



Warby Parker

Learn SQL from Scratch

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Table of Contents

1. Warby Parker – The Who, What & Why
2. Style Quiz Analysis
3. Home Try-On Funnel
4. Conclusion

1. Warby Parker – The Who, What & Why

1. Warby Parker – Who, What & Why

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.

This report delves into two aspects of Warby Parkers business. The first is a deep dive into Warby Parkers “Style Quiz” which is a 5 step survey. The goal of this quiz is to help users find their perfect frame and is designed to guide users through each step of the survey. We will take a closer look at each step of the funnel and determine where improvements can be made.

The second part of this report focus’ on a “Home Try-On Funnel”, which consists of a quiz, product testing and purchasing phase. We will look at the user journey and how Warby Parker can improve conversions based on user behavior.

2. Quiz Funnel

1.1 Quiz Funnel – Table Content

Let's start by establishing an overview of what data is stored in the "survey" table. The first line in our query ('SELECT' being an aggregate Function) refers to the columns we would like included. In this instance, '*' refers to 'all' content, so the first line requests all content. The 'FROM' aggregate function, refers to the table that we are querying. Finally, the 'LIMIT' function specifies how many rows we would like displayed in our query result. The table contains the following columns: 'question', 'user_id' & 'response'.

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

Query:

```
SELECT *  
FROM survey  
LIMIT 10;
```

2.1 Quiz Funnel – User journey

Now let's have a look at the user journey. The goal of the Quiz is to have the user go from step one and all the way through step five. Unfortunately, not all of users complete the quiz. Let's start by establishing an overview of the quiz funnel and how many users complete each step.

Using the SELECT function we want to query which questions are being answered by the amount of unique users (using the COUNT () function to return amount of users and the DISTINCT function to query distinct values). This returns the amount of distinct user_ids answered in each step. We then choose to group (or bucket) our query based on the first column indicated in the SELECT function by using the GROUP BY 1 function. If we had used the GROUP BY 2 function, we would have requested to bucket our query by user_id. Findings listed below:

question	COUNT(DISTINCT user_id)
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

Query:

```
SELECT question, COUNT(DISTINCT user_id)
FROM survey
GROUP BY 1;
```

3.1 Quiz Funnel – Completion Rate (%)

In the previous step, we established an overview of the amount of people completing each step of the funnel/quiz. In order to visualize where people are abandoning the quiz, we can divide the amount of users completing each step with the amount that have completed the previous step e.g. $(475/500)*100 = 95\%$.

The results below show noteworthy declines in completion on two steps, namely step 3 & step 5. On the following two slides, let's take a look at what the cause might be.

question	COUNT(DISTINCT user_id)	Completion rate (%)
1. What are you looking for?	500	100%
2. What's your fit?	475	95%
3. Which shapes do you like?	380	80%
4. Which colors do you like?	361	95%
5. When was your last eye exam?	270	75%

3.2 Quiz Funnel – Step 3

Step 3 of the survey differs from the other steps as it asks users “Which shapes do you like?: Pick as many as you want”. User is meant to select one or more shapes and the actively move to the next step by selecting “continue”. In the previous slide, we’ve already established that the is a 80% completion rate on this step (lower than other steps). We see here that user is expected to actively press continue, rather than automatically being taken to the next page. An A/B test could help understand whether this could be remedied by ushering the user onwards automatically. Note that step 4, however, prompts users for multiple answers and here the completion rate is 95%, so this is most likely not the cause.

In addition, using the query to the right, we see that the most popular choices are “Rectangular” and “Square” and very few say “No preference”. Again, A/B testing could help understand whether the “No preference” button should be moved up, as a choice/image, next to the glasses.

response	Responses
No Preference	29
Rectangular	141
Round	91
Square	119

Query:

```
SELECT response, COUNT(response) AS 'Responses'
FROM survey
WHERE question LIKE '3. Which shapes do you like?'
GROUP BY response;
```

3.3 Quiz Funnel – Step 5

Step 5 sees a lower completion rate of 75%. The query to the right only tells us the choices made by those users that completed the quiz, but shows that the majority of users that complete the survey, are users that have had an eye exam during the last year. The high drop-off at this point could be a consequence of design. The images used to illustrate the amount of time hurts the eyes. A hypothesis could be that users are overwhelmed with the amount of numbers they are presented with. Consider using simpler images (not numbers). A/B testing would help resolve.

response	Responses
1-3 Years	56
3+ Years	37
<1 Year	141
Not Sure. Let's Skip It	36

Query:

```
SELECT response, COUNT(response) AS 'Responses'  
FROM survey  
WHERE question LIKE '5. %'  
GROUP BY response;
```

3.4 Survey Comments

A few comments on errors found:

- 1) The active quiz found on <https://www.warbyparker.com/quiz> now contains 6 steps and not 5. The database needs updating.
- 2) On step 5, the images and questions refer to “months”. The database refers to these in years. If providing a report to the account team, this could cause confusion.

