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PERCEPTION OF MODES OF PUBLIC TRANSPORT COMPARED TO TRAVEL BEHAVIOUR OF URBAN INHABITANTS IN LIGHT OF MARKETING RESEARCH

Summary. The study introduces the notion of "travel behaviour" among urban inhabitants, as well as highlighting its most common determinants, one of which is the perception of public transport. The study includes a comparative analysis of the link between passenger perceptions of the main modes of public transport in relation to the actual mode of transport chosen to complete a certain journey, based on market research results collected within a given city.

Keywords: urban transport; marketing research; perception; modes of public transport; travel behaviour.

1. INTRODUCTION

Traffic congestion, as well as the social and environmental problems with which it is often associated, forms part of the daily reality of all urban areas in Poland. This phenomenon is the result of an increasingly motorized society, in which an almost continual access to privately owned cars coincides with the increasingly infrequent use of public transportation,

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as well as its unfavourable perception. This trend is reinforced by the tendency towards an uncontrolled, chaotic urban sprawl resulting from the dispersion of legal power in spatial planning.

The aim of the study is to investigate the link between the travel behaviour of urban inhabitants and their perceptions of the various modes of public transport.

2. TRAVEL BEHAVIOUR OF URBAN INHABITANTS

Consumer behaviour is the science of an individual's decisions and the processes involved in acquiring goods and services, new experiences or ideas, as well as the way in which they are consumed or utilized [Mowen and Minor 2001, pp. 3-5]. Antonides and van Raaij also underline the importance of psychological and physical factors, including the motivations and reasons behind them, in a consumer's decision-making process [2003, p. 24]. Światowy points to the fact that reactions to stimuli (in this case, instincts and emotions), which call for one's perceptual needs to be satisfied, are both structured and constant in character [2006, p. 12].

Considering the above-mentioned concepts, travel behaviour may be defined as a combination of actions and agents, the aim of which is to satisfy a person's transport requirements by relocating them from one location to the next, in accordance with their own perceptual system of preferences. Due to its role in both proceeding and determining the process associated with travel behaviour, the decision-making process should also be recognized as one of its integral parts [Hebel 2013, p. 32].

Travel behaviour constitutes the undertaking of a journey or a decision leading to its abandonment. The way in which a given journey is carried out is connected with the decision to make use of a particular mode of transport, such as a train, plane, ferry, bus or car [Hebel 2013, p. 33], the length of the journey and its frequency [Banister 2005, p. 126]. Economic factors (e.g., personal income and fare prices), social factors (e.g., social status, such as employed, unemployed, student or retired) and psychological factors (e.g., motivations, perceptions, attitudes, personality, education and perceived risk) are all recognized as determinants of travel behaviour.

According to Goodwin, the most important factors determining travel behaviour are the following [2008, p. 2]:

- the number of passengers;
- destination
- the number of cars within a household
- lifestyle (including free time, frequency and scale of grocery shopping)
- place of residence
- cost of public transport
- privately owned car maintenance costs
- local transport infrastructure
- personal reasons (e.g., change of workplace or place of residence, access to schools)

An analysis of the determinants of travel behaviour of urban inhabitants should, therefore, take into consideration all possible factors (economic, spatial, social and psychological). Such an analysis may be carried out on different scales (global, national, regional or local). As per its requirements, the analysis pertaining to this study has been carried out on a local scale and

focuses on the mode of transport chosen by urban inhabitants, as well as the way in which they perceive individual modes of public transport. In doing so, this analysis puts forward the thesis that the way in which public transport is perceived is an essential determinant of the public travel behaviour of urban inhabitants.

