



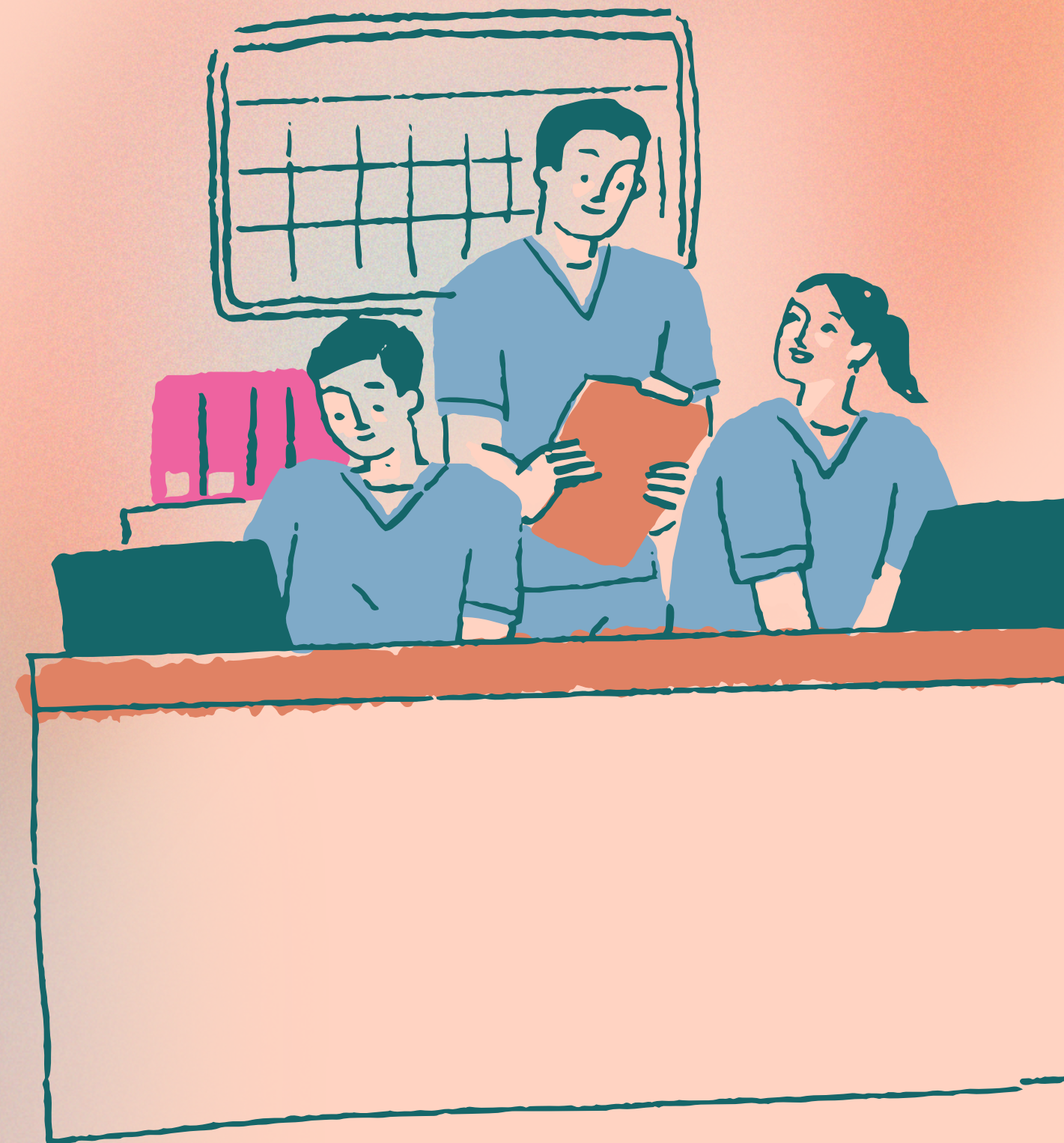
# Vertical Institute Data Analytics Capstone Project

Prepared By:

Cyrus Thio

Link to Tableau Public:

[https://public.tableau.com/views/CapstoneProject\\_17105000043050/  
CreditCardCustomersBreakdown?:language=en-  
US&publish=yes&:sid=&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/CapstoneProject_17105000043050/CreditCardCustomersBreakdown?:language=en-US&publish=yes&:sid=&:display_count=n&:origin=viz_share_link)







# Problem Statement:

In the dynamic landscape of the banking industry, understanding customer behavior and factors influencing attrition is crucial for maintaining a loyal customer base.

This analysis aims to uncover patterns and insights from a dataset of bank customers, examining demographic information, account details, and transactional behavior.

By identifying key drivers of customer attrition and loyalty, the goal is to provide actionable recommendations to enhance customer retention strategies and improve overall satisfaction.



# Goals

## Identify Factors Influencing Attrition:

Explore the dataset to pinpoint demographic and account-related factors that significantly contribute to customer attrition. This involves analyzing columns such as "Customer\_Age," "Gender," "Marital\_Status," and others.

## Evaluate Transactional Behavior:

Examine transactional behavior metrics like "Total\_Trans\_Amt," "Total\_Trans\_Ct," and "Avg\_Utilization\_Ratio" to understand how customer interactions with the bank impact their likelihood of attrition.

## Assess Customer Engagement:

Evaluate metrics such as "Months\_Inactive\_12\_mon" and "Months on book" to gauge customer engagement and identify any correlations with attrition.

## Demographic Analysis:

Investigate the influence of demographics, including "Education\_Level," "Income\_Category," and "Dependent\_count," on customer attrition to tailor retention strategies for specific customer segments.

## Recommendation Generation:

Based on the analysis, generate actionable recommendations for the bank to enhance customer retention efforts. These recommendations may include targeted marketing strategies, personalized customer experiences, or adjustments to product offerings.

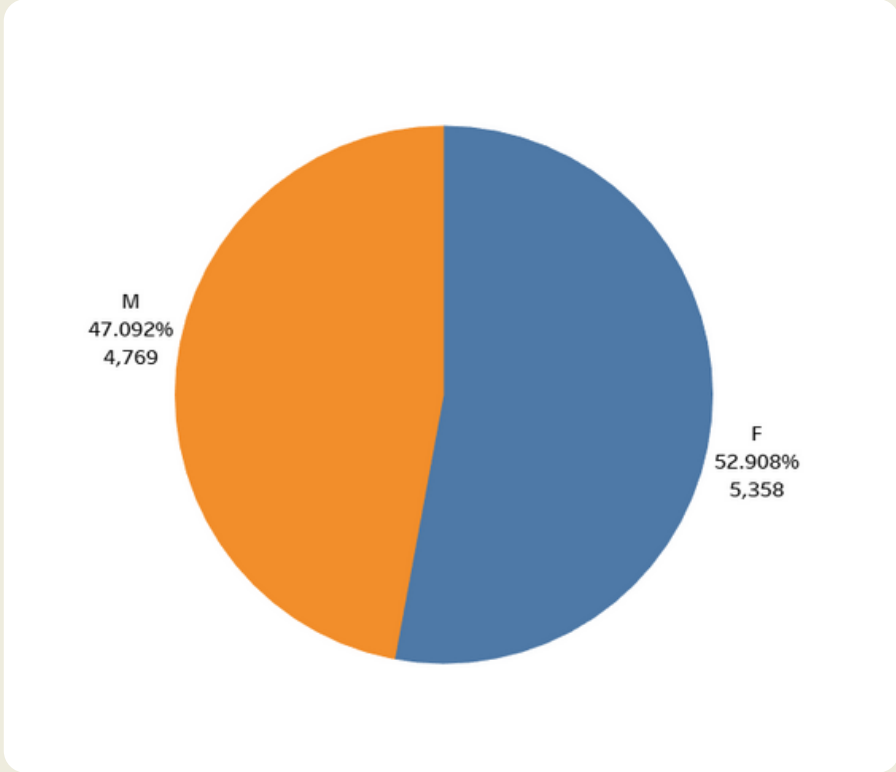


### Customer Overview

it was discovered that the largest customer sub group (approx 24%) consist of single/married females in their 40s - 50s, who have an income of less than \$40,000 and hold Blue cards.



# Number of cardholders by gender



The total customerbase is generally balanced among both genders; with a slightly greater amount of female customers at 52.9% of the total customerbase

**\*\*Note:** moving forward, analysis will be done on the **total of 9015 customers**, excluding the remaining 1000+ customers due to lack of demographic information

# Demographics - Income & Card category against Genders

After comparing card types against income and genders, it can be seen that there is a large disparity in the income gap between females and males.

