

Characterizing Donors to the Pittsburgh Parks Conservancy

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Background & Introduction

Background: Our client is Pittsburgh Parks Conservancy (PPC), a nonprofit organization that initiates projects to restore parks through fundraising. PPC has been maintaining a comprehensive database of donor interactions with the organization for two decades. Through this project, PPC would like us to find out if there are any trends in donor behaviors and what kinds of fundraising campaigns have been successful. PPC hopes to use these insights to develop more effective fundraising activities in the future.

Overall Goal: The main objectives of this project are twofold. First, we will explore the database from a donor perspective to profile donor characteristics and behaviors. Second, we will also look at the data from a campaigns perspective and analyze the effectiveness of PPC's various fundraising campaigns.

Data Preparation

The data used in this project is 25 years' worth of donation information recorded with *Raiser's Edge*, a campaign/donor management database platform used by PPC. We can separate the data into five main categories:

- **Demographics:** anonymized information about donors
- **Appeals:** direct donation solicitations sent by PPC
- **Actions:** more personal interactions with donors
- **Events:** PPC events attended by donors
- **Gifts:** monetary donations made by donors

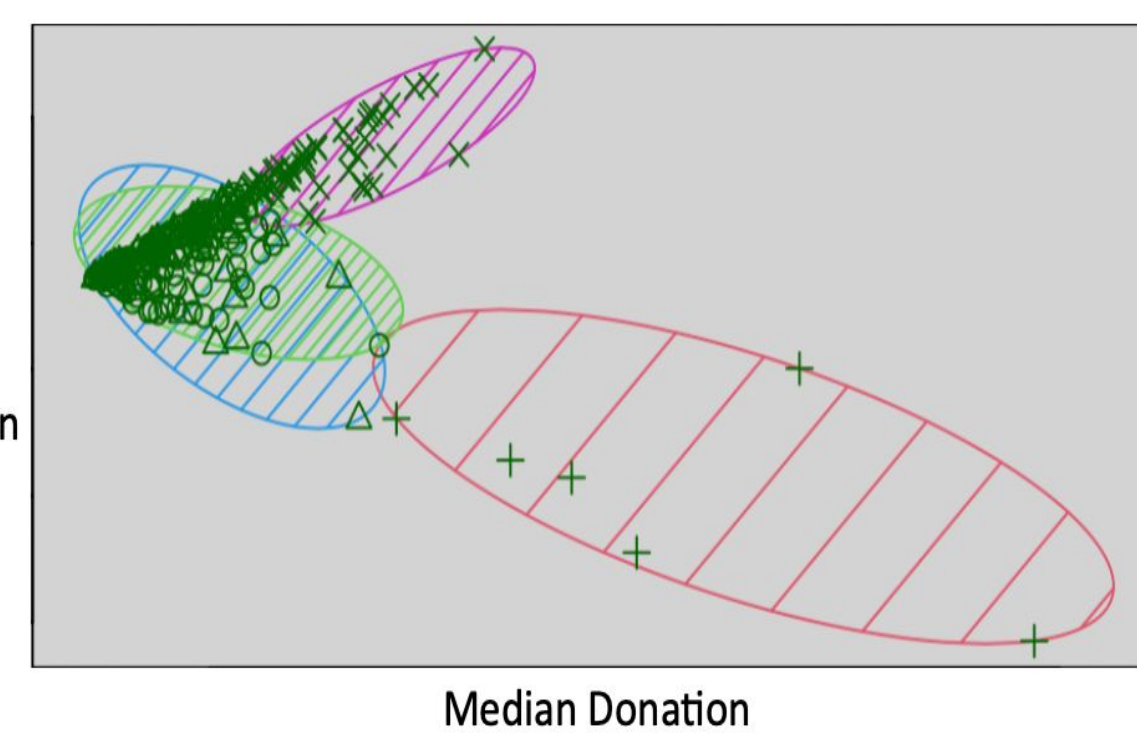
For each category, the name/date of campaign and amount of donation are recorded if available. After data cleaning and feature engineering, the final dataset has 1564 columns and 15745 rows, with each row representing a donor.

