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Usage Funnels with Warby Parker

Learn SQL from Scratch

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1. Quiz Funnel

1.1 Survey Table

To help users find their perfect frame, Warby Parker poses several questions. Answers to these questions are stored in a table called “Survey”. The query on the right was used to pull the sample section of data listed below.
The Survey columns are entitled: 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

SQL Code:

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

1.2 User Response

Users may not proceed to subsequent levels of the survey. The query on the right identifies the number of responses to each question of the survey. The results below identify the drop off from one question to the next.

question	completed question
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

SQL Code:

```
SELECT question, COUNT(DISTINCT
user_id) AS 'completed question'
FROM survey
GROUP BY question;
```

1.3 Completion Rates

Based on the results in the previous table, we can identify the completion rate by dividing the number of people completing each step by the number that completed the previous step. There is a drop-off between questions 4 and 5 possibly due to users not knowing when their last eye exam was, or perhaps never having had one and unsure how to answer the question.

question	completed question	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

2. Home Try-On Funnel

2.1.1 A/B Testing with Home Try-On Funnel

Warby Parker offers a Home Try-On stage to promote sales. During this, an A/B test group is established in which 50% of users get 3 pairs to try on, while 50% get 5 pairs to try on. Data gathered during this purchase funnel is stored in 3 tables. The query on the left pulls the first 5 rows from each table. Column names are as follows:

Quiz Table: user_id, style, fit, shape, color
Home Try-On Table: user_id, number_of_pairs, address
Purchase Table: user_id, product_id, style, model_name, color, price

Query results are listed on slide 2.1.2.

SQL Code:

```
SELECT *
FROM quiz
LIMIT 5;

SELECT *
FROM home_try_on
LIMIT 5;

SELECT *
FROM purchase
LIMIT 5;
```

2.1.2 A/B Testing with Home Try-On Funnel

Quiz Table

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

Home Try-On Table

user_id	number_of_pairs	address
d8addd87-3217-4429-9a01-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-accc-49a7bb46c586	3 pairs	347 Madison Square N
3bc8f97f-2336-4dab-bd86-e391609dab97	5 pairs	182 Cornelia St

Purchase Table

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

2.2 Combing Funnel Tables

To further analyze the purchase funnel, we combined the 3 tables in the previous slide, starting with the top of the funnel (browse) and ending with the bottom of the funnel (purchase). The query on the right produced the following sample size of 10 rows. A “1” in the is_home_try_on and is_purchase fields signifies a ‘True’, which can tell us which users participated in the demo phase and which went on to complete a purchase.

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		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

SQL Code:

```
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;
```

2.3 Calculating Conversion Rates

Building off of the previous slide, the query on the right can be used to calculate overall numbers for those that participated in the demo stage and how many continued on to make a purchase. Results are as follows:
1000 users took the Warby Parker quiz
750 participated in the home try on stage
495 made a purchase

num_quiz	num_home_try_on	num_purchase
1000	750	495

SQL Code:

```
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 'num_quiz',
   SUM(is_home_try_on) AS
'num_home_try_on',
   SUM(is_purchase) AS
'num_purchase'
FROM funnels;
```

2.4 Conversion Comparison

Further building off of the previous query, we can then determine the percentage of users that moved from one funnel stage to the next. Based on the query to the right:
1000 users took the Warby Parker quiz
750 participated in the home try on stage
495 made a purchase
75% of users moved from the quiz stage to the home_try_on stage
66% of users moved from the home_try_on stage to the purchase stage

num_quiz	num_home_try_on	num_purchase	Funnel 1 to 2 (%)	Funnel 2 to 3 (%)
1000	750	495	75.0	66.0

SQL Code:

```
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 'num_quiz',

             SUM(is_home_try_on) AS
'num_home_try_on',
    SUM(is_purchase) AS
'num_purchase',
    100.0 * SUM(is_home_try_on) /
COUNT(*) AS 'Funnel 1 to 2',
    100.0 * SUM(is_purchase) /
SUM(is_home_try_on) AS 'Funnel 2 to
3'
FROM funnels;
```

