Unlocking Insights: Visualizing Mobile Usage Patterns

Group 3:
Janani Krishnamurthy
Mohit Shyam Amode
Lavanya Bunadri
Maelice Yamdjieu

Introduction

- **Importance of Analysis**
  - Mobile devices are integral to daily life, influencing communication, work, and entertainment.
  - Analyzing usage patterns helps optimize user experiences and guide technological innovations.
  - Provides insights into emerging trends in digital behavior.
- **Motivation for the Project**
  - Inspired by the growing role of mobile devices in communication, productivity, and entertainment.
  - Aimed to explore how user demographics and behaviors influence mobile usage.
  - Highlights the significance of mobile technology in shaping modern lifestyles.
- **Purpose**
  - Identify meaningful trends in mobile usage across demographics.
  - Provide insights for researchers, technology designers, and individuals interested in user behavior.
  - Contribute to data-driven decisions in mobile technology design and development.

Dataset Overview

- Source: Mobile Device Usage and User Behaviour Dataset - Kaggle
- **Dataset Size: 11 variables capturing mobile usage and user demographics.**

Variable Details

Variable_Name	Description
User_ID	Unique identifier for each user
Device_Model	The model of the device used by the user
Operating_System	The operating system of the device (e.g., Android, iOS)
App_Usage_Time_Mins_Per_Day	Time spent on apps per day in minutes
Screen_Time_Hours_Per_Day	Time the screen is on per day in hours
Battery_Consumption_mAh_Per_Day	Daily battery consumption in milliampere-hour (mAh)
Number_Of_Apps_Installed	Total number of apps installed on the device
Data_Usage_MB_Per_Day	Daily data usage in megabytes (MB)
Age	Age of the user
Gender	Gender of the user (e.g., Male, Female)
User_Behavior_Class	Class representing user behavior patterns

Data Preprocessing Steps

- **Removed duplicates to eliminate redundancy.**
- **Adjusted column names for better readability and clarity.**
- **Validated for unrealistic or outlier values in columns such as:**
  - **App Usage Time (minutes/day)**
  - **Screen-On Time (hours/day)**
  - **Battery Consumption (mAh/day)**
- **Factorized categorical variables - "Operating System" and "Gender" for analysis.**
- **Inspected data structure using summary statistics and head rows.**

Project Goals

- **Exploring User Behaviour Patterns:**

  Analysing how mobile usage influences different behaviour classes.

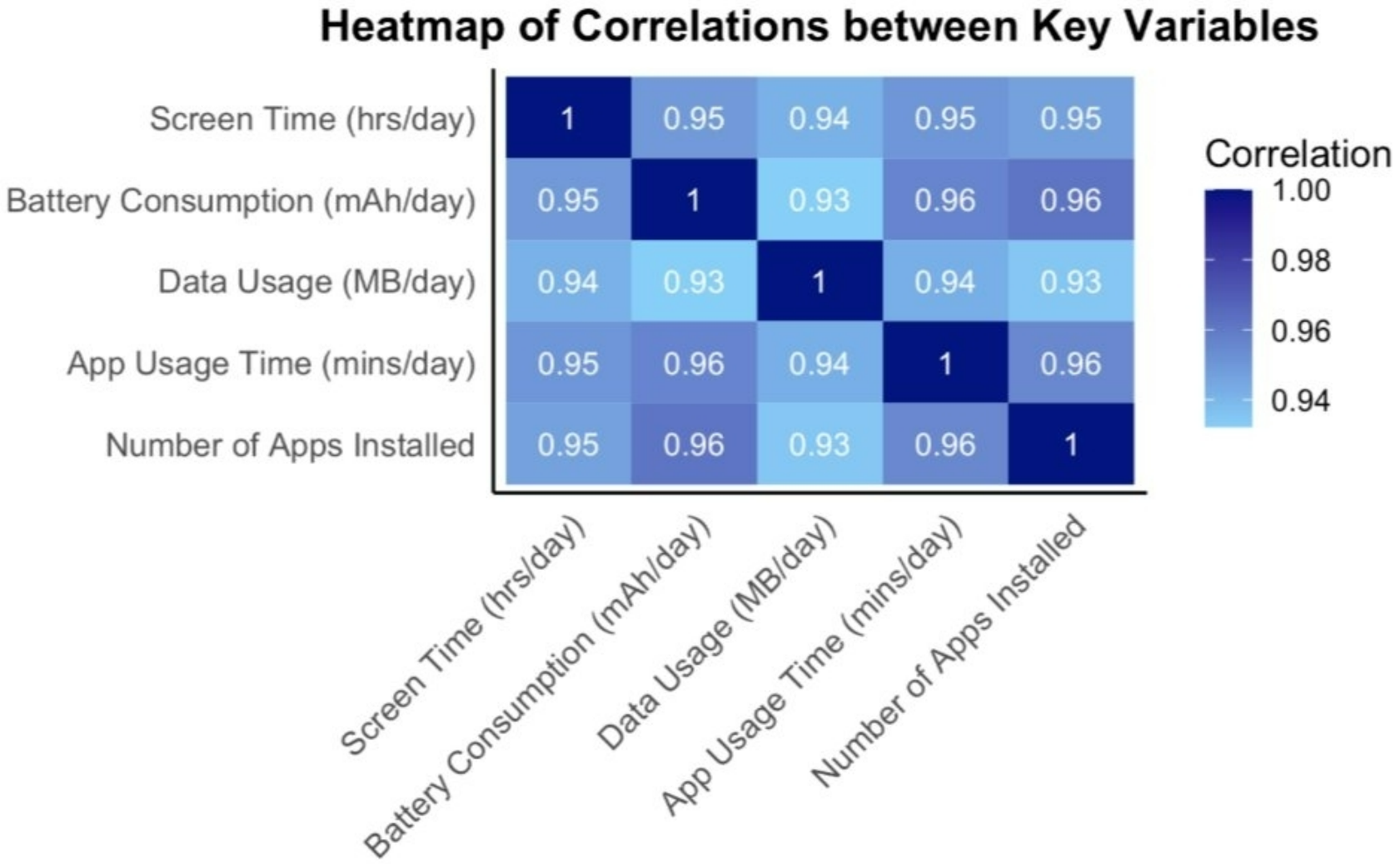
- **Gender Differences in Usage:**

  Analysing if male and female users exhibit distinct mobile usage patterns.

- **Age-Based Usage Trends:**

  Examining mobile usage across different age groups.