3. PERCEPTION OF MODES OF URBAN TRANSPORT

A city's image plays a central part in its rivalry with other cities. It represents "a simplification of the larger number of associations and pieces of information connected with the place" [Kotler, Asplund, Rein and Haider 1999, p. 141). The "city's mega-product", which represents the sum of all potential benefits offered to a particular consumer, as a result of the exchange process, constitutes the starting point for the creation of a city's image. On a more general level, it translates to "the benefits of an agglomeration which is the balance of positive and negative external effects" [Markowski 1999, p. 342]. Partial products, which on the one hand constitute the elements of the mega-product, and are independent subjects of exchange on the other, are more familiar within the everyday life of the "users" of urban space. They are the subjects of exchange in partial markets within a city, such as real estate, the service market (inclusive of transport services) or the job market. The perception of each of the partial products is subjective and depends on many factors, such as the type of buyer (inhabitant, tourist or visitor), their preferences and behaviour, the level of recognition of their needs and their purchasing power. The perception of a city, therefore, is created from the angle of one or more partial products, which possess a unique selling proposition. The dysfunction of one of them, even though the others may maintain a high level, could result in a decrease in the overall satisfaction of the consumer. An ineffective transportation system that poses difficulties in being able to reach various partial products dispersed around the entire city, which in turn increases their purchase cost through the external costs of traffic congestion, may serve as a good example.

Public transportation is a vital partial product within a city, as it determines the accessibility to other partial products. It plays an important role in developing and maintaining a city's positive image. Its main features are its rolling stock, the density of the network (spatial and temporal availability), the ticketing system, the physical design of the stations and the linear infrastructure, its spatial inclusion within the urban structure and the history of its development. The "rail factor" constitutes a highly unique factor when creating the image of public transportation within a city. It results from the conviction of inhabitants that rail transportation is superior to that of buses and trolleybuses, mainly due to its superior level of comfort and shorter duration of travel [Axhausen, Haupt, Fell and Heidl 2001, p. 367; Scherer 2011, p. 21; Scherer and Dziekan 2012, p. 90; Wolek 2013, p. 9].

4. CHARACTERISTICS OF THE ANALYSIS METHOD

Primary market research into transport behaviour was conducted in Gdynia during 2015 by the Chair of Transportation Market at the University of Gdansk, along with Gdynia's Board of Urban Transportation (ZKM Gdynia) with the participation of the authors of this article. The research sample consisted of 1% of the inhabitants of Gdynia aged between 16 and 75 years, with the data collected using one-to-one interviews, which were carried out in households using a specially formulated questionnaire.

5. TRANSPORT BEHAVIOUR OF THE INHABITANTS OF GDYNIA IN LIGHT OF RESEARCH

5.1. Chosen means of travel

The following pie chart (Fig. 1), created on the basis of the research findings, represents the chosen means of travel as declared by the inhabitants of the city of Gdynia.

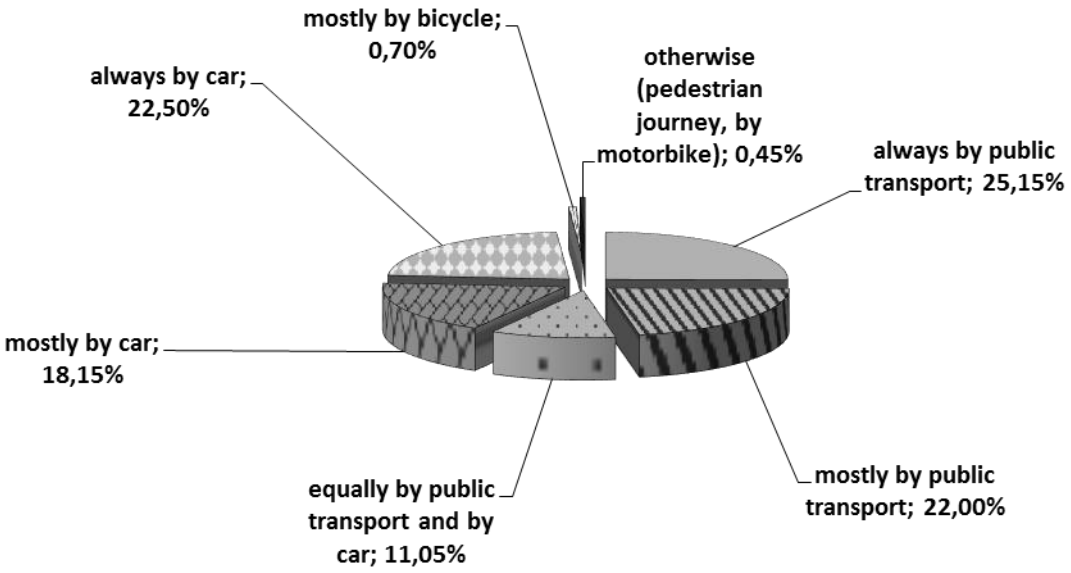

Fig. 1. Chosen modes of travel as declared by the inhabitants of Gdynia in 2015
Source: self-study based on marketing research results described in Chapter 4