Income against Card Category								
Card Categ..	Income Category / Gender							Grand Total
	Less than \$40K		\$40K - \$60K		\$60K - \$80K	\$80K - \$120K	\$120K +	
	F	M	F	M	M	M	M	
Blue	3,146	257	960	715	1,273	1,395	645	8,391
Gold	22	2	7	8	29	21	18	107
Platinum	4			1	4	2	4	15
Silver	112	18	47	52	96	117	60	502
Grand Total	3,284	277	1,014	776	1,402	1,535	727	9,015

- 3/4 of females earn less than \$40,000
- there are no females earning more than \$60,000
- majority of women are Blue card holders
- Males hold a greater share in both higher income categories and higher card tiers



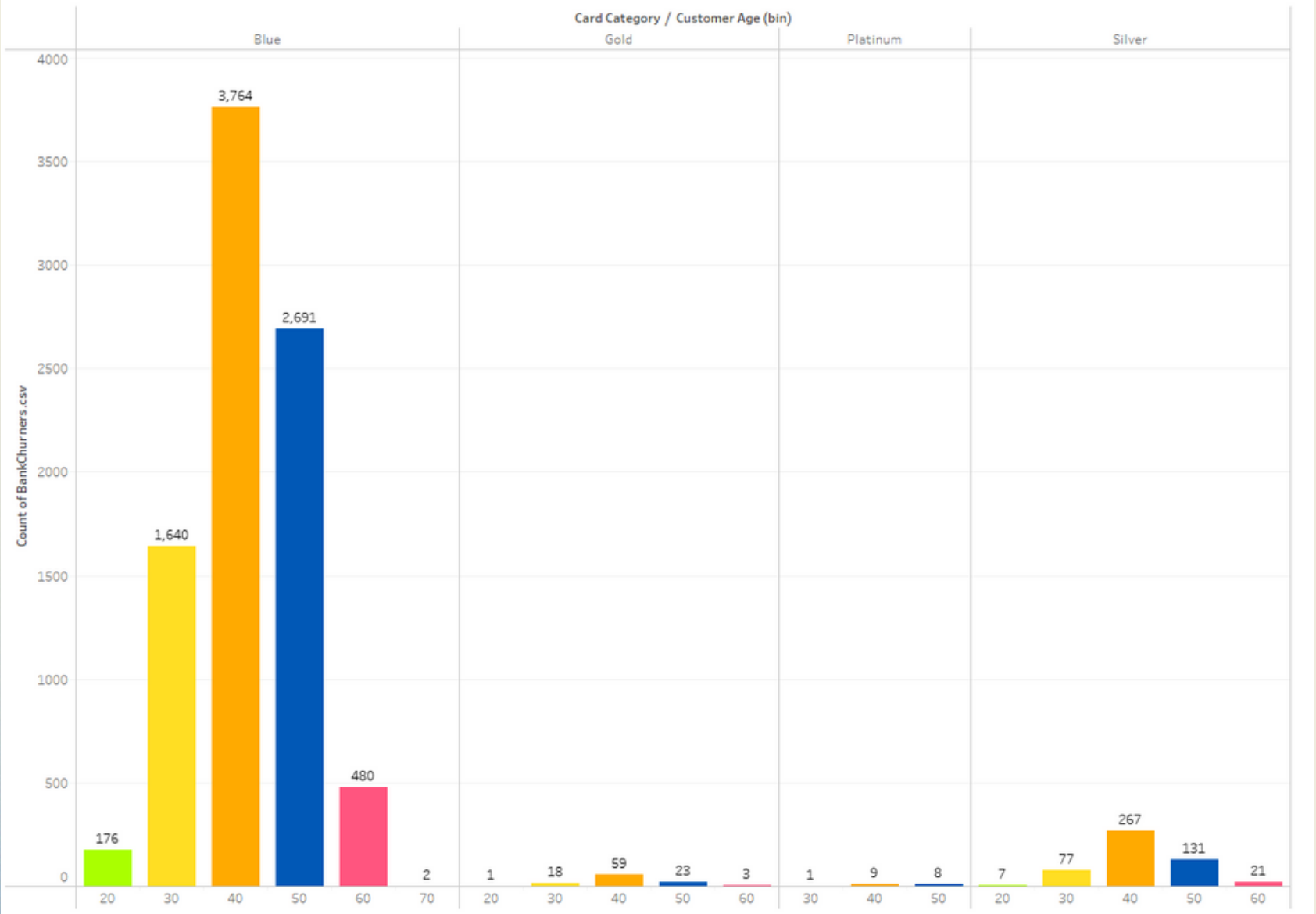
# Income & Card category against Education

Looking at the table, it can be seen that irregardless of education, customers who earn less make up the majority of blue card holders and the largest group blue card holders consist of customers who are graduates and earning less than \$40,000.

Income and Card Category against Education

Income Category	Card Category	Education Level					
		College	Doctorate	Graduate	High School	Post-Gra..	Uneduca..
Less than \$40K	Blue	332	151	1,084	642	164	494
	Gold	1	3	11	4		2
	Platinum		1	1	1		
	Silver	12	3	43	24	6	26
\$40K - \$60K	Blue	170	64	518	338	103	234
	Gold	4		3	1		2
	Platinum					1	
	Silver	9	6	32	16	7	13
\$60K - \$80K	Blue	122	54	375	283	69	178
	Gold	5	1	8	7	2	2
	Platinum			2		1	
	Silver	5	4	37	17	5	15
\$80K - \$120K	Blue	153	55	432	277	73	199
	Gold			6	8	2	4
	Platinum			1			
	Silver	22	2	39	23	6	14
\$120K +	Blue	60	33	181	136	23	109
	Gold	4	1	5	3		1
	Platinum		1	1			2
	Silver	6	2	17	8	7	7

Card Category against Age



## Card Category against Age

When comparing the total number of customers against age and card category, it was observed that the bulk of customers are Blue card holders in their 40s and 50s



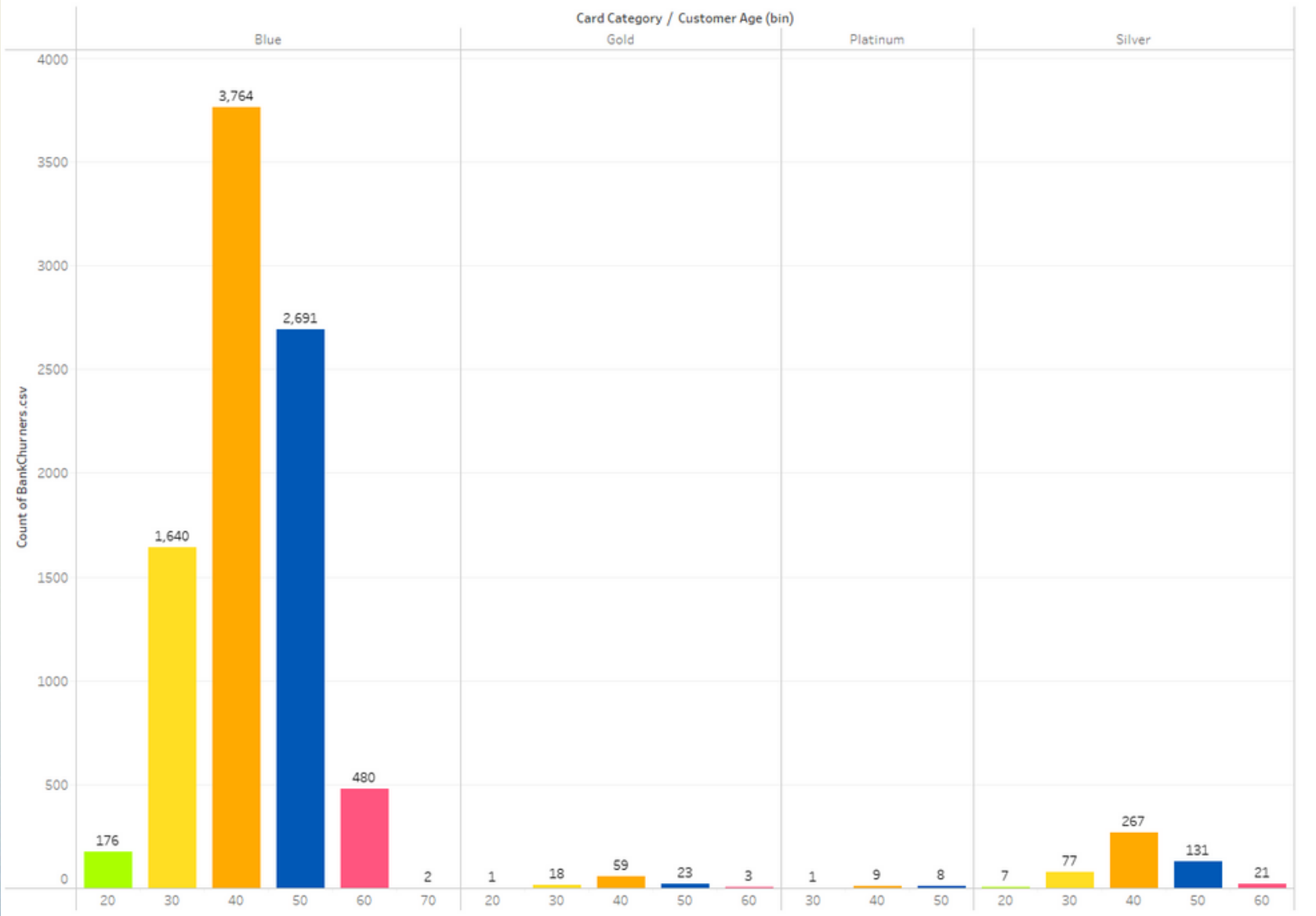
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Card Category against Age

