



# Funnels with Warby Parker

Learn SQL from Scratch

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# 1. Get familiar with Warby Parker

Warby Parker is a transformative lifestyle brand with a lofty objective: to offer designer eyewear at a revolutionary price while leading the way for socially conscious businesses. Founded in 2010 and named after two characters in an early Jack Kerouac journal, Warby Parker believes in creative thinking, smart design, and doing good in the world. For every pair of eyeglasses and sunglasses sold, a pair is distributed to someone in need.

## 2. Quiz Funnel

To help users find their perfect frame, Warby Parker has a Style Quiz that has following questions:

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

The users' responses are stored in a table called `survey`. Select all columns from the first 10 rows.

```
1 SELECT *
2 FROM survey
3 LIMIT 10;
```

question	user_id	response
1. What are you looking for?	005e7f99-d48c-4fce-b605-10506c85aaf7	Women's Styles
2. What's your fit?	005e7f99-d48c-4fce-b605-10506c85aaf7	Medium
3. Which shapes do you like?	00a556ed-f13e-4c67-8704-27e3573684cd	Round
4. Which colors do you like?	00a556ed-f13e-4c67-8704-27e3573684cd	Two-Tone
1. What are you looking for?	00a556ed-f13e-4c67-8704-27e3573684cd	I'm not sure. Let's skip it.
2. What's your fit?	00a556ed-f13e-4c67-8704-27e3573684cd	Narrow
5. When was your last eye exam?	00a556ed-f13e-4c67-8704-27e3573684cd	<1 Year
3. Which shapes do you like?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	Square
5. When was your last eye exam?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	<1 Year
2. What's your fit?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	Medium

What columns does the table have?

- The survey table has the following columns:
  - question
  - user\_id
  - response

Users will “give up” at different points in the survey. Let’s analyse how many users move from Question 1 to Question 2, etc.

Create a quiz funnel using `GROUP BY` command.

```
SELECT question,  
       COUNT (DISTINCT user_id) AS 'No. of answers'  
FROM survey  
GROUP BY 1;
```

question	No. of answers
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

What is the number of responses for each question?

- Question 1 - 500
- Question 2 - 475
- Question 3 - 380
- Question 4 - 361
- Question 5 - 270

Using a separate program like Excel or Google Sheets, calculate the percentage of users who answer each question.:

question 1	500	1
question 2	475	0.95
question 3	380	0.76
question 4	361	0.722
question 5	270	0.54

Which question(s) of the quiz have a lower completion rates?

- We see that Question 3, 4, and 5 have lower response rates.

What do you think is the reason?

- Question 3 and 4 are asking about the customers' personal preferences but some people may not know what they prefer. This could make them unsure of how to answer. In contrast, Question 5 is not related to preference but is asking for a piece of personal health information. So people may want privacy in relation to their health information.

# 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 will be distributed across three tables:

- quiz
- home\_try\_on
- purchase

Examine the first five rows of each table

```
-- Home Try-On Funnel

SELECT *
FROM quiz
LIMIT 5;

SELECT *
FROM home_try_on
LIMIT 5;

SELECT *
FROM purchase
LIMIT 5;
```

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-a301-27ddd93b12e2	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-d56d68111da7	5 pairs	145 New York 9a
f52b07c8-abe4-4f4a-9d39-ba9fc9a184cc	5 pairs	383 Madison Ave
8ba0d2d5-1a31-403e-9fa5-79540f8477f9	5 pairs	287 Pell St
4e71850e-8bbf-4e6b-acc6-49a7bb46c586	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
0176bfb3-9c51-4b1c-b593-87edab3c54cb	10	Women's Styles	Eugene Narrow	Rosewood Tortoise	95
01fd106-f73c-4d3f-a036-2f3e2ab1ce06	8	Women's Styles	Lucy	Jet Black	150

What are the column names?

- **quiz** table has the following columns:
  - user\_id
  - style
  - fit
  - shape
  - colour
- **home\_try\_on** has the following columns:
  - user\_id
  - number\_of\_pairs
  - address
- **purchase** table has the following columns:
  - user\_id
  - product\_id
  - style
  - model\_name
  - colour
  - price

We'd like to create a new table with the following layout:

user_id	is_home_try_on	number_of_pairs	is_purchase
4e8118dc	True	3	False
291f1cca	True	5	False
75122300	False	NULL	False

Each row will represent a single user from the browse table:

- If the user has any entries in `home_try_on`, then `is_home_try_on` will be 'True'.
- `number_of_pairs` comes from `home_try_on` table
- If the user has any entries in `is_purchase`, then `is_purchase` will be 'True'.

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).