2.5 Home-Try-On Rates between A/B Test Group

Continuing to build, we can then determine the following using the query on the right:
250 users did not participate in the home-try-on stage.
379 users were in the test group that received 3 pairs of glasses
371 users were in the test group that received 5 pairs of glasses

COUNT(is_home_try_on)	number_of_pairs
250	
379	3 pairs
371	5 pairs

SQL Code:

```
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(is_home_try_on),
number_of_pairs
FROM funnels
GROUP BY 2;
```

2.5 Purchase Rates between A/B Test Group

Finally, we can determine the number of final purchases for each test group using the query on the right. Results determined:
Test group that received 3 pairs of glasses, made 201 purchases.
Test group that received 5 pairs of glasses made 294 purchases.

SUM(is_purchase)	number_of_pairs
201	3 pairs
294	5 pairs

SQL Code:

```
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 SUM(is_purchase),
number_of_pairs
FROM funnels
Group by 2;
```

3. Additional Info

3.1 Common Quiz Results

Using data from the quiz table, the query on the right can produce useful information on the most common choices for characteristics like style, fit, shape and color. The results below are sorted in descending order from the most commonly chosen to the least.

COUNT(user_id)	style
469	Women's Styles
432	Men's Styles
99	I'm not sure. Let's skip it.

COUNT(user_id)	fit
408	Narrow
305	Medium
198	Wide
89	I'm not sure. Let's skip it.

COUNT(user_id)	shape
397	Rectangular
326	Square
180	Round
97	No Preference

COUNT(user_id)	color
292	Tortoise
280	Black
210	Crystal
114	Neutral
104	Two-Tone

SQL Code:

```
SELECT COUNT (user_id), style
FROM quiz
GROUP BY style
ORDER BY 1 DESC;

SELECT COUNT (user_id), fit
FROM quiz
GROUP BY fit
ORDER BY 1 DESC;

SELECT COUNT (user_id), shape
FROM quiz
GROUP BY shape
ORDER BY 1 DESC;

SELECT COUNT (user_id), color
FROM quiz
GROUP BY color
ORDER BY 1 DESC;
```

3.2 Common Purchases

Using data from the purchase table, the query on the right can produce useful information on the most common model and color of purchase, as well as the most common price-points. The results below are sorted in descending order from the most commonly chosen to the least.

COUNT(user_id)	model_name
116	Eugene Narrow
107	Dawes
95	Brady
86	Lucy
50	Olive
41	Monocle

COUNT(user_id)	color
86	Jet Black
63	Driftwood Fade
62	Rosewood Tortoise
54	Rose Crystal
52	Layered Tortoise Matte
50	Pearled Tortoise
44	Elderflower Crystal
43	Sea Glass Gray
41	Endangered Tortoise

COUNT(user_id)	price
261	95
193	150
41	50

SQL Code:

```
SELECT COUNT(user_id), model_name
FROM purchase
GROUP BY 2
ORDER BY 1 DESC;

SELECT COUNT(user_id), color
FROM purchase
GROUP BY 2
ORDER BY 1 DESC;

SELECT COUNT(user_id), price
FROM purchase
GROUP BY 2
ORDER BY 1 DESC;
```

4. Summary

1. (Style) Quiz Funnel

- A drop-off was detected before users completed the survey. Tracking completion rates can help gauge both the quality and validity of your questions. If users are dropping off before completion, perhaps a change in questioning is required to maintain retention. If additional information is required by the user, then perhaps a notification prior to the start of the survey to identify requirements will improve completion rates (eg. Eye exam dates).

2. Home Try-On Funnel

- Despite having a slightly smaller sample size, users that received 5 pairs of glasses at home to try on, were more likely to make a purchase than those that received 3 pairs. Providing more options resulted in higher purchase rates. Warby Parker should continue to follow this strategy

3. Additional Info

- Knowing customer search and purchasing trends can allow Warby Parker to make decisions on inventory, production and possibly advertising. Popular characteristics require more stock while other unpopular choices can either be retired, re-tooled, or a change to advertising strategies.