"I can do perfectly well without a car!"

An exploration of stated preferences for middle-distance travel

N. J. A. van Exel · G. de Graaf · P. Rietveld

Abstract This article presents the results of a study exploring travellers' preferences for middle-distance travel using Q-methodology. Respondents rank-ordered 42 opinion statements regarding travel choice and motivations for travel in general and for car and public transport as alternative travel modes. By-person factor analysis revealed four distinct preference segments for middle-distance travel: (1) choice travellers with a preference for public transport, (2) deliberate-choice travellers, (3) choice travellers with car as dominant alternative, and (4) car-dependent travellers. These preference segments differ in terms of the levels of involvement and cognitive effort in travel decision making, the travel consideration-set and underlying motivations. The study showed that for most people there is more to travel than getting from point A to point B, and that there is considerable heterogeneity in middle-distance travel preferences. Policy implications for reducing the need for travel and promoting a modal shift from car to other travel modes are discussed.

Keywords Travel behaviour · Travel demand management · Preferences · Q-methodology · Segmentation

Introduction

In Western countries car ownership and use have increased dramatically over the last 50 years. For instance, every other person in the EU now owns a car and between 80 and

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90% of all land passenger kilometres are travelled by car. Extensive differences in car ownership and use among EU Member States and with the US indicate that these levels are not yet saturated and can be expected to increase. Current levels of car ownership and use, however, already cause considerable road congestion and have led to a substantial decline in the accessibility of certain vital economic areas (Eurostat 2009; Banister 2002).

One important reason for the automobile's increasing dominance in passenger transport is that (the recent past notwithstanding) the price of car travel relative to public transport has largely remained steady while the (system) quality of car travel has considerably increased relative to public transport. Other prominent reasons include increasing economic well-being, socio-cultural trends (more individualized and intensified lifestyles), and a history of 'predict and provide' policies chiefly concerned with compliance to the increased demand for road infrastructure (e.g. SCP 2003, 1993; MoT 1997; Banister 2002; Cameron et al. 2004; Lyons et al. 2000). Because these policies have not been very effective in accommodating the growing demand for car kilometres, the focus of transport policy in Western countries has recently shifted to travel demand management (TDM). The foremost aims of TDM policies are to reduce the need for travel and promote a modal shift from car to alternate modes of travel, such as public transport and cycling.

Developing policies that will effectively persuade people to modify their travel behaviour requires a solid understanding of individual travel behaviour. Twenty-five years ago Burnett and Hanson (1982) stated that to do so, it is important to distinguish sizeable subgroups that display a particular behavioural response to specific circumstances or changes therein. There is little point in developing policies aimed at 'the average car driver'; it is more relevant to recognise distributions of differences among individuals and to address significant subgroups in different ways. As Goodwin (1995) said, there is one simple but important proposition for travel behaviour policy and research that arises from past research: people differ. But there also are important communalities between people in how they behave. To be effective, policy interventions need to be responsive to the different motivations and constraints of such travel behaviour segments (Anable 2005).

Several methods of segmenting travellers into fairly homogenous subgroups have been pursued over time. For instance, some have distinguished travellers according to similarity in tastes, preferences, choice-sets, and the nature and strength of travel habits (e.g. Anable 2005; Schlich 2003; Bamberg and Schmidt 2001; Wardman and Tyler 2000; Rooijers and Welles 1996; Pas and Huber 1992; Hanson and Huff 1988; Huff and Hanson 1986). Others have argued that segmentation should be based on antecedents of behaviour such as attitudinal, motivational, and lifestyle dimensions (Anable 2005; Götz et al. 2003); imperative social roles (Orfeuil and Salomon 1993); and stages in the family lifecycle stage (Jones et al. 1983). As an example, Anable (2005) identified six travel behaviour segments among car users varying in predisposition to use alternative transportation[1] and found that they were associated with more favourable attitudes to alternatives, less psychological attachment to cars, stronger moral norms, and greater perceived control. Anable (2005) argued that segmentation according to predisposition toward alternative modes can contribute to our understanding of the modal choice process for reasons other than behaviour similarities. Is current travel behaviour, for example, the result of reasoned choice from a multimodal choice-set (and therefore susceptible to changing circumstances)? Or is it the result of deep-seated habitual behaviour (and consequently inert within changing circumstances)?

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[1] The six behaviour segments are malcontent motorists, complacent car addicts, die-hard drivers, aspiring environmentalists, car-less crusaders, and reluctant riders (Anable 2005).

This study segments travellers according to their preferences in terms of (i) whether they are 'choice travellers' and (ii) their attitude toward car and public transport as alternative travel modes. The objective of this exploratory study is thus similar to that of some of the abovementioned studies, but contributes to the accumulating literature on heterogeneity in travel by combining the aspects of choice and attitude in a single study. It also adds to the literature by applying a research method that is fairly novel to transportation research: Q-methodology. This method was chosen because it allows to explore the communalities and differences between travellers' preferences in depth, by combining the richness of qualitative studies and the rigour of quantitative methods. This combination may strengthen our knowledge by validating current evidence from largely separate methods of research, but, on the other hand, may also contribute new perspectives.

For focus and clarity the study was limited to middle-distance travel (30–100 km or 20–60 miles) because they represent common trips and rule out private travel alternatives such as walking, cycling, roller skating. It was also limited to non-captive travellers, that is, people possessing a driver's license,[2] because travel choice was part of the study objective.

Methods

What is Q-methodology?

Q-methodology is a mixed qualitative-quantitative small-sample method that provides a scientific foundation for the systematic study of human subjectivity, such as opinions, attitudes, preferences, and so on (Brown 1980, 1993; Cross 2005; Smith 2001; Van Exel and De Graaf 2005; Watts and Stenner 2005). Q-methodology is perhaps fairly novel in transportation research, but it has been around for about 75 years (Stephenson 1935) and is well-established in the political and social sciences (De Graaf 2005; 2001; De Graaf and van Exel 2009; Durning 1999; Ellis et al. 2007; Niemeyer et al. 2005; Steelman and Maguire 1999; Van Eeten 2000) and health services research (Baker 2006; Boot et al. 2009; Bryant et al. 2006; Cramm et al. 2009; Jedeloo et al. 2010; Kreuger et al. 2008; Risdon et al. 2003; Stenner et al. 2000; Tielen et al. 2008; Van Exel et al. 2006, 2007). The number of published Q-studies in transportation research is limited. Rajé (2007) used Q-methodology to explore people's perceptions of transport's role in their lives. Steg et al. (2001) investigated the relative importance of different motives for car use. Van Eeten (2000) explored public views on the expansion of Amsterdam Schiphol Airport.

The aim of a Q-methodological study is to reveal a topic's existing principal views. Typically, respondents are presented with a sample of statements about the topic (the Q-set). Respondents (the P-set) are asked to rank-order the statements from their individual points of view. By sorting the statements people give subjective meaning to the Q-set and so reveal their subjective viewpoint (Smith 2001). The individual rankings (the Q-sorts) are then correlated to reveal similarities in viewpoint. Stephenson presented Q-methodology as an inversion of conventional factor analysis, in the sense that Q correlates persons instead of tests (i.e., by-person factor analysis). If each individual had his own specific likes and dislikes, their Q-sorts would not correlate. If, however, significant clusters of correlations

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[2] That is, non-captive in objective terms because everyone potentially can avail of car and public transport. Whether both modes in the objective choice-set (or opportunity-set) are also part of a person's subjective choice-set (or consideration-set) is the subject of study.

exist, they can be factorised and described as common viewpoints, and individuals can be mapped to a particular factor.

