



Ministerie van Infrastructuur  
en Waterstaat

## **Multicultural diversity in mobility**

### The travel behaviour of migrants and children of migrants in the Netherlands

Background report

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## Summary

**People with a migration background, especially first-generation Dutch individuals, are less mobile than those without a migration background. At the same time, the commuting distance and travel time for migrants and children of migrants is longer than for other working individuals. Second- and especially first-generation Dutch individuals tend to cycle less often, but use public transport and walk more often than people without a migration background. Differences between groups are large though; this makes it difficult to talk about “the” travel behaviour of people with a migration background.**

There are currently 4.5 million people with a migration background living in the Netherlands. The share of people with a migration background is expected to increase in the coming years.

First-generation Dutch individuals in particular are less mobile, are less likely to own a driving licence and tend to cycle less frequently than people without a migration background. Importantly, differences between groups with different countries of origin are sometimes large. Among second-generation Dutch individuals, children of migrants, these differences tend to be less pronounced. In fact, their travel behaviour tends to be closer to that of people without a migration background than to first-generation Dutch individuals on many aspects.

This study confirms that the travel behaviour of migrants and children of migrants is relevant for policy. After all, a changing composition of the population in the Netherlands also means changing mobility patterns.

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# 1 Introduction

## 1.1 Motivation

Migrants and children of migrants form a significant and increasing share of the population in the Netherlands. 17% and 24% of inhabitants of the Netherlands were born abroad or had at least one parent born abroad in 2000 and 2022, respectively (Statistics Netherlands, 2022e). This share is expected to increase further to one third somewhere between 2040 and 2045 (Statistics Netherlands, 2019c; 2022g). Immigration is expected to play an increasingly large role in the total population growth (Statistics Netherlands, 2022g). Therefore, explicitly investigating the travel behaviour of migrants and children of migrants matters. Since people with a migration background can be a decisive factor in overall mobility patterns.

Yet there is little up-to-date knowledge on the travel behaviour of migrants and children of migrants. The Netherlands Institute for Social Research (Sociaal en Cultureel Planbureau, SCP) and the Netherlands Institute for Transport Policy Analysis (Kennisinstituut voor Mobiliteitsbeleid, KiM) studied in 2006 and 2008, respectively, the mobility of migrants and children of migrants living in the Netherlands (Harms, 2006; Olde Kalter, 2008). These studies focused on people born or with at least one parent born in Turkey, Morocco, Suriname and the (former) Netherlands Antilles (nowadays called the Dutch Caribbean); commonly referred to as the TMSA groups. Harms (2006) and Olde Kalter (2008) concluded that there are differences regarding mobility patterns and attitudes towards travel modes between Dutch people in the TMSA groups and Dutch people without a migration background. These differences were statistically significant even when accounting for spatial, sociodemographic and socioeconomic characteristics between both groups. Differences in relation to cycling were especially pronounced. Over the past 15 years, the mobility of migrants and children of migrants has not been researched in the Netherlands at a national level.

This study has been initiated by the Active Mobility team of the sustainable mobility directorate (directie Duurzame Mobiliteit) of the Dutch Ministry of Infrastructure and Water Management. Their interest stems from previous research showing that migrants and children of migrants are less likely to cycle and much less likely to have a bicycle than those born in the Netherlands from parents who were born in the Netherlands as well (Harms, 2006). In this study, we focus on the overall travel behaviour of migrants and children of migrants, and not exclusively on cycling patterns. After all, trips are generally made as a means to an end and not as an end in themselves.

## 1.2 Goal and research questions

The main research question in this study is the following:

**What is the current travel behaviour of migrants and children of migrants in the Netherlands?**

To address into our research question, the following three sub-research questions will be considered:

1. How does travel behaviour differ between (children of) migrants from various migration backgrounds (with a special focus on the TMSA groups), and to what extent does their travel behaviour contrast with that of people without a migration background?

2. What are the underlying reasons for the travel behaviour of the TMSA groups in particular?
3. To what extent have changes happened within fifteen years in terms of the travel behaviour of the TMSA groups?

### 1.3 Definitions

In line with the guidelines set by Statistics Netherlands (CBS) in 2022 (Statistics Netherlands, 2022c) and following the practice of the Netherlands Institute for Social Research (see e.g. Dagevos et al. (2022)), we apply the following vocabulary in this study:

**Migrants:** Individuals born outside of the Netherlands. They are **first-generation Dutch individuals**.

**Children of migrant(s):** Individuals born in the Netherlands with at least one parent born outside of the Netherlands. They are **second-generation Dutch individuals**.

In order to refer to **migrants and children of migrants** as one entity, we will also make use of the term **people with a migration background**, or **(children of) migrants**.

Technically, **individuals born in the Netherlands from parents born in the Netherlands** is the proper name for **people without a migration background**. Nevertheless, we will make more use of the latter term for readability reasons. Individuals from the third generation – namely, people whose grandparents have immigrated to the Netherlands – fall into the category of individuals without a migration background, provided both of their parents were born in the Netherlands.

**Country of origin:** country where migrants emigrated from. For children of migrants, the country of origin implicitly refers to the country where their parents or one of their parent emigrated from.

The **TMSA Dutch communities** or (shorter) **TMSA groups** refer to Turkish Dutch, Moroccan Dutch, Surinamese Dutch and Dutch-Caribbean Dutch individuals. These groups are also referred to as the **four traditional groups** (see explanation below, in section 1.4).