Exploratory Data Analysis



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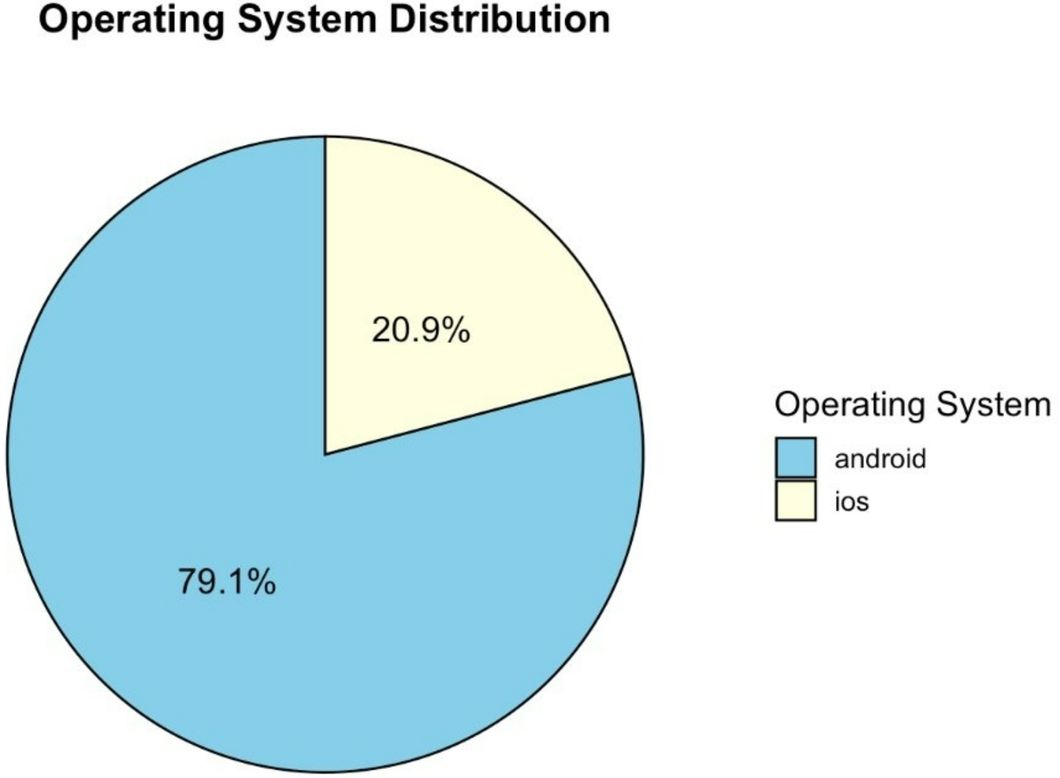
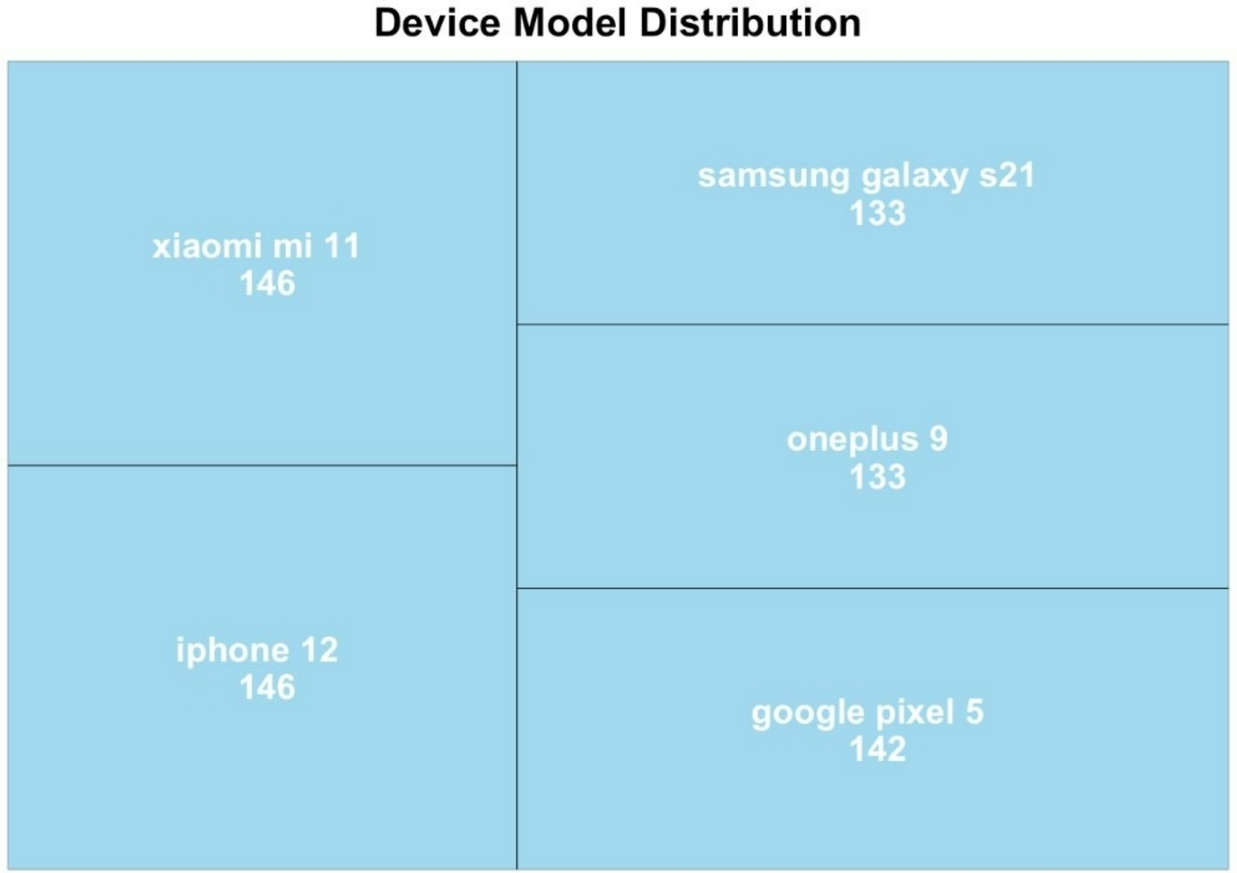
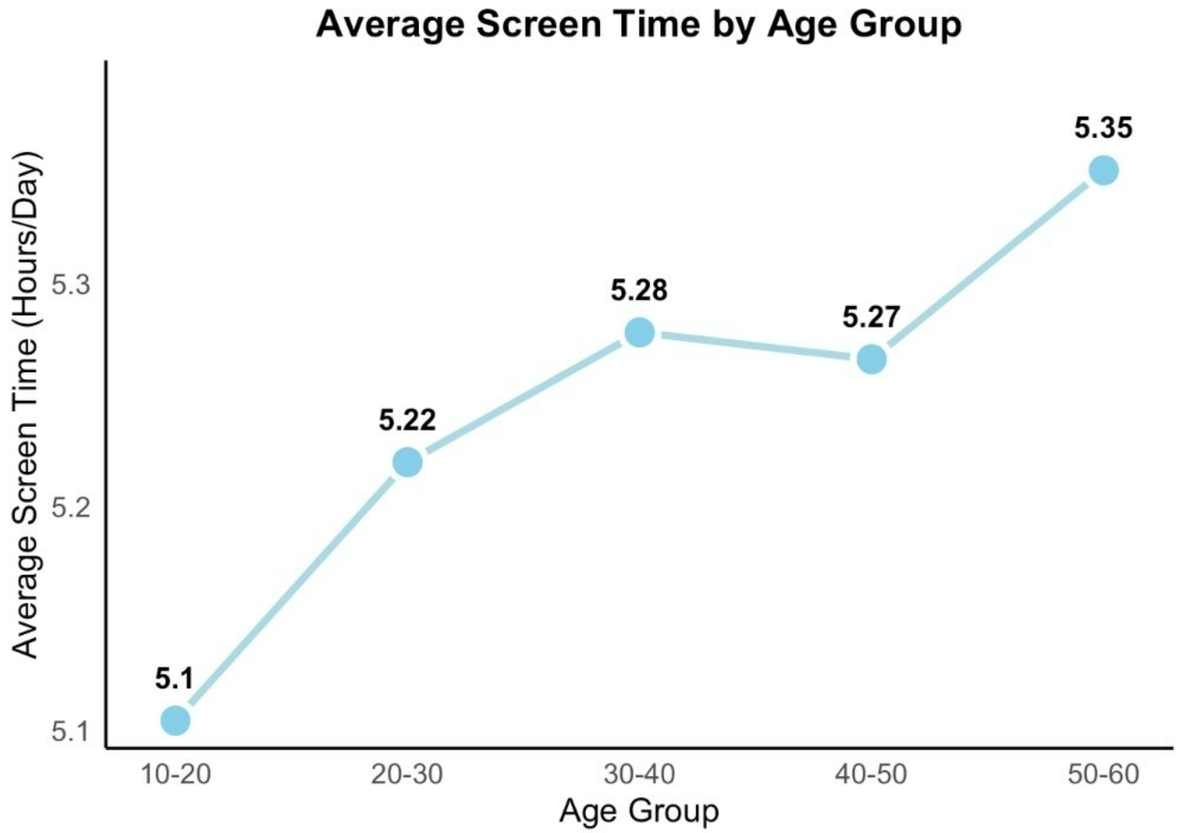