Select only the first 10 rows from this table.

```
SELECT DISTINCT q.user_id,
               h.user_id IS NOT NULL
               AS 'is_home_try_on',
               h.number_of_pairs,
               p.user_id IS NOT NULL
               AS 'is_purchase'
FROM quiz AS 'q'
LEFT JOIN home_try_on AS 'h'
  ON q.user_id = h.user_id
LEFT JOIN purchase AS 'p'
  ON p.user_id = q.user_id
LIMIT 10;
```

user_id	is_home_try_on	number_of_pairs	is_purchase
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	1	3 pairs	0
291f1cca-e507-48be-b063-002b14906468	1	3 pairs	1
75122300-0736-4087-b6d8-c0c5373a1a04	0	Ø	0
75bc6ebd-40cd-4e1d-a301-27dd93b12e2	1	5 pairs	0
ce965c4d-7a2b-4db6-9847-601747fa7812	1	3 pairs	1
28867d12-27a6-4e6a-a5fb-8bb5440117ae	1	5 pairs	1
5a7a7e13-fbcf-46e4-9093-79799649d6c5	0	Ø	0
0143cb8b-bb81-4916-9750-ce956c9f9bd9	0	Ø	0
a4ccc1b3-cbb6-449c-b7a5-03af42c97433	1	5 pairs	0
b1dded76-cd60-4222-82cb-f6d464104298	1	3 pairs	0



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

- We can calculate overall conversion rates by aggregating across all rows.
- We can compare conversion from quiz → home\_try\_on and home\_try\_on → purchase.
- We can calculate the difference in purchase rates between customers who had 3 number of pairs with ones who had 5.

We can also use the original tables to calculate things like:

- The most common results of the style quiz.
- The most common types of purchase made.

We can calculate overall conversion rates by aggregating across all rows.

COUNT (*)	home_try_on	purchase	Percent_home_try_on	Percent_purchase
1000	750	495	0.75	0.66

```
WITH funnels AS (  
  SELECT DISTINCT q.user_id,  
    h.user_id IS NOT NULL  
      AS 'is_home_try_on',  
    h.number_of_pairs,  
    p.user_id IS NOT NULL  
      AS 'is_purchase'  
  FROM quiz AS 'q'  
  LEFT JOIN home_try_on AS 'h'  
    ON q.user_id = h.user_id  
  LEFT JOIN purchase AS 'p'  
    ON p.user_id = q.user_id)  
SELECT COUNT (*),  
  SUM (is_home_try_on) AS 'home_try_on',  
  SUM (is_purchase) AS 'purchase',  
  1.0 * SUM (is_home_try_on) /  
  COUNT (user_id) AS  
'Percent_home_try_on',  
  1.0 * SUM (is_purchase) /  
  SUM (is_home_try_on) AS  
'Percent_purchase'  
FROM funnels;
```

In this overall conversion, we can analyse 75% of people have tried home\_try\_on and 66% of people made it through purchasing the product.

We can compare conversion from  
quiz → home\_try\_on and  
home\_try\_on → purchase.

```
WITH funnels AS (  
  SELECT DISTINCT q.user_id,  
    h.user_id IS NOT NULL  
      AS 'is_home_try_on',  
    h.number_of_pairs,  
    p.user_id IS NOT NULL  
      AS 'is_purchase'  
  FROM quiz AS 'q'  
  LEFT JOIN home_try_on AS 'h'  
    ON q.user_id = h.user_id  
  LEFT JOIN purchase AS 'p'  
    ON p.user_id = q.user_id)  
SELECT COUNT (*) AS 'quiz',  
  SUM (is_home_try_on) AS  
'home_try_on',  
  SUM (is_purchase) AS 'purchase',  
  1.0 * SUM (is_home_try_on) /  
  COUNT (user_id) AS  
'quiz_to_home_try_on',  
  1.0 * SUM (is_purchase) /  
  SUM (is_home_try_on) AS  
'home_try_on_to_purchase'  
FROM funnels;
```

quiz	home_try_on	purchase	quiz_to_home_try_on	home_try_on_to_purchase
1000	750	495	0.75	0.66

The above data shows the purchase funnel of Warby Parker.

There were 75% of the people who actually tried some pairs of glasses home after taking the quiz. And only 66% among who tried in their home made the actual purchase. This seems like the home\_try\_on didn't succeed on making the purchase. We can examine better by comparing with people who tried 3 pairs to try on and 5 pairs.