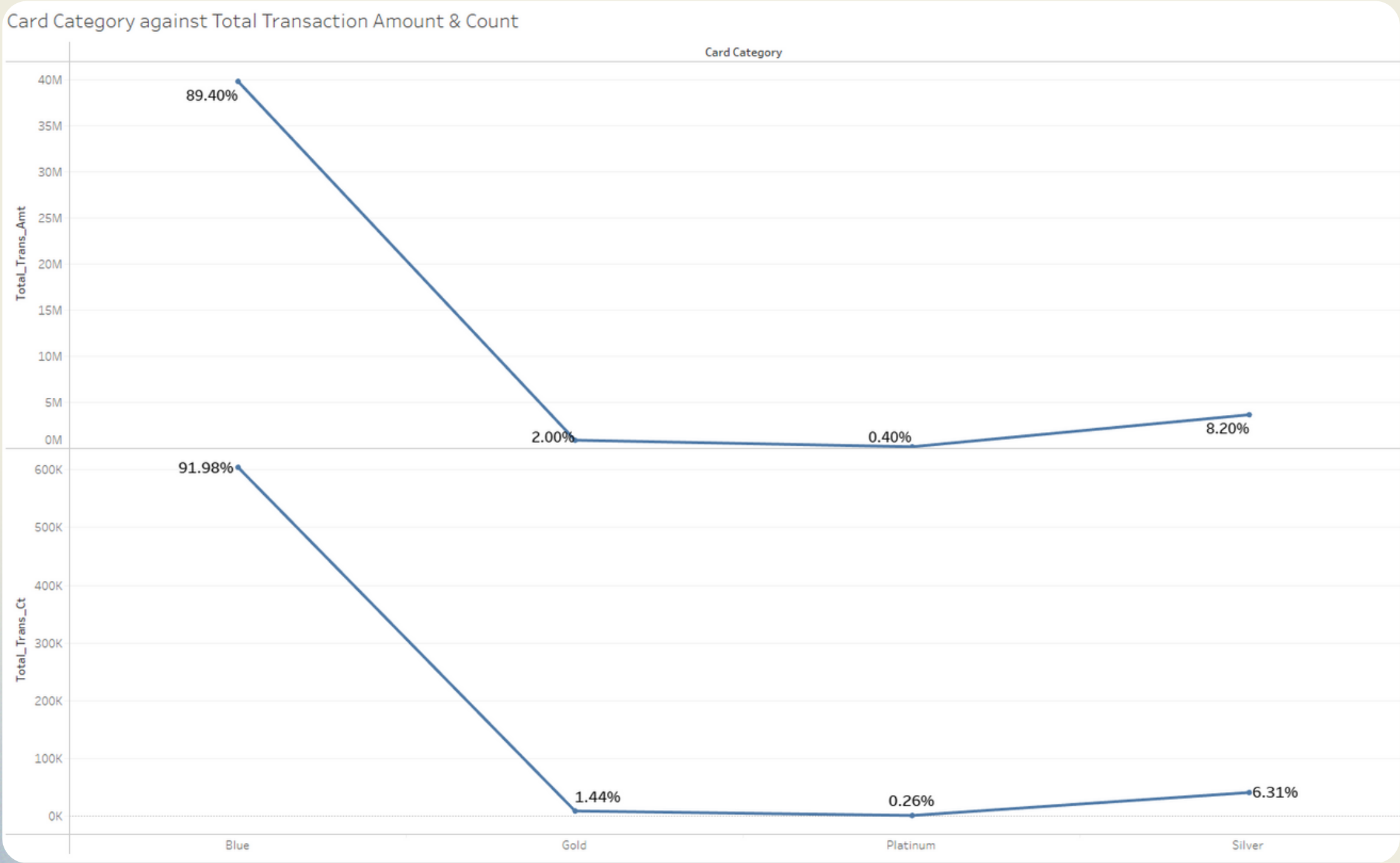


## Card Category against Age

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# Card Category against Total Transaction Amount & Count



From the 2 graphs, it can be observed that Blue card holders form the majority of the customer transactions.

Taking up a large chunk of the business; **90% of total transaction amount and count**



# Definition - Average Utilization Ratio

Taken from investopedia, The average utilization ratio is typically focused primarily on a borrower's revolving credit. It is a calculation that represents the total debt a borrower is utilizing compared to the full revolving credit that they have been approved for by credit issuers.

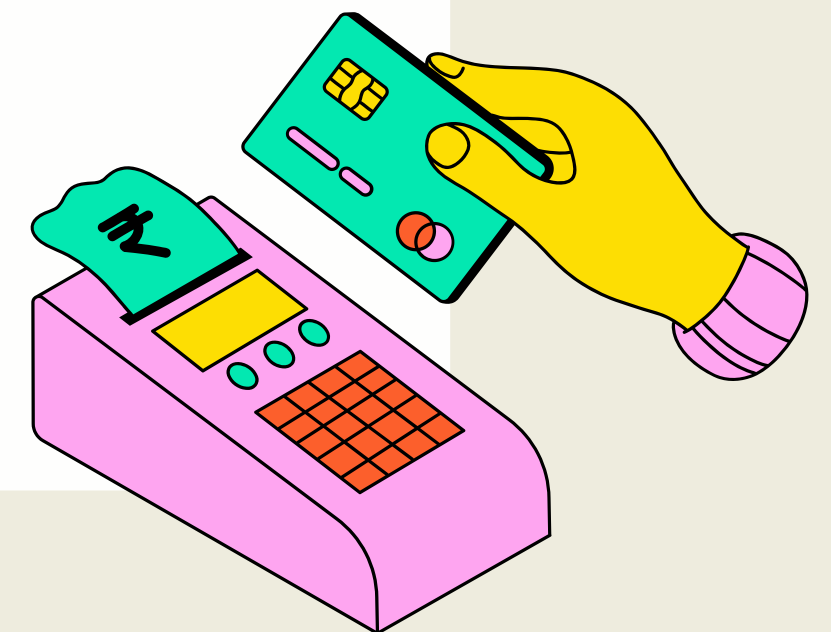
To calculate your average utilization ratio:

**Total outstanding balances / Total credit limit**

**e.g.**

- Card 1: Credit line \$5,000, balance \$1,000
- Card 2: Credit line \$10,000, balance \$2,500
- Card 3: Credit line \$8,000, balance \$4,000

$$\begin{aligned} \text{AUR} &= (1000 + 2500 + 4000) / (5000 + 10000 + 8000) \\ &= \text{\$7,500} / \text{\$23,000}, \text{ or } \mathbf{32.6\%}. \end{aligned}$$





# AUR against Gender

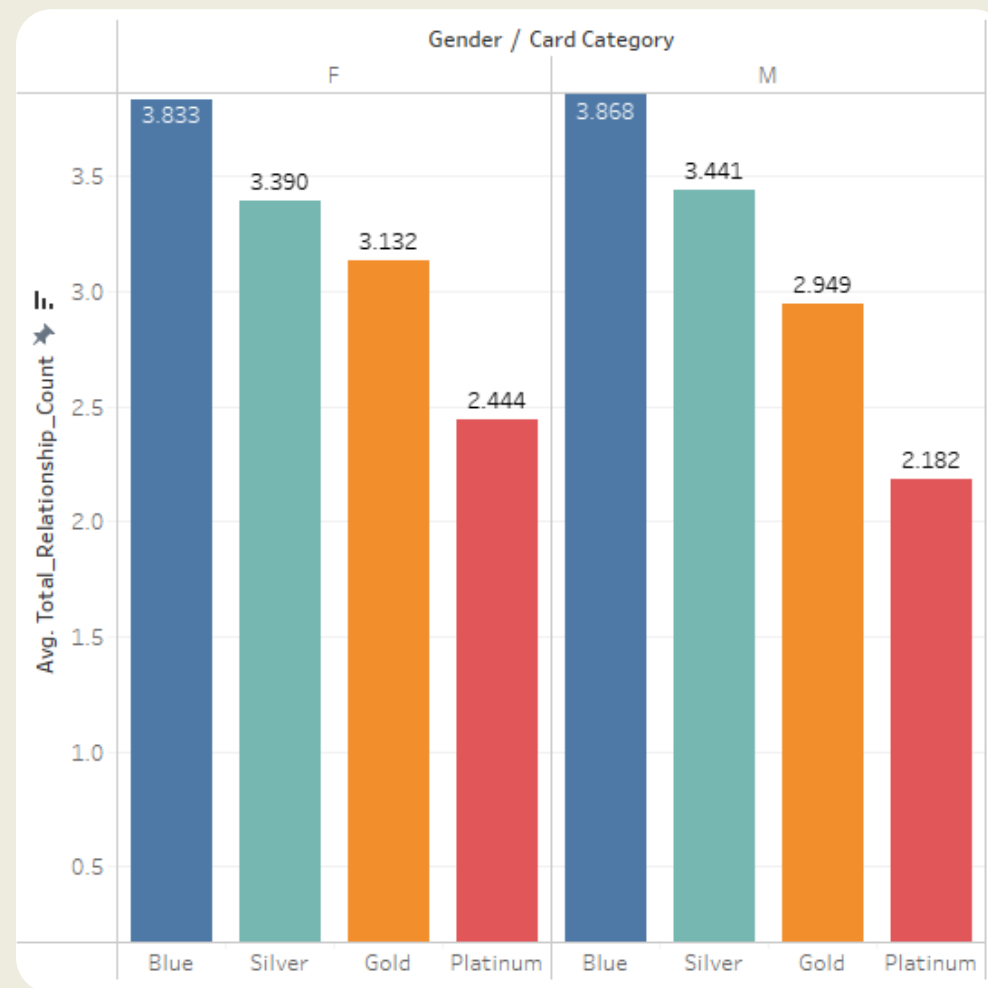
Females have a higher Average Utilization Ratio (AUR) (0.342) as compared to males (0.199)

This can either mean that :