Limitations & Future Work

Limitations: We are limited by the structure of the dataset and the information that is available within it. There are some limitations in what information is stored about the donors or if there is repeated information or relationships between the variables. The data, as they are currently, also do not allow us to easily construct full contact and donation timelines for donors. The distinction between organizational and personal donations as well if a donor could be classified as recurring or not is not clear.

Future Work:

Donor Segmentation based on Median Income



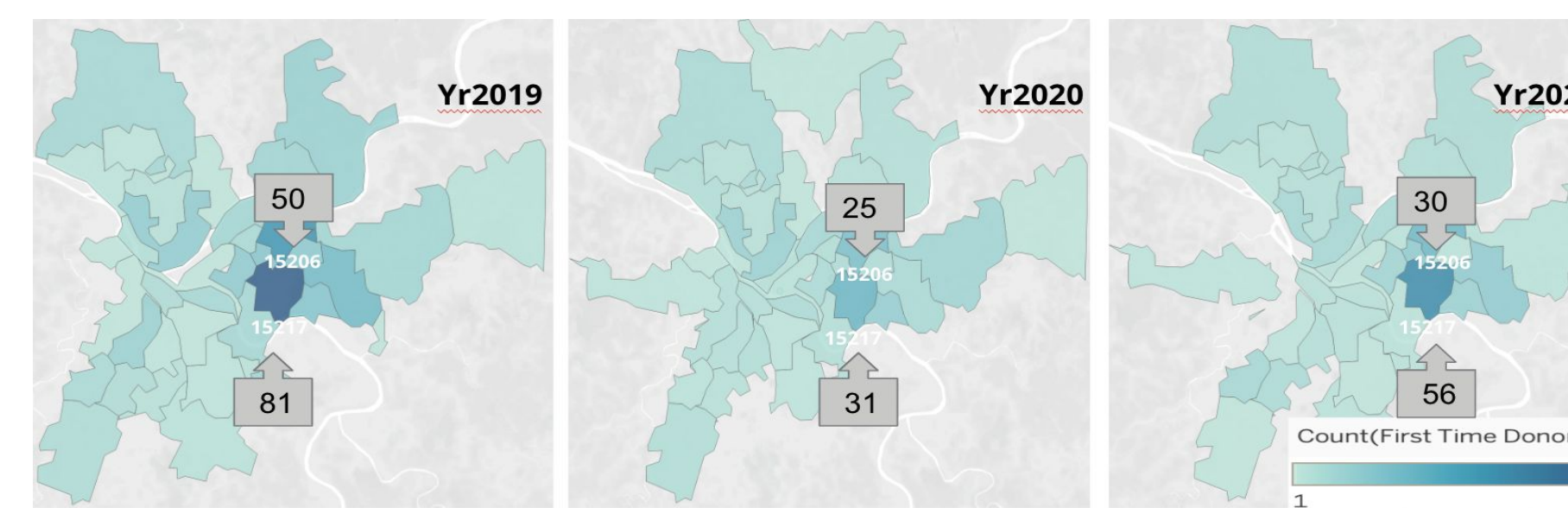
The figure to the left shows an example result from our preliminary customer segmentation analyses. It shows clusters found using the k-means algorithm, based on median incomes and donation amounts grouped by zip code. Future work would involve extracting additional features from the data and exploring them using different algorithms, including PCA.