Less than half of inhabitants declared that they always or mostly travel by public transportation. From the point of view of sustainable development, it is crucial that journeys carried out by public transport account for at least 50% of the total number of trips. In the case of Gdynia, however, this threshold is reached only when those who travel equally by public transport and by car are included as part of this figure. This indicates the need for certain measures to be taken in order to increase the share of public transport within these journeys, so as to minimize the environmental and social impacts caused by increasing volumes of traffic.

The analysis of data presented in Figure 1 leads to the conclusion that the percentage of those inhabitants who always travel by car and the percentage of those who mostly travel by car are comparable (a difference of 4.35%); together, they constitute over 40% of all journeys. There are very few inhabitants who travel by bicycle or on foot (0.7% and 0.45%, respectively).

5.2. Modal split

Each respondent was asked to declare their chosen means of travel by answering a question about the way in which they travelled on the day prior to the survey. Using the "day in a photograph" method, the analysis took into consideration all methods in which the respondent travelled, the duration of each journey and the mode of transportation used. Pedestrian journeys were also included, provided that they exceeded 500 m. The findings are represented in Figure 2.

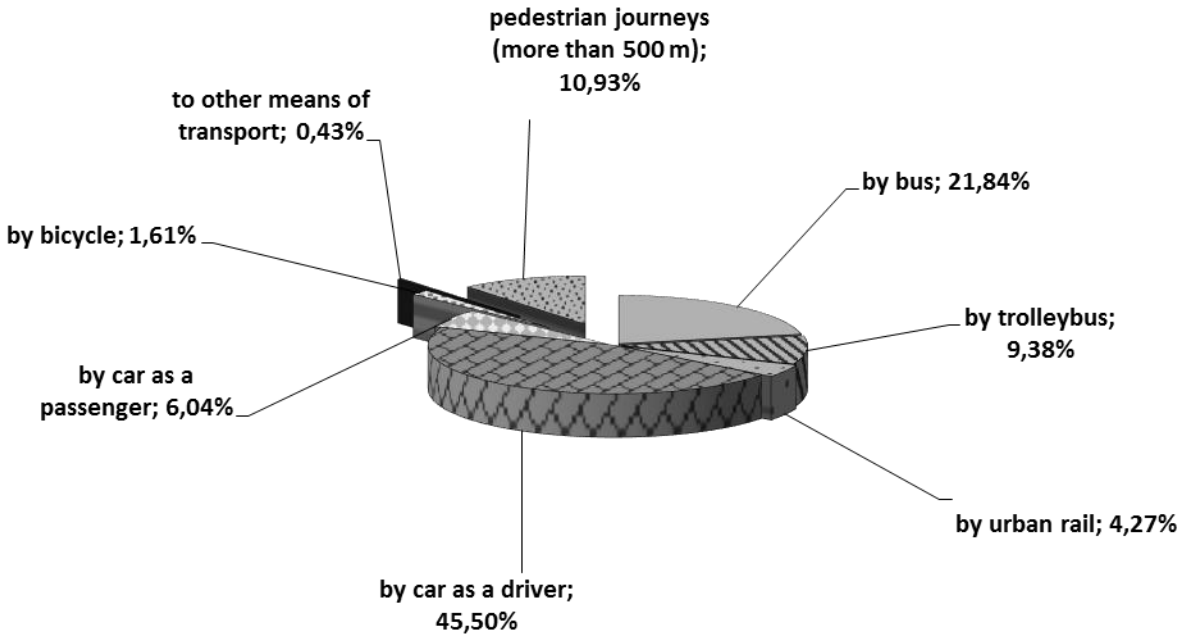

Fig. 2. Modal split on the basis of journeys carried out by the inhabitants of Gdynia on the day prior to research in 2015
Source: self-study based on marketing research results described in Chapter 4