Dutch individuals with a **western migration background** are Dutch individuals whose country of origin is in Europe (except for Turkey), North America, Oceania, or is Indonesia or Japan. By contrast, Dutch individuals with a **non-western migration background** are those whose country of origin is in Africa, Latin America or Asia (except Indonesia and Japan), or is Turkey. Starting in 2022, Statistics Netherlands has stopped using these terms. However, this is a common distinction in most of the data available so far, which makes it hard to avoid. Note that individuals in the TMSA groups belong to the group of Dutch individuals with a non-western migration background. In our quantitative approach, we are modelling the TMSA groups separately from other people with a non-western migration background. We make it clear in our text when we refer to people with a non-western migration background excluding individuals with a Turkish, Moroccan, Surinamese or Dutch Caribbean background.

### 1.4 Scope

#### *Travel behaviour*

At the core of our research question lies the concept of travel behaviour. We focused on multiple aspects of travel behaviour, from the extent to which individuals make trips, to trip distances, trip purposes, driving license ownership, car ownership,

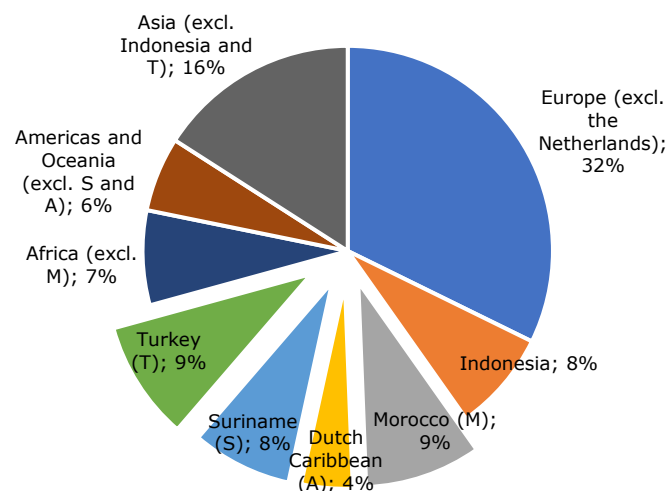
frequency of cycling/walking/using public transport and the car, as well as modal split. More details are provided in chapter 2.

*Countries of origin: focus on TMSA groups*

We acknowledge that there is an increasing diversity of countries of origin among the population in the Netherlands (see figure 1.1). Nevertheless, we chose to pay special attention to the TMSA groups. Besides the fact that a large part of previous studies in mobility focused on these groups (see e.g., Harms (2006); Olde Kalter (2008)), there are three main reasons why we chose so:

1. Taken together, the TMSA Dutch communities constitute a relatively large group. Almost one in three migrants or children of migrants in the Netherlands belongs to the TMSA groups (Statistics Netherlands, 2022a), as shown in figure 1.1. In total, more than one in twelve inhabitants of the Netherlands (around 8%) was born in Turkey, Morocco, Suriname or the Dutch Caribbean, or has at least one parent who was born there (Statistics Netherlands, 2022a). These relatively high shares are explained by historically strong migration ties and the colonial legacy of the Netherlands. See box 1.1 for some context on the TMSA groups in the Netherlands in 2023.
2. Precisely because there has been a long history of immigration from these countries, half (53%) of the individuals in TMSA groups was in fact born and raised in the Netherlands (Statistics Netherlands, 2022a). A special focus on the TMSA groups therefore allows us to distinctly investigate travel behaviour over two generations.
3. Individuals with an Indonesian migration background also constitute a relatively large group. However, they are traditionally classified as having a western migration background based on their socioeconomic and socio-cultural position. Therefore, we did not focus specifically on this group.

**Figure 1.1 Region of origin of individuals with a migration background living in the Netherlands (country where migrants were born or one of the parents of children of migrants were born).**



Source: Statistics Netherlands (2023a)

In a part of our analysis, we also investigate individuals with a non-western migration background (excluding the TMSA groups, which would otherwise be counted twice), and individuals with a western migration background; see chapter 3.

This is because these categories are available in the data (see chapter 2), thereby allowing us to make more comparisons between different groups.

This research does not focus on refugees.

### Box 1.1 TMSA groups in the Netherlands: key characteristics

**Place of residence.** 50% of the people from the TMSA Dutch communities live in the 10 largest cities in the Netherlands, against 16% of the people without a migration background (Statistics Netherlands, 2022a).

**Language.** Compared with other groups of people with a migration background, the TMSA groups are usually more likely to speak Dutch (Dagevos et al., 2022). This is because the four traditional groups have usually been established in the Netherlands for a longer period, and 53% of individuals in these groups were born and raised in the Netherlands (Statistics Netherlands, 2022a). Still, 1 in 6 first-generation Turkish Dutch individuals and 1 in 9 first-generation Moroccan Dutch individuals struggle with Dutch (Dagevos et al., 2022). First-generation Dutch-Caribbean Dutch and Surinamese Dutch individuals have virtually no language issues.

**Education.** The education level of children of migrants from TMSA Dutch communities has substantially increased compared with the first generation (Dagevos et al., 2022; Huijnk, 2020). Yet differences exist within the TMSA groups. For instance, the share of highly educated<sup>1</sup> children of migrants is lower when both parents were born abroad, versus when only one of their parents was born abroad (Statistics Netherlands, 2022f). On average, children of migrants within the TMSA groups still have a lower education level than people without a migration background (Jongen et al., 2019; Statistics Netherlands, 2022f).