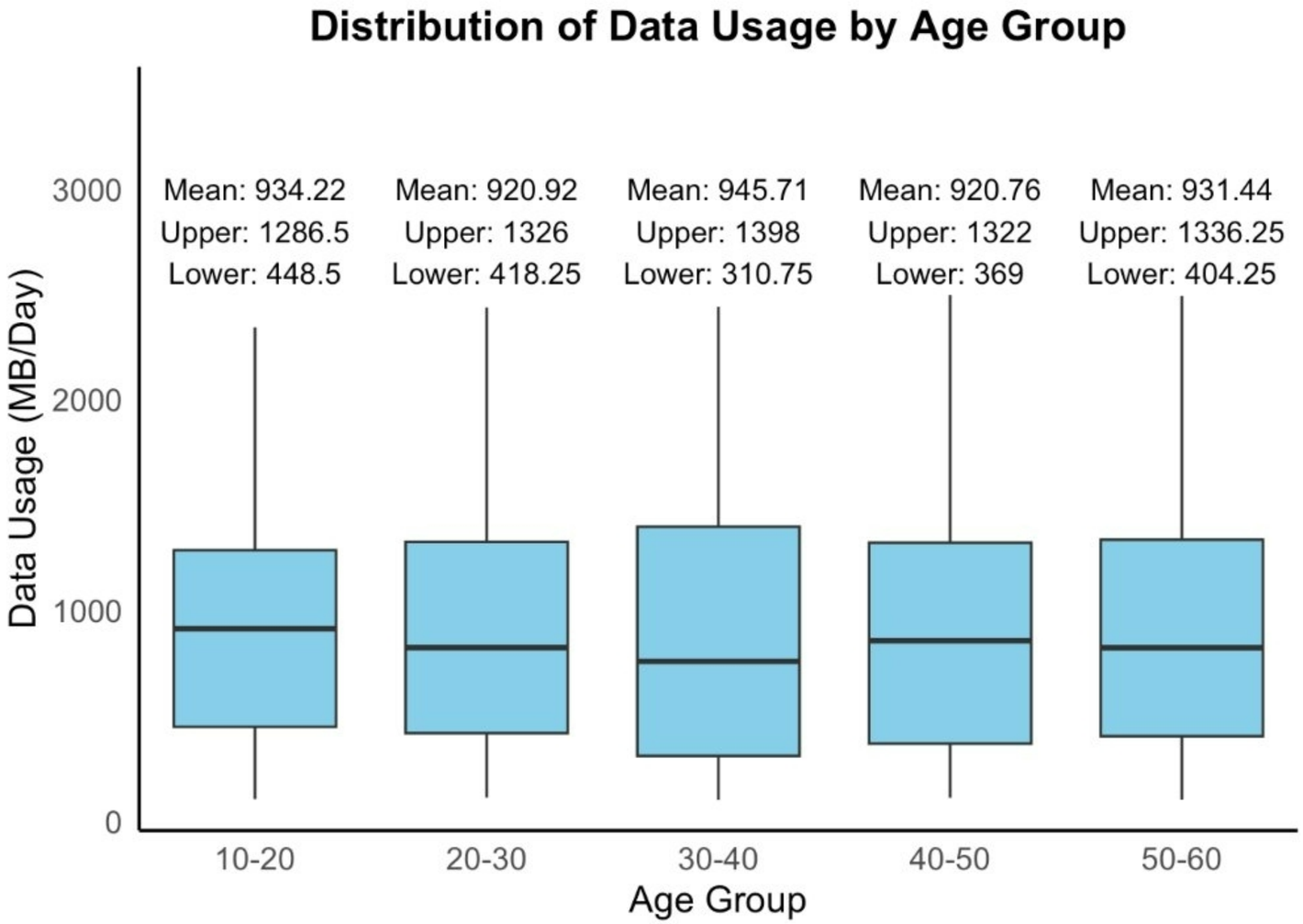
Age-Based Usage Trends



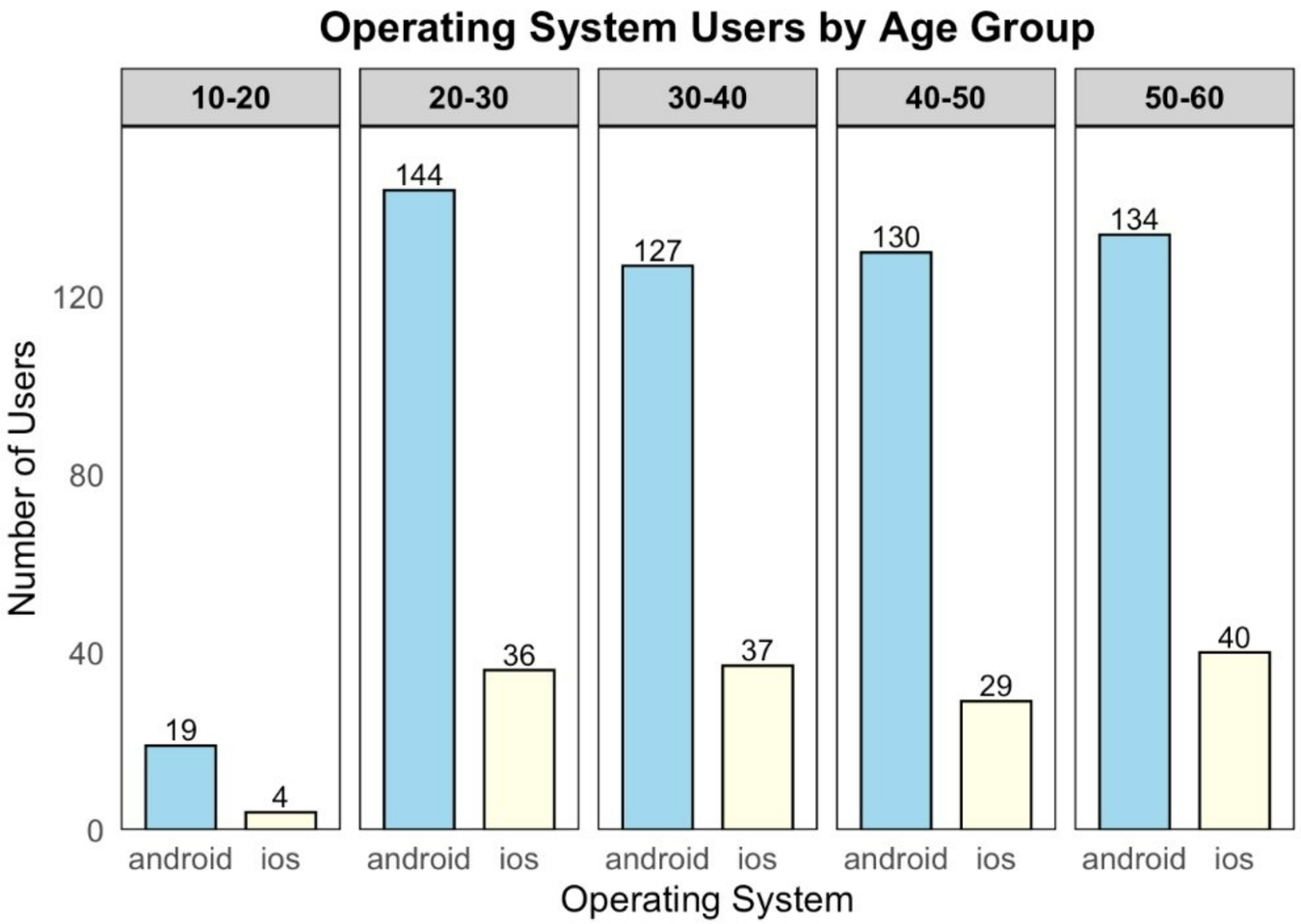
Key Points:

- Mobile usage is prevalent across all age groups, **contrary to common perceptions.**
- Steady rise in average screen time across age **groups.**