Q-methodology can thus be used to reveal and describe populations of *viewpoints* rather than populations of people, as in conventional factor analysis. For the purpose of a Q-methodological study, a small sample of purposively selected respondents is sufficient (Smith 2001). The study thus does not reveal information about the distribution of the revealed viewpoints and the people that adhere to them (Brown 1980; Risdon et al. 2003).

The present study in four steps[3]

First, the Q-sample was developed. This was the actual research instrument and is the basis of any Q-methodological study. Opinion statements were collected regarding (i) travel choice (reasoned, inert, and anything in between) and (ii) motivations for travel in general and for car and public transport as alternative modes. Statements were extracted from newspapers, periodicals, advertisements from public transport companies, a survey by the Dutch public transport travellers association (ROVER 2001), popular literature (Van Kleef 1997), scientific literature (Rooijers. 1992; Desmet et al. 2000; Steg et al. 2001; Hiscock et al. 2002; Petit 2002; Hagman 2003; Staal 2003; Wall 2006), and two of our previous studies. In the first study—a conjoint analysis of commuting behaviour—we asked respondents to elaborate on their responses during a follow-up interview (Van Exel and Rietveld 2004). In the second study—a participant observational study on subjective reliability comprising 338 trips by public transport—we collected other travellers' and public transport employees' personal observations and statements (Van Exel 2003).

The raw material was edited and then categorized. Composite statements were split so that each addressed a single issue; similar statements were grouped and taken together. All statements were assigned to one of two categories: choice or motivation. The four statements in the choice category were selected to represent reasoned choice (Table 3, statement 25), inertia (16, 37), and the subjective choice-set (33). The 38 statements in the motivation category were sub-divided into four sub-categories arising from our literature review: (1) instrumental-reasoned motives,[4] (2) symbolic-affective motives,[5] (3) personal and subjective norms, and (4) need/desire for control. Finally, within each (sub)category we made a broadly representative selection leading to a final set of 42 statements for Q-sorting. Each statement was randomly assigned a number and printed on a card. (See Appendix Table 4 for a full overview.)

The purposive sample was then constructed. The underlying idea of a purposive sample is to approach respondents on the basis of characteristics that *ex-ante* are expected to be associated with certain views on the study subject. Because choice and attitude may be related to the accessibility of travel modes, a two-dimensional structure for the P-set was

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[3] The results of a preliminary analysis were presented at the Conference of the International Society for the Scientific Study of Subjectivity (ISSSS), Canton (Ohio), 2003. The conference paper was published in the ISSSS journal (Van Exel et al. 2005).

[4] Instrumental-reasoned motives play an important role in cognitive-reasoned models that assume travel behaviour is the result of a trade-off between the costs and benefits of travel alternatives. Central motives relate to individual preferences and attitudes, for instance, travel time, reliability, safety, and comfort (Steg et al. 2001).

[5] Symbolic-affective motives stem from psychological analyses of travel behaviour and include, among other things, status, self-expression, self-esteem, and control (Steg et al. 2001). Wall (2006) studied car drivers' motivations for reducing or maintaining their car use for commuting and found a total of 67 psychological and contextual factors influencing travel mode choice.

constructed based on car ownership (no car; private car, or leased/company car) and living in a city with an intercity rail station (yes; no). Car ownership was expected to be an important determinant of travel behaviour as proxy for access, commitment, and habituation to a car. In addition, we distinguished between people with a private car and a leased or company car because the latter group generally drives better cars at negligible marginal costs, which may affect their travel decision making and view of public transport as an alternative mode of transport. Furthermore, living in a city with an intercity rail station was selected as proxy for availability of a (more) competitive public transport alternative for long distance trips. Travel time by intercity rail relative to car is often acceptable for trips whose origins and destinations are close to rail stations. Easy access to an intercity rail furthermore limits transfers, which are associated with waiting and travel time uncertainty. In addition, people of different age, gender, and level of education were approached, but not systematically across cells of the 3×2 P-set matrix; the aim was to recruit at least five respondents in each of the cells of this matrix. A first wave of respondents was recruited within the authors' circles of family, friends and colleagues based on their reputation of being car- or public transport-minded and their level of involvement with spatial and environmental aspects of travel. Subsequent respondents were recruited through snowballing: the first wave of respondents was asked to suggest one or two people with a different view from theirs on the subject, who were next approached to participate in the study.

Third, the Q-sorts were administered. Potential respondents were approached by telephone or email to ascertain willingness to participate, possession of a driver's license, car ownership, and place of residence. Those who met the selection criteria and agreed to participate were sent the Q-survey by mail to their home address with a request to return it in within ten days. The written instructions directed participants to read through the statements carefully and begin with a rough sorting of the statements into three buckets: statements with which they generally agreed, those with which they generally disagreed, and those about which they were neutral, doubtful, or undecided. After recording the number of statements in each pile, they were instructed to read through the "agree" statements again, select the two statements they agreed with most, and place them in the rightmost boxes of the score sheet (Fig. 1). They were then asked to read through the remaining statements in the "agree" bucket, select the three they now agreed with most, and place them in the designated boxes. This procedure was continued until all "agree" statements had been ranked. The same procedure was followed for the cards in the "disagree" bucket, beginning with the leftmost boxes. Next, respondents read again the statements from the "neutral" bucket and placed them in the remaining open spots in the middle of the score sheet, according to their opinion about them. Finally, participants were asked to explain why they were most emphatic about the four outermost statements; for each of these four statements individually, respondents explained in writing why they agreed/disagreed most with it. After finishing the Q-sort, respondents completed a short questionnaire on individual characteristics, their travel choice-set and the biggest (dis)advantage of car and public transport.

Fourth and last, the individual Q-sorts were subject to by-person factor analysis using PQMethod 2.11[6] (extraction method: centroid; rotation method: varimax). The purpose of this analysis is to identify groups of respondents who rank-ordered the 37 opinion statements in a similar way, under the assumption that this indicates similarity in preference for

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[6] Dedicated software and a manual can be downloaded from http://www.lrz.de/~schmolck/qmethod/.

middle-distance travel. First, the correlation matrix of all Q-sorts is computed.[7] Next, within this matrix, groups of respondents are identified with mutually high correlation coefficients. Finally, for each identified group, a composite rank-ordering of the statements is computed, which is called a factor, based on the ranking of the statements by the individual respondents defining that factor[8] and their correlation coefficient with the factor (see Table 2) as weight. This idealized Q-sort of a factor (see Table 3; Appendix Table 5) represents the way in which a person loading 100% on that factor would have ranked the 37 statements.

Each factor was then interpreted and described using the statistical results, with a focus on the characterizing and distinguishing statements, and the explanations of the respondents defining the factor. A statement is considered to be *characterizing* if it has a score of −4, −3, +3 or +4 in the idealized Q-sort of the factor (see Table 3; in other words, if it is positioned in the outer two columns of the idealized Q-sort (see Appendix Table 5 as an example)). A statement is *distinguishing* if its score in the idealized Q-sort of the factor is statistically significantly different from its score in all other factors. The explanations of the respondents defining a factor were used to confirm and clarify the interpretation of the statistical results. Some explanations are cited in the results section, to illustrate and support the description of that particular viewpoint.

Results

A total of 39 people participated in the study: 9 without a car, 18 with a private car, and 12 with a leased/company car; 23 respondents lived in a city with an intercity rail station, 16 did not. As was our aim, 5 or more participants were recruited in each cell of the P-set matrix. The overall balance in the Q-sample was good: the mean number of statements pre-sorted under generally agree, neutral/undecided, and generally disagree was 15, 9, and 18, respectively.