**Socioeconomic position.** Because of these changes in education level, children of migrants in the TMSA groups have significantly better access to the labour market and a better socioeconomic position than their parents (Huijnk, 2020). Employment rates of the TMSA groups remain, however, relatively low and job progression is notably slower than people without a migration background (Huijnk, 2020; Huijnk & Andriessen, 2016; Jongen et al., 2019). Discrimination on the labour market is one of the explanations (Andriessen et al., 2020; Thijssen et al., 2019), along with study choice, social network and cultural differences (Jongen et al., 2019).

#### *Generation*

We will solely be investigating migrants and children of migrants. Grandchildren of migrants – the third generation – are not counted as people with a migration background in register data. Besides, 85% of them were younger than 18 in 2016 (Statistics Netherlands, 2016). Around 15% of the children born in 2021 had one or two parent(s) from the second generation (Statistics Netherlands, 2022f).

#### *Period*

We study the behaviour of (children of) migrants from the past recent years. Nevertheless, the COVID-19 pandemic was a huge abnormality, and we want to

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<sup>1</sup> To describe the education followed, we use the terms 'low', 'medium' and 'high' education levels. However, we are aware that such a classification is loaded and does not do justice to the education that individuals have followed. One education level is not better than the other. However, we do not have a good alternative at the moment for situations where it is not possible to state the specific education followed (vocational training, university, etc.) separately.



avoid drawing conclusion based on data during the COVID-19 period. Therefore, we use data from 2018 and 2019 for the quantitative part. With respect to the qualitative part, we asked people to ignore the effects of the pandemic as much as possible when reflecting on their travel behaviour. This was possible because most of the interviews and all focus groups only took place in summer 2022, when most measures had been lifted (see chapter 2 for more details).

#### *Geographic scope*

We study travel behaviour in the Netherlands and not elsewhere. This also implies that we focus on daily mobility patterns. Long-distance trips abroad are out of our scope. See Mattioli and Scheiner (2022) for a recent study on the impact of migration background on air travel in the UK.

## 1.5 Approach

#### *Mixed methods*

This study uses a mixed-methods approach: we used both a qualitative and a quantitative track. Our main reason for doing so was the nature of our sub-research questions. A quantitative approach is more suitable for answering sub-research question 1 while a qualitative approach fits more sub-research question 2. Besides, the studies of Harms (2006) and Olde Kalter (2008) already illustrated the complementarity of both approaches. Our two approaches ran in parallel and influenced each other to some extent. The interview guideline was influenced by the first descriptive analyses of the quantitative data. In turn, the results from focus groups and interviews helped us generate hypotheses to test with quantitative data.

#### *Comparisons between Dutch people with and without a migration background*

In the quantitative approach, we make an explicit comparison between Dutch people with and without a migration background. It is important to note that differences in travel behaviour between people with and without a migration background **do not necessarily indicate the existence of a problem.**

By contrast, we have not interviewed Dutch people without a migration background in our qualitative approach. We have only interviewed Dutch people *with* a migration background. Indeed, our goal was to understand the underlying motivations for the travel behaviour of the TMSA groups, rather than to seek a comparison. As such, the points raised in our interviews and focus groups may also apply to Dutch people *without* a migration background. We relied on literature in order to put our insights from the qualitative approach into perspective.

## 1.6 Outline of the report

We start by explaining our approach in chapter 2, namely a mixed-method approach. The next chapters successively describe our main insights from our quantitative approach (chapter 3) and qualitative approach (chapter 4). We bring together these insights in our conclusion in chapter 5 and reflect on implications and potential future research possibilities.

## 2 Data and methods

This chapter discusses our quantitative approach first, and then our qualitative approach.

### 2.1 Quantitative approach

#### *Data*

The quantitative analysis relies on the Dutch national travel survey, ODiN. We chose to use ODiN (Onderweg in Nederland) because of its quality, representativeness, robustness (large sample size), additional mobility-related information (e.g., vehicle ownership) and socioeconomic characteristics. That makes it an ideal source for our analysis. Most importantly, we were able to link socio-demographic information to the dataset within the Statistics Netherlands microdata environment.

ODiN data is representative for the known population of the Netherlands at the national level. People with a migration background are known to be hard to reach in surveys. To ensure representativeness Statistics Netherlands oversamples Dutch individuals with a non-western migration background and includes a dedicated explanatory leaflet in the invitation letter (Statistics Netherlands, 2020b). In 2019, 12% of individuals in ODiN sample had a non-western migration background, compared to 13% in the overall population (Statistics Netherlands, 2023b). We checked the composition of the ODiN sample for the years we used against the composition of the Dutch population for the same years, focusing on age, gender and education level. Based on this, we conclude that ODiN is largely representative for the groups of individuals with a migration background studied here; see appendix A for more details. This enables us to analyse the mobility of migrants and children of migrants in a way that accurately reflects their situation. There may still be a few biases left that we cannot clearly detect with the variables we have access to. In particular, individuals with low Dutch language skills or with low digital skills may still be underrepresented in ODiN.