We can calculate the difference in purchase rates between customers who had 3 number of pairs with ones who had 5.

```
WITH funnels AS (  
  SELECT DISTINCT q.user_id,  
    h.user_id IS NOT NULL  
    AS 'is_home_try_on',  
    h.number_of_pairs,  
    p.user_id IS NOT NULL  
    AS 'is_purchase'  
  FROM quiz AS 'q'  
  LEFT JOIN home_try_on AS 'h'  
    ON q.user_id = h.user_id  
  LEFT JOIN purchase AS 'p'  
    ON p.user_id = q.user_id)  
SELECT number_of_pairs,  
  COUNT (*) AS 'quiz',  
  SUM (is_home_try_on) AS 'home_try_on',  
  SUM (is_purchase) AS 'purchase',  
  1.0 * SUM (is_home_try_on) /  
  COUNT (user_id) AS 'quiz_to_home_try_on',  
  1.0 * SUM (is_purchase) /  
  SUM (is_home_try_on) AS  
  'home_try_on_to_purchase'  
FROM funnels  
GROUP BY 1  
ORDER BY 1;
```

number_of_pairs	quiz	home_try_on	purchase	quiz_to_home_try_on	home_try_on_to_purchase
Ø	250	0	0	0.0	Ø
3 pairs	379	379	201	1.0	0.530343007915567
5 pairs	371	371	294	1.0	0.792452830188679

We could see in the above data that people who got 3 pairs to try on had only 53% purchase rate while people who tried 5 pairs of glasses had 79% of them purchasing the product. Maybe it's because 3 pairs were not enough to find the right style or fit of the person's preference while 5 pairs gave higher success at fitting or styling one's preference.

We can calculate the most common results of the style quiz.

```
SELECT style, fit, shape, color,  
       COUNT(*)  
FROM quiz  
GROUP BY style, fit, shape, color  
ORDER BY 5 DESC  
LIMIT 10;
```

style	fit	shape	color	COUNT(*)
Men's Styles	Narrow	Rectangular	Tortoise	23
Women's Styles	Narrow	Rectangular	Black	20
Women's Styles	Narrow	Rectangular	Tortoise	20
Men's Styles	Medium	Rectangular	Tortoise	19
Men's Styles	Narrow	Rectangular	Black	18
Men's Styles	Medium	Rectangular	Black	17
Men's Styles	Narrow	Square	Tortoise	16
Women's Styles	Medium	Rectangular	Tortoise	16
Women's Styles	Medium	Square	Tortoise	16
Women's Styles	Narrow	Square	Crystal	16

By calculating the most common results of the style from the quiz table, we could see both men and women prefer the narrow/medium fit, rectangular/square shape, and tortoise/black colour were the most popular type that people would most likely to buy.

**\*\***Only the top 10 common results were taken into considerations because the rest of the results were quite insignificant.

We can also calculate the most common types of purchase made

```
SELECT product_id, style, model_name,  
color, price, COUNT (*)  
FROM purchase  
GROUP BY 1  
ORDER BY 2,6 DESC;
```

product_id	style	model_name	color	price	COUNT (*)
3	Men's Styles	Dawes	Driftwood Fade	150	63
1	Men's Styles	Brady	Layered Tortoise Matte	95	52
4	Men's Styles	Dawes	Jet Black	150	44
2	Men's Styles	Brady	Sea Glass Gray	95	43
5	Men's Styles	Monocle	Endangered Tortoise	50	41
10	Women's Styles	Eugene Narrow	Rosewood Tortoise	95	62
9	Women's Styles	Eugene Narrow	Rose Crystal	95	54
6	Women's Styles	Olive	Pearled Tortoise	95	50
7	Women's Styles	Lucy	Elderflower Crystal	150	44
8	Women's Styles	Lucy	Jet Black	150	42

We could learn that Men's model didn't take a huge part in making the purchase but Driftwood Fade colour was the men's most favourite and it seems like price didn't matter when purchasing the product.

On the other hand, Women's were affected by the model named Eugene Narrow and the most purchased product prices were below 100 dollars. It seems like women are more sensitive with the price.

By calculating these data, Warby Parker can offer better gender specific glasses.

## What are some actionable insights for Warby Parker?

- Warby Parker could continue with home\_try\_on because 75% of the people who took the quiz found interests in trying the glasses in their home.
- When offering the home\_try\_on, Warby Parker should provide at least 5 pairs of glasses to try on based on the results of the data which had 79% purchase rate.
- Warby Parker can send 5 pairs of home\_try\_on glasses based on the data collected (can be gender specific) from the purchase table where actual purchase was made.
- Warby Parker can make use of the calculated data from quiz table for the advertisement. People will show more interest by looking at the words like “narrow fit”, “rectangular shaped”, and “tortoise colour”
- Warby Parker can try higher price with model named Eugene Narrow to see if women are affected by the model or by the price.
- Warby Parker can eliminate the production of less common types of glasses to save the cost of goods.



Thanks! 😊

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