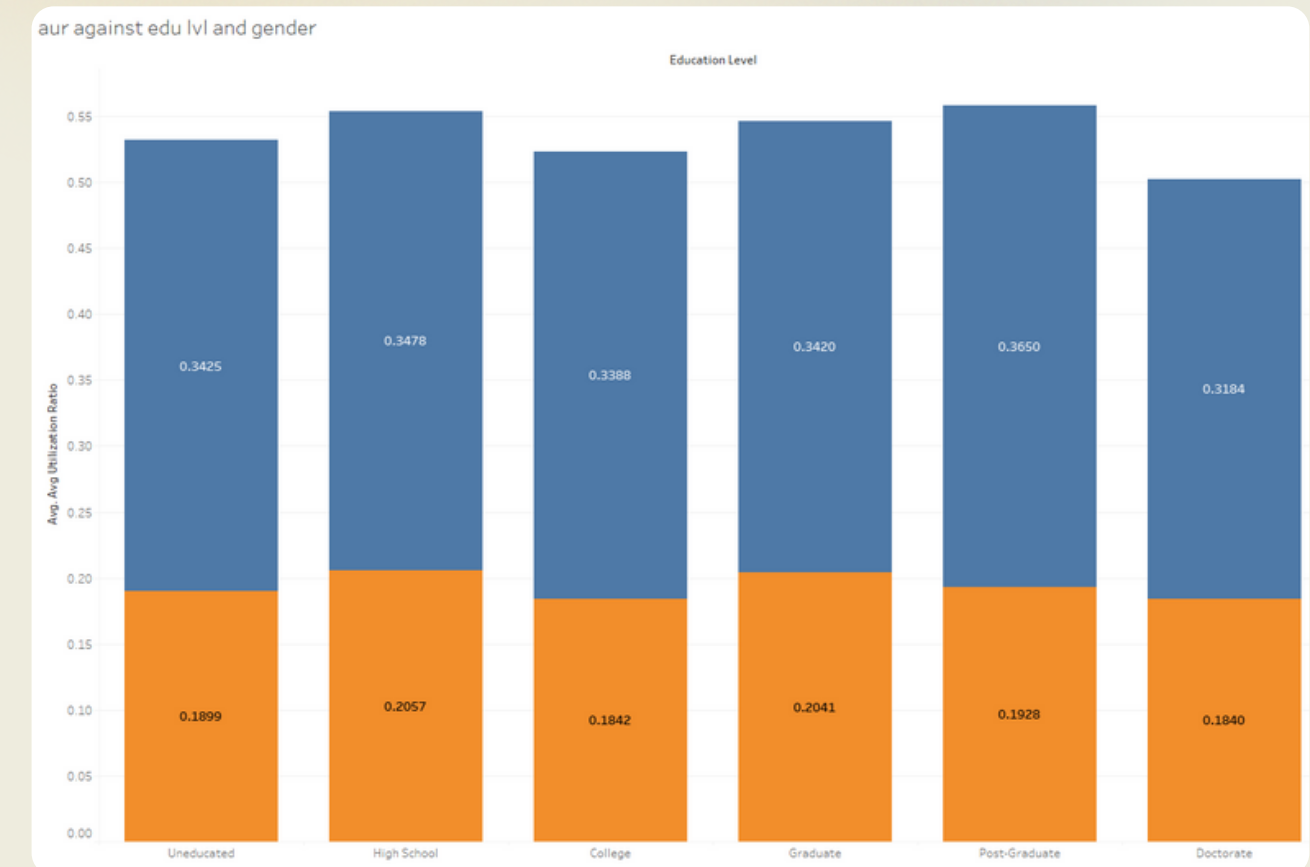
- females have a higher credit card usage or high credit card debt
- males have more lines of credit
- females have more lines of credit and higher credit card usage

Average Utilisation Ratio against Gender

Gender	
F	0.3420
M	0.1995



- After further analysis, it was discovered that both females and males generally hold the same number of products across all card categories.
- Bluecard holders have more products as compared to the other categories.
- And on a whole, AUR was seen to be constant across all education levels among both females and males.



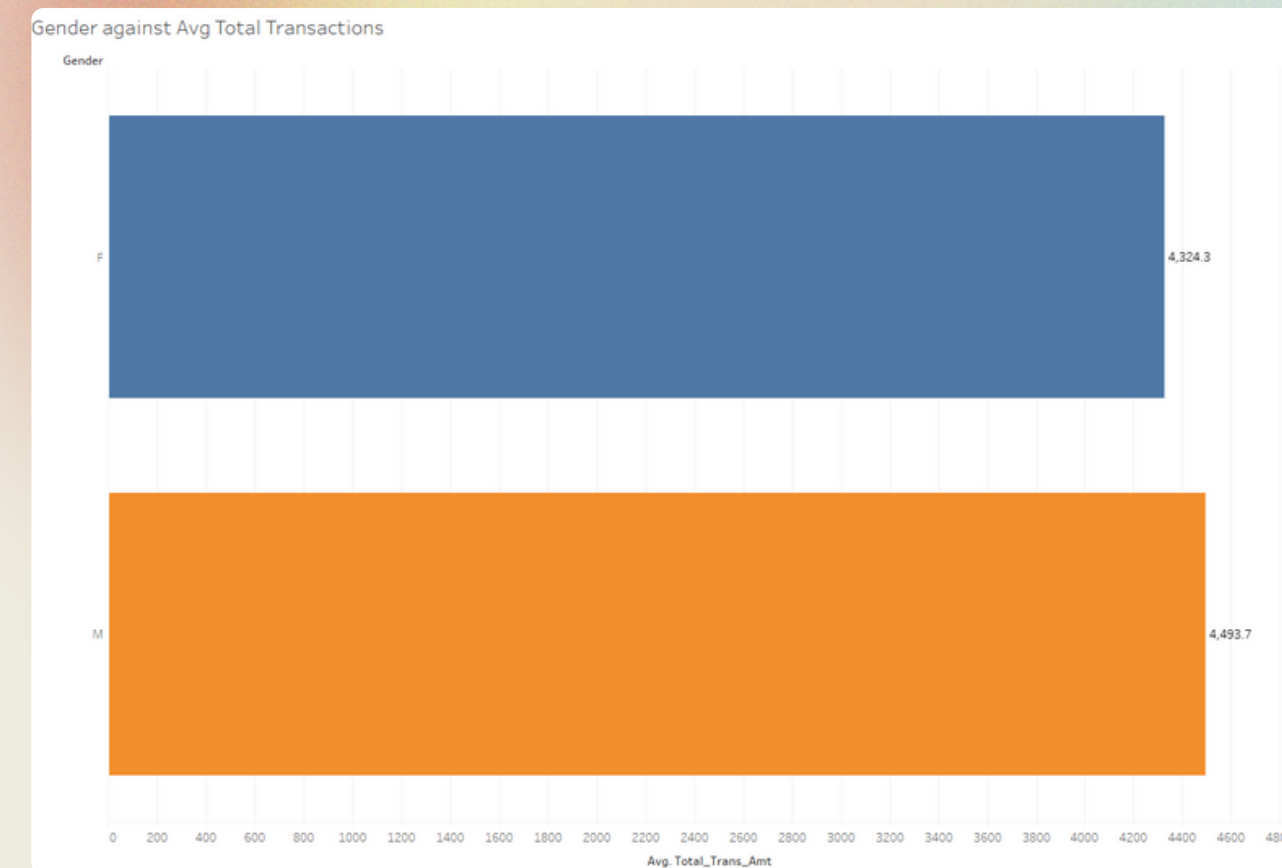
Increasing the plausibility that based on a higher AUR, **females have higher credit card usage or high credit card debt**



# AUR against Gender

By diving deeper to understand the relationship between gender and AUR, it was found that males have a slightly higher average transaction amount compared to females.

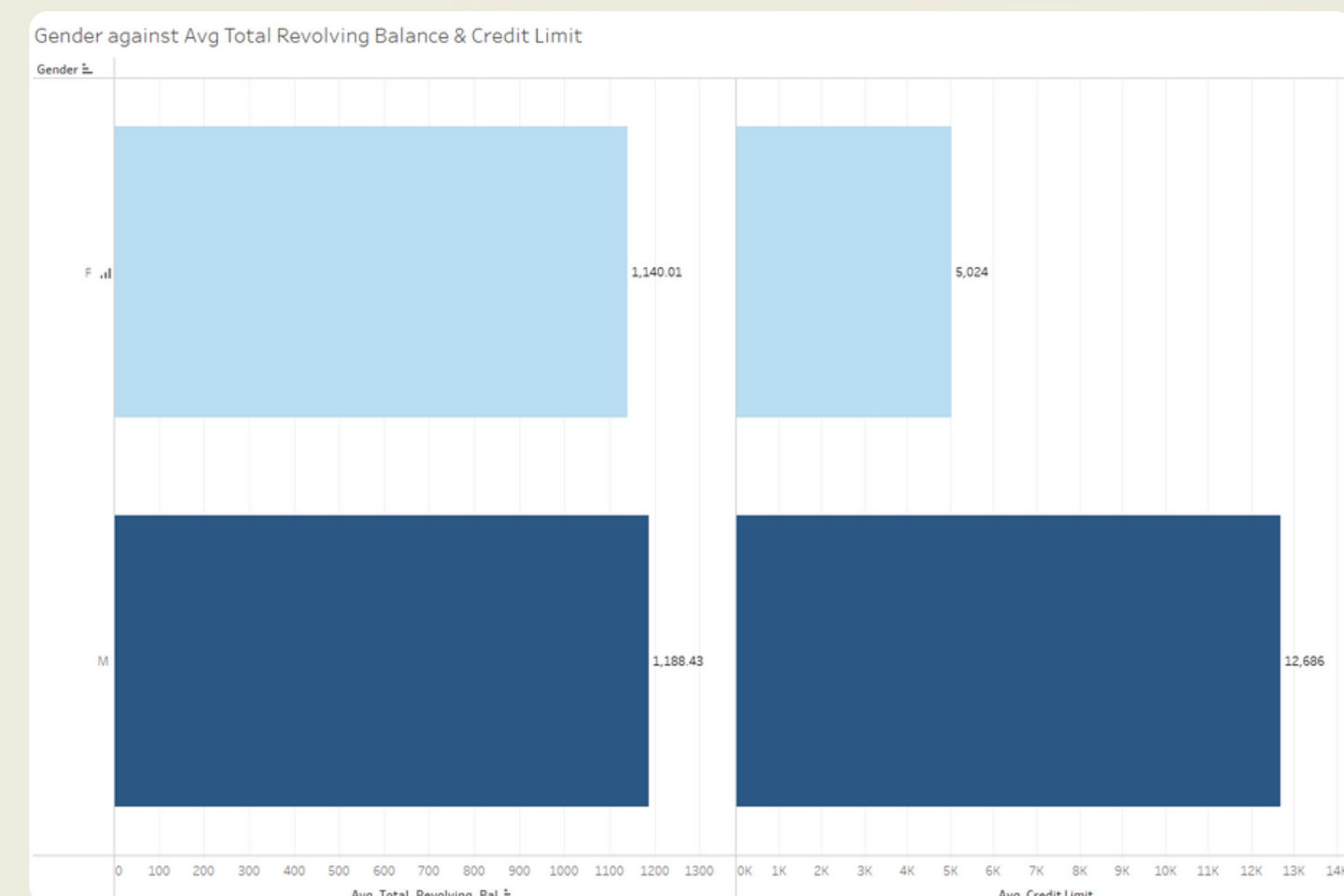
*(note, this is perhaps skewed due to the fact there more males in the higher income card categories)*



