

How crowded is the train? Optimal conditions for providing information on capacity utilization in public transport

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Introduction

Background

Crowded public transport vehicles have negative consequences for:

(1) Passengers

- Higher stress levels (Legrain et al., 2015)
- Lower security perception (Cox et al., 2006)
- Lower performance ability (Evans & Wener, 2007)

(2) Transport companies

- Longer dwell times in stations
- Delays in the whole public transportation system (Yuan & Hansen, 2007)

Approach of this study

The provision of information on capacity utilization (ICU) can reduce the problem of overcrowded public transport if the information is perceived as useful and passengers consequently switch to an alternative route or travel at a later time.

Objectives of this study

Compare the effects of trip purpose, trip duration and service frequency on the perceived usefulness of ICU of people living in a metropole (Berlin; PLB) with people living in smaller cities (PLSC)

Method

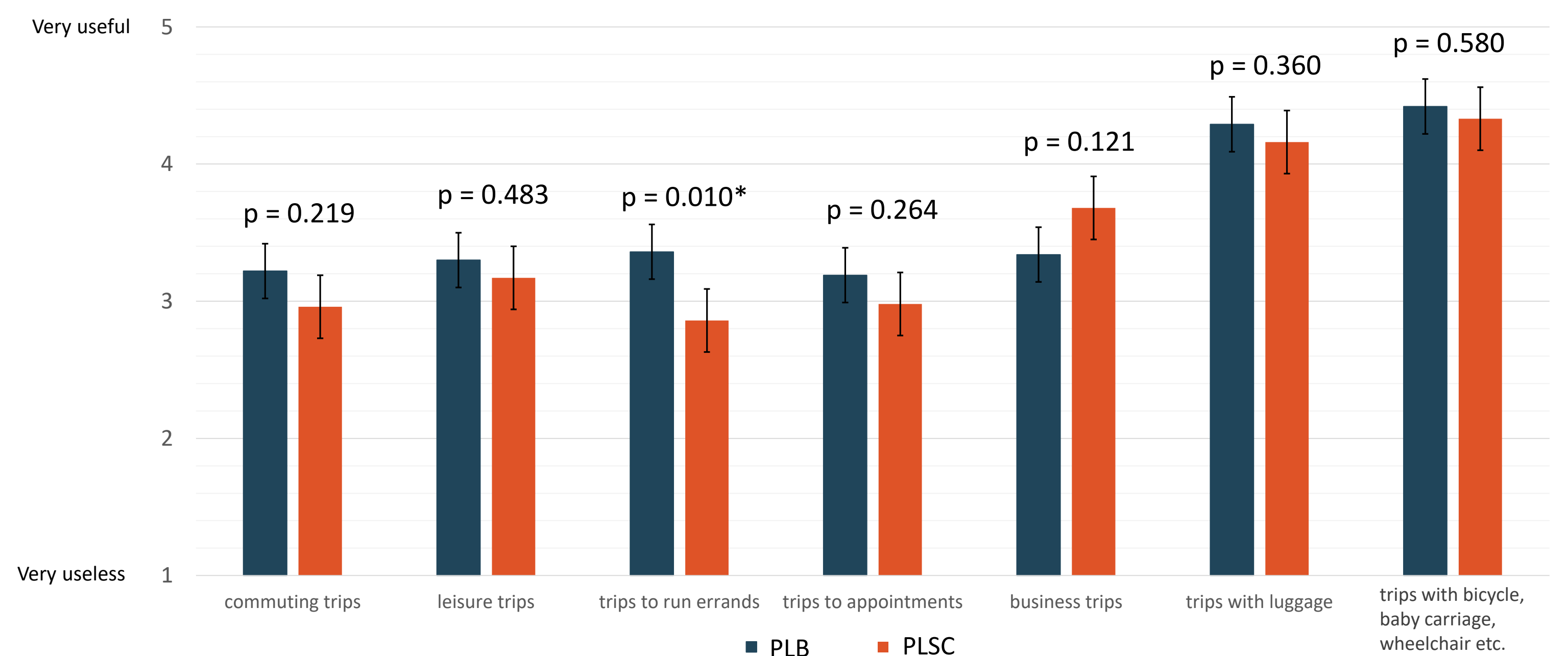
- Online study via Sosci Survey
- Survey period: November 2022 - January 2023
- Sample information:

	PLB	PLSC
Sample size	85	119
Mean age (SD)	33.5 (12.7)	32.9 (13.8)
Gender		
male	58.8%	63.0%
female	35.3%	33.6%
divers	3.5%	1.7%
not specified	2.4%	1.7%

