Analysis of Credit Card Selection Behavior Using SAS

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**Abstract**

This study analyzes how time spent viewing credit card features affects decision-making, focusing on whether it influences the selection of an optimal card and exploring gender differences in viewing patterns. Using SAS for statistical analysis and visualization, the findings show no significant correlation between viewing time and choosing the best card, indicating that time spent on features does not strongly impact decision-making. However, gender-based patterns emerged, with females exhibiting more sustained engagement compared to males. These insights suggest that while viewing duration alone may not predict card choice, incorporating gender-specific behaviors could enhance marketing strategies.

1. **Introduction**

This report aims to analyze the factors affecting credit card selection, focusing on the time spent by individuals viewing different card features. The study explores whether the duration spent on various features influences the likelihood of choosing the dominant card and investigates gender differences in viewing patterns.

# Data Preparation

**Data Cleaning**: Outliers were removed by filtering time variables with values greater than specified thresholds. Observations with zero engagement were excluded from the analysis.

**Variables Analyzed:** Time variables included introductory rate viewing time (time0intro), minimum payment viewing time (timeminpay), and other feature-related times.

1. **Analysis Approach**

The analysis was performed using SAS procedures, including:

1. **Descriptive Statistics:** Calculated measures such as mean, median, standard deviation, and quartiles for time variables, offering insights into general viewing behavior.
2. **Frequency Analysis:** Used **PROC FREQ** to explore relationships between viewing times and card choice, indicating how often individuals chose the optimal card based on the time spent on each feature.
3. **Histograms:** Created using **PROC SGPLOT** to visualize distributions of time variables, allowing comparison across different card features and user groups (male vs. female).
4. **Correlation Analysis:** Examined associations between time spent on features and the likelihood of choosing the optimal card.

* **Hypothesis 1 Findings:**
* The descriptive analysis showed minimal differences in the average time spent across various card features, suggesting limited influence on card choice.
* Correlation results indicated no significant relationships (correlation values < 0.5), confirming that time spent on features did not substantially impact the decision-making process.
* Histograms revealed that viewing patterns were not consistent predictors of optimal card selection.
* **Hypothesis 2 Findings:**
* Gender-based analysis indicated that females generally spent more time exploring card details than males, especially for introductory rates and payment terms.
* Notably, males tended to lose interest earlier in the viewing process, as observed in histogram peaks occurring sooner than for females.
* Analysis of time spent across different features showed two peaks, around 9-10 seconds, highlighting crucial points where viewers either engaged further or disengaged.

The SAS procedures used included descriptive statistics for summarizing the data, frequency analysis for examining relationships between time spent and card choice, and correlation analysis for assessing associations between variables. Histograms were utilized to visualize the distribution of viewing times.

1. ***Results and Graphs***

**4.1 Descriptive Statistics**

Summary statistics for the key time variables are presented below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Mean (sec)** | **Std Dev (sec)** | **Median (sec)** | **Min (sec)** | **Max (sec)** |
| time0intro | 12.5 | 8.3 | 10 | 0 | 50 |
| timeminpay | 14.8 | 9.2 | 12 | 0 | 50 |
| timenomem | 13.3 | 7.8 | 11 | 0 | 50 |
| timeforeign | 11.2 | 6.5 | 9 | 0 | 50 |

These statistics indicate variability in the time spent viewing different credit card features, with timeminpay having the highest average time.

**4.2 Frequency Analysis and Histograms**

The frequency analysis explored whether the time spent on specific features affected the likelihood of choosing the optimal (dominant) card. **time0intro vs. Card Choice**: Below is the histogram of time0intro for those who chose the optimal card (chosedom = 1) and those who did not (chosedom = 0).

**Time0intro for wrong and right card**

A graph of a number of columns

Description automatically generated with medium confidenceA graph of a person

Description automatically generated

**Time intro for females (1 and 0)**

A graph of a graph

Description automatically generated with medium confidenceA graph of a number of columns

Description automatically generated with medium confidence

Females trying to understand more about the card regardless of if they are buying or not

**Time intro for males (1 and 0)**

A graph of a graph

Description automatically generated with medium confidenceA graph of a graph

Description automatically generated with medium confidence

Report: Two peaks around (9 to 10 secs) which determine an important point that either they will continue after that time, or they will leave.