However when gender was plotted against the average total revolving balance and credit limit.

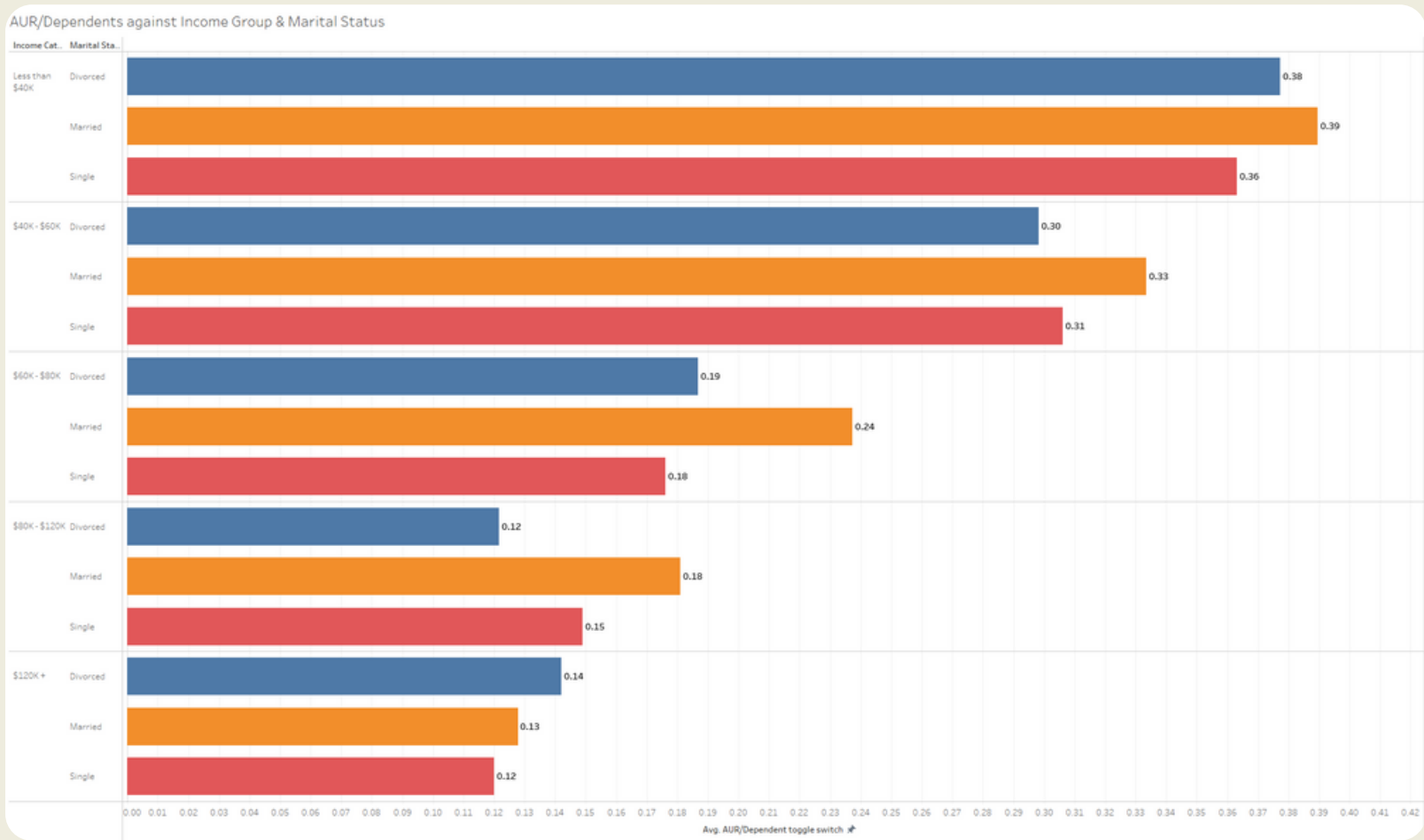
We are able to see that despite both genders approximately holding the same revolving balance, **females** on average have a **lower credit limit**; more than half as compared to males.

As a result, we are able to confirm the relationship that **females generally have a higher AUR due to a higher credit debt over total credit limit.**