Analysis & Results

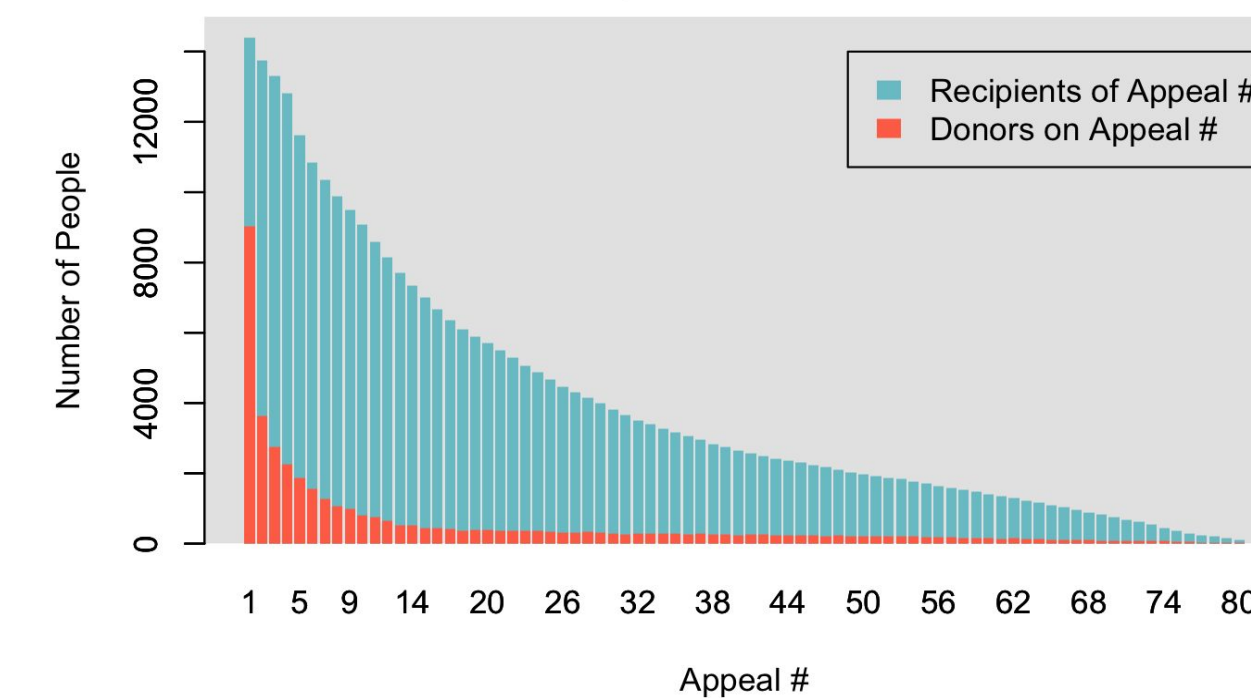
Donor

- **Geographical Distribution of First-time Donors:** By looking at number of first-time donors grouped by zip codes, we see count of first-time donors has been decreasing since 2019. Given that the number of appeals sent by PPC remains approximately the same amount, this drop may be due to the impact of Covid. We can also see that the largest concentration of first-time donors is in the East End of Pittsburgh.