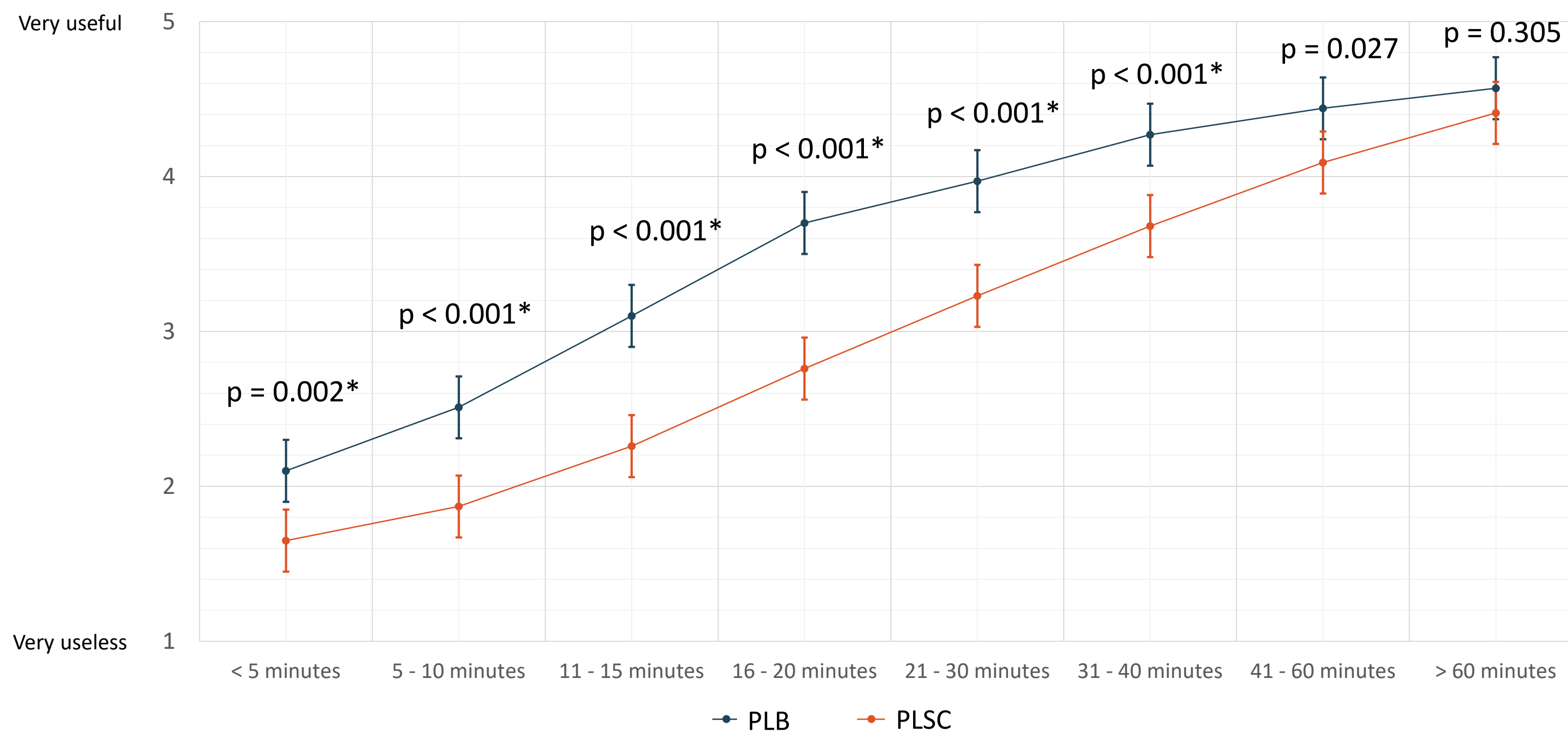
Results

- Results are shown for the perceived usefulness of ICU depending on:
 - Trip purpose
 - Trip duration
 - Service frequency
- For group comparisons between PLB and PLSC two-tailed t-tests were conducted
- Exact p-values are presented in the figures
- To avoid the multiple comparisons problem the Holm-Bonferroni correction (Holm, 1979) was applied

