 3 pairs-> purchase, and ROUND to 2
  decimals
18   ROUND((1.0 * SUM(is_purchase) / SUM(is_home_try_on)), 2) AS
  '%_purchase_3'
19 FROM funnels
20 WHERE number_of_pairs = '3 pairs';
21
22 --4.Repeat the process to create table for 5 pairs conversion number
23 WITH funnels AS (
24   SELECT DISTINCT q.user_id,
25     h.user_id IS NOT NULL AS 'is_home_try_on',
26     h.number_of_pairs,
27     p.user_id IS NOT NULL AS 'is_purchase'
28   FROM quiz AS 'q'
29   LEFT JOIN home_try_on AS 'h'
30    ON h.user_id = q.user_id
31   LEFT JOIN purchase AS 'p'
32    ON p.user_id = q.user_id)
33 --5.Create table for 5 pairs conversion numbers from funnels
34 SELECT COUNT(user_id) AS 'num_user_id_5',
35        SUM(is_home_try_on) AS 'num_home_try_on_5',
36        SUM(is_purchase) AS 'num_purchase_5',
37 --6.Calculate conversion rate 5 pairs-> purchase, and ROUND to 2
  decimals
38   ROUND((1.0 * SUM(is_purchase) / SUM(is_home_try_on)), 2) AS
  '%_purchase_5'
39 FROM funnels
40 WHERE number_of_pairs = '5 pairs';

```

Using the temporary table funnels and the query used to calculate the conversion of home\_try\_on → purchase is possible to calculate the purchase rates for 3 and 5 number\_of\_pairs by adding a WHERE clause to distinguish the number\_of\_pairs.

Since the result of those divisions have too many decimal a ROUND clause was used to limit the decimal to 2.

num_user_id_3	num_home_try_on_3	num_purchase_3	%_purchase_3
379	379	201	0.53
num_user_id_5	num_home_try_on_5	num_purchase_5	%_purchase_5
371	371	294	0.79



# 3. A/B Testing with Home Try-On Funnel

- What are the most common results of the Style quiz?

style	num_user_style
Women's Styles	469
Men's Styles	432
I'm not sure. Let's skip it.	99
fit	num_user_fit
Narrow	408
Medium	305
Wide	198
I'm not sure. Let's skip it.	89
shape	num_user_shape
Rectangular	397
Square	326
Round	180
No Preference	97
color	num_user_color
Tortoise	292
Black	280
Crystal	210
Neutral	114
Two-Tone	104

Women's style, Narrow fit, Rectangular shape and Tortoise color are the most common results from the quiz

```
1 --6 Data Analysis - Extra
2 --6.4 The most common results of the style quiz.
3 --1 Most chose style
4 SELECT DISTINCT style AS 'style',
5     COUNT(style) AS 'num_user_style'
6 FROM quiz
7 GROUP BY 1
8 ORDER BY 2 DESC;
9 --2 Most chose fit
10 SELECT DISTINCT fit AS 'fit',
11     COUNT(fit) AS 'num_user_fit'
12 FROM quiz
13 GROUP BY 1
14 ORDER BY 2 DESC;
15 --3 Most chose shape
16 SELECT DISTINCT shape AS 'shape',
17     COUNT(shape) AS 'num_user_shape'
18 FROM quiz
19 GROUP BY 1
20 ORDER BY 2 DESC;
21 --4 Most chose color
22 SELECT DISTINCT color AS 'color',
23     COUNT(color) AS 'num_user_color'
24 FROM quiz
25 GROUP BY 1
26 ORDER BY 2 DESC;
```

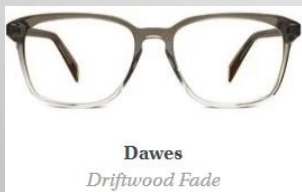
Using SELECT DISTINCT for each column of the table quiz, it is possible to count the number of each item.

## 3. A/B Testing with Home Try-On Funnel

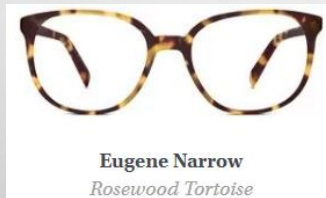
- What the most common types of purchase made?

product_id	num_purchase	style	model_name	color
3	63	Men's Styles	Dawes	Driftwood Fade
10	62	Women's Styles	Eugene Narrow	Rosewood Tortoise
9	54	Women's Styles	Eugene Narrow	Rose Crystal
1	52	Men's Styles	Brady	Layered Tortoise Matte
6	50	Women's Styles	Olive	Pearled Tortoise
4	44	Men's Styles	Dawes	Jet Black
7	44	Women's Styles	Lucy	Elderflower Crystal
2	43	Men's Styles	Brady	Sea Glass Gray
8	42	Women's Styles	Lucy	Jet Black
5	41	Men's Styles	Monocle	Endangered Tortoise

The most common purchase are product\_id 3 and 10.



Dawes  
Driftwood Fade  
product\_id 3



Eugene Narrow  
Rosewood Tortoise  
product\_id 10

