

CONCERNING THE BEHAVIOR OF PASSENGERS WHEN CHOOSING A SEAT IN A COMPARTMENT PASSENGER RAILWAY CAR

Svilena Arabadzhieva

Faculty of "Fire safety and civil protection", Academy of Ministry of Interior, Bulgaria
ssarab@mail.bg

ОТНОСНО ПОВЕДЕНИЕТО НА ПЪТНИЦИТЕ ПРИ ИЗБОР НА МЯСТО В КУПЕЕН ПЪТНИЧЕСКИ ВАГОН

Abstract

This report presents the results of an empirical study of the behaviour of passengers when choosing a seat in a second class compartment passenger railway car. The most and least used seats are identified.

Keywords: *Seating Behavior; Occupancy; Compartment Passenger Railway Car.*

INTRODUCTION

A number of studies [1], [2], [3], [4], [5], [6], [7], [8] have been conducted globally on passenger seating behaviour, occupancy dynamics and occupancy of various vehicles. Research is both psychologically oriented and aimed at creating mathematical models. The research object is mainly an aircraft, metro trains, suburban trains or high-speed trains. These vehicles are open (saloon) type and are used only in short or long distance. Mathematical models have been created that have great adequacy. In the Republic of Bulgaria, a large number of the passenger railway cars are compartment type. This type of railway car is used in long-haul trains that are used by both long-distance and short-distance commuters. The objectives of the present study are twofold: to analyze passenger seating behavior and to identify the most frequently and least frequently used seats in a second class compartment passenger railway car. As a subsequent stage, the fire characteristics of these seats will be compared after a certain operational period.

MAIN RESULTS

As the first stage of the research, the passengers' seating preferences were studied through a survey. A survey was conducted among travelers from the Central Railway Station in the city of Sofia in the period May-August 2022 and through the Google Survey platform. The full survey results are presented in [9]. The main factors that most often determine the passengers' seating choice have been identified. These are: direction of movement of the train, location of the seat relative to the window/door/WC, pre-occupancy of the compartment, profile of the other passengers in the compartment, serviceability of the interior, position of the sun and others. These factors can be classified into two groups: permanent and relative. The direction of movement and the location of the place in relation to certain elements of the interior are constant preferences of the individual. The remaining factors are relative and depend on the current situation.

Respondents were presented with a diagram of a second class compartment passenger railway car, (Figure 1) and asked to indicate the compartment and seat they would choose for their journey. The hypothesis is that all seats are free and the respondent is traveling alone.

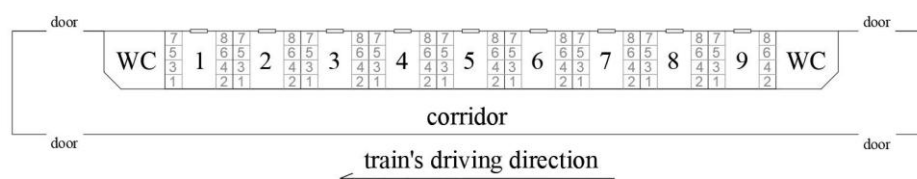


Fig. 1. Distribution of compartments and seats in a second class passenger railway car

According to the answers of the respondents, compartment No. 2 is the most preferred, and compartment No. 8 is the least preferred. The results regarding the passengers' seating preferences in the compartment are eloquent – the most preferred seat is No. 8, followed by seat No. 7, and the least preferred seats are No. 5 and No. 6. It can be concluded that the most preferred seats by travellers, regardless of the compartment, are next to the window, and the least percentage of passengers prefer to travel in middle seats. Seats facing the train's driving direction are preferred.

Reservation of a seat is mandatory when buying a ticket only on some of the passenger trains in the Republic of Bulgaria. For other trains this is optional and the passenger can choose whether to reserve a seat in advance or choose a seat after boarding the train.

In case of pre-selection of a place, the traveler can comply with only a part of his preferences. The ticketing system of Bulgarian State Railways gives a diagram of the car, but not the train's driving direction. The cars are symmetrical and they can be attached in a train bilaterally. Passengers cannot determine the driving direction and in reality compartment No. 9 may be first and compartment No. 8 second in train's driving direction. In the pre-selection of a seat, only two factors have an influence: the location of the seat in relation to certain elements of the interior and the momentary occupancy of the compartments during the selection. In the period [November - December 2023, the preliminary seat reservations for several trains on the Sofia – Gorna Oryahovitsa - Varna line were analyzed. The conclusion of the conducted survey is confirmed that the most preferred seats by an independent traveler are those by the window and they are booked the fastest. The conclusion made in [5] that if the one seat next to the window is occupied, the choice diagonally wins cannot be unequivocally confirmed. In 58% of cases, the other seat next to the window is chosen, and the diagonal seat in 31% of cases. If the seat selection is in the same row, travelers choose to keep their personal space and leave an empty seat between them and the already reserved seat.