The 39 Q-sorts were factor analyzed. Consecutive one- to seven-factor extractions showed that the data supported a maximum factor structure of five factors. Table 1 shows the correlations between factors from consecutive factor structures, with a high correlation indicating high similarity in content between factors. The factor diagram (Fig. 2), which presents a selection of the data in Table 1, shows that the data contains two fairly stable components. The consecutive correlations between factors 2/1 and 3/1, 3/1 and 4/1 and so on until 7/1 (left side of Fig. 2) were all very high and was .96 between 2/1 and 7/1 (see Table 1); indicating practically identical content between these factors, across factor structures. The second stable component is shown at the right side of Fig. 2, with a correlation coefficient between the factors 2/2 and 7/6 of .84 (see Table 1). The factor diagram also clearly shows that, from the fifth extraction on, five factors remained practically identical (with correlation coefficients between .96 and 1.00) and no significant additional components emerged. Considering the two stable components discussed before and high correlations between two other groups of factors (i.e. 3/2–4/2–5/2 and 4/3–5/3),

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[7] Given we have 39 respondents, this is a 39 × 39 table (not presented here).

[8] A respondent defines (or loads on) a factor if: (i) the respondent correlates statistically significantly with that factor; the loading of a respondent on a factor should exceed the multiplier for the statistical significance level ($p = 0.05$) divided by the square root of the number of statements, in this case: $1.96/\sqrt{42} = 0.30$. (ii) the factor explains more than half of the common variance; that is, the square of the loading on that factor should exceed the sum of the squares of the factor loadings on the remaining factors.

the statistics indicated that the selection of the most interesting factor structure for the data was contingent on the added value of the accounts represented by factors 3/2, 4/3 and 5/4, consecutively. Next, based on close inspection of the content of all factors in the three-, four- and five-factor structures, the four-factor solution was selected.[9] Table 2 presents the factor loadings: 30 Q-sorts loaded on a single factor and 8 were confounded. Factors one, two, three, and four were defined by 8, 6, 4, and 12 variables, respectively. The four factors individually explained between 8 and 20% of the variance in Q-sorts, and collectively 57%. Table 3 presents the idealized Q-sorts of the four factors.

Factor 1

Travellers in this preference segment expressed a general preference for public transport. Most emphasized the possibility of accomplishing something during the trip (Table 3, statement 42): —*For me the possibility to spend my travel time on something useful is an important reason to prefer travelling by public transport. —I often have a lot of reading to do. And I can catch up with some sleep as well. —It is relaxing. A cup of coffee, do some reading, rest a bit.* Public transport apparently has for them a process utility[10] over the outcome utility of reaching their destination (31, 32): —*The train usually is more practical, more enjoyable, and more relaxing than the car.* Perhaps that is why they, of all the travellers, are least concerned with door-to-door travel time (40). In addition, they refer strongly to environmental aspects of public transport, both in normative (28) and affective (4, 5) terms: —*The environment is a great concern in our small and densely populated country. Everyone should think about this and use public transport more often. —Public transport contributes to a better society: less pollution, higher safety, less stress. —Environmental aspects are an important motivation for me to choose travelling by public transport.*

These travellers regard the car as an alternative (33), but least of all see the car as a necessity for their personal travel (1, 22, 30, 36): —*Public transport and bicycle are fine alternatives. —If you want you can get almost everywhere by public transport; you are only a bit less independent. My social life is not worse without a car. —Generally I do not need a car. On the occasions I do need one, there is always someone that can help me out.* Moreover, they do not seem to particularly like the car as a travel mode (7, 11, 29): —*It's brainwashing to think you could not do without a car. —The car is not superior. It's a fallacy that you would have more privacy and less delay with your car. —A car is just an object I don't attach much value to, definitely not a status symbol. —The car as such is irrelevant to me, only the functional aspects count.* It definitely is not more than a mode of transport (23, 35): —*For me, identity is purely associated with immaterial things.*

Although these travellers do not exclude the car as an alternative (33), the preference for public transport and dislike of the car appear to result in a fairly stable travel behaviour pattern (16, 25, 37). As a consequence, they are very familiar with the public transport system (8, 14): —*I use public transport almost daily and can find my way very well.*

This preference segment for middle-distance travel was labelled 'choice travellers with a preference for public transport'. As an example, the idealized Q-sort of factor 1 is included in Appendix Table 5.

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[9] The limited added value of factor 5/4 is also evident from its substantial correlation with factors 4/3 and 4/4.

[10] Brouwer et al. 2005; (or: procedural utility; Frey and Stutze 2005).

Table 1 Correlations between consecutive factor solutions

Factor	1/1	2/1	2/2	3/1	3/2	3/3	4/1	4/2	4/3	4/4	5/1	5/2	5/3	5/4	5/5
1/1		**0.65***	**0.35**†	0.61*	0.52*	0.28	0.58*	0.69*	0.38†	0.01	0.57*	0.71*	0.26	−0.20	0.24
2/1		−0.48*		**0.97***	0.53*	−0.53*	**0.95***	0.55*	0.17	−0.71*	**0.96***	0.58*	−0.02	−0.61*	−0.46*
2/2				−0.49*	−0.06	**0.98***	−0.51*	0.12	0.23	**0.90***	−0.53*	0.12	0.33†	0.52*	**0.85***
3/1					0.31	−0.50*	**0.94***	0.40†	0.35†	−0.73*	**0.93***	0.46*	0.10	−0.75*	−0.41*
3/2						−0.23	0.45*	**0.81***	−0.49*	−0.18	0.52*	**0.70***	−0.40†	0.25	−0.28
3/3							−0.55*	−0.01	0.34†	**0.90***	−0.58*	0.00	0.40†	0.44*	**0.88***
4/1								0.33†	0.06	−0.64*	**0.99***	0.35†	−0.15	−0.58*	−0.38†
4/2									0.05	−0.22	0.39†	**0.96***	0.09	0.01	−0.21
4/3										−0.08	0.00	0.19	**0.80***	−0.60*	0.24
4/4											−0.66*	−0.25	0.07	**0.70***	**0.86***
5/1												0.38†	−0.15	−0.52*	−0.46*
5/2													0.05	−0.19	−0.10
5/3														−0.13	0.06
5/4															0.25
5/5															
6/1															
6/2															
6/3															
6/4															
6/5															
EV	0.33	0.27	0.21	0.26	0.9	0.18	0.20	0.12	0.08	0.17	0.17	0.10	0.09	0.08	0.17
CEV	0.33	0.48		0.53			0.57				0.61				