For the purposes of our study, we enriched the ODiN dataset with additional sources. Most importantly, we combined ODiN data with information from Statistics Netherlands microdata files. This allowed us to obtain migration-specific attributes, such as country of origin and main migration purpose. We also obtained spatial information from PBL Netherlands Environmental Assessment Agency data sources, such as distance to nearby stations and urban environment.

We used ODiN data for the full years 2018 and 2019 to avoid measuring impacts from mobility changes caused by the COVID-19 pandemic, as our goal was to understand mobility differences in a more stable context. Both years are combined and treated as a single cross-sectional sample.

The ODiN data for 2018 and 2019 combined has a total of 110,588 respondents. 21% of respondents in the sample have a migration background, versus 24% in the general population in the Netherlands (Statistics Netherlands, 2023b). 9% had a western migration background and 12% had a non-western migration background, as previously cited. Furthermore, we distinguish between the four commonly studied groups, namely Turkish Dutch, Moroccan Dutch, Surinamese Dutch and Dutch-Caribbean Dutch people. Sample characteristics are shown in table 2.1.

**Table 2.1** ODiN 2018 and 2019 sample characteristics by migration background, and associated number of trips

Country of origin	Number of respondents	Share of respondents in ODiN	Number of trips
Turkey	1,798	2%	3,917
Morocco	1,534	1%	3,569
Suriname	2,232	2%	5,536
Dutch Caribbean	940	1%	2,458
Other countries formally considered as non-western	6,449	6%	13,798
Country formally considered as western, except for the Netherlands	10,486	9%	28,095
The Netherlands	87,149	79%	259,763

Data is processed in a secure Statistics Netherlands environment. Results are exported – with the approval of Statistics Netherlands - without personal level information to avoid any disclosure risk.

#### *Method*

The quantitative approach primarily addresses sub-research question 1. Our main objective is to examine the relevance of a variety of migration backgrounds on aggregated mobility patterns, as well as differences in travel behaviour between people with different backgrounds. To make the concept of “travel behaviour” more tangible, we have developed four categories. Each category represents an important aspect of travel behaviour for which we selected several variables. These are the dependent variables that form the basis of the 11 models we use in our analysis to capture different aspects of travel behaviour (table 2.2).

- Category 1, entitled "Mobility", focuses on the presence or absence of trips, the total number of trips per person per day, and distance travelled per person. Participants who reported making a trip on the survey day were defined as not staying at home.
- Category 2, "Travel time and distances", investigates the average travel time and distance for various travel purposes, with a focus on commutes.
- Category 3, "Car Access", focuses on driving license ownership and car ownership. It is important to note that the car ownership data is based on personal ownership rather than household level ownership.
- Category 4, "Mode Use Frequency", looks at the frequency of transport mode use per day, such as the bike, the car, public transport (PT), and others. The mode frequency is based on respondents' self-reported data on transport mode usage over a relatively long term, typically a month. This is preferred over a one-day travel diary as the latter may not be representative of average travel behaviour.

We use a variety of explanatory statistical regression models to explain the variance of these different aspects of travel behaviour (table 2.2). We briefly discuss basic set up, important variables and type of regression models.

Since current transport models and planning implicitly assume that migration background has little or no relevance to travel behaviour, we wanted to check the extent to which this assumption makes sense. We started from the premise that we can explain a fair share of observed differences in travel behaviour *without* even having to use information about the migration background of people. We therefore

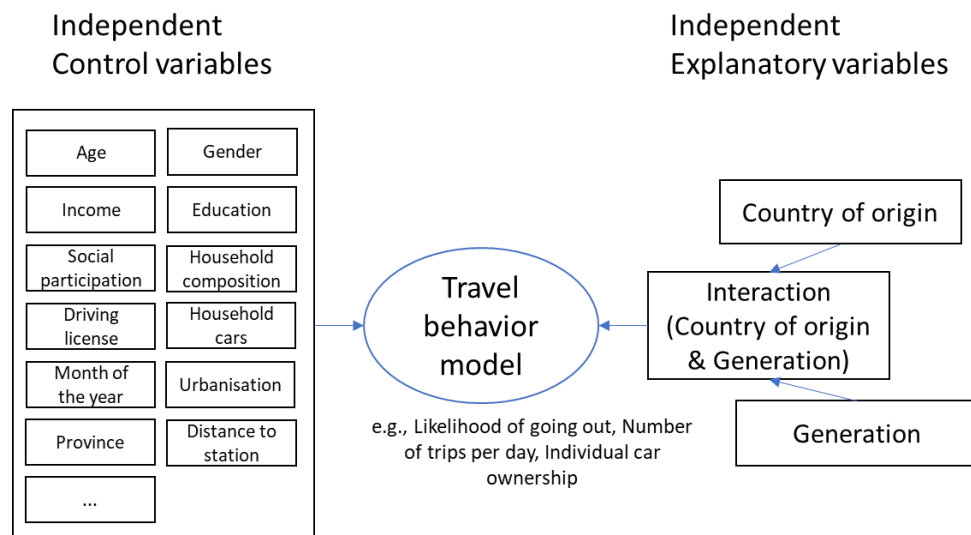
developed models with independent variables, like income and age, that are known to explain differences in travel behaviour. We then improved these models<sup>2</sup> following an iterative process. Subsequently, we added explanatory variables related to individual's migration background, namely country of origin and generation (figure 2.1). Then, we checked their contribution to the model, relative to other explanatory variables. Note that our approach is opposite to that used by Harms (2006): he started by looking at the importance of migration background and then added alternative explanations.