Number of First-time Donors Decreases Since 2019

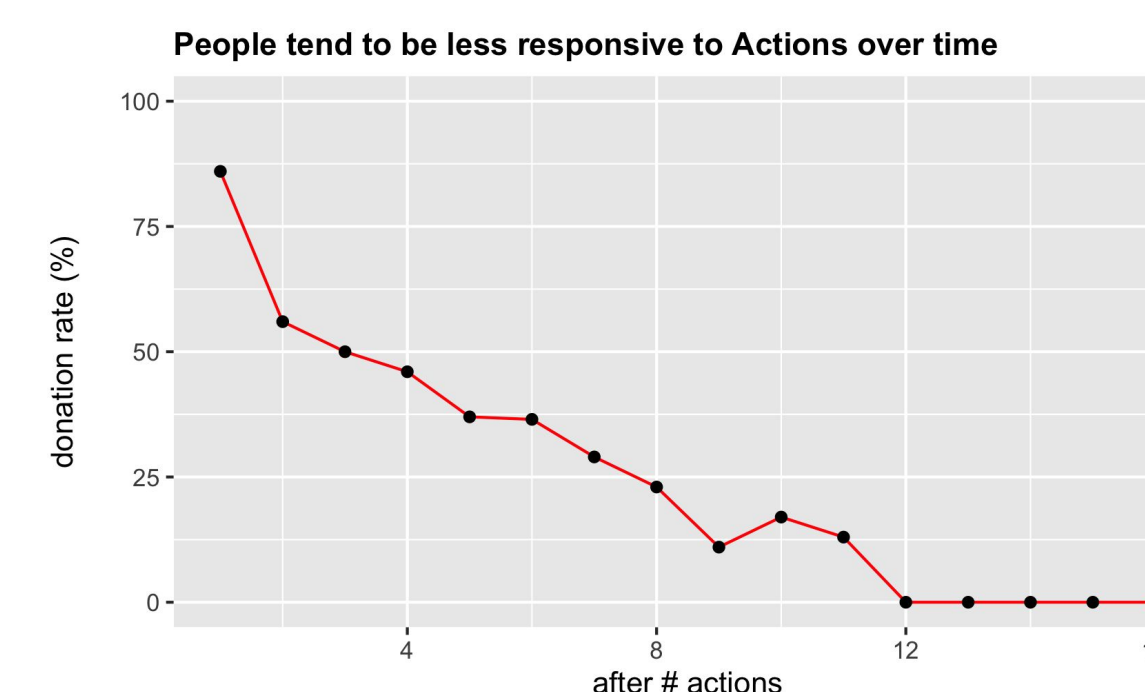


Donor number drops sharply as people receive more appeals from PPC

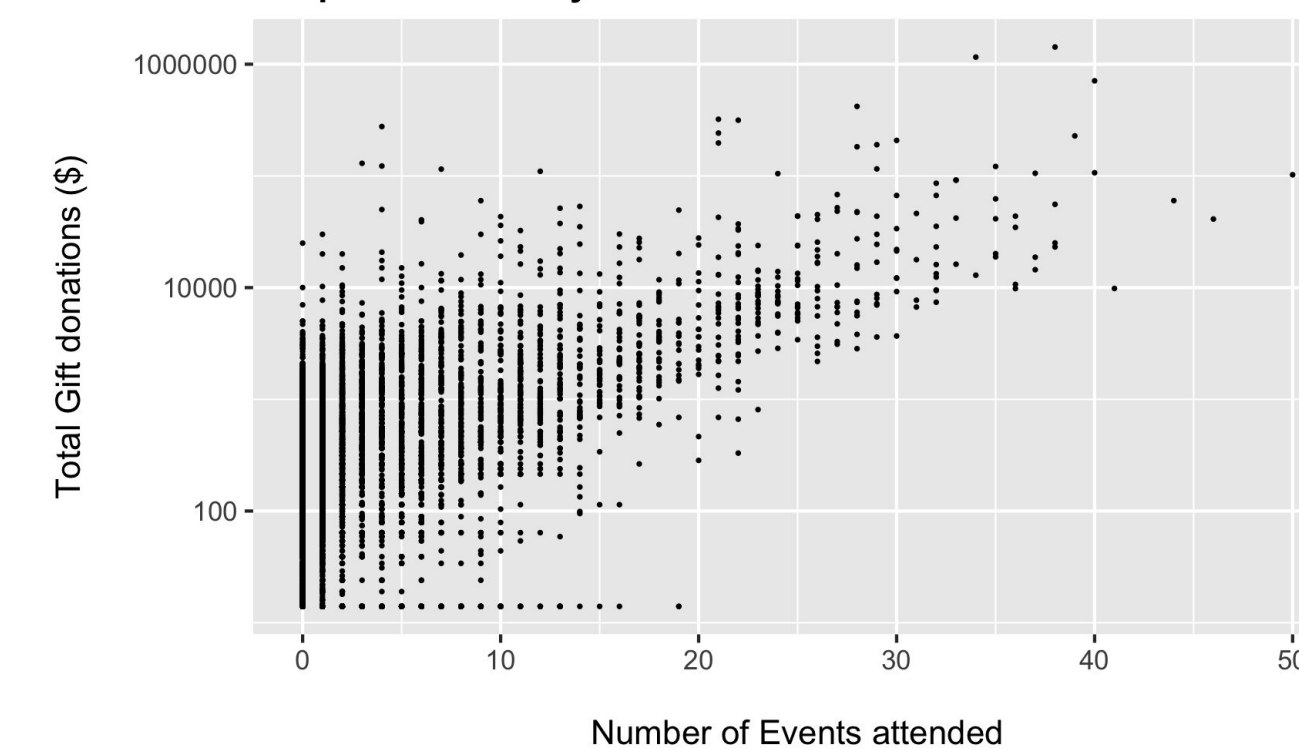


- **Donor Behavior on Appeals Received from PPC:** The figure on the left shows that when people receive more appeals from PPC, they become less likely to donate. Specifically, after receiving around 19 appeals from PPC, the number of donors just remained consistently low. Hence, PPC should carefully consider whether to send more appeals to someone who has already been contacted 19 times.