Table 1 continued

Factor	6/1	6/2	6/3	6/4	6/5	7/1	7/2	7/3	7/5	7/6
1/1	0.56*	0.73*	0.24	−0.20	0.28	0.53*	0.71*	0.35†	−0.26	0.30
2/1	**0.96***	0.58*	−0.02	−0.64*	−0.42*	**0.96***	0.58*	0.06	−0.68*	−0.40†
2/2	−0.54*	0.11	0.31	0.56*	**0.84***	−0.57*	0.11	0.33†	0.54*	**0.84***
3/1	**0.93***	0.46*	0.11	−0.77*	−0.37†	**0.94***	0.46*	0.17	−0.80*	−0.35†
3/2	0.51*	**0.69***	−0.42*	0.21	−0.26	0.47*	**0.70***	−0.28	0.16	−0.25
3/3	−0.59*	0.00	0.39†	0.48*	**0.87***	−0.62*	−0.00	0.39†	0.47*	**0.87***
4/1	**0.99***	0.35†	−0.15	−0.62*	−0.34†	**0.99***	0.36†	−0.05	−0.66*	−0.32†
4/2	0.39†	**0.96***	0.07	0.00	−0.19	0.37†	**0.95***	0.16	−0.02	−0.17
4/3	0.01	0.21	**0.80***	−0.56*	0.25	0.04	0.19	**0.73***	−0.52*	0.26
4/4	−0.67*	−0.26	0.05	0.72*	**0.84***	−0.71*	−0.26	0.07	0.70*	**0.83***
5/1	**1.00***	0.38†	−0.15	−0.56*	−0.42*	**0.99***	0.39†	−0.05	−0.60*	−0.40†
5/2	0.39†	**1.00***	0.03	−0.19	−0.08	0.37†	**1.00***	0.09	−0.21	−0.06
5/3	−0.15	0.07	**1.00***	−0.11	0.06	−0.14	0.04	**0.96***	−0.07	0.07
5/4	−0.53*	−0.20	−0.15	**0.99***	0.23	−0.57*	−0.19	−0.09	**0.97***	0.21
5/5	−0.46*	−0.10	0.05	0.28	**0.99***	−0.48*	−0.10	0.06	0.26	**0.99***
6/1		0.38†	−0.14	−0.56*	−0.43*	**0.99***	0.40†	−0.04	−0.62*	−0.41*
6/2			0.05	−0.20	−0.08	0.37†	**0.99***	0.11	−0.22	−0.06
6/3				−0.13	0.05	−0.13	0.02	**0.96***	−0.09	0.06
6/4					0.25	−0.60*	−0.19	−0.07	**0.96***	0.24
6/5						−0.45*	−0.08	0.05	0.24	**1.00***
EV	0.17	0.10	0.08	0.08	0.16	0.17	0.10	0.09	0.08	0.16
CEV	0.59					0.63				

Correlations between factors in consecutive factor solutions in *bold*. Factors 6/6, 7/4 and 7/7 not shown because they were not retained (Eigen value <1)

EV explained variance and *CEV* cumulative explained variance

* $p < 0.01$; † $p < 0.05$

Factor 2

Travellers in this preference segment share some of the above travellers' appreciation for public transport, but attach more weight to some advantages of the car. Public transport is favoured for the possibility of doing something during the trip (42) and its environmental benefits (28): —*The environment is very important. If we can contribute by decreasing car use we should, but costs of public transport should go down.* The car is liked because it makes life easier (22) —*For some destinations and especially when travelling with children it is easier to travel by car. —You're not dependent on time schedules and station locations. —You can get where you want, when you want and, if there are no traffic jams, within a reasonable time.* It is perceived as necessary to maintain an active social life (1, 30): —*In the evenings connectivity between train and urban public transport is virtually non-existent. —At night, the safety of the car is better than that of an abandoned platform. By car the barrier to get up and go is much lower. —Some family and friends live in places difficult to reach other than by car. if I didn't have a car I think I wouldn't visit them that often. —I definitely need a car. You can't go everywhere with public transport, at least not within a reasonable time.* They clearly are not, however, 'car addicts' (23, 27, 29, 35): —*Maybe for yuppies, not for an old lady. —All that noise, definitely not a pleasure! —The mere thought of deriving your identity from a vehicle is very strange. —I can do perfectly without a car!*

Their travel behaviour is not habitual (16, 37) and they like to plan their travel in advance (15, 19). More than others they regard car and public transport as good alternatives for personal travel (33): —*Depends on trip destination and purpose. —If there's a good train connection I prefer the train, if not I prefer the car.* They are well informed (8, 14, 17) and take travel alternatives into consideration when making their plans (25): —*I always compare my options for a trip on the basis of cost, travel time, and comfort. I usually choose the train when travel time is not much longer than the car because of comfort.* They emphasize travel time as an important argument for their mode choice (18, 40): —*Reliability is important when you have an appointment, for instance, or have to catch a flight.*

This preference segment for middle-distance travel was labelled 'deliberate choice travellers'.

Factor 3

Travellers in this preference segment express a general like for travel by car. Of all travellers in our study, they most enjoy driving a car (29) and attach a value to the car they drive (26). The car, however, remains primarily a mode of transport (23, 35): —*For me a car is a means to get from A to B and back. A nice car makes it pleasant, but reliability is more important.* They do not feel inconvenienced on a day they do not have their car at their disposal (20): —*If by chance I don't have the car at my disposal I travel by another mode, no problem.* They do not really need a car (1, 12) but travelling by car makes life easier (22): —*You can probably get anywhere with public transport, but by car you are much less dependent on time schedules, connections, and departure frequencies.*

In travel decision making they are most concerned about costs (4, 13, 34): —*I could take the train more often, but I find train fares too high when compared with the convenience of just taking the car. —Driving a car is becoming increasingly unaffordable for private car owners.* They are also concerned about travel time (18, 40). Of all travellers they most like to organize their trips well in advance (15, 19). They regard car and public transport as alternatives for personal travel (33), but attach the least value to the benefits of

public transport (42) and least disagree with the negative aspects of public transport (6, 21): —*Nowadays public transport is no longer a necessity and it's generally unsafe and filthy*. They are least familiar with the public transport system (8, 14). For the most part they consider the car the better alternative for all their personal travel (7, 27): —*If I have the car at my disposal, I use it for all my trips; if not, I have to look for an alternative*. Consequently they do not deliberate much about their choice of travel mode (16, 25).

This preference segment for middle-distance travel was labelled as 'choice travellers with car as dominant alternative'.

Factor 4

Travellers in this preference segment are clearly car-oriented. They find the car superior to other modes (7, 27, 36): —*Comfort, convenience and pleasure. —Dense network, no transfers! —For most of my trips public transport is too complicated and travel time is unacceptable. —I would say, by definition* [the car is superior]. —*When you live in a small town, public transport is fairly inaccessible. You always have transfers and miss connections, leading to long travel times. —Available 24/7, no scheduling problems. Travel-plan dependence, time schedules, and strikes weigh heavily for me* [against public transport]. They feel they really need a car for their personal and work-related travel (1, 12, 30, 35): —*I make a lot of chained trips, for instance, taking the kids to kindergarten and to school before work. A car then becomes a necessity.* The car generally makes their life easier (22): —*It is much easier to take the car unthinkingly than to undertake a trip by public transport.* They feel inconvenienced when they do not have a car at their disposal (20). They are happy driving a car (11, 29), but still regard it primarily as a means of transport (23, 26): —*The car as part of your identity is nonsensical. The most important thing is that it's a reliable mode of transport. —A car is not a status symbol for me, just a practical and necessary resource in daily life.*

These travellers attach high value to travel time (4, 18, 40): —*Travel time is crucial; convenience comes second.* But they attach much less to travel costs (34): —*I don't look at the costs; convenience is paramount. The ease of having a car at hand and the fact that costs are 'sunk' mean that you no longer make a financial trade-off,* and to environmental aspects (4, 28): —*Environmental aspects play no role in my personal choices.* In addition, they find it important to have control over their journey (15): —*Go where I want when I want, optimal mobility,* but not in terms of planning ahead (19): —*That's just the point of having a car; no planning, no trouble.*

Of all travellers they least regard public transport as an alternative to the car (33): —*Public transport is unreliable, expensive, and crowded.* They do not deliberate about their travel much (25): —*I don't feel like thinking about it. —I'm a creature of habit and often delude myself into believing that travel by leased car is free. —Ninety-five percent of the time I just take the car. In some cases, like going to big events or cities, I consider public transport.* Like the travellers in factor three, they are not 'car addicts' but simply strongly prefer the car for pragmatic reasons: comfort and travel time (perceptions[11]). Because they are satisfied, they behave fairly routinely (16, 37).