The majority of journeys, some 45.5%, made by respondents were carried out by car, of which they themselves were the drivers. The bus proved to be the mode of public transportation chosen most often (in one in five cases). The share of trolleybus journeys amounted to one in 10 of all journeys, similar to that for pedestrian journeys. The share of travel by bicycle amounted to only 1.6% of all journeys, although it is steadily increasing. It should also be pointed out that trolleybus services operate mostly within the city centre on the two main transport corridors of the city. The range of operations is also similarly restricted in the case of urban rail (its destinations being Gdansk and Wejherowo), whilst the bus network is much more developed.

6. PERCEPTION OF THE MODE OF TRANSPORTATION IN LIGHT OF RESEARCH

Seven features of public transportation were analysed, namely:

- fare price

- duration of travel
- comfort
- cleanliness
- punctuality
- modernity
- safety

The respondents were asked to evaluate each of the above features for each mode of transportation (bus, trolleybus and urban rail). Each of them was evaluated using the Likert scale (1-5). Another possible response was, "I do not have an opinion".

A comparison of the answers given for each mode of transportation (bus, trolleybus, urban rail) is presented in Figure 3.

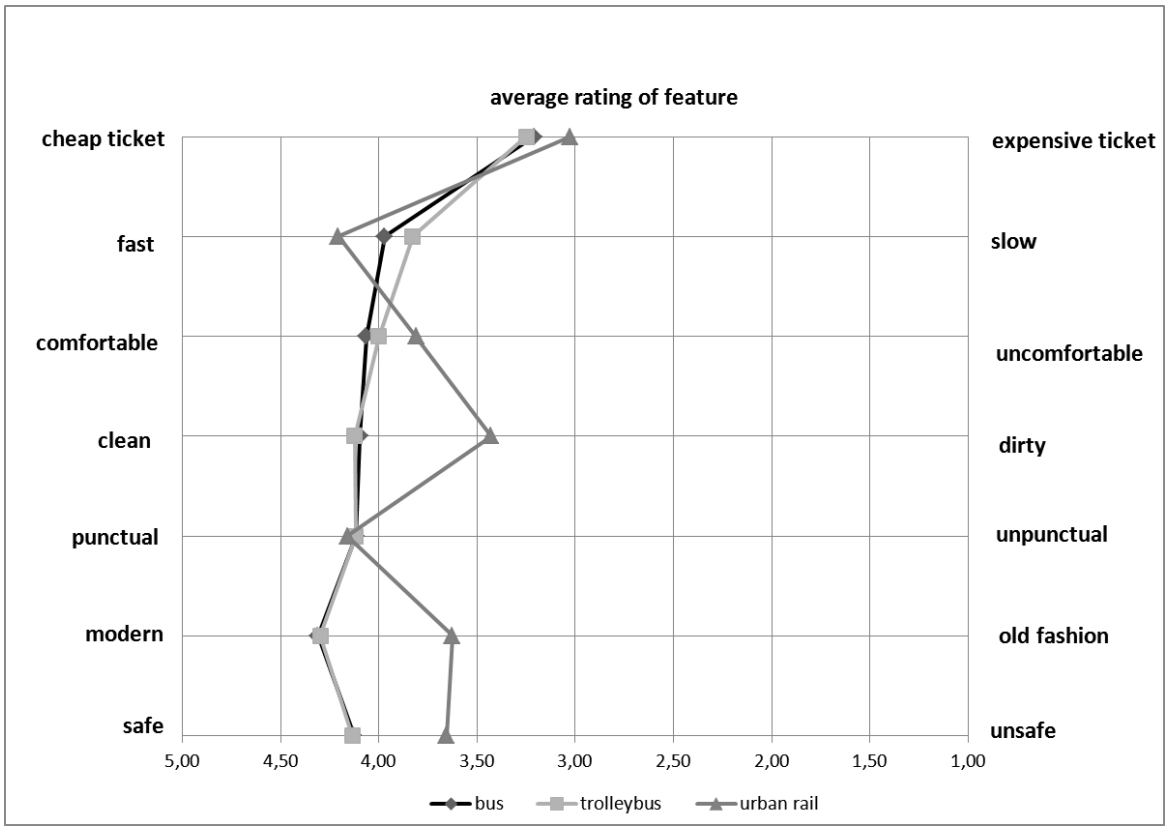

Fig. 3. Perception of the modes of public transportation among the inhabitants of Gdynia in 2015