Age-Based Usage Trends



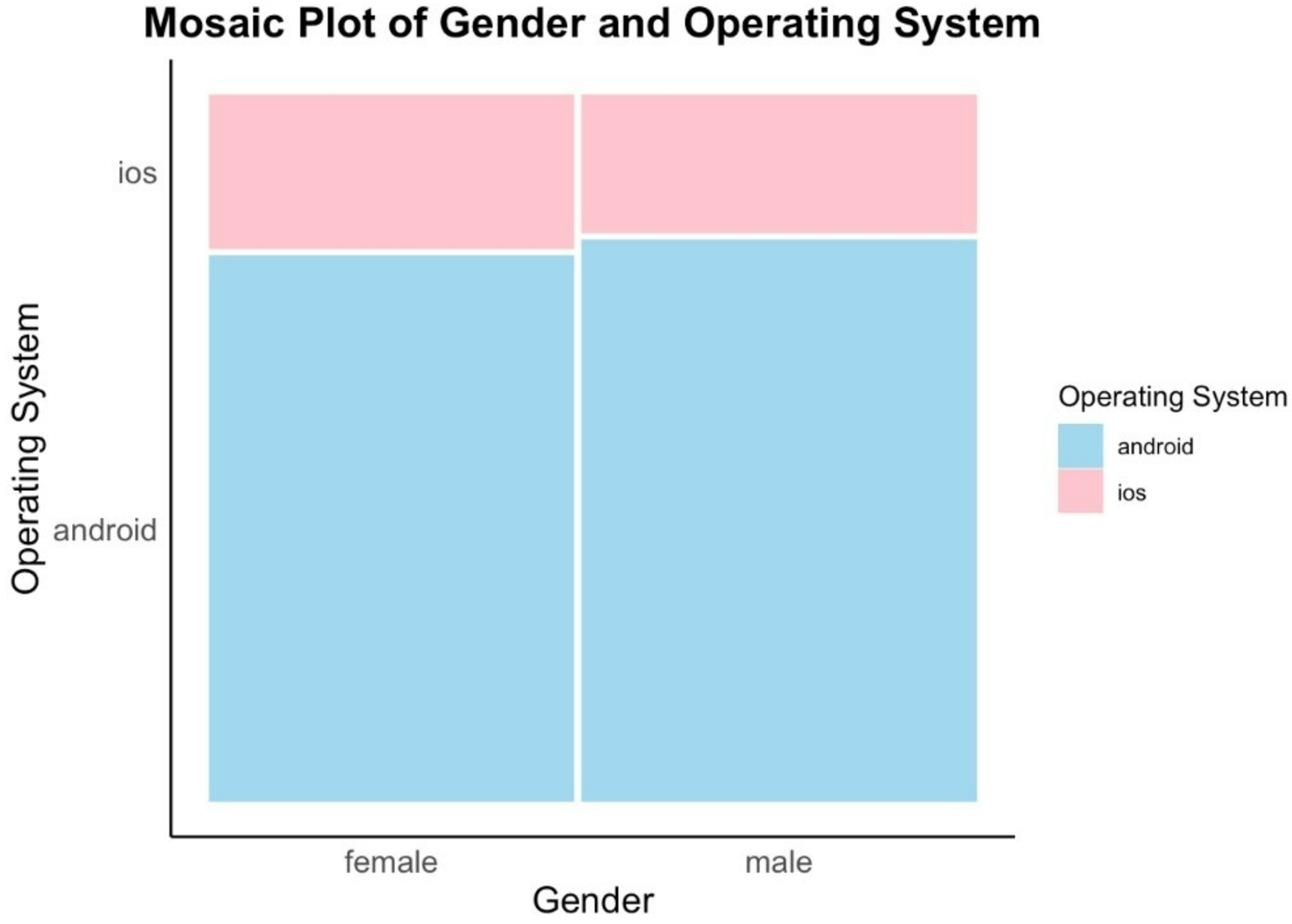
Age-Based Usage Trends



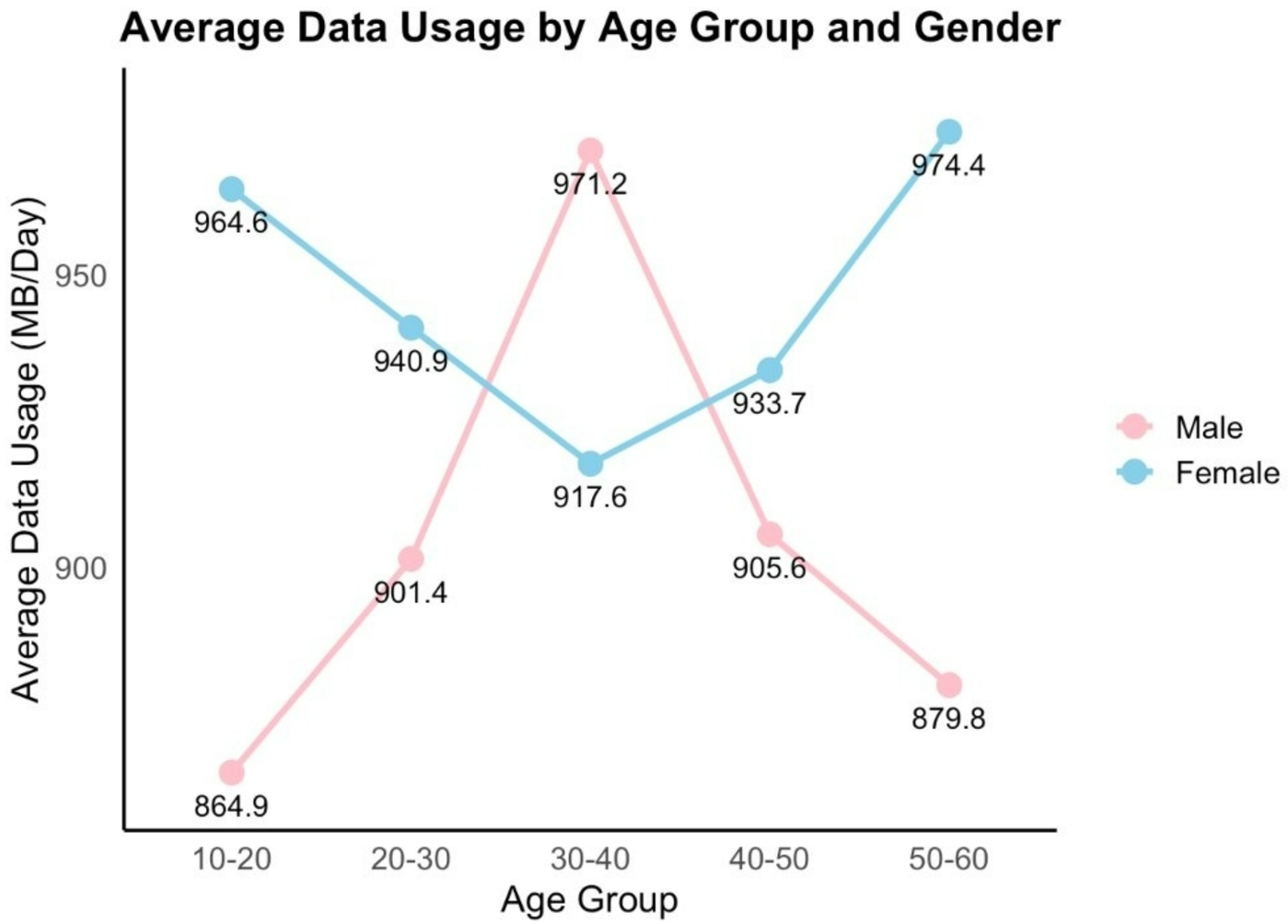
Key Points:

- Android Leads: Dominates across all age **groups.**
- **Steady Trends:** Android remains **high; iOS lower but stable.**