- **Donor Behavior on Actions Received from PPC:** Similar to appeals, the donation rate (the proportion of people responding to the nth action directed towards them) also steadily drops with the number of actions, which suggests that people tend to be less responsive to Actions from PPC over time.



People who actively attend events tend to make more donations



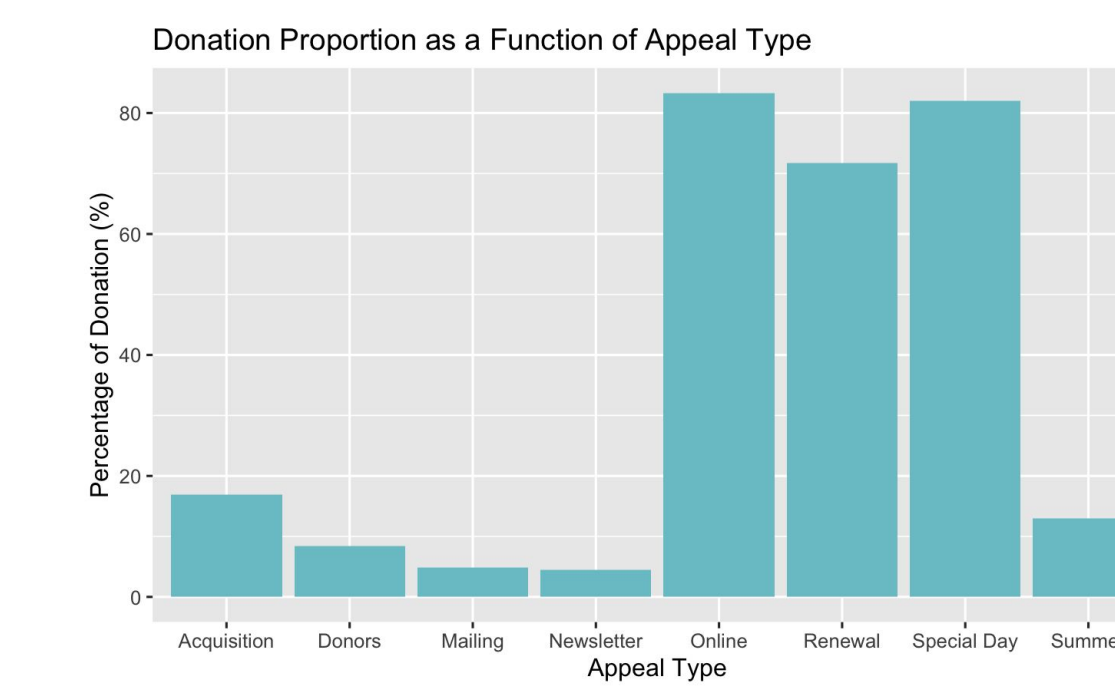
- **Event Attendance and Donation Behavior:** There is a clear upward trend between the number of events attended by individual donors and the total amount of their donations, which suggests that event attendees are more likely to become supportive donors.

- **Time Lag between Gift Dates:** The median time lag between gifts is approximately one year, which corresponds with membership renewals and PPC yearly appeals.