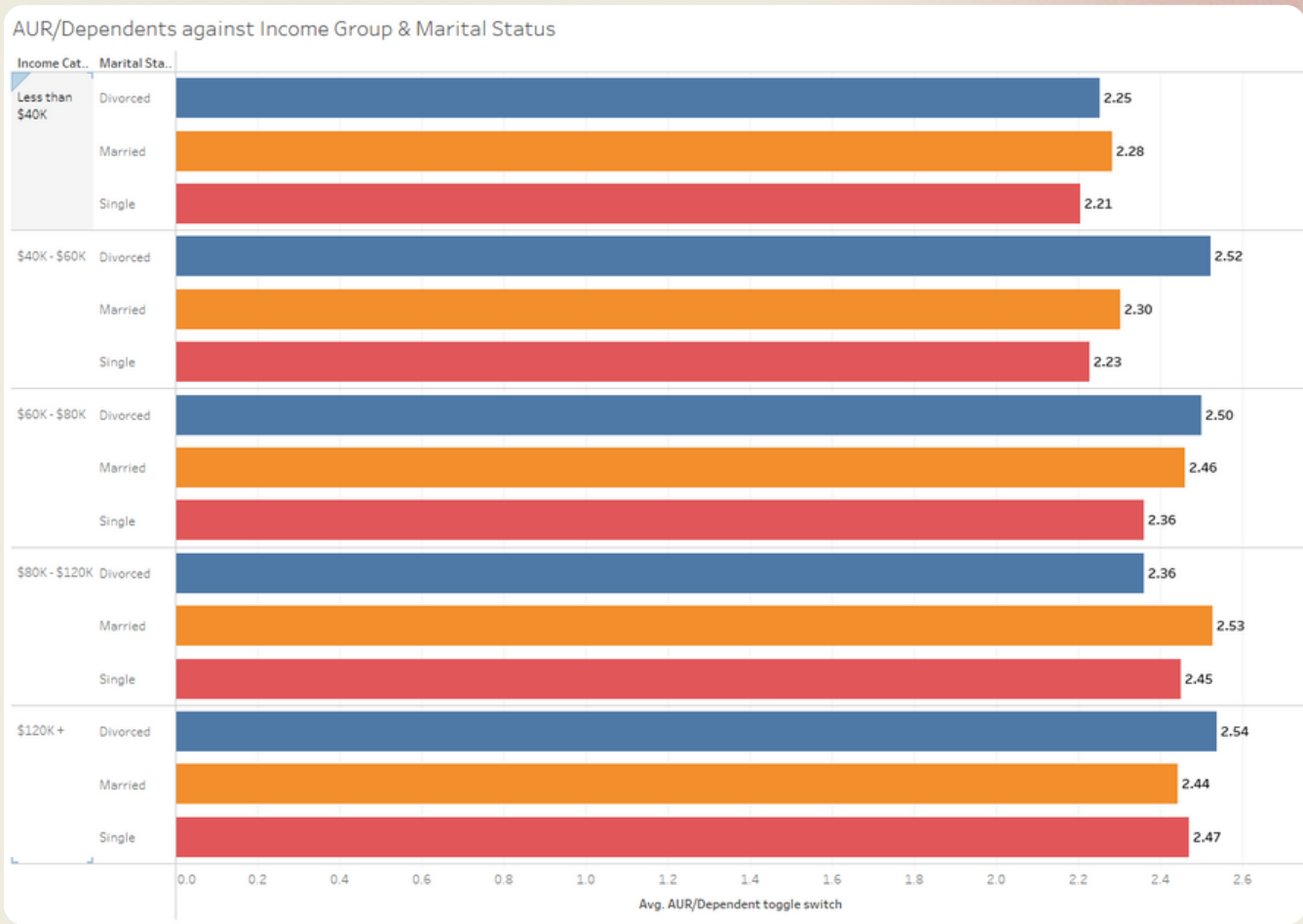




# AUR/Dependents against Income & Marital Status



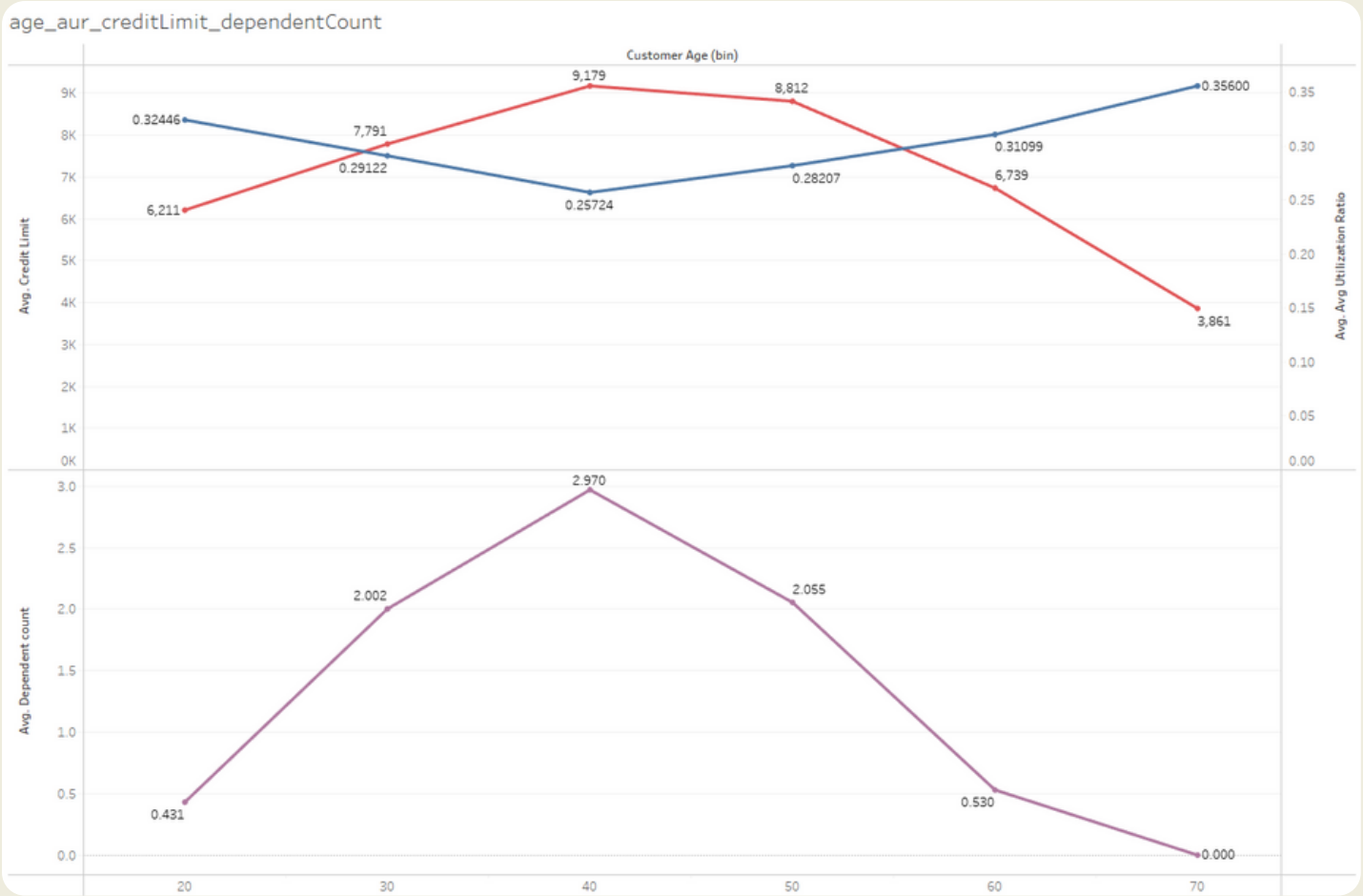
When AUR was plotted against Income category & Marital Status, it was observed that AUR is higher where income is lower across all marital statuses.



When no. of dependents were plotted against Income category & marital status, it was observed that across all income groups and marital statuses, customers generally are looking after 2.3 dependents.



# Age against Dependent Count, Credit Limit & AUR



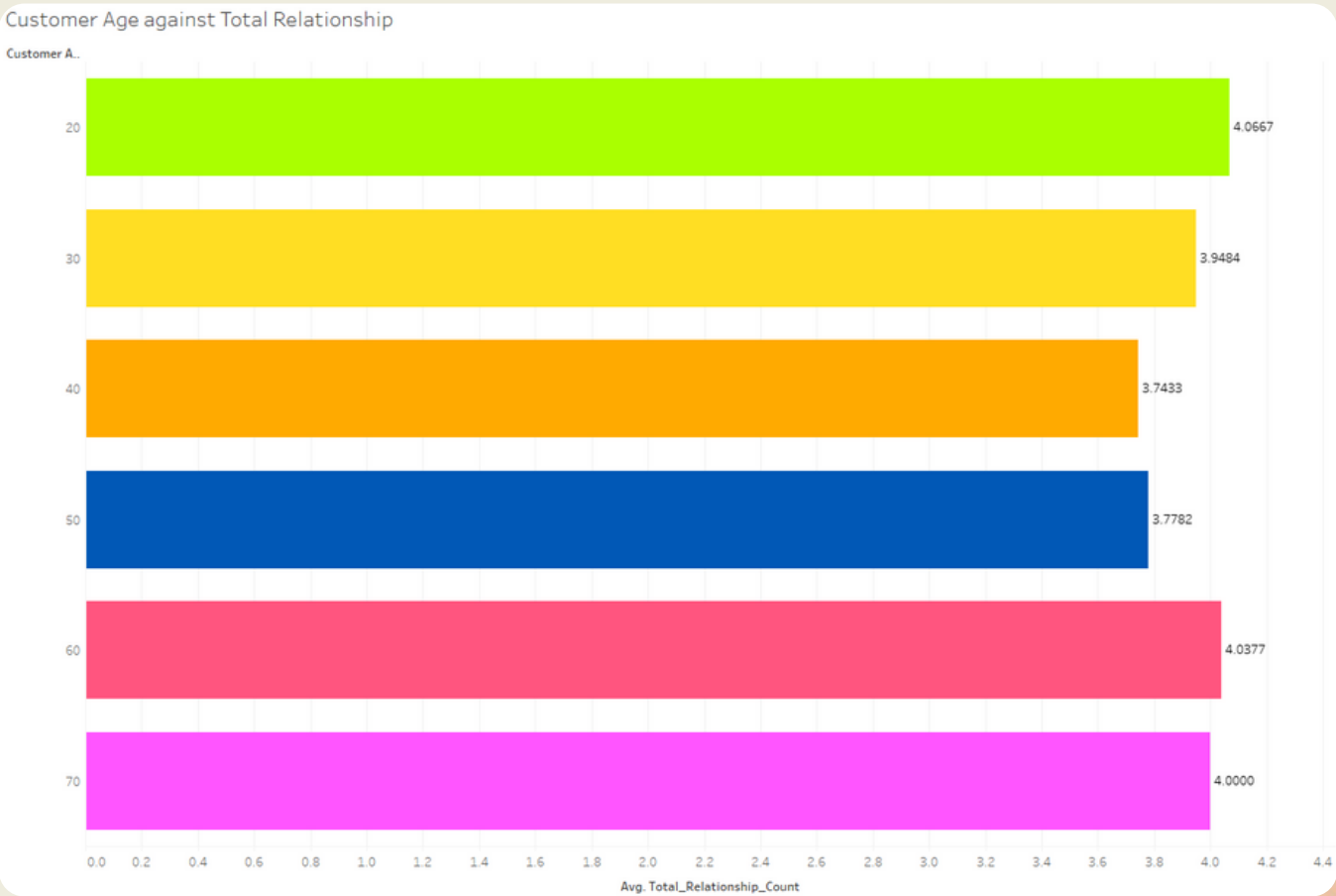
The following graph was plotted to observe if the number of dependents across different age groups can have an impact on AUR.

We can see that for the age group of 40, despite having approx 3 dependents, the AUR is the lowest and credit limit is highest among all the other age groups

This particular observation is of interest as in general, with more dependents to look after, customers would have to increase spending on necessities. The low AUR for customers in the age group of 40 are prudent in their spending or have multiple lines of credit/products with us or with other banks.

Furthermore, after plotting age group against the total relationship count, customers within the age group of 40 have the lowest figure among the other age groups.

