

Unveiling the Links: TripAdvisor Ratings and Extrinsic Factors on Vacation Rentals in British Columbia, Canada - Analysis Report

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The purpose of this project was to explore and analyse data from TripAdvisor and Geoapify APIs to examine the impact that nearby businesses and attractions have on a rental's rating. More specifically we aimed to uncover any discernible relationship between a property's rating and its proximity to external locations, including tourist landmarks, activity centres, entertainment spots, water spots, and spa locations. Our hypotheses for the relationships were: "If a vacation rental receives a high number of ratings, then the average rating of the rental is expected to be higher", "If there are more entertainment spots around a vacation rental, then the vacation rental rating is expected to be higher", "There is no correlation between the number of spa spots and a vacation rental's rating", "There is no correlation/relationship between clubs/community centres and vacation rental ratings. , and "There is a correlation between the number of tourism spots and a vacation rental's rating".

During our research stage, we read various tourism journal articles exploring factors affecting the satisfaction of tourists. According to Chu et al., they found that reviews were a helpful tool for tourists to judge experiential goods since these allow for two-way information exchange (2022). They also found that reviews often mentioned parking accessibility, and it inspired us to explore whether public transport might influence a location's rating. Similarly, Van der Zee & Bertocchi's findings demonstrated that the closure of a tourist landmark had a detrimental effect on attendance to nearby businesses. Taking this into consideration we decided to take a step further and explore if the proximity of vacation rentals to tourist landmarks had any impact on their rating.

The project was conducted using Python in a Jupyter Notebook environment. The primary libraries utilised included Pandas for data manipulation, Matplotlib and Seaborn for data visualisation, and requests for API interactions. The TripAdvisor and Geoapify APIs were used to gather relevant data. Data from TripAdvisor was used to extract information about rental properties in British Columbia. We ultimately cleaned this data and standardised the data to include the property name, location, rating, and other relevant information such as Longitude and Latitude coordinates. We removed any rental locations with zero reviews or if there were duplicate locations with the same property name. We then used these coordinates and the Geoapify API to search for external businesses near each rental. The businesses we searched for included activity centres (sports clubs and community centres), entertainment spots (cinemas, zoos, museums, etc.), natural water bodies (rivers, lakes, springs, etc.), spa locations, and tourist landmarks (religious temples, city hall, bridges, etc.).

We then graphed scatter plots based on the number of external locations surrounding the top 20 reviewed vocational rentals. We then used the plots to uncover potential relationships between rental ratings and the proximity to external locations. Preliminary data about the external locations surrounding our top 20 rentals demonstrated that tourism landmarks had the highest mean, followed by the water bodies and activity centres. Lastly, public transit and spa spots had the lowest mean values. In order to confirm the proximity of these locations impacted rental ratings.

Correlation of external locations to rentals R-values:

- Average rating versus review count: 0.0176
- Average rating versus number of entertainment spots: 0.0003
- Average rating versus number of spa spots: 0.0695
- Average rating versus number of activity centres: 0.00823
- Average rating versus number of tourism spots: 0.00215

Based on these findings This implies that the proximity to tourist sites, activity centres, entertainment spots, water spots, and spa locations does not strongly dictate rental ratings. However, the rentals were spread across different geographical locations within British Columbia, including urban, suburban, and rural areas. Most of the rentals were concentrated around Vancouver Island and Vancouver. Given that the further locations in rural areas might have been too far apart, we needed to account for sampling bias in our data. Based on Van der Zee & Bertocchi's research it's possible that the lack of tourist landmarks could have had a detrimental effect on the number of reviews for our locations (2018). This would explain why our data appears skewed in favour of rentals located near tourist landmarks. But most importantly, Hernández et al. found that in relation to tourist landmarks, geographic proximity between rentals and tourist landmarks doesn't necessarily overlap. They found that tourist attractions reviewed by the same tourist segments are not always located close together (2018). Implying that the location of a rental property in relation to a landmark might not be very influential to a tourist's decision to stay there.

Sampling bias is possibly the most harmful factor for our correlation analysis. We should have taken it into consideration since only a select group of tourists or locals such as influencers and bloggers might be the ones contributing to the reviews of a location. As a result, these locations form a review network, they are likely to attract consecutive visits and reviews leading to skewed perceived popularity (Van der Zee & Bertocchi, 2018). There might be more factors that limited the significance of our findings. Such as the audience of each reviewing database. Some scholars found most reviews posted on TripAdvisor are positive; hence, the rating distribution is skewed towards the positive end of the scale (Filieri et al., 2020). Taking these flaws into consideration, for any future studies we plan to include more databases such as Google Reviews and Yelp. We also wanted to change the external locations to include more modern

services such as glamping, sports events, and medical tourism (Sangkaew & Zhu, 2020).

In conclusion, our project successfully mined data from TripAdvisor and Geoapify APIs to analyse the relationship between rental ratings in British Columbia and their proximity to external locations. While some weak correlations were observed, further analysis is needed to establish causation and identify other factors influencing ratings. This led us to reject our hypotheses and accept the null hypotheses for all the questions we aimed to explore in this analysis. This project provides a foundation for future investigations into the factors contributing to the success of rental properties in this region.

References

- Çakırtaş, M., & Ozdemir, M. K. (Eds.). (2021). Big Data and Social Media Analytics. *Lecture Notes in Social Networks*. doi:10.1007/978-3-030-67044-3
- Chu, M., Chen, Y., Yang, L., & Wang, J. (2022). Language interpretation in travel guidance platform: Text mining and sentiment analysis of TripAdvisor reviews. *Frontiers in psychology*, 13, 1029945. <https://doi.org/10.3389/fpsyg.2022.1029945>
- Filieri, R., Acikgoz, F., Ndou, V., & Dwivedi, Y. (2020). Is TripAdvisor still relevant? the influence of review credibility, review usefulness, and ease of use on consumers' continuance intention. *International Journal of Contemporary Hospitality Management*. doi:10.1108/IJCHM-05-2020-0402
- Hernández, J. M., Kirilenko, A. P., & Stepchenkova, S. (2018). Network approach to tourist segmentation via user generated content. *Annals of Tourism Research*, 73, 35–47. doi:10.1016/j.annals.2018.09.002
- Sangkaew, N., & Zhu, H. (2020). Understanding Tourists' Experiences at Local Markets in Phuket: An Analysis of TripAdvisor Reviews. *Journal of Quality Assurance in Hospitality & Tourism*, 1–26. doi:10.1080/1528008x.2020.1848747
- Van der Zee, E., & Bertocchi, D. (2018). Finding patterns in urban tourist behaviour: a social network analysis approach based on TripAdvisor reviews. *Information Technology & Tourism*. doi:10.1007/s40558-018-0128-5