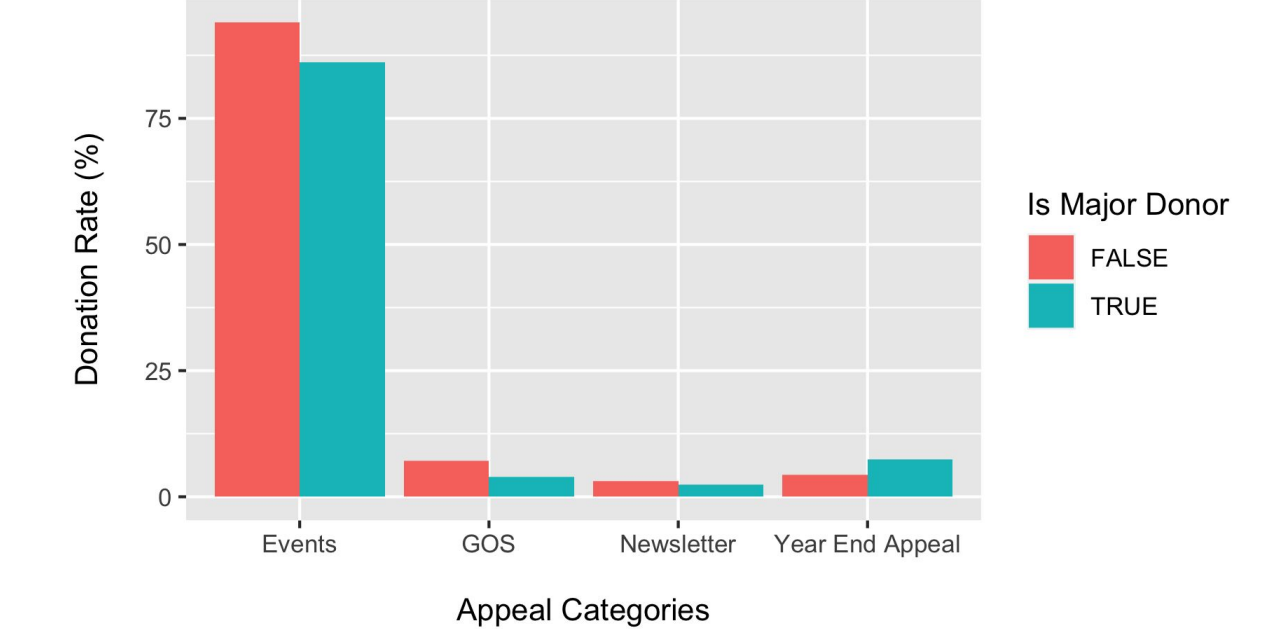


Campaign

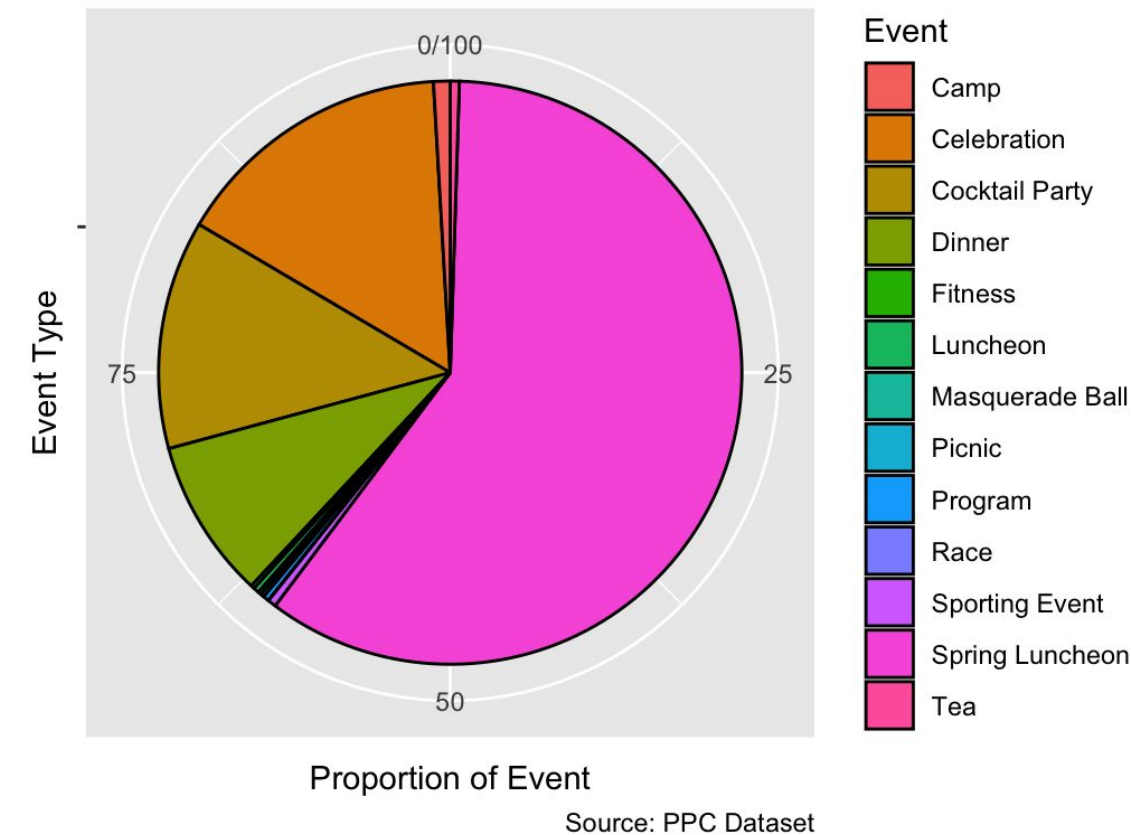
- **Percentage of Donation Comparison by Appeal Features:** We categorized different types of appeals and compared their percentage of donation (defined as number of donors/number of recipients). In summary, online appeals, appeals sent on a special day (such as Valentine's Day), and appeals for renewal of memberships generate the highest percentage of donations.