Gender Differences in Usage



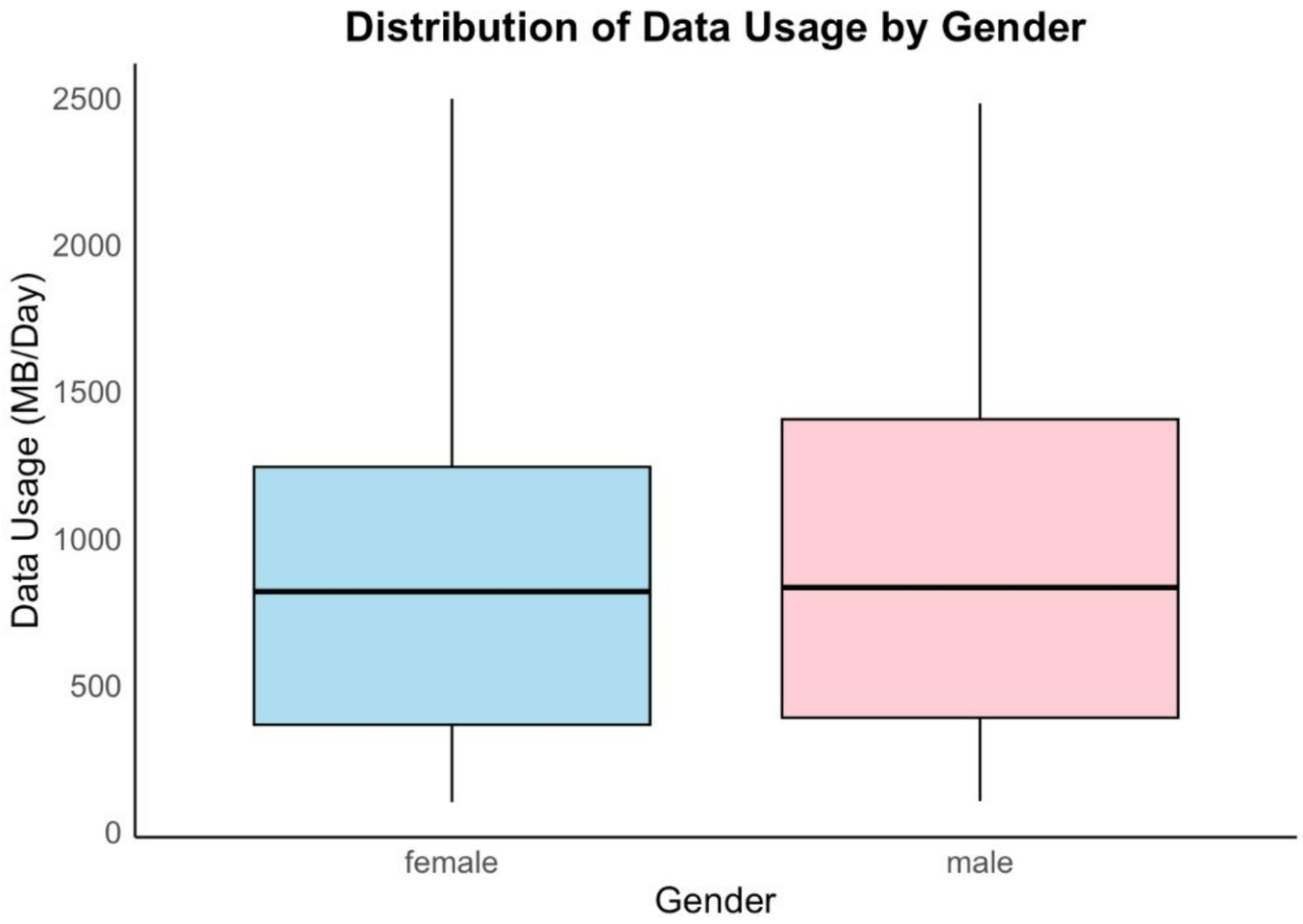
Gender Differences in Usage



Key Points:

- Data usage remains relatively stable across different age **groups.**
- **Males:** Tend to have higher data usage in younger and **older age groups.**
- **Females:** Exhibit higher data **usage in the 30-40 age group.**

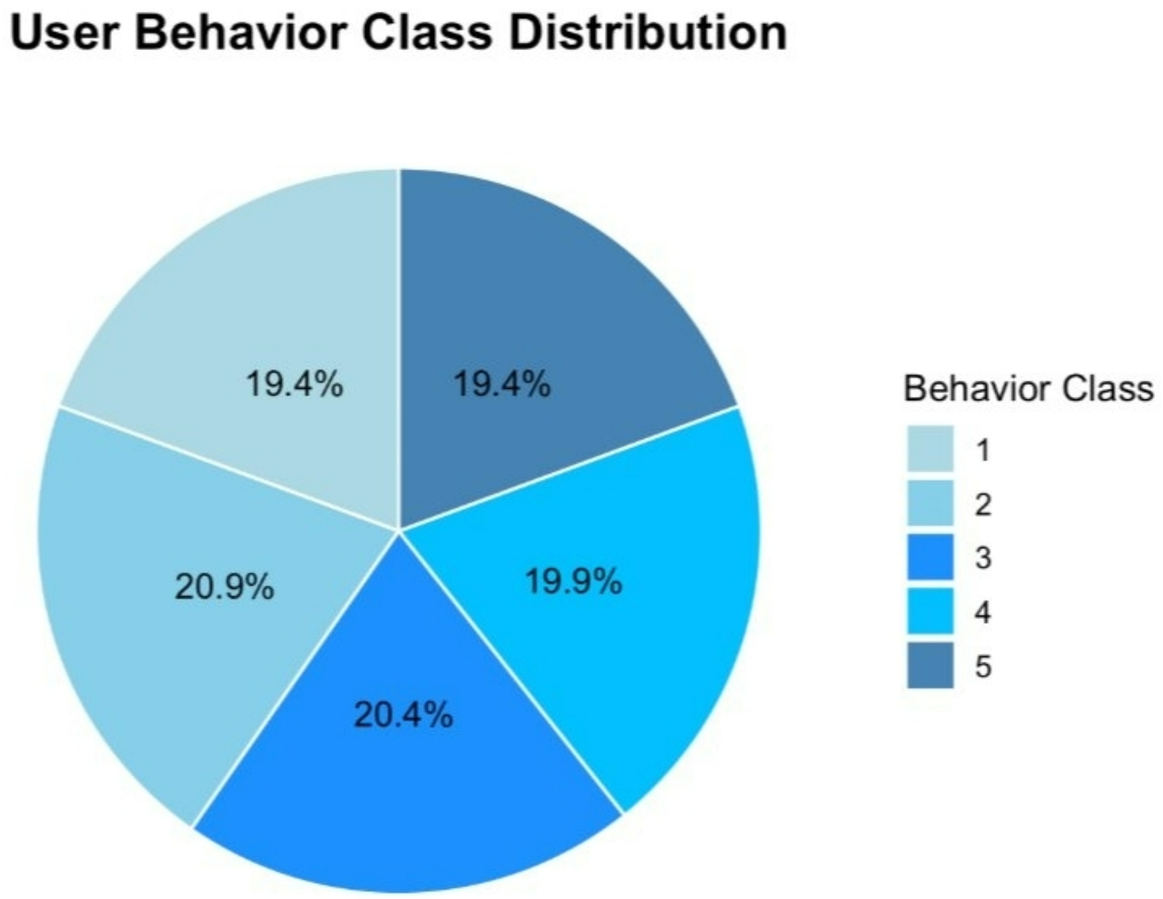
Gender Differences in Usage



Key Points:

- **Both genders show similar median usage.**
- Males seems to have slightly more variability in data usage than females.