This can possibly provide us a hint towards current attrition levels as customers may have lines of credit with other banks





# Recap: observations made so far..

The **total customerbase** is around **10,000**

There are slightly more female vs male customers, with the largest sub group consisting of **single/married women** in their **40s - 50s**, who are **Blue card holders** with an **income less than \$40,000**

**Males** hold a **greater share in both higher income categories and higher card tiers**

it was observed that the bulk of customers are **Blue card** holders in their **40s and 50s** (approx 6,300)

There are a large number of **Blue card** holders who are **graduates** and **earning less than \$40,000** (approx 1000)

**Blue card** holders take up approx **90%** of total transaction amount and count

**Females** generally have a **higher AUR** due to a higher credit debt over total credit limit.

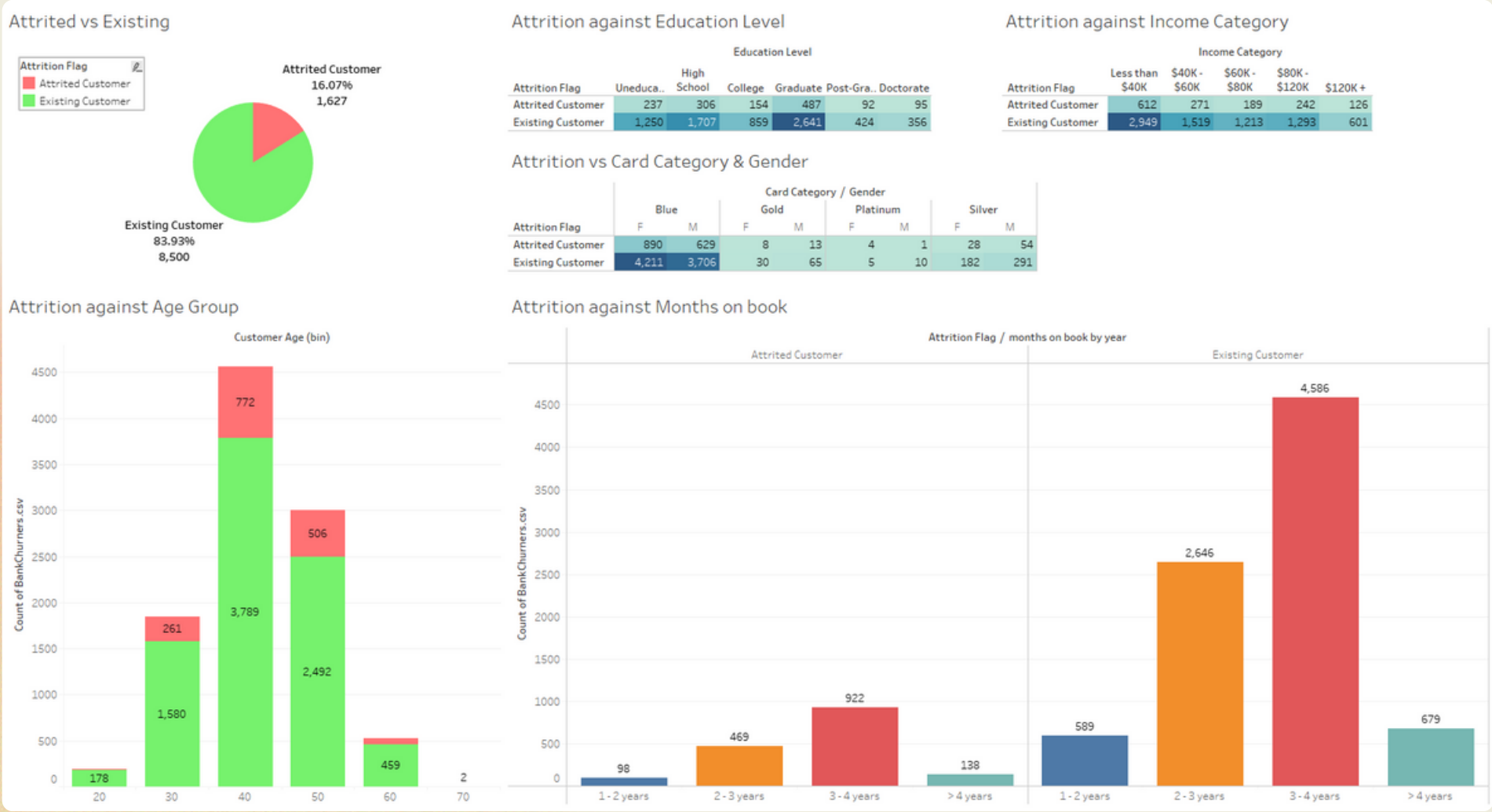
**AUR is higher** where **income is lower** across all marital statuses.

Across all income groups and marital statuses, customers generally are **looking after 2.3 dependents**

Customers within **age group of 40**, on average have an approx **3 dependents** (*highest among other age groups*), have the **lowest AUR** and **highest credit limit** among all the other age groups.



# Identifying factors which influence attrition



*\*\*Refer to dashboard on Tableau*

After plotting various dimensions against attrited and existing customers, the following observations were made:

- Customers who are within the **age range of 40 - 50**, make up the bulk of attrited customers (**79% of total**)
- Graduates** make up at least **30%** of total attrited customers
- 38%** of attrited customers **make less than \$40,000**
- 93%** of attrited customers are **Blue card holders** with a gender ratio (F:M) of 141:100 ; with **slightly more women** who have attrited.
- 56%** of attrited customers have been with the bank for around **3 - 4 years**

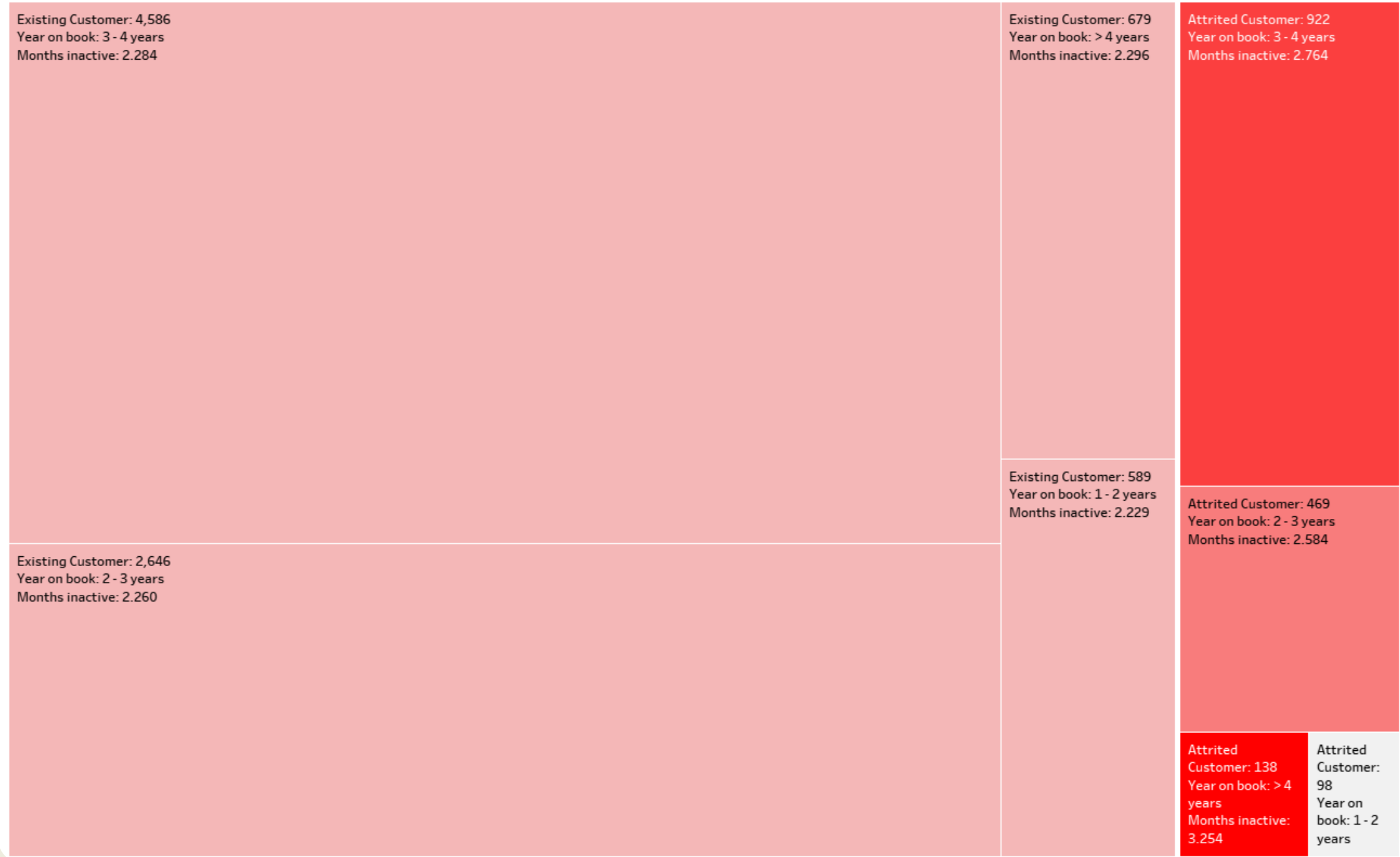


# Attrition against Months inactive & Year on book

Customers who have attrited were found to have around **2 - 4 years** of relations with the bank and had longer periods of inactivity as compared to existing customers of around **0.5 months**.

the difference in period of inactivity across existing and attrited customers can provide hints on when should the bank intervene to engage customers and secure retention.