Perceived usefulness of ICU for different trip purposes

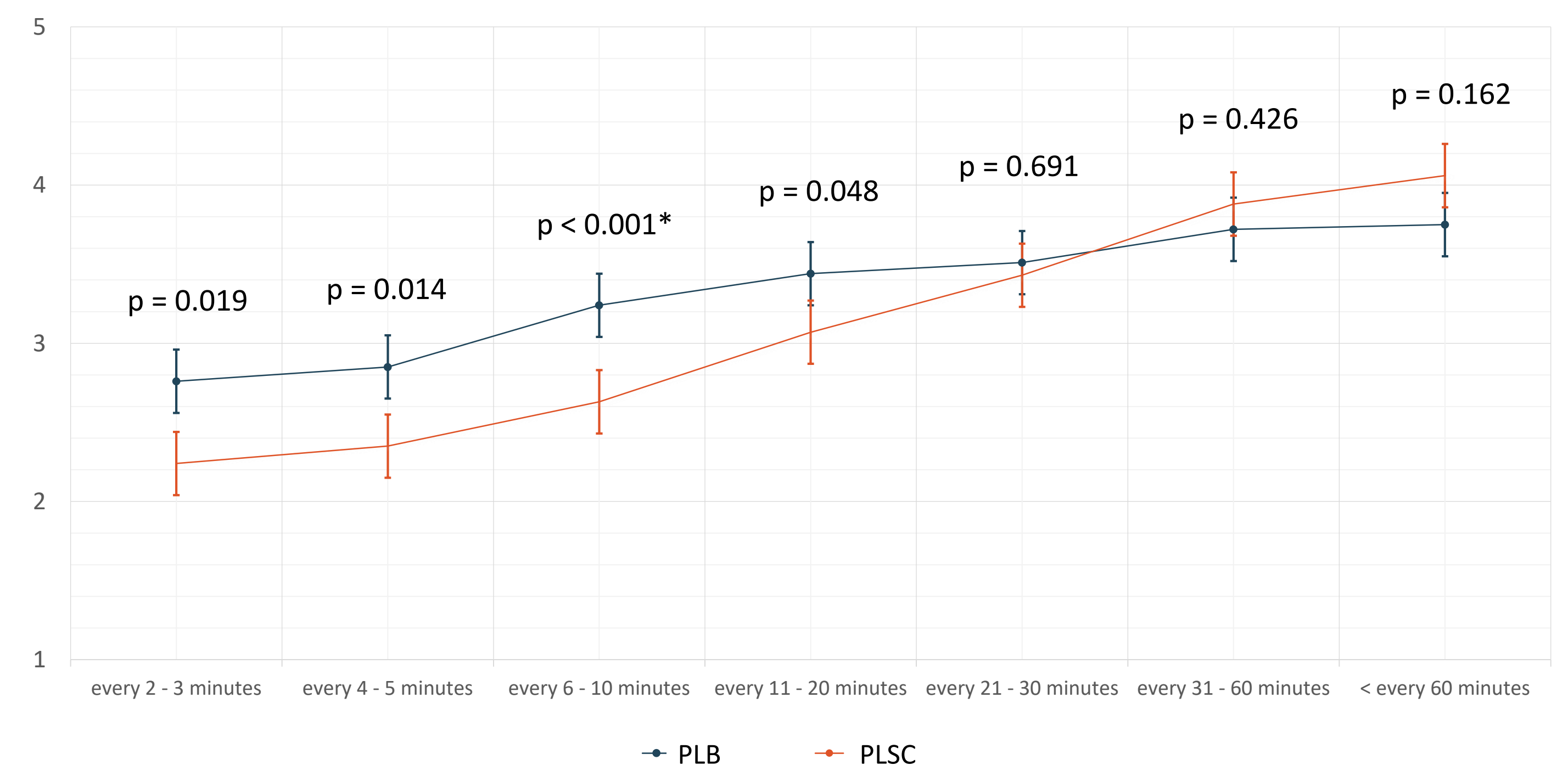


Perceived usefulness of ICU depending on trip duration



*statistically significant after Holm-Bonferroni correction

Perceived usefulness of ICU depending on service frequency



Discussion

Summary

- In general, people from a metropole perceive ICU as more useful than people from smaller cities
- Especially for short or moderate trip durations and high service frequencies these differences can be found; nonetheless, both groups perceived ICU as useful for longer trips and low service frequency
- Regardless of city size, for trips with luggage, bicycles, baby carriages, wheelchairs ICU is rated as useful
- For other trip purposes, ICU is perceived moderately useful

Conclusion

This study shows that the findings on the perceived usefulness of ICU can not be generalized across all regions. Especially people from metropolitan regions are used to an extensive supply of public transportation and high service frequencies which probably leads to a different prioritization. In order to take into account the individual needs of passengers, transportation companies should offer target group specific ICU as a service in route planning to reduce the problem of overcrowded public transport. Further research should investigate if passengers are actually willing to change their planned route based on ICU. Also other strategies such as optimizing passenger transfer times by directing passengers at the platform should be investigated and considered as a possibility.

Literature

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