Source: self-study based on marketing research results described in Chapter 4

The opinions held by the inhabitants of Gdynia on the features of buses, when compared with trolleybuses, proved to be very similar. This means that the perception of buses and trolleybuses among all of the city's inhabitants is almost uniform. Most of the evaluated features were given a rating of 4 or above. Differences can be noticed in the evaluation of the duration of travel, resulting from the fact that trolleybuses operate mostly in the city centre and are, therefore, more prone to congestion [Wolek 2014, p. 23]. Fare price was evaluated significantly lower (by a rating of 1) than for urban rail, which proved to be the most diverse in this respect. Most positively evaluated were duration of travel and punctuality, the former

receiving the best results amongst all mode of transportation. Fare price was, however, most negatively evaluated in terms of all other modes of transportation, alongside cleanliness and modernity.

7. DETERMINANTS OF THE PERCEPTION OF MODES OF PUBLIC TRANSPORTATION

7.1. Transport behaviour as a determinant of the perception of urban bus transportation

In order to determine the influence of actual transport behaviour on the perception of bus transportation, a comparative analysis of the evaluation results, which relate to those who travel by bus, trolleybus or urban rail, as well as by car, has been carried out. Figure 4 presents the result of this analysis.

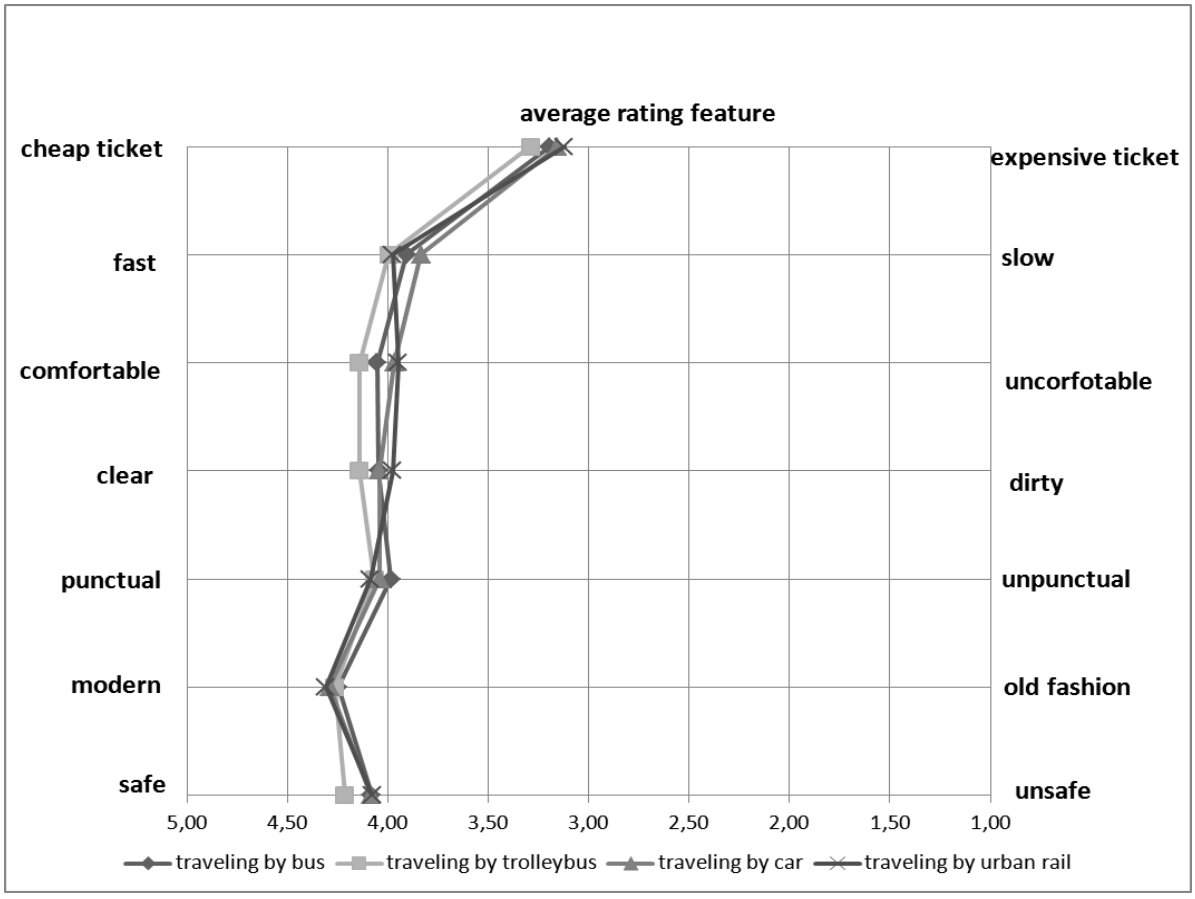

Fig. 4. Perception of buses among inhabitants of Gdynia in 2015
Source: self-study based on marketing research results described in Chapter 4

The graph shows that the means by which a respondent travels has minimal bearing on their perception of urban bus transportation. Safety, cleanliness and comfort were evaluated slightly more positively by those travelling by trolleybuses. It is interesting that those who travel by car perceive buses in the same way as those respondents who choose to travel by public transport. This shows that the image of urban transportation is deeply embedded in

the consciousness of inhabitants, while travelling by such means does not greatly influence their perception.

7.2. Transport behaviour as a determinant of the perception of trolleybus transportation

A separate analysis was carried out on the influence of transport behaviour on the perception of trolleybuses. Figure 5 presents the results.