Events-related appeals have very high donation rate; Major Donors mainly react to End-of-Year Appeals

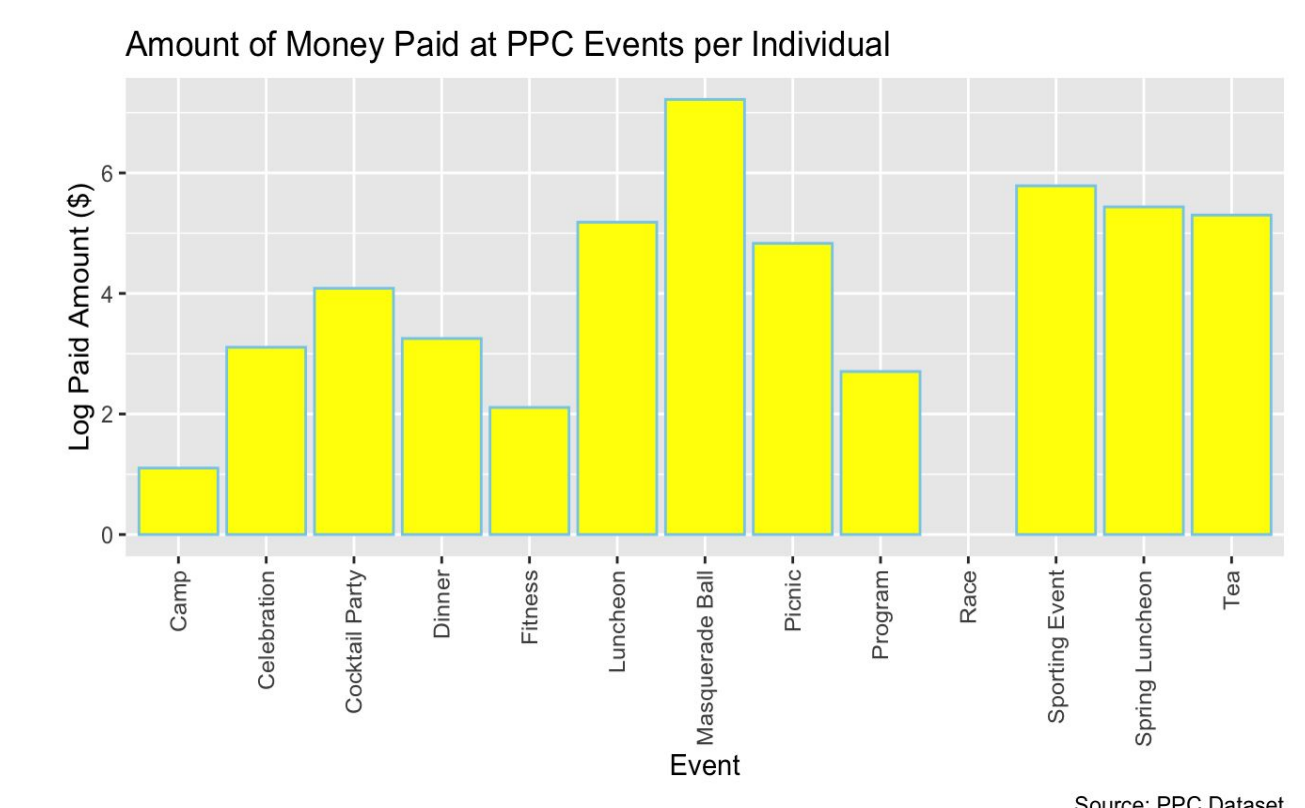


Types of Events hosted by PPC

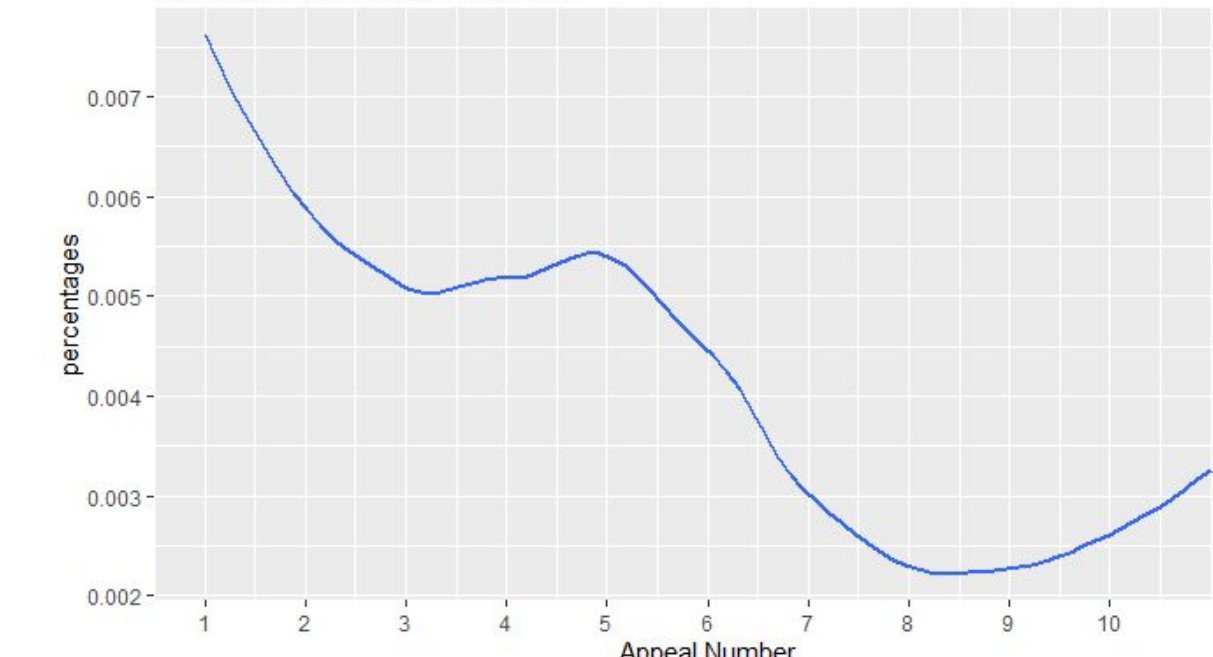


- **Types of Event Hosted by PPC:** PPC has hosted various events for community engagement since 2001. Spring Luncheons have been held most often, followed by celebration, cocktail party, and dinner events.

- **Money Collected at Events Per Individual:** PPC donors paid different amounts of money for different events. Individual donors paid the highest amounts of money when attending masquerade ball, sporting events, spring luncheon and teas.



People that respond with a gift between appeals goes down as they receive more appeals



- **Relationship between Number of Appeals and Gifts Made:** The figure to the left displays the proportion of people that donated to PPC between the first and second appeals they received, the second and third, etc. It shows how the rate of response to appeals generally decreases with the number of appeals received.