```
1  --6 Data Analysis - Extra
2  --6.5 The most common types of purchase made.
3  --Each combination of style, model_name and color a unique
   product_id. Find DISTINCT product_id
4  SELECT DISTINCT product_id,
5  FROM purchase
6  ORDER BY product_id ASC;
7
8  --6 Data Analysis - Extra
9  --6.5 The most common types of purchase made.
10 --1 COUNT number of purchase per product_id, then GROUP by
    product_id, and ORDER from the most bought to the least
11 SELECT DISTINCT product_id,
12     COUNT(product_id) AS 'num_purchase'
13 FROM purchase
14 GROUP BY 1
15 ORDER BY 2 DESC;
16 --2 Find witch style, model_name and color are related to
    each product_id
17 SELECT DISTINCT product_id,
18     COUNT(product_id) AS 'num_purchase',
19     style,
20     model_name,
21     color
22 FROM purchase
23 GROUP BY 1
24 ORDER BY 2 DESC;
```

## 4. Insights

- **What are some actionable insights for Warby Parker?**
- For que quiz funnel I would consider to change question 3 from "Which shapes do you like?" to "What is your face shape?" based on the users' answer suggest the frame shapes that would go better with each face shape.
- People could shop for frames just to look cool and not have the intention to use any prescription on it. So Question 5 "When was your last eye exam?" could be tuned in a extra one by adding before it the following question "Do you need prescription lenses?". If yes, this person goes to (now) question 6 "When was your last eye exam?". If not, the person sees the result of the Style Quiz.
- The Home Try-On with 5 pairs increases the purchase rates considerably (26 p.p.) if compared with the purchase rates for Home Try-On with 3 pairs. I would recommend to do a pilot with 7 pair for Home Try-On to see if the conversion rates would increase as well.



## 5. Extra – Price Analyze/Product Sale Rate

- What are the prices of the frames?

\$150, \$95 and \$50

- What is the average price?

\$112.72

- What is the price of the Top 5 selling products?

\$150 (Top 1) and \$95 (from Top 2 to 5).

```
1 --6.6 Price - Extra
2 --1. What are the DISTINCT prices?
3 SELECT DISTINCT price
4 FROM purchase;
5 --2. What is Warby Parker price average?
6 --ROUND to 2 decimals.
7 SELECT ROUND(AVG(price),2) AS 'price_avg'
8 FROM purchase;
9 --3. Price of the top 5 selling glasses
10 SELECT DISTINCT product_id,
11 COUNT (product_id) AS 'num_purchase',
12 price
13 FROM purchase
14 GROUP BY 1
15 ORDER BY 2 DESC
16 LIMIT 5;
```

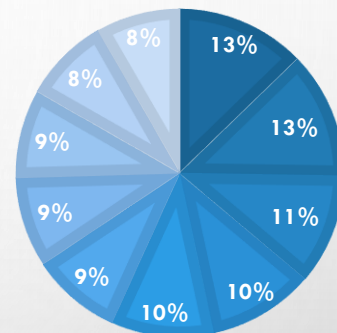
price		
		150
		95
		50
price_avg		
		112.72
product_id	num_purchase	price
3	63	150
10	62	95
9	54	95
1	52	95
6	50	95

- What is the sale rate of each product\_id?

% purchase per product\_id

product_id	num_purchase
3	63
10	62
9	54
1	52
6	50
4	44
7	44
2	43
8	42
5	41

■ 3 ■ 10 ■ 9 ■ 1 ■ 6 ■ 4 ■ 7 ■ 2 ■ 8 ■ 5



```
1 --6.6 Price - Extra
2 --4. Number of purchases per product_id
3 SELECT DISTINCT product_id,
4 COUNT (product_id) AS 'num_purchase'
5 FROM purchase
6 GROUP BY 1
7 ORDER BY 2 DESC;
```