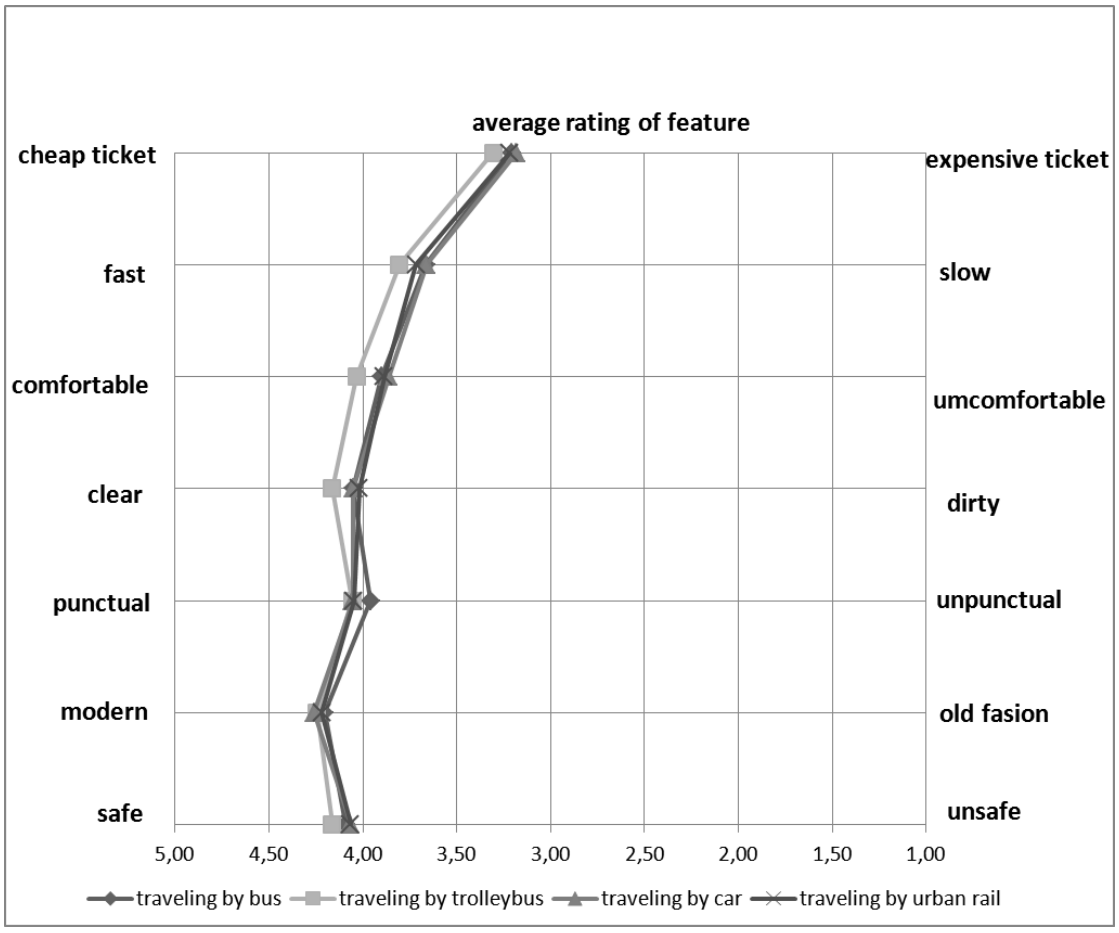

Fig. 5. Perception of trolleybuses among inhabitants of Gdynia in 2015
Source: self-study based on marketing research results described in Chapter 4

Similar to the perception of bus transportation among the inhabitants of Gdynia, the way in which the respondents choose to travel has a minimal bearing on their perception of trolleybuses. However, in this case, respondents who choose to travel by trolleybus evaluated this mode of transport slightly more positively in terms of safety, cleanliness, comfort, the duration of travel and fare price.

7.3. Transport behaviour as a determinant of the perception of urban rail

Despite the fact that the share of urban rail in the total amount of journeys in Gdynia amounts to less than 10% (the duration of travel by urban rail being normally longer, as this kind of journey is usually carried out between the cities of the metropolitan area),

an evaluation of respondents' chosen mode of travel, compared to their perception of this mode of transport, was nevertheless carried out. Figure 6 presents the findings.