When traveling in a group and booking more than one seat, the results show that if there are two travelers in 46% of the cases the two seats next to the window are chosen, in 24% of the cases the one seat next to the window and the one next to it are chosen, in 20% of the cases the two seats by the door. If there are three passengers, in 86% of cases the two seats next to the window and the one next to it are chosen. Cases of a larger group of travelers have not been analyzed. If the seats by the window are occupied, the seats by the door are chosen, leaving a free seat for the other passengers.

Regarding the choice of compartment, the analysis shows that the most reserved seats are in compartments No. 1, 2 and 9. The least reserved seats are usually in compartment No. 6.

It is observed that the occupancy of the carriage is uneven and depends on the time of departure, the day of the week, the presence of a public holiday. The final destination of the

CONCLUSIONS

The passenger seating behavior in a compartment passenger railway car depends on many random events. It is difficult to draw general conclusions given the possibilities of pre-booking a seat and choosing one after boarding the train.

The observational field study showed that there is a discrepancy between the initial preferences of the passengers and the real choice of seat in the car. According to the survey conducted, the least preferred seats are No 5 and No 6, and the real choice indicates that it is seat No 4. However, it is confirmed that seats No. 7 and 8 are most preferred.

REFERENCES

1. Berkovich A., A. Lu, A. Reddy, “Observed Customer Seating and Standing Behavior and Seat Preferences on Board Subway Cars in New York City”, Transportation Research Record: Journal of the Transportation Research Board, Volume 2353, Issue 1, 2013, DOI: <https://doi.org/10.3141/2353-04>
2. Jaehn, F.; S. Neumann, “Airplane boarding”, European Journal of Operational Research, Volume 244, Issue 2, 2015, pp. 339–359, DOI: <https://doi.org/10.1016/j.ejor.2014.12.008>
3. Milne J., M. Salari, L. Kattan, “Robust Optimization of Airplane Passenger Seating Assignments”, Aerospace 2018, 5, 80; doi: <https://doi.org/10.3390/aerospace5030080>
4. Pavlik J., I. Ludden, S. Jacobson, E., “Airplane Seating Assignment Problem”, Service Science, Vol. 13, No. 1, 2021, DOI: <https://doi.org/10.1287/serv.2021.0269>
5. Schottl Jakob, M. Seitz, G. Koster, “Investigating the Randomness of Passengers’ Seating Behavior in Suburban Trains”, Entropy, 2019, 21(6), 600; DOI: <https://doi.org/10.3390/e21060600>
6. Steiner, A.; M. Phillipp, “Speeding up the airplane boarding process by using pre-boarding areas”. In Proceedings of the Swiss Transport Research Conference, Ascona, Switzerland, 9–11 September 2009
7. Trinkoff, A., “Seating patterns on the Washington, DC Metro Rail System”. Am J Public Health, 185, 75(6):657-8, DOI: <https://doi.org/10.2105/ajph.75.6.657>
8. Wardman, M.; P. Murphy, “Passengers’ valuations of train seating layout, position and occupancy”. Transportation Research Part A: Policy and Practice, Volume 74, 2015, pp. 222-238, DOI: <https://doi.org/10.1016/j.tra.2015.01.007>
9. Arabadzhieva S., S. Parvanov, “Probability Analysis of Passenger Safety When Using Rail Transport”, Science Series “Innovative STEM Education”, volume 05, 2023, pp. 142-152, DOI: <https://doi.org/10.55630/STEM.2023.0517> (Bulgarian);

Received: 13-07-2024 Accepted: 21-11-2024 Published: 20-12-2024

Cite as:

Arabadzhieva, S. (2024). “Concerning the Behavior of Passengers when Choosing a Seat in a Compartment Passenger Railway Cart”, Science Series “Innovative STEM Education”, volume 06, ISSN: 2683-1333, pp. 120-123, 2024. DOI: <https://doi.org/10.55630/STEM.2024.0613>