The main explanatory variable related to individuals' migration background is the interaction of one's country of origin with one's generation. We called it the migration background variable, or simply migration variable. This interaction variable contains thirteen categories: six regions of origin times two generations, plus people without a migration background. The latter is used as the default reference category. A reference category is not a norm or a goal, but a statistical necessary.

In addition to analyses based on the main explanatory variable, we also studied the effect of country of origin and generation separately, in order to get a better understanding of the importance of the country of origin or generations. Next, we also looked at within group differences, by interactions of the main explanatory variable with other variables, like gender.

The selection of the other independent variables is based on factors known to influence the travel behaviour aspect under study in each model. These variables cover personal or household characteristics, situational and contextual characteristics. These variables are called *control variables* from here onward. An overview of these control variables is presented in table 2.3.

**Figure 2.1** The concept behind our travel behaviour models



The selected model specification is based on the nature of our dependent variables. For binary variables (e.g., whether individuals leave their house on a survey day, ownership of a driving license or car), a binary logit model is used to estimate the probability of the event occurring (Gelman & Hill, 2006). For integers or count

<sup>2</sup> In cases where we have to choose between variables with similar attributes or decide which independent variables give a better fit, we use Schwartz's Bayesian information criterion (BIC) (Schwartz, 1978).

variables (e.g., number of trips per day), a Poisson regression model is used (Agresti, 2002). For continuous (interval) variables (e.g., travel time and travel distance), an ordinary least squares (OLS) regression model is used, while the dependent variable is transformed to ensure a normal distribution of the standard errors (Kutner et al., 2005). For variables that represent proportions or fractions (e.g., fraction of days over a year that a person uses a certain transport mode), a fractional logit model is suitable (Papke & Wooldridge, 1996).

We use log-likelihood as a variable importance measure to determine the relevance of each independent variable in a travel behaviour model. This measure helps us compare the independent explanatory variable, the migration background variable, to the independent control variables in terms of their importance for the model. Since the models are nested (one model is a reduced version of the other), a likelihood ratio tests is more appropriate than the BIC (Agresti, 2002). Overall, the more a model relies on a variable to explain differences in outcomes, the more important that variable is for the model.

Our approach identifies what migration background (country or origin and generation) adds in terms of explanation of each selected aspect of travel behaviour, once variables that are usually taken into account are considered. It is important to stress that our approach can under- or overestimate the importance of migration background by overcontrolling for known factors that are related to travel behaviour (Pearl & Mackenzie, 2019). Indeed, migration background can also affect the factors we try to control for. For example, it is well-documented that migration background is related to labour participation (Jongen et al., 2019). People with a migration background spend more time finding a job and get more easily rejected (Andriessen et al., 2010; Jongen et al., 2019). Therefore, the labour participation variable (called here *social participation*, see table 2.3) will also capture some of the variance related to migration background.

This is why the contributions of migration background (interaction of country of origin and generation) to explain the dependent variable both with and without other control variables are interesting to know. The relative importance of our migration background variable is obtained with a log-likelihood ratio test. This test measures how much the model fit changes when the migration background variable is excluded, providing an estimate of its contribution to the model's performance. We can normalise results, which allows us to get the relative importance of the variable as a proportion of the total reduction in error. Our bandwidth analysis, i.e. the relative contribution of the migration background variable with and without controlling for other factors, is shown in section 3.5.

The marginal effects of the migration background variable and outcomes of the variable importance measure are presented to illustrate the model results. The marginal effects of the migration background variable show how travel behaviour differs between Dutch individuals with and without a migration background. Specifically, the marginal effects of migration variable tell us how travel behaviour changes when the migration variable changes from individuals without a migration background to individuals with a migration background, while holding everything else in the model constant. Outcomes of the variable importance measure tell us how important the impact of the migration background variable is on each analysed travel behaviour aspect. The detailed model estimations of all models are shown in appendix B.

**Table 2.2** Travel behaviour categories and model specifications

Category	Dependent variable	Data selection	Type of model	Number of obs.	Number of control variables

<b>Mobility</b>	<b>Go out</b>		All	Binary logit	110588	14
	<b>Number of trips per day</b>		Participants with trips	Poisson	94228	14
	<b>Total distance per day</b>		Participants with trips	OLS	94228	16
<b>Travel time and distance</b>	<b>Commuting</b>	Distance	All home to work trips for participants younger than 70 years old.	OLS	23416	11
		Travel time		OLS	23416	11
	<b>(Grocery) shopping</b>	Distance	All home to shopping or grocery shopping trips	OLS	22206	14
		Travel time		OLS	22206	14
	<b>Leisure</b>	Distance	All home to leisure trips	OLS	50764	14
		Travel time		OLS	50764	14
<b>Car Access</b>	<b>Driving license</b>		Participants older than 18	Binary logit	93209	8
	<b>Individual car ownership</b>		Participants older than 18, with driving license	Binary logit	78537	11
<b>Mode Use Frequency</b>	<b>Frequency of car use</b>		All	Fractional Logit model	110588	11
	<b>Frequency of bicycle use</b>		All	Fractional Logit model	110588	12
	<b>Frequency of PT use</b>		All	Fractional Logit model	110588	14