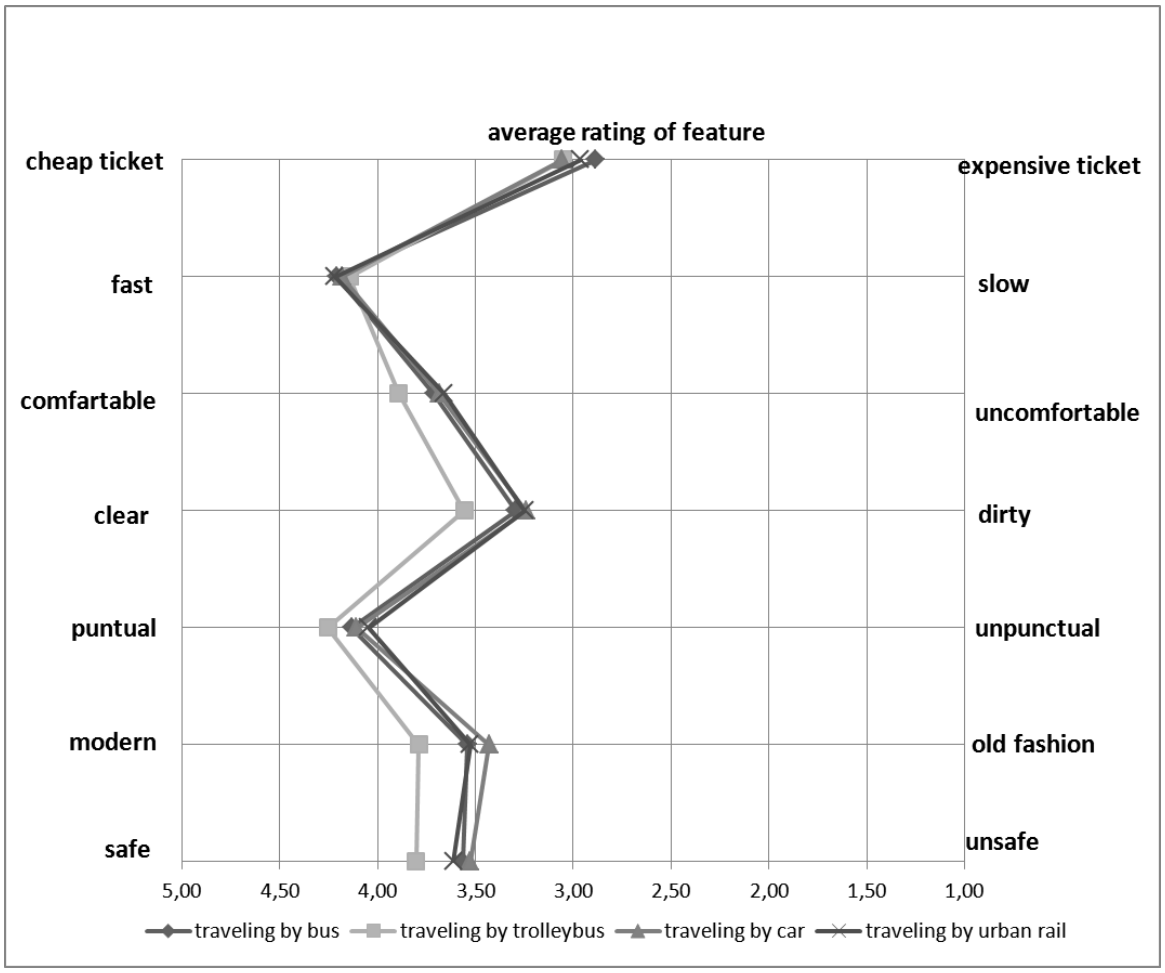

Fig. 6. Perception of urban rail among inhabitants of Gdynia in 2015
Source: self-study based on marketing research results described in Chapter 4

Unlike buses and trolleybuses, the perception of urban rail proved to be more diverse depending on respondents' chosen means of travel. The evaluations of those respondents who normally travel by trolleybus proved to be more diverse still. Such respondents evaluated safety, modernity, punctuality, cleanliness and comfort of travel more positively than respondents who travel by bus, urban rail and car. Only in relation to the duration of travel and fare price are the evaluations of all groups of passengers found to be equal, which interestingly provides a strong hint as to the direction that further promotional efforts regarding this mode of transportation should take.

8. CONCLUSION

Based on the analysis carried out in this study regarding the link between actual travel behaviour of the inhabitants of the city of Gdynia and passenger perceptions of the main means of public transport (bus, trolleybus, urban rail), it can be concluded that the thesis

concerning the importance of perceptions of public transport as one of the essential determinants of the travel behaviour of urban inhabitants can only be maintained in the case of passengers travelling by trolleybus. Only the evaluation of these respondents was significantly different than that of the respondents who choose to travel by other modes of public transport or by car. This means that the image held regarding the main modes of public transport within a city is deeply embedded within the collective consciousness of its inhabitants, who, despite highly positive evaluations of urban transport, increasingly choose to undertake urban journeys by car (currently, half of all inhabitants). As a result, there is evidently a challenge to be faced in terms of the comprehensive promotion of public transport, which is based, as it should be, on differentiating criteria other than the frequency of usage of privately owned cars.

Of all the features of the means of public transport that underwent evaluation, modernity received the most positive feedback. Safety, punctuality, cleanliness and comfort were viewed almost equally positively. The cost of transport was, in connection with all modes of transport, viewed most negatively. In the case of urban rail, it was the duration of travel that was most positively evaluated. Given the current expansion of the metropolitan area and increasingly lengthier, yet necessary, daily commutes, this represents a viable focal point for coordinated promotional efforts based on such a quality.

Those passengers who travel by trolleybus rate public transport most highly.

The evaluations of those who choose to travel by car coincide with those passengers who travel by bus or urban rail.

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