3. Home Try-On Funnel

4.1 Home Try-On Funnel

Now let's look at Warby Parker's Home Try-On Funnel. First of all, we want to establish an overview of the 3 tables in the funnel and determine the column names.

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-acc-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
01fdf106-f73c-4d3f-a036-2f3e2ab1ce06	8	Women's Styles	Lucy	Jet Black	150

Query :

```
SELECT *  
FROM quiz  
LIMIT 5;
```

```
SELECT *  
FROM home_try_on  
LIMIT 5;
```

```
SELECT *  
FROM purchase  
LIMIT 5;
```

5.1 Home Try-On Funnel – Joining tables

Now that we've established an overview of the tables and their content, let's merge this data into a single table that we can query.

When working with multiple tables, we want to specify the columns and the tables that we are querying. In this scenario, we are interesting in selecting unique user ids from the "quiz" table, user ids from the "home_try_on" table that have received a sample, the number of pairs that users have received and the users that did or did not purchase shoes. Note that users that have purchased or not purchased, received or haven't received are displayed as a boolean data type (1 or 0 for true or false).

To create our table, we need to merge them. This can be done using several types of JOIN functions, but in this instance, we use the LEFT JOIN function which includes all data from the first table and only joins matching data from the second table. In order for us to correctly merge the tables we identify the Primary key in the first table and find the corresponding key in the second (or third) table to join on (the foreign key). Here the primary and foreign keys are the user ids.

Query :

```
SELECT
    DISTINCT quiz.user_id,
    home_try_on.user_id IS NOT NULL AS 'Received
sample?',
    home_try_on.number_of_pairs,
    purchase.user_id IS NOT NULL AS 'Purchased?'
FROM quiz
LEFT JOIN home_try_on
    ON quiz.user_id = home_try_on.user_id
LEFT JOIN purchase
    ON purchase.user_id = quiz.user_id
LIMIT 10;
```

user_id	Received sample?	number_of_pairs	Purchased?
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	1	3 pairs	0
291f1cca-e507-48be-b063-002b14906468	1	3 pairs	1
75122300-0736-4087-b6d8-c0c5373a1a04	0		0
75bc6ebd-40cd-4e1d-a301-27ddd93b12e2	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		0
0143cb8b-bb81-4916-9750-ce956c9f9bd9	0		0
a4ccc1b3-cbb6-449c-b7a5-03af42c97433	1	5 pairs	0
b1dded76-cd60-4222-82cb-f6d464104298	1	3 pairs	0

6.1 Actionable Insights – Conversion Rates (Overall)

Using the table that we have created in step 5, we can query this table to gain some actionable insights. First of all, let's gain an understanding of how many users that tested ending up buying a pair of glasses.

By using the "WITH x AS ()" function, we can query the table created in step 5. If we divide the amount of people that purchased by the amount of people that tested we have the conversion rate $((495/1000)) * 100 = 49,5\%$. Nearly half of all users that test end up buying a pair of glasses. Note that we multiply by 1.0 so the result isn't rounded to an integer.

num_tested	num_purchased	tested_to_conversion
1000	495	0.495

Query:

```
WITH funnel AS (  
  SELECT  
    DISTINCT quiz.user_id AS 'tested',  
    home_try_on.user_id IS NOT NULL AS  
    'received_sample',  
    home_try_on.number_of_pairs,  
    purchase.user_id IS NOT NULL AS 'purchased'  
  FROM quiz  
  LEFT JOIN home_try_on  
    ON quiz.user_id = home_try_on.user_id  
  LEFT JOIN purchase  
    ON purchase.user_id = quiz.user_id  
  
  SELECT  
    COUNT(*) AS 'num_tested',  
    SUM(purchased) AS 'num_purchased',  
    1.0 * SUM(purchased) / COUNT(tested) AS  
    'tested_to_conversion'  
  FROM funnel;
```

6.2 Actionable Insights – Conversion Rates (By steps)

Warby Parkers funnel consists of three steps. Understanding the users journey can provide added insights. Using the query to the right we see that 75% of the users that take the test, end up receiving a sample. Of the users that receive a sample 66% of these users convert.