Table 2.3 Definition of the independent variables

	Variable names	Description
<b>Independent control variables</b>		
Personal or household characteristics	Age	Categorical variables with 11 groups. 6-11, 12-17, 18-24, 25-29, 30-39, 40-49, 50-59, 60-64, 65-69, 70-79, >79. Source: ODiN
	Gender	Dummy variable, male and female. Source: ODiN
	Income	Categorical variables with 6 groups. From low to high levels with an unknown group. Source: ODiN
	Education	Categorical variables with 3 groups, low, middle and high education groups. Source: ODiN
	Social participation	Categorical variables with 6 groups: full-time job, part-time job, student, retired, unemployed and others. Source: ODiN
	Household composition	Categorical variables with 7 groups: single household, couple household, couple with 1 or 2 children under 12 years old, couple with more than 2 children under 12 years old, single household with 1 or 2 children under 12 years old and single household with more than 2 children under 12 years old, and the rest. Source: ODiN
	Household cars	Dummy variable, household with a car/cars or household without a car. Source: ODiN
	Driving license	Dummy variable, person with driving license or person without driving license. Source: ODiN
Situational aspects	Week	Categorical variables with 7 levels, which are the days of the week. Source: ODiN
	Month	Categorical variables with 12 levels, which are the 12 months of a year. Source: ODiN
	Holiday	Dummy variable. Source: ODiN
Contextual aspects	Province	Categorical variables with 12 levels, which are the 12 provinces in the Netherlands. Source: ODiN
	OAD (omgevingsadressendichtheid)	Continuous variable. This variable is a measure of urbanity. It is the number of addresses within a circle of one kilometre around that address. Source: ODiN
	Ground Space Index (GSI)	Continuous variable. The GSI indicates what proportion of an area is built-up. Source: PBL

Mixed Use Index (MXI)	Continuous variable. MXI is the ratio between living and non-living areas. Source: PBL
Open Space Ratio (OSR)	Continuous variable. OSR is an internationally used indicator for the "building pressure" on undeveloped space, and it can be understood as an indicator for the intensity of use of public space. Source: PBL
FSI (Floor Space Index)	Continuous variable. The FSI shows how the floor area (the area of all floors together) relates to the terrain area, regardless of the function and regardless of the intensity of use. Source: PBL
Layers (L)	Continuous variable. L stands for the average number of building layers. Source: PBL
Distance to station	Continuous variable, distance as the crow flies (m) to nearest intercity train station. Source: PBL
Distance to centre	Continuous variable, distance as the crow flies (m) to the nearest centre of a metropolitan area. Source: PBL
Distance to highway	Continuous variable, distance as the crow flies (m) to the nearest entrance or exit of highway. Source: PBL
<b>Independent explanatory variables</b>	
Country of origin	Categorical variables with 7 levels: TMSA groups, other individuals with a non-western migration background, individuals with a western migration background and individuals without a migration background. Source: Statistics Netherlands microdata
Generation	Categorical variables with 3 levels: migrants (first generation), children of migrants (second generation) and people without a migration background. Source: Statistics Netherlands microdata
Interaction of generation and country of origin	Categorical variables with 13 groups. The interaction of country of origins and generation. Source: Statistics Netherlands microdata

## 2.2 Qualitative approach

The qualitative part of the research primarily addresses sub-research question 2, and also serves to give insights to answer sub-research questions 1 and 3. As such, our main goal was to examine motivations underlying the current travel behaviour of the TMSA groups. We used both focus groups and interviews, as explained below. Both methods have a unique set of participants. The consultancy agency Motivaction was responsible for recruiting participants and conducting the field work, in coordination with KIM.

### *Selection and grouping of participants*

The focus groups covered the main part of the qualitative fieldwork. Focus groups are ideal to address a particular topic among a group where interaction among participants is valuable (Lune & Berg, 2017). In our case, interactions add value because we asked participants to bring up prevalent perspectives regarding various transport modes in their communities. They were conducted in Dutch.

We selected and grouped participants into focus groups based on five main criteria: country of origin, gender, age, education level and place of residence.

- Regarding country of origin, we chose to keep individuals with Turkey and Morocco as a country of origin together, and individuals with Suriname and the Dutch Caribbean as a country of origin together. Note that in the case of children of migrants, this is the country of origin of their parent(s) (as explained in section 1.3). Such a grouping is relatively common in Dutch research when individuals within the TMSA groups need to be clustered.
- In terms of gender, we wanted to involve both male and female participants, and to keep them separate from each other. We deemed such separation relevant as previous research shows that female and male (children of) migrants usually display a different travel behaviour (Harms, 2006; Olde Kalter, 2008).
- Regarding age, we aimed to involve both adult migrants and adult children of migrants, and to keep them separate. For first-generation Dutch individuals in particular, we aimed for variation in terms of age upon arrival in the Netherlands as well. Our assumption is that immigrating as a young

child or as an adult makes a difference in terms of how individuals appropriate various travel modes in the Netherlands.

- We kept each group relatively homogenous and representative in terms of education level. That meant selecting first-generation Dutch individuals with a lower or a middle education level and second-generation individuals with a middle or a higher education level (see details in appendix C).
- We sought to have participants coming from various urban areas in the Netherlands. 50% of the TMSA groups live in the ten most populated municipalities in the Netherlands, against only 16% of people without a migration background (Statistics Netherlands, 2022a).

Because we wanted to involve individuals who may not be comfortable with speaking in Dutch, we complemented these focus groups with interviews. These were conducted in the mother tongue of each participant. As table 2.4 shows, first-generation Dutch individuals involved in our study can be split into two groups: a younger one and an older one (figure 2.2).