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[11] e.g. Van Exel and Rietveld (2009) showed that car users may have fairly distorted perceptions of public transport travel time, particularly when they are unfamiliar with public transport. They found the that car users on average overestimate actual (scheduled) travel time by public transport for a common car trip by 50% and that this misperception of public transport travel time varies between 10 and 70%, depending on the frequency of public transport use.

This preference segment for middle-distance travel was labelled as 'car dependent travellers'.

Preference segments and characteristics of respondents

The sample size and sampling method were appropriate for the purpose of the study, but do not allow generalization of the findings in terms of the distribution of the four preference segments across a larger population, or with respect to their relation to characteristics collected in the post-Q-sort survey. With this in mind, some associations are presented below, some of which may serve as hypothesis for further investigation (or as sampling a criterion in a replication of the current study). First, car ownership was statistically significantly different across preference segments for middle-distance travel; living in a city with an intercity rail station was not.

'Choice travellers with a preference for public transport' were characterized largely by being older-than-average, higher-educated males not owning a car. More than 80% had a public transport season pass and used the train once or more per month. Sixty percent walked or cycled to work; about 40% regarded carpooling an acceptable alternative to get to work, and more than 80% would consider both train and car for a middle-distance trip. They mentioned flexibility, independence, and convenience as primary advantages of the car; environment, stress and congestion were disadvantages. Advantages of public transport were relaxation, absence of parking concerns, and environmental benefits; disadvantages were transfers, delays, and inaccessibility.

'Deliberate choice travellers' were characterized largely by being older-than- average females owning a private car. More than 80% had a public transport season pass and used the train once or more per month; about 80% regarded carpooling an acceptable alternative to get to work. 80% would consider train for a middle-distance trip, 100% a car. They mentioned control, door-to-door destination, and travel time as advantages of a car; disadvantages were congestion, parking, and long-distance inefficiency. Advantages of public transport were doing something en route and convenience; disadvantages were transfers, delays and inflexibility.

'Choice travellers with car as dominant alternative' were younger than average and less educated. Twenty-five percent had a public transport season pass and used train once or more per month, over 80% regarded carpooling an acceptable alternative to get to work; 100% would consider the train for middle-distance travel, 75% by car. They mentioned freedom and privacy as the primary advantages of the car; costs, maintenance, and parking were disadvantages. The only advantage of public transport was cost; disadvantages were travel time and crowds.

'Car dependent travellers' were largely younger-than-average, higher-educated males All had a leased or company car; none had a public transport season pass. Fewer than 10% used the train once or more per month; 90% always went to work by car. They had the highest frequency of business trips. About 40% regarded carpooling an acceptable alternative to get to work; 50% would consider the train for a middle-distance travel, 100% the car. They mentioned practicality, availability, and flexibility as advantages of the car; disadvantages were congestion, parking, and not being able to do anything other than driving the car. Advantages of public transport were doing something en route and relaxing; disadvantages were travel time, waiting, and dependency.

Opinions about car and public transport differed significantly between preferences (Fig. 3). The difference in level between the two modes is noteworthy.

Discussion and conclusion

Researchers and policymakers in the field of transportation increasingly recognize that traveller homogeneity is rare and consideration of traveller heterogeneity is necessary to develop effective TDM policies. In this study we have used Q-methodology to explore the communalities and differences between travellers in preferences for middle-distance travel. Our study revealed four distinct preference segments: (1) choice travellers with a preference for public transport, (2) deliberate-choice travellers, (3) choice travellers with a car as the dominant alternative, and (4) car-dependent travellers. These preference segments differ in travellers' (a) level of involvement and cognitive effort in travel decision making, (b) travel consideration-set,[12] and (c) underlying motivations. This study thus underlines the findings of previous studies: choice of travel mode is not a black and white matter, but shades of gray. It appears uncommon for travellers to be addicted to or totally abstain from any particular mode, but travellers explicitly differ in the extent to which they consider different modes to be alternatives for their personal travel in different circumstances.

Considering the travel opportunity-set[13] and traffic intensity in a small and densely-populated country like the Netherlands, the four preference segments for middle-distance travel observed in this exploratory study may be considered fairly realistic. It is impractical to have a single mode choice-set, in particular a car. Nonetheless, obvious groups missing from this study are people who drive cars as a form of status consumption and people who strictly object to driving a car for environmental reasons. Statements relating to these aspects did not come out as important in any of the four preferences for middle-distance travel (nor could they support a factor on their own). We cannot rule out the possibility that people gave what they considered to be socially-desirable answers. People may shy from admitting that the car is a status symbol or part of their identity. But, because responses were anonymous[14] and respondents were requested to make complex trade-offs between multiple aspects of travel, we see this complication as limited with respect to the veracity of the study results.

That environmental aspects (4, 28, 38) seem to be of limited influence on peoples' travel preferences, as observed before (e.g. Gardner and Abraham 2008; Garvill et al. 2003), also among 'choice travellers with a preference for public transport' and 'deliberate choice travellers'. Environmental aspects receive only marginally higher rank scores, largely due to the rather casual and normative statement (28) that everyone should use public transport more often.

Another notable finding is that the statement, "What really matters is reaching my destination and getting back, the mode of travel does not matter much" is ranked in the middle range throughout. Apparently for most people there is much more to travel than just the transfer between two locations. What also stands out is that all statements portraying negative aspects of public transport (2, 6, 9, 21 and 39) received neutral or negative rank-scores almost throughout. That is, most travellers do not have a bad image of public

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[12] The subjective choice-set consisting of the choice alternatives a person is aware of and considers feasible and acceptable. This is the set that is actively considered in the choice process and is a subset of the objective choice-set (see footnote 13). The size of this set may vary from all theoretically possible alternatives to a single alternative or even none at all (Punj and Brookes 2001).

[13] The objective travel choice-set as determined by the location of activities, the available travel alternatives between activity locations (in terms of quality and density of road infrastructure and public transport services, transport policies and fiscal regulations) and a person's capabilities (e.g. to walk, cycle, use public transport or drive a car) (Burnett and Hanson 1982).

[14] The names in Table 2 were provided by respondents as identification code so that results could be communicated back to them. Respondents were instructed to fill in an alias if they wanted their response to be anonymous.
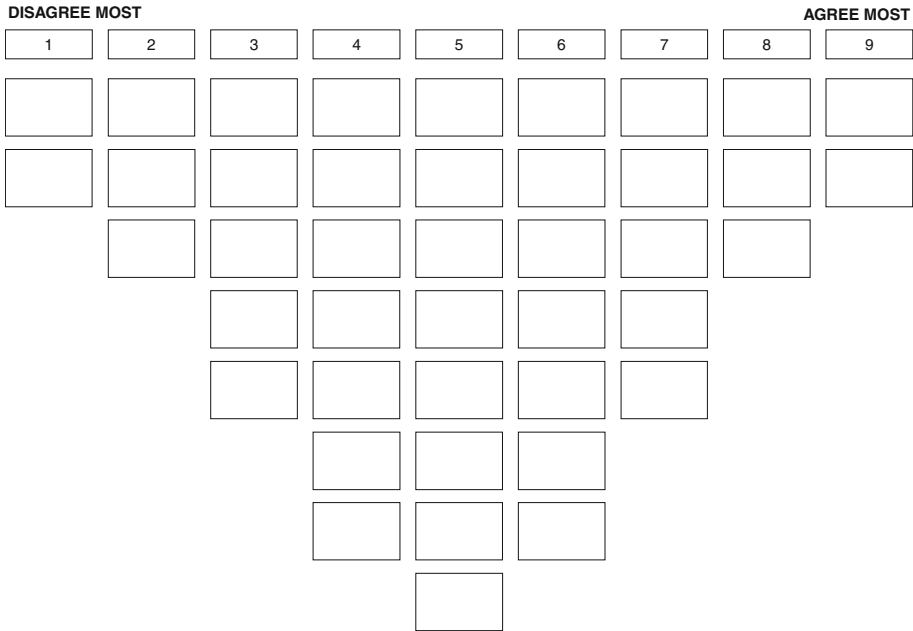
DISAGREE MOST   **AGREE MOST**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Fig. 1 Score sheet[15]

transport, regardless of their like or dislike of the mode. Along the same lines, the statement "The Netherlands is a car country. We could just as well pave all railroads and transform all stations into parking garages" elicited emotion: —*Ridiculous idea; this country needs exactly the opposite.* —*A disaster for landscape and environment, a despicable statement.* —*Nonsense. The Netherlands cannot do without trains. Not everyone can drive.* —*It is public transport that should be invested in; both options must remain available. There must be choice.*