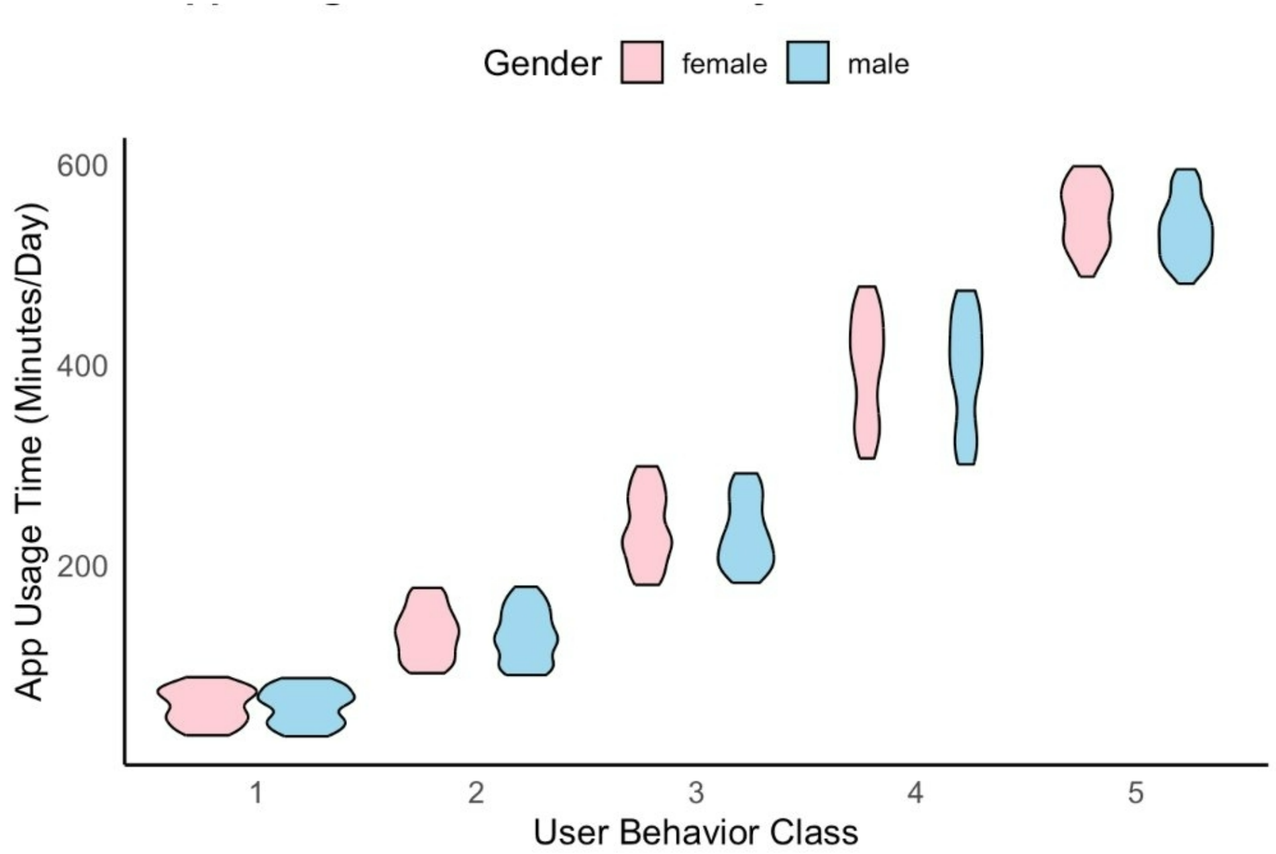
Exploring User Behaviour Patterns



Key Points:

- **Light Usage (Class 1): Minimal User**
- **Moderate Usage (Class 2):** Slightly higher **usage than Class 1**
- **Average Usage (Class 3):** Typical user patterns with moderate values across **metrics.**
- **Heavy Usage (Class 4):** High user compared **to other 3 classes.**
- **Extreme Usage (Class 5): Maximum levels representing as power users**

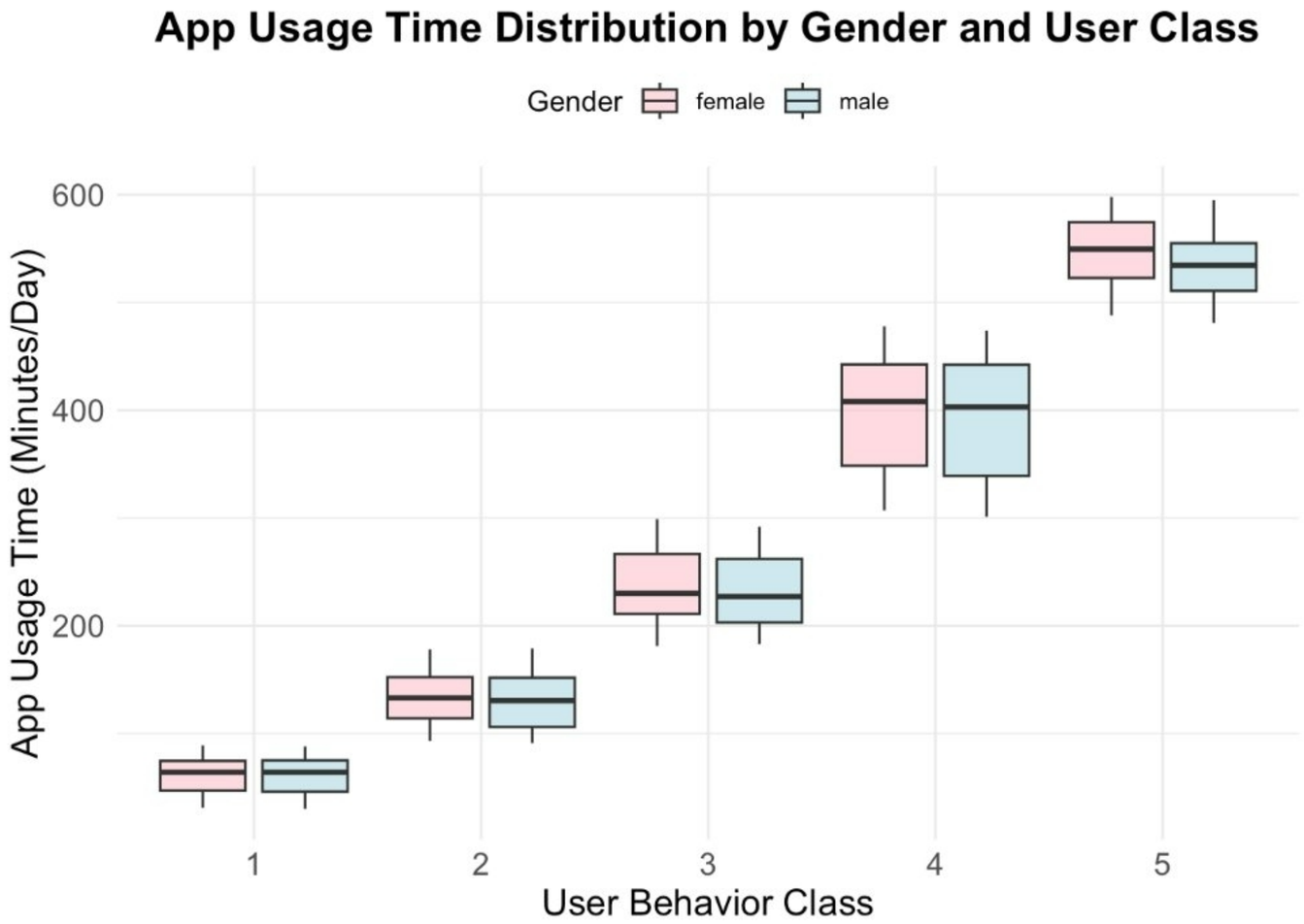
Exploring User Behaviour Patterns



Key Points:

- App usage time increases with user **class.**
- Do they vary between Gender?