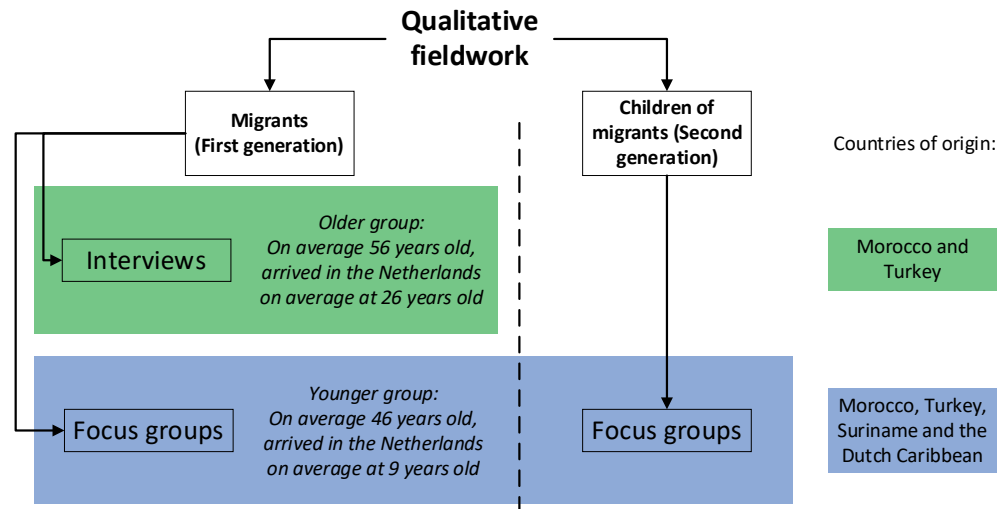
We organised eight focus groups with four to five participants as well as ten single interviews. In total, 46 respondents participated in this part of the research. Table 2.4 details the composition of both focus groups and interviews.

**Table 2.4** Overview of the composition of the focus groups and interviews

Focus group (FG) or Single interview (SI) number	Country of origin of individual or parents	Generation and age range (age range upon arrival in the Netherlands)	Gender	Amount of participants
FG1	Turkey & Morocco	Migrants, 38-51 (2-17)	Female	5
FG2	Turkey & Morocco	Migrants, 38-51 (0-14)	Male	4
FG3	Suriname & the Dutch Caribbean	Migrants, 36-60 (0-13)	Female	4
FG4	Suriname & the Dutch Caribbean	Migrants, 39-54 (0-29)	Male	5
FG5	Turkey & Morocco	Children of migrants, 20-35	Female	5
FG6	Turkey & Morocco	Children of migrants, 23-35	Male	5
FG7	Suriname & the Dutch Caribbean	Children of migrants, 26-39	Female	4
FG8	Suriname & the Dutch Caribbean	Children of migrants, 32-37	Male	4
I1 I2 I3	Turkey	Migrants, 55-59 (19-28)	Female	3
I4 I5	Turkey	Migrants, 51-63 (23-34)	Male	2
I6 I7 I8	Morocco	Migrants, 59-60 (17-33)	Female	3
I9 I10	Morocco	Migrants, 55-62 (32-35)	Male	2



**Figure 2.2** Overview of the countries of origin and generations of individuals involved in focus groups and interviews



#### Setup of the interviews and focus groups

In both focus groups and interviews we used a discussion guide to structure the meetings. Focus group participants were prompted before the start of discussions by filling in a form about their weekly activities outside of home, which travel mode they use and what their favourite transport mode is. The discussion guide itself placed emphasis on the attitudes of the TMSA groups towards different transport modes; see appendix D. In short, the discussion provided insights into:

1. The participants' attitudes towards the car, public transport, bike and walking.
2. The social norm towards the same four modes in the participants' community. Their community was understood as their family and friends.
3. The evolution of the participants' attitudes over the years (mobility biographies approach).
4. The participants' attitudes towards recent transport mode developments (electric bikes, shared cars, bikes and scooters).

Interviews and focus groups were led by either a woman or a man, matching participants' gender. Focus groups took place in June and July 2022 and lasted approximately 90 minutes. Interviews took place in November 2021, in June and in September 2022 and lasted between 30 and 60 minutes. We had originally planned to conduct all of the fieldwork in November 2021 but had to pause due to the sharp increase in COVID-19 infections and new restrictions.

Interviews and focus groups took place face-to-face. We wanted to minimise distraction from other household members or tasks and to foster a group dynamic. Interviews took place either at the respondent home or at the Motivaction office in Amsterdam. All focus groups took place at the Motivaction office. The trade-off we had to make to allow for face-to-face interviews is that the geographical spread of participants remained limited to the Randstad. Despite greater incentives for participants living outside of North-Holland, around two thirds of participants came from North-Holland and half from Amsterdam itself. We acknowledge that this creates a bias in our data and indicate in the analysis where we believe it may have influenced results.

### *Analysis*

Our analysis is mainly based on verbatim transcripts. Interviews were translated from the mother tongue to Dutch before the analysis. The analysis itself was assisted by qualitative data analysis software called Atlas.web.