If the purpose of TDM policies is to reduce the need for (car) travel and to stimulate modal switch away from automobiles, the results from this study have definite policy implications. 'Choice travellers with a preference for public transport' are clearly not the primary target group for TDM policies: these travellers will tend to choose public transport when possible. They consider the car occasionally, but this urge can be further discouraged by promoting the attractiveness of public transport. 'Deliberate choice travellers' are expected to be sensitive to changes in the relative quality of both modes, particularly improvements in accessibility, reliability, connectivity in non-urban areas, and safety at night. 'Choice travellers with car as dominant alternative' are less likely to switch to public transport because they are fairly negative about it and also unfamiliar with it. They are, however, concerned with the costs and affordability of travel and thus increasing car-travel costs are likely to influence their use of it. Whether this means reducing car travel or switching to another mode of travel is difficult to ascertain. 'Car dependent travellers' are least likely to dispense with its use. They appear most sensitive to travel time and seem to use public transport circumstantially, for instance, in cases of inaccessible areas, dense traffic, crowded events. Although not fond of public transport, they are practical about their

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[15] Column numbers 1–9 correspond with factor scores −4 to +4 (see Table 3).
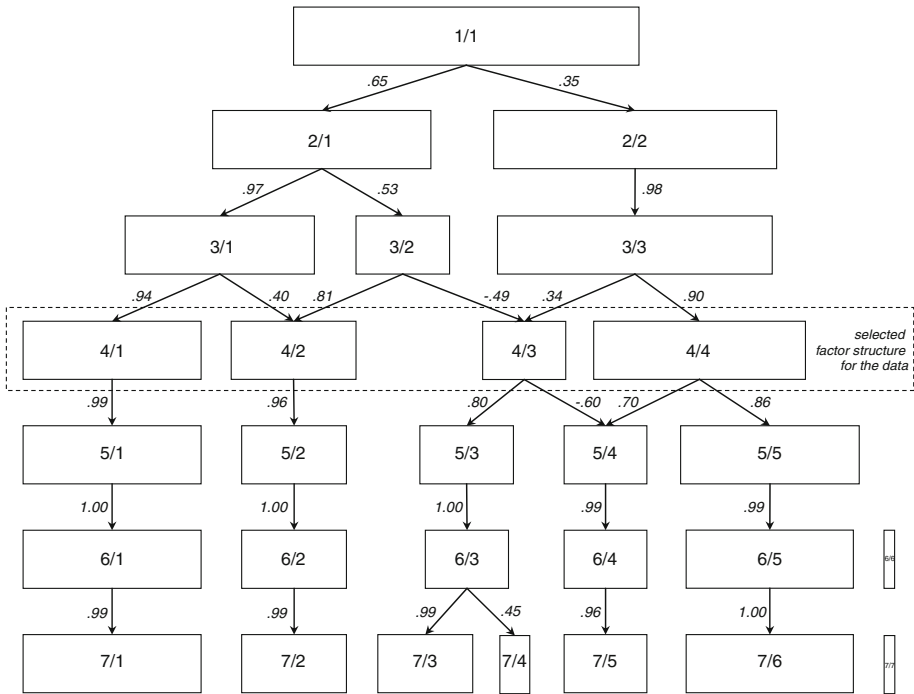
Fig. 2 Factor diagram[16]

travel. Therefore, these travellers most likely can be persuaded to reduce their car use by offering accessible and high-quality 'park and ride' facilities strategically located near economic (and social) centres and by encouraging technological alternatives to travel—telework and teleconference facilities, for example. In sum, 'deliberate choice travellers' and 'choice travellers with car as dominant alternative' should be the primary focus groups for TDM policies.

A few issues regarding this study merit further discussion. First, this was a novel application of Q-methodology and little can be said about the reliability and validity of the results. We are confident that the survey instrument was representative for the variety of issues relevant to peoples' preferences for middle-distance travel and that the respondents recruited for conducting the Q-sort covered the relevant range of characteristics. But, for

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[16] Explanation: A factor diagram is a simplified visual representation of the hierarchical factor structure in a data-set (Goldberg 2006). Each row of the factor diagram presents a consecutive factor structure for the data (from separate analyses of the data), from the one-factor structure at the top to the seven-factor structure at the bottom, and the selected four-factor structure shaded in grey; factors 6/6, 7/4 and 7/7 had an Eigenvalue <1 (i.e. the data supports a maximum of five factors). The boxes in each row represent individual factors, and the width of boxes their percentage-explained variance (see bottom of Table 1 for the values). The arrows between boxes indicate the most important correlations between factors in consecutive factor structures (i.e., between-structures comparison), and the numbers next to the arrows the corresponding correlation coefficient (see Table 1 for a full overview). For example, the correlation between the first factor of the four-factor structure (i.e. 4/1) and the first factor of the five-factor structure (i.e. 5/1) was 0.99, meaning that the content of these factors is practically identical. Considering also the correlations between 5/1 and 6/1 and between 6/1 and 7/1, the factor diagram shows that the content of factor 4/1 remains the same for all four- to seven-factor structures (correlation coefficient between 4/1 and 7/1 is 0.99; see Table 1).

Table 2 Correlation coefficients of Q-sorts with the factors

Respondent	Factor			
	1	2	3	4
Johan	**0.81**	0.06	0.20	0.02
Klaas	**0.64**	0.14	0.13	0.02
Marije	**0.79**	0.09	0.08	0.03
Mike	**0.63**	−0.01	0.25	0.08
Pai	**0.70**	0.55	0.06	−0.06
Petra	**0.76**	0.21	−0.01	−0.19
Rik	**0.70**	0.42	−0.06	0.11
Ruurd	**0.73**	0.35	0.10	0.00
Anna	0.50	**0.59**	0.05	0.18
Arjan	0.14	**0.50**	0.11	0.23
Elly	0.26	**0.72**	0.23	0.17
Irene	0.16	**0.59**	0.41	0.24
Johanna	0.28	**0.65**	0.01	0.39
Marc K	0.52	**0.62**	0.29	0.10
Anita	0.16	0.06	**0.59**	0.20
Anke	0.27	0.22	**0.55**	0.40
Henri	0.18	0.31	**0.56**	0.13
Huib	−0.37	−0.14	**0.44**	0.00
Benedikte	0.28	0.08	0.22	**0.67**
Dani	−0.25	0.20	−0.23	**0.59**
Dirk-Jan K	0.02	0.37	−0.08	**0.64**
Dirk-Jan M	0.23	0.22	0.11	**0.75**
Geert	−0.09	0.22	0.09	**0.82**
Ines	0.05	0.24	0.25	**0.40**
Kees	0.22	−0.01	0.31	**0.74**
KJ	−0.21	0.01	0.03	**0.75**
Marlene	−0.38	−0.28	0.05	**0.51**
Michiel	0.03	0.19	0.24	**0.64**
Wag	−0.10	0.25	0.16	**0.66**
Ytzen	0.13	0.07	0.15	**0.73**
Bob	0.42	0.48	0.27	0.48
Elsbeth	0.16	0.29	0.42	0.48
Esther	0.34	0.19	0.51	0.47
Maria	−0.08	0.46	0.41	0.56
Nientje	0.45	0.29	0.35	0.38
Oever	0.24	0.38	−0.13	0.30
Rob	0.20	0.33	0.42	0.56
Teun	0.44	0.43	0.32	0.05
Ulf	−0.27	−0.12	−0.42	0.48