How could Warby Parker improve this conversion rate?

num_tested	num_received_sample	num_purchased	tested_to_received_sample	sample_to_purchase
1000	750	495	0,75	0,66

Query :

```
WITH funnel AS (  
  SELECT  
    DISTINCT quiz.user_id,  
    home_try_on.user_id IS NOT NULL AS  
    'received_sample',  
    home_try_on.number_of_pairs,  
    purchase.user_id IS NOT NULL AS 'purchased'  
  FROM quiz  
  LEFT JOIN home_try_on  
    ON quiz.user_id = home_try_on.user_id  
  LEFT JOIN purchase  
    ON purchase.user_id = quiz.user_id  
  
  SELECT COUNT(*) AS 'num_tested',  
    SUM(received_sample) AS 'num_received_sample',  
    SUM(Purchased) AS 'num_purchased',  
    1.0 * SUM(received_sample) / COUNT(user_id) AS  
    'tested_to_received_sample',  
    1.0 * SUM(purchased) / SUM(received_sample) AS  
    'sample_to_purchase'  
  FROM funnel;
```


6.3 Actionable Insights – Conversion Rates (By type)

The overall conversion rate seems to be fairly good (around the 50% mark), but as we saw in the last step, 66% of the people that receive samples end up converting. With this in mind, it would be interesting to see who exactly buys more, the persons that receive 3 pairs, or the persons that receive 5 pairs.

The query listed to the right provides us these insights and as we can see, users that receive 5 pairs of glasses tend to purchase (convert) more often than those that receive 3 pairs. This insight could help Warby Parker improve conversion rates by sending out 5 pairs rather than 3.

number_of_pairs	num_received	num_purchased	Conversions
	0	0	0
3 pairs	379	201	0.530343007915567
5 pairs	371	294	0.792452830188679

Query :

```
WITH funnel AS (  
  SELECT  
    DISTINCT quiz.user_id AS 'tested',  
    home_try_on.user_id IS NOT NULL AS  
    'received_sample',  
    home_try_on.number_of_pairs,  
    purchase.user_id IS NOT NULL AS 'purchased'  
  FROM quiz  
  LEFT JOIN home_try_on  
    ON quiz.user_id = home_try_on.user_id  
  LEFT JOIN purchase  
    ON purchase.user_id = quiz.user_id)  
  
SELECT number_of_pairs,  
SUM(received_sample) AS 'num_received',  
SUM(purchased) AS 'num_purchased',  
1.0 * SUM(purchased) / COUNT(received_sample) AS  
'Conversions'  
FROM funnel  
GROUP BY number_of_pairs;
```

6.4 Extra Insights – Demographic split

A few more added insights could be drawn from the “raw” tables. The query to the right provides us insights into the gender of their users. The results show close to a 50/50 split on gender. The 10% that are uncertain is interesting and may merit a closer look into UX/Design.

style	Total Choices	Split %
I'm not sure. Let's skip it.	99	9,9
Men's Styles	432	43,2
Women's Styles	469	46,9

Query :

```
WITH style_choice AS (  
  SELECT  
    style,  
    COUNT(style) AS 'Choices'  
  FROM quiz  
  GROUP BY style)  
  
SELECT  
  style,  
  Choices AS 'Total Choices',  
  1.0 * Choices / 1000 AS 'Split %'  
FROM style_choice  
GROUP BY style;
```

6.4 Extra Insights – Popular purchases

Finally, a look into which products are most popular, we can see that the Dawes model in Driftwood Fade is the most popular model for men and the Eugene Narrow in Rosewood Tortoise is the most popular model for woman.

Using this information, Warby Parker could prioritize to have these models sent in the test packages.

Query :

```
SELECT
    product_id,
    style,
    model_name,
    color,
    COUNT(product_id) AS Purchases
FROM purchase
GROUP BY product_id
ORDER BY Purchases DESC;
```

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

4. Conclusion

Conclusion:

Digging into the user journey and user behaviour we were able to conclude two major insights.

- 1) The first is that users have a higher conversion rate when they receive 5 pairs of glasses to test.
- 2) Two models are very popular. If Warby Parker were to include these in every sample set sent, they could possibly increase sales.