We conducted the analysis and subsequently coded transcripts through the lens of two theoretical frameworks: the motility framework (Kaufmann et al., 2004) and the framework presented by Steg (2005) to explain car use. We coded transcripts using a deductive approach, and we coded per transport mode (car, public transport, bike, walking, shared mobility).

The codes we used per transport mode were directly derived from these frameworks, explained below and shown in figure 2.3. The motility framework can be seen as the main framework, and the framework by Steg (2005) as a complement (see figure 2.3). The reason why we wanted to include the latter is that it provided us with more structure to examine the concept of appropriation. Nevertheless, we kept a code called "Other" for instances that would fall under the code "Appropriation", but not under the framework of Steg (2005). Where relevant we enriched our analysis with our own memos from the focus group meetings and discussions with the focus group and interview leaders.

**Motility** is a way of understanding mobility based on three interdependent factors, that taken together, define the potential to be physically mobile. These three factors are:

- Access, which depends on the concept of the service itself. Costs, ticket prices, schedules, owning a vehicle, vehicle design: these aspects can all influence access to a mode.
- Skills, referring to the (potential) traveller's competences. This factors includes both acquired knowledge and organisational capacities to plan for activities (Flamm & Kaufmann, 2006).
- Appropriation, which is about what individuals do with access and skills. The appropriation of a transport mode is linked with the assimilation of standards and values prevalent in the dynamic spatial and social contexts in which people's life course unfolds (Flamm & Kaufmann, 2006).

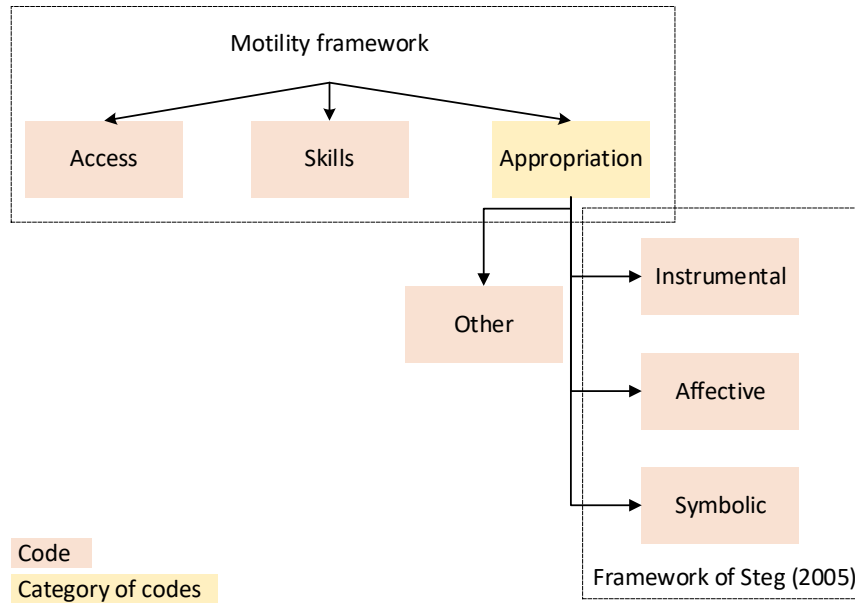
The concept of motility is used to understand the (lack of) use and adoption of various transport modes, from cars (Musselwhite & Curl, 2018) to bikes (van der Kloof et al., 2014) and public transport (Bastiaanssen, 2012). It is a relatively well-known concept in Dutch bike policy spheres (de Gijt et al., 2018).

In addition to the concept of motility, we use the **framework by Steg (2005)**. She proposed to explain car use based on three main reasons:

- An instrumental motive, linked with the speed, flexibility, convenience, safety, privacy and costs of a car,
- An affective motive, consisting of liking cars and experiencing forms of arousal and pleasure while using them,
- A symbolic motive, linked with social norms, comparison with others and expressing who you are as a person while using a car.

Although originally presented to explain car use, this framework has since been extended to explain the use of other transport modes, like public transport (Sevillano et al., 2010).

**Figure 2.3** Frameworks and codes used in our qualitative data analysis



### Reporting

While these frameworks helped us organise our findings, we do not explicitly refer back to them in the reporting of our results (chapter 4) so as to give our empirical material a central place.

Literature also plays an important role in our reporting of our qualitative analyses. Indeed, we did not use a reference group (e.g. people without a migration background), contrary to the quantitative approach. Therefore, previous studies helped us to contextualise the patterns that we saw in the data.

In chapter 4, quotations are provided both in Dutch and in English. We translated the quotations in English based on the Dutch transcripts. Some quotations have been lightly adapted in order to make them more readable. Each quotation is followed by a focus group or interview number that refers to table 2.4.

### 3 Insights from the quantitative analysis

**Information on people’s migration background – their country of origin and their generation – proves important to understand multiple aspects of travel behaviour. There is a large diversity of travel behaviours among individuals with a migration background. To summarise the main trends, migrants and children of migrants tend to be less mobile, to have a longer commute and to be less likely to have a driving license than people without a migration background. Their use of public transport tends to be more frequent, and they tend to cycle less frequently than people without a migration background. Second-generation Dutch individuals are usually between first-generation Dutch individuals and people without a migration background on multiple travel behaviour aspects. They are closer to either one of these groups depending on the specific travel behaviour aspect and the country of origin. Additionally, gender differences are sometimes notable within first-generation Dutch individuals.**

In this chapter we discuss results based on the four categories of travel behaviour aspects described in previous chapter, and end with a discussion.