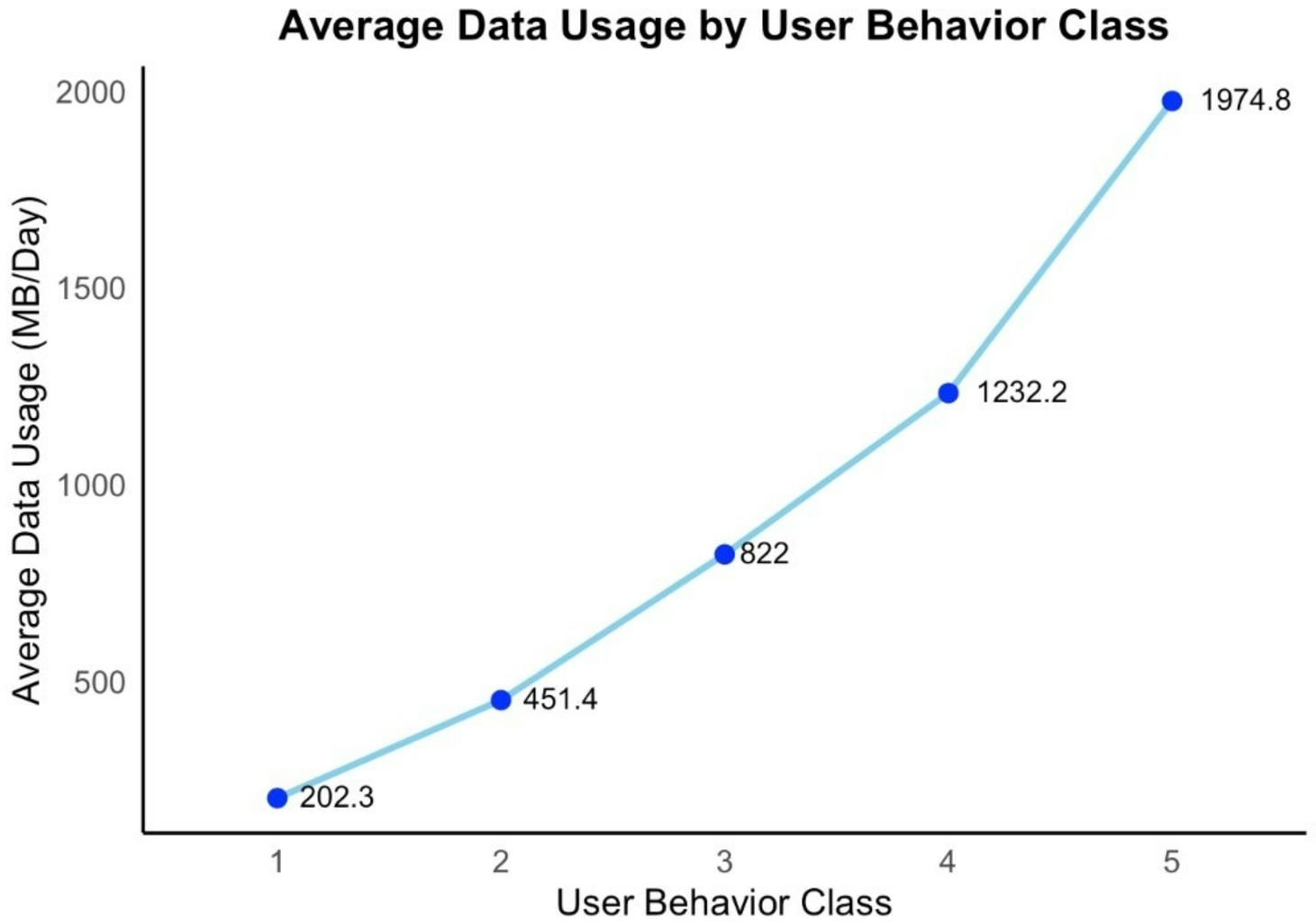
Exploring User Behaviour Patterns



Key Take away:

- Female users in Class 5 have slightly higher average app usage time than male users.

Exploring User Behaviour Patterns



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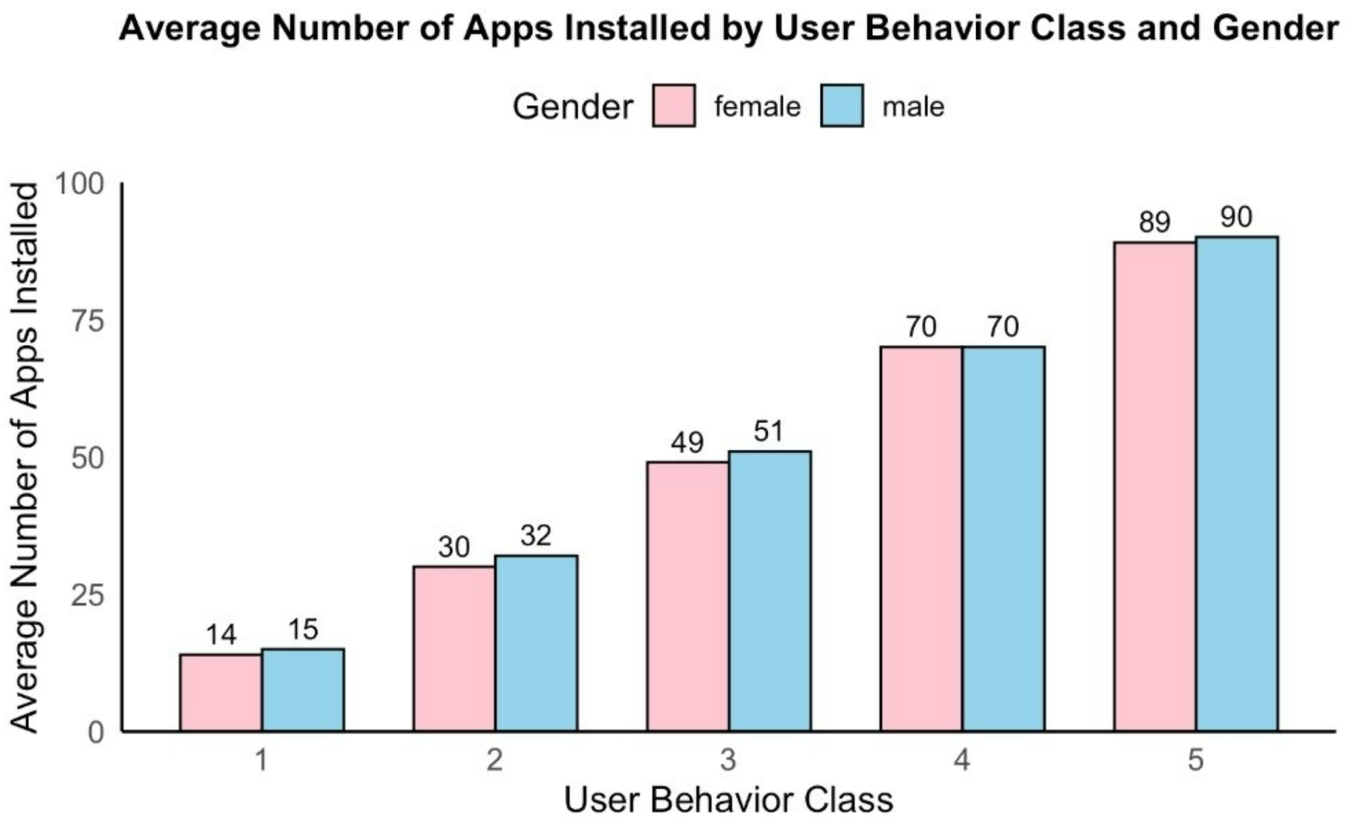
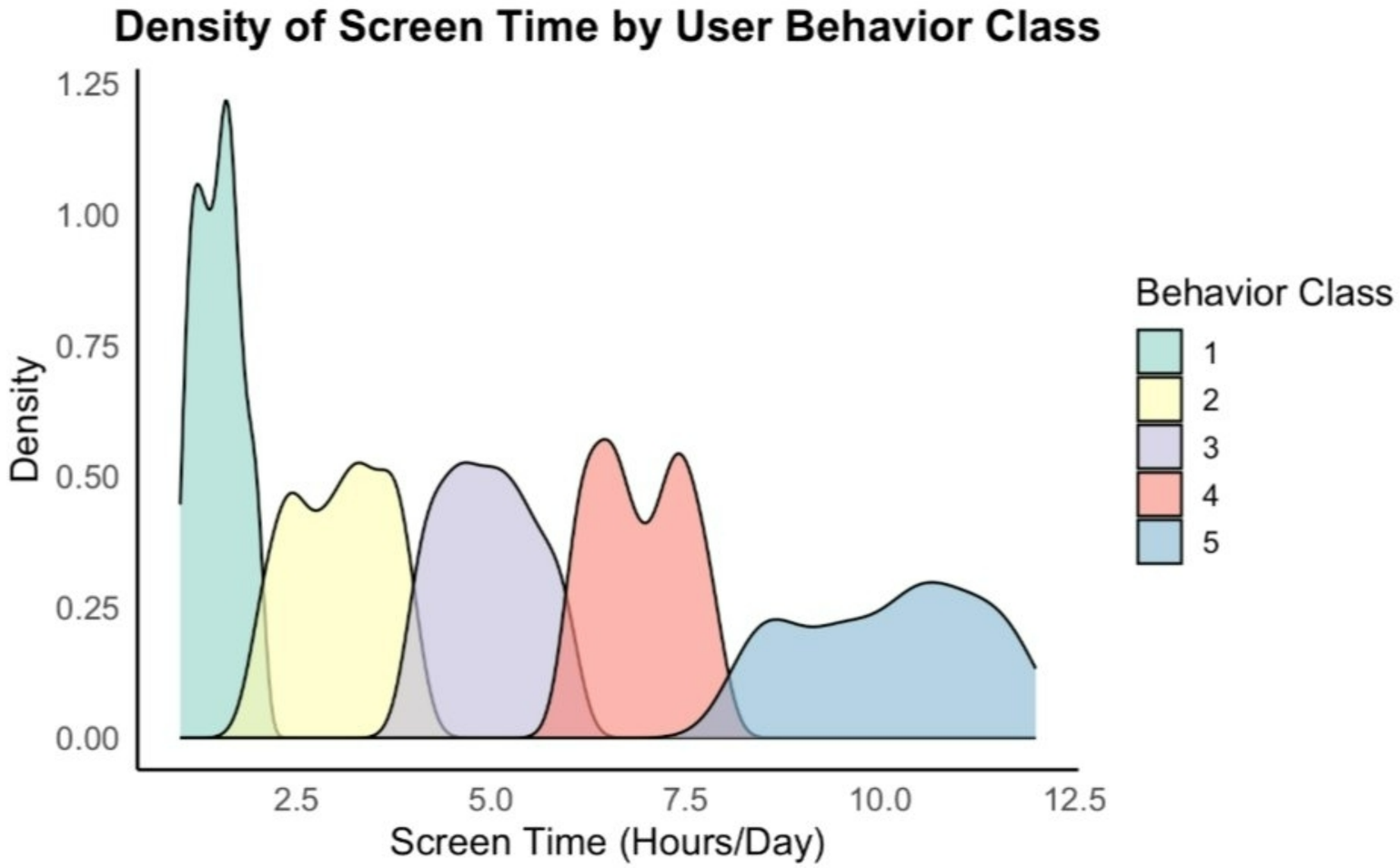