Attrition against Months inactive & Year on book





# Attrition across Card Category, against Credit Limit & Total Relationship

Looking at total relationship across all card categories, the following points were observed:

The **average total relationship** for **Blue card** holders was significantly lower for attrited customers at **0.66**

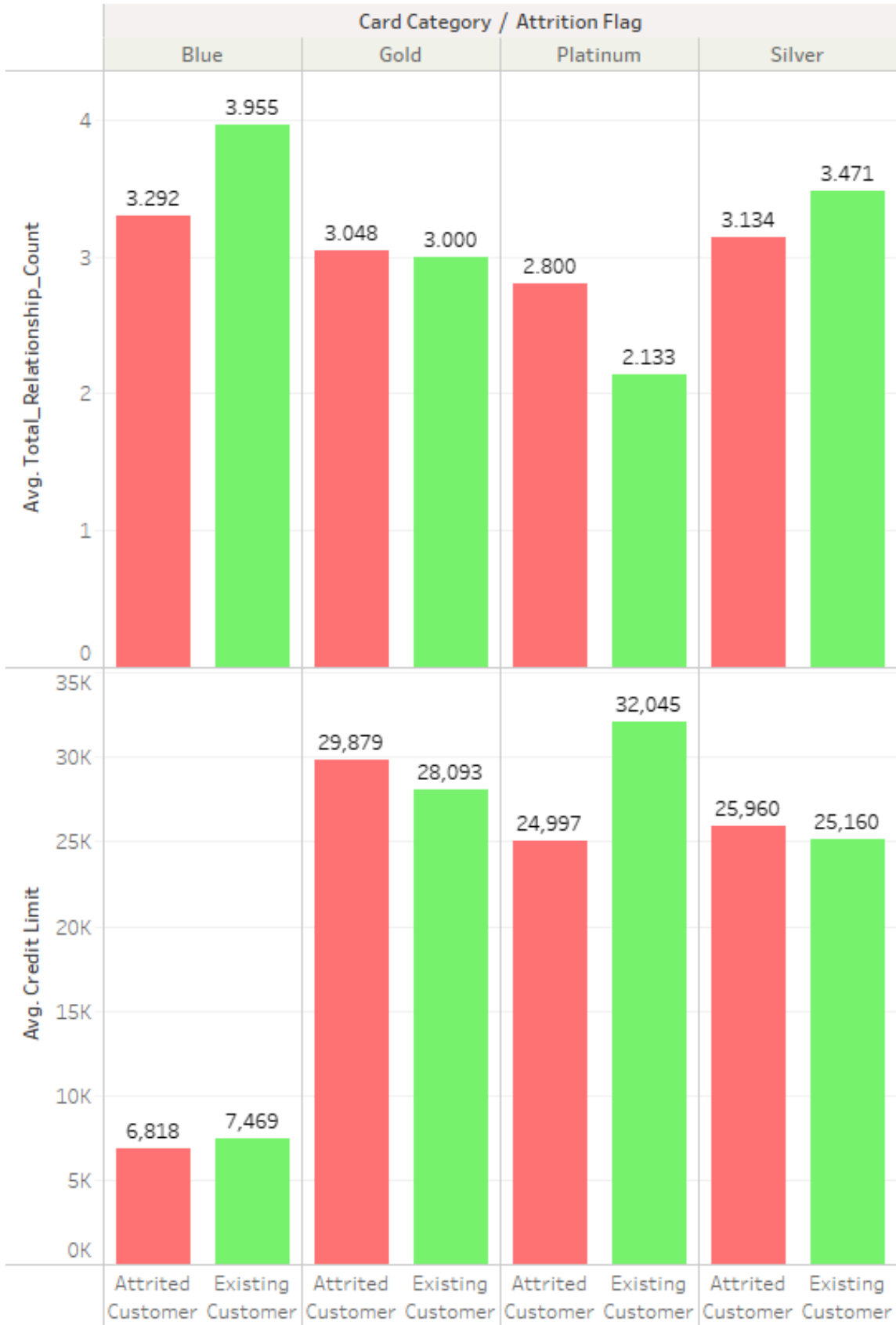
Additionally, there is a slight difference of **\$651** with regard to the **credit limit** among **Bluecard** holders

Taking into consideration these points and other demographic data, it is probable to infer that Attrited Blue card holders **may have held relationships** with other banks due to the lower credit limit.

Through demographic data, we have observed that majority of Bluecard holders fall under the income category of **less than \$40,000**. They are mostly within the **40 - 50 age group** and have an average of **2.97 dependents** to care for.

Assuming a salary of \$40,000. The credit limit of \$651 forms up to at least **20% of a bluecard holder's monthly wage**. As a result, we can make the plausible inference that Bluecard holders **may be supplementing with other lines of credit to support their family unit**.

Attrition across Card Category against Credit Limit and Total Relationship



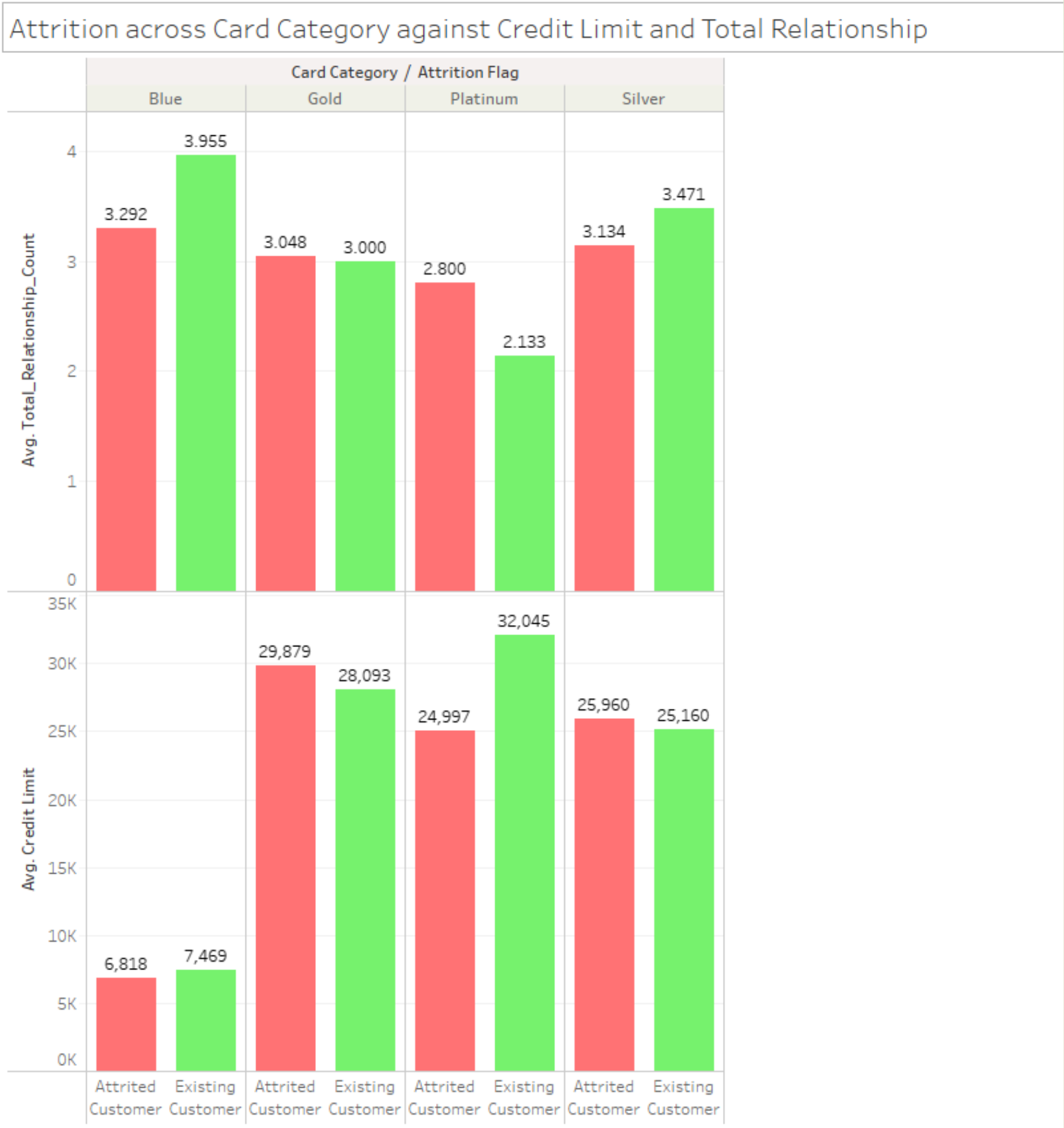


# Attrition across Card Category, against Credit Limit & Total Relationship (Cont.)

Another observation made was that the average total relationships for **Platinum card** holders was significantly higher for **attrited customers** at **0.66**

Moreover, the **credit limit** was seen to be **lower** for **attrited platinum card** holders at a **22% (7048)** difference compared to existing card holders

This could possibly mean that attrited Platinum card holdders could have been **previously supplementing with other credit lines within the bank** before attriting.





# Making sense of everything - recommendations

## Focus on Blue card holders



With blue card holders forming the majority of transaction count, amount as well as attrited customers. Additionally, it was found that most of these attrited customers fall under the 40 - 50 age group and have an average of 2.97 dependents to care for.

It will be imperative to reexamine and redesign card details and offerings to suit the specific needs of the majority subgroup.

## Conduct survey to identify gender specific needs



Given that the AUR for females is higher than men, across education levels and card categories, it will be prudent to conduct surveys targeted at different card holders to better understand the unique appeal of each card (if any) that may be gender specific.

## Dive deeper into Platinum card holder relationships



Look into further detail as to what other relationships attrited Platinum card holders have held with the bank and ascertain if the increased relationships was due to the lower credit limit. If the following is true, look into redesigning the Platinum card.



# Thank you

**Prepared By:**

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