Note: Defining variables for factors in bold (see footnote 8 for definition)

instance, we do not know how well-articulated peoples' preferences were at the start of the study. Respondents may have adjusted their preferences or even constructed new preferences while reading and sorting the statements. Although this can also be regarded as a

Table 3 Idealized Q-sorts

No	Statement	Factors			
		1	2	3	4
1	For private use I do not need a car	3	−3	2	−3
2	As a result of all those different timetables and lines, travelling by public transport is too complicated	−1	0	−1	−1
3	What really matters is reaching my destination and getting back, the mode of travel does not matter much	1	0	1	0
4	I am not really price- or time-sensitive, environmental aspects are most important to me	1*	−1*	−3	−4
5	I had rather look out of the compartment window to the passing Dutch landscape than to the bumper of the car before me	3*	1†	−1	0
6	Public transport is for people who can not afford a car	−3	−3	−2	−3
7	All things considered, to me the car is superior to public transport	−3*	−1*	2	3
8	I know the public transport system pretty well because I make use of it frequently	3	2	0	0
9	The last time I travelled by public transport was a complete disaster	−2	−1	−1	−2
10	Things like comfort, privacy and safety are more important to me than travel costs and travel time	0	0	−1	−1
11	I had rather not drive in big cities… lots of traffic, lots of traffic lights, problems with parking	2†	0	1	−3*
12	For my work I need a representative mode of transport	−1	−1	−3	1†
13	For me, travelling by public transport is more expensive than travelling by car	−1	0	3*	1*
14	I know very well where in my neighbourhood I can get on public transport to the rail station and I have a fairly good notion of the timetable	2	1	−2*	1†
15	It is important to me to have control over my journey	1	2	2	4†
16	For the greater part my travel behaviour is routine, I do not really give it much thought	−1	−2†	1	1*
17	I am well aware of the costs of a trip, by car as well as by public transport	1	1	0	0
18	I find the reliability of travel time important	1	3	1	2
19	I find it pleasant to plan my trips in advance and to have everything well organized before I leave	0*	2	3	−1*
20	On a day when I do not have my car at my disposal for a day, I am greatly inconvenienced	−1	−2	−4*	2*
21	I often feel unsafe when using public transport and on stations, especially at night	0	0	1	−1
22	A car is not a necessity, but it does make life a whole lot easier	2†	4	4	2
23	For me the car is more than a mode of transport, it is a part of my identity, a way to distinguish myself from others	−3	−3	−3	−2†
24	I recall the day I got my first car very well, I had been looking forward to that day for quite a while	0	1	0	0
25	Before every trip, I draw a comparison between car and public transport regarding travel costs, time and so forth, and select the best alternative	−1	1*	−2	−2
26	You are what you drive	−2*	−2	0*	−2
27	Once you own a car, you'll use it for all your travel	1	−2*	4*	2*

Table 3 continued

| No	Statement	Factors			
		1	2	3	4
28	A better environment starts with yourself. Therefore, everyone should use public transport more often	4	3	0	0
29	Driving a car is a great pleasure. The sound of the engine, accelerating sportily at traffic lights, cruising on the highway, listen to music	$-2^{\dagger}$	$-1^{\dagger}$	$1^{\dagger}$	$1^{\dagger}$
30	For an active social life I need a car. Without a car I would visit my family and friends less often and would make fewer leisure trips	-2^*	4	1^*	3
31	In the train you sometimes meet nice people. I enjoy that. The car is much duller and more lonesome	2^*	-1	-1	-1
32	A lovely view, a pleasant encounter, a surprising book, a brain wave. A train journey often is an experience	2^*	1	0	0
33	As far as I am concerned, car and public transport both are good transport alternatives	1	2	2	$1^{\dagger}$
34	Travel costs play an important role in my mode choice	0	0	3^*	$0^{\dagger}$
35	I am a dedicated follower of the four-wheel-credo. The car can maybe do without me for a day, but I can not do without my car	-4	-4	-4	-1^*
36	Only the car takes me where I want, when I want it	-2^*	1	0	3^*
37	I always travel in the same way and find it satisfactory	0	-1	-1	2^*
38	My family and friends appreciate it when I travel by public transport	0	0	-2	-2
39	Public transport is much too dirty and unsafe to be an alternative for the car	-1	-2	-1	-1
40	Door to door travel time plays an important role in my mode choice	0^*	2	2	4^*
41	The Netherlands is a car country. We could just as well pave all railroads and transform all stations into parking garages	-4	-4	-2	-4
42	A big advantage of travelling by train is that you can do something useful en route: do some reading or take a nap	$4^{\dagger}$	3	0^*	1

Note: Statements with factor scores -4, -3, 3 or 4 (i.e. those ranked in two outer columns on either side of the score sheet; see Fig. 1) are called *characterizing statements* for that factor. Statements with a factor score that is statistically significantly different from the score in the other factors are called *distinguishing statements* for that factor

* $p < 0.01$; † $p < 0.05$

strength of the method, like any other methodology, the study needs to be replicated and followed-up with revealed preference studies, so that over time we can develop an idea of the reliability and validity of the results. We encourage this with the understanding that the current Q-set is not necessarily directly applicable in other countries. The research instrument needs to be carefully reviewed for missing and superfluous stimuli because, after all, the Q-set consists of context-dependent opinion statements.

Second, based on this study little can be said about the distribution of the four preference segments among travellers in general, or their association with characteristics of travellers and the context of travel. This conventional form of representativeness is not relevant to Q-methodology. The associations presented here are tentative and serve as hypotheses to be tested in follow-up research. We can, however, say that these preferences are representative for those that can be observed among travellers in the Netherlands for middle-distance travel. To investigate distribution and associations it is necessary to conduct a regular survey among
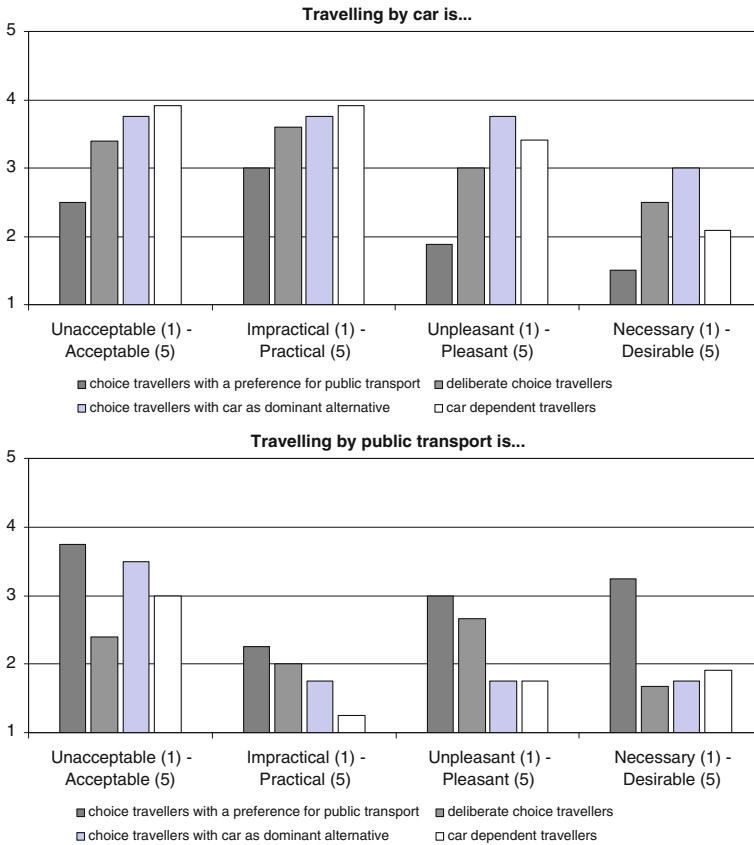
Fig. 3 Opinions about car and public transport