**4.3 Gender-Based Analysis**

Gender differences in viewing behavior were analyzed by plotting histograms for time0intro, **timeminpay**, and other variables.

Viewing Time for Females and Males

|  |  |  |
| --- | --- | --- |
| **Feature** | **Peak Time for Females (sec)** | **Peak Time for Males (sec)** |
| time0intro | 10 | 9 |
| timeminpay | 12 | 8 |
| timenomem | 11 | 10 |
| timeforeign | 9 | 7 |

Graphs demonstrated that females generally spent more time reviewing the features compared to males. For instance, during the analysis of **timeminpay**, females showed a consistent interest, while males tended to disengage earlier.

**Time in pay for females (0 and 1)**

A graph of a number of columns

Description automatically generated with medium confidenceA graph of a graph

Description automatically generated with medium confidence

Females again showing a pattern near to 9 and 10 secs which propose videos does catch the interest from first few seconds

**Time in pay for males (0 and 1)**

A graph of a number of bars

Description automatically generated with medium confidenceA graph of a number of columns

Description automatically generated with medium confidence

Males not buying the card shows a contradictory behaviour than female while as the they are losing interest by the video in first few seconds

**Time no mem for females (1 and 0)**

A graph of a number of columns

Description automatically generated with medium confidence A graph of a number of columns

Description automatically generated with medium confidence

Similar pattern as they are not losing the interest, and they do try to get more information as the video progress

**Time no mem for males (0 and 1)**

A graph of a number of columns

Description automatically generated with medium confidenceA graph of a graph

Description automatically generated with medium confidence

Similar pattern to females which shows a different behaviour than other 2 schemes

**Time foreign for females (0 and 1)**

A graph of a number of columns

Description automatically generated A graph of a number of columns

Description automatically generated with medium confidence

They try to see the videos, but they are losing interest in general

**Times Foreign for Males (0 and 1)**

A graph of a number of columns

Description automatically generated with medium confidenceA graph of a number of columns

Description automatically generated with medium confidence

The more the people get into video, the more chances of them buying

1. **Best Insights from Analysis:**
2. **Viewing Time Has Minimal Impact on Card Choice:**
   * The analysis found no significant correlation between the time spent viewing specific credit card features (e.g., introductory rates, minimum payment terms) and the likelihood of choosing the optimal card. Correlation coefficients were consistently below 0.5, indicating a weak relationship. This suggests that merely spending more time on evaluating features does not strongly influence the decision to choose the best available credit card.
3. **Gender Differences in Engagement Patterns:**
   * **Females exhibit more thorough engagement:** On average, females spent more time reviewing credit card details, especially introductory rates and payment terms. This sustained engagement suggests that females may take a more methodical approach when evaluating options, potentially making them more thorough in their decision-making process.
   * **Males disengage more quickly:** Males tended to lose interest sooner, as reflected in histogram peaks occurring earlier than for females (e.g., 8-9 seconds for males vs. 10-12 seconds for females). This pattern indicates that males are less likely to spend time scrutinizing features in detail and may benefit from marketing strategies that quickly capture their attention.
4. **Critical Time Window for Engagement Identified:**
   * There were consistent peaks in engagement around 9-10 seconds across different viewing scenarios. This critical time window suggests that the first few seconds of presenting credit card features are crucial in capturing the viewer's interest. If marketing materials (e.g., videos, ads) can effectively convey key benefits within this time frame, it may increase the chances of retaining viewer engagement and influencing card choice.
5. **Mixed Engagement for Foreign Transaction Fees:**
   * Time spent on evaluating foreign transaction fees showed varied engagement patterns, with some users paying little attention to this feature. This could imply that for many users, foreign transaction fees are not a priority when choosing a credit card, or it may be relevant only for specific segments (e.g., frequent travelers).
6. **Marketing Strategy Implications:**
   * **Personalized Marketing:** Given the observed gender-based differences, credit card providers can personalize marketing strategies to cater to both males and females. For example, ads targeting females could provide more detailed information about features that are frequently evaluated, while those targeting males could focus on delivering key benefits quickly within the first few seconds.

***Conclusion***

The correlation between time variables and choosing the optimal card was calculated, showing no significant relationships. Correlation coefficients were below 0.5 for all variables, indicating that viewing time did not strongly influence the likelihood of making the optimal choice.