Key Take away:

- **Increasing App Installations with User Class**
- Men lead the way in app diversity across all **user classes.**

Exploring User Behaviour Patterns



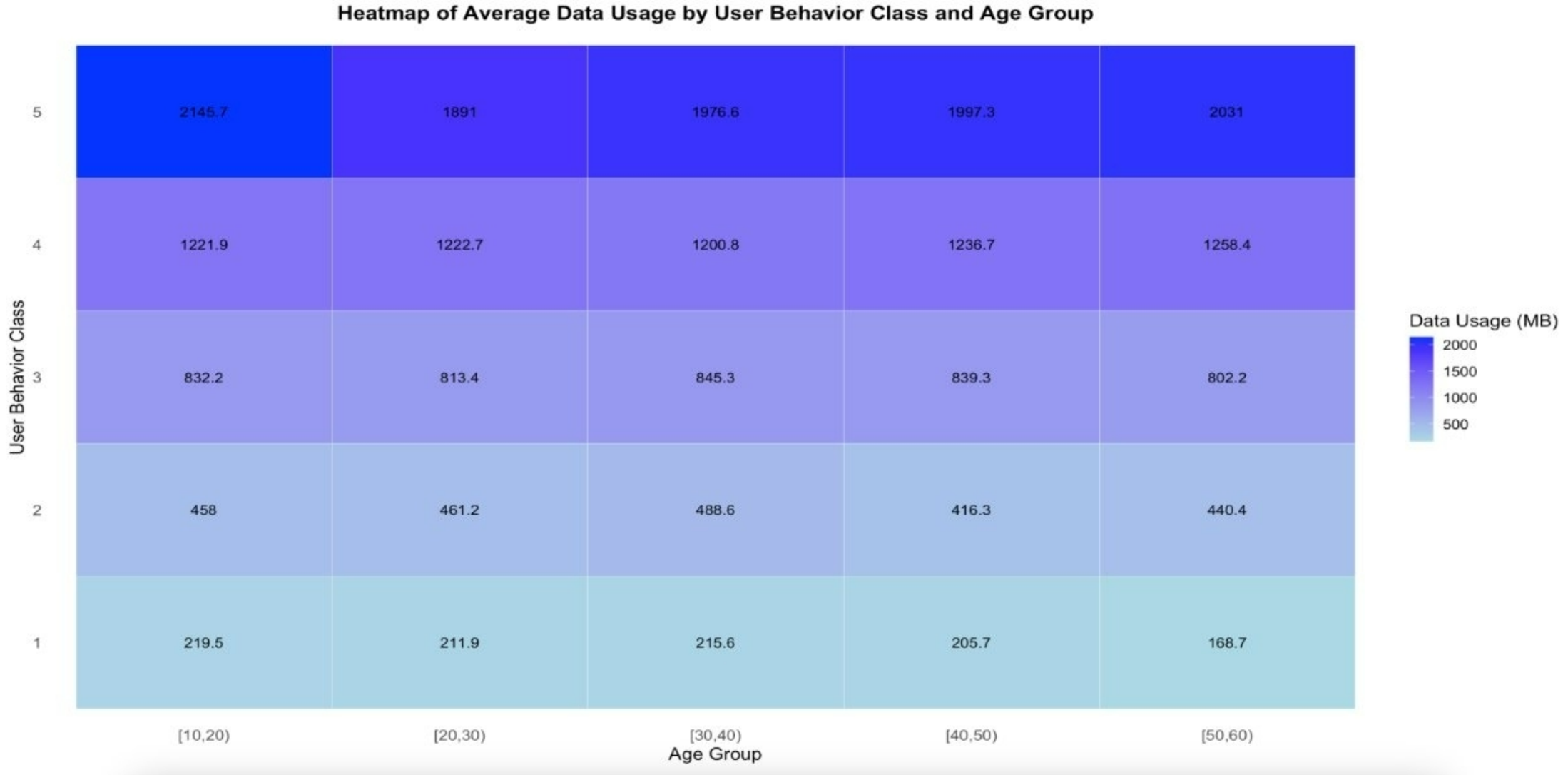
Key Take away:

•**Screen Time Increases with User Class**

•Each class exhibit varying levels of **screen time.**

•Overlap in screen time between **different user classes**

Exploring User Behaviour Patterns



Conclusion

- **Dominance of Android**

Android devices are significantly more popular than iOS among users.

- **Mobile Usage Across Age Groups**

Contrary to common perceptions, mobile usage is relatively consistent across all age groups.

- **Gender-Based Insights**

Men tend to have more apps installed, while women show slightly higher app usage time.

- **Gender-Based Trends in Data Usage**

Males have higher data usage in younger and older age groups, whereas females show higher usage in middle age **compared to younger and older groups.**

- **Classification of User Behaviours**

User behaviour was effectively categorized based on usage rates, highlighting distinct patterns.

Future Scope

- **Expand User Segmentation: Analyse more user groups (e.g., location, income).**
- **Explore Temporal Trends: Study how mobile usage patterns evolve over time.**
- **App Category Analysis:** Investigate usage by specific app categories (social, **productivity).**
- **Predictive Modelling: Build models to forecast future usage trends.**
- **Mobile Usage & Health:** Analyse the impact of usage on health (e.g., screen time, sleep)

Questions and Discussion

Thank You!