a sizeable, representative sample of the population, using a questionnaire that makes it possible to match travellers to preference segments (Baker et al. 2010).

Third, the preference segments of this study should not be interpreted as 'stable types'. Although the test–retest reliability of Q-sorts generally is in the neighbourhood of .80 (Brown 1980), a person's preference may vary over time with changes in the travel context and individual circumstances. The associations between preferences and characteristics of travellers and the context of travel may, however, be far more stable.

Appendix

See Tables 4 and 5

Table 4 Structured Q-sample

Category		Statement	No.
Motivation	Instrumental/ reasoned	A big advantage of travelling by train is that you can do something useful en route: do some reading or take a nap	42
		A car is not a necessity, but it does make life a whole lot easier	22
		All things considered, to me the car is superior to public transport	7
		Door to door travel time plays an important role in my mode choice	40
		For an active social life I need a car. Without a car I would visit my family and friends less often and would make fewer leisure trips	30
		For me, travelling by public transport is more expensive than travelling by car	13
		For private use I do not need a car	1
		I am not really price- or time-sensitive, environmental aspects are most important to me	4
		I find the reliability of travel time important	18
		I know very well where in my neighbourhood I can get on public transport to the rail station and I have a fairly good notion of the timetable	14
		I often feel unsafe when using public transport and on stations, especially at night	21
		On a day when I do not have my car at my disposal for a day, I am greatly inconvenienced	20
		Public transport is much too dirty and unsafe to be an alternative for the car	39
		Things like comfort, privacy and safety are more important to me than travel costs and travel time	10
		Travel costs play an important role in my mode choice	34
		What really matters is reaching my destination and getting back, the mode of travel does not matter much	3
	Symbolic/ affective	A lovely view, a pleasant encounter, a surprising book, a brain wave. A train journey often is an experience	32
		Driving a car is a great pleasure. The sound of the engine, accelerating sportily at traffic lights, cruising on the highway, listen to music	29
		For me the car is more than a mode of transport, it is a part of my identity, a way to distinguish myself from others	23
		I would rather look out of the compartment window to the passing Dutch landscape than to the bumper of the car before me	5
		I recall the day I got my first car very well, I had been looking forward to that day for quite a while	24
		In the train you sometimes meet nice people. I enjoy that. The car is much duller and more lonesome	31
		Once you own a car, you'll use it for all your travel	27
		Only the car takes me where I want, when I want it	36
		You are what you drive	26
	Norms	A better environment starts with yourself. Therefore, everyone should use public transport more often	28
		For my work I need a representative mode of transport	12
		I am a dedicated follower of the four-wheel-credo. The car can maybe do without me for a day, but I can not do without my car	35
		My family and friends appreciate it when I travel by public transport	38

Table 4 continued

Category	Statement	No.
	Public transport is for people who can not afford a car	6
	The Netherlands is a car country. We could just as well pave all railroads and transform all stations into parking garages	41
Control	As a result of all those different timetables and lines, travelling by public transport is too complicated	2
	I am well aware of the costs of a trip, by car as well as by public transport	17
	I find it pleasant to plan my trips in advance and to have everything well organized before I leave	19
	I would rather not drive in big cities… lots of traffic, lots of traffic lights, problems with parking	11
	I know the public transport system pretty well because I make use of it frequently	8
	It is important to me to have control over my journey	15
	The last time I travelled by public transport was a complete disaster	9
Choice	As far as I am concerned, car and public transport both are good transport alternatives	33
	Before every trip, I draw a comparison between car and public transport regarding travel costs, time and so forth, and select the best alternative	25
	For the greater part my travel behaviour is routine, I do not really give it much thought	16
	I always travel in the same way and find it satisfactory	37

Note: Numbers assigned to statements at random for purpose of identification

Table 5 Idealized Q-sort of factor 1 'choice travellers with a preference for public transport

DISAGREE MOST								AGREE MOST
I am a dedicated follower of the four-wheel-credo. The car can maybe do without me for a day, but I can not do without my car	Public transport is for people who can not afford a car	The last time I travelled by public transport was a complete disaster	As a result of all those different timetables and lines, travelling by public transport is too complicated	Things like comfort, privacy and safety are more important to me than travel costs and travel time	What really matters is reaching my destination and getting back, the mode of travel does not matter much	I had rather not drive in big cities… lots of traffic, lots of traffic lights, problems with parking	For private use I do not need a car	A better environment starts with yourself. Therefore, everyone should use public transport more often
The Netherlands is a car country. We could just as well pave all railroads and transform all stations into parking garages	All things considered, to me the car is superior to public transport	You are what you drive	For my work I need a representative mode of transport	I find it pleasant to plan my trips in advance and to have everything well organized before I leave	I am not really price- or time-sensitive, environmental aspects are most important to me	I know very well where in my neighbourhood I can get on public transport to the rail station and I have a fairly good notion of the timetable	I had rather look out of the compartment window to the passing Dutch landscape than to the bumper of the car before me	A big advantage of travelling by train is that you can do something useful en route: do some reading or take a nap
	For me the car is more than a mode of transport, it is a part of my identity, a way to distinguish myself from others	Driving a car is a great pleasure. The sound of the engine, accelerating sportily at traffic lights, cruising on the highway, listen to music	For me, travelling by public transport is more expensive than travelling by car	I often feel unsafe when using public transport and on stations, especially at night	It is important to me to have control over my journey	A car is not a necessity, but it does make life a whole lot easier	I know the public transport system pretty well because I make use of it frequently	
		For an active social life I need a car. Without a car I would visit my family and friends less often and would make fewer leisure trips	For the greater part my travel behaviour is routine, I do not really give it much thought	I recall the day I got my first car very well, I had been looking forward to that day for quite a while	I am well aware of the costs of a trip, by car as well as by public transport	In the train you sometimes meet nice people. The car is much duller and more lonesome		
		Only the car takes me where I want, when I want it	On a day when I do not have my car at my disposal for a day, I am greatly inconvenienced	Travel costs play an important role in my mode choice	I find the reliability of travel time important	A lovely view, a pleasant encounter, a surprising book, a brain wave. A train journey often is an experience		
			Before every trip, I draw a comparison between car and public transport regarding travel costs, time and so forth, and select the best alternative	I always travel in the same way and find it satisfactory	Once you own a car, you'll use it for all your travel			
			Public transport is much too dirty and unsafe to be an alternative for the car	My family and friends appreciate it when I travel by public transport	As far as I am concerned, car and public transport both are good transport alternatives			
				Door to door travel time plays an important role in my mode choice				

Note: distinguishing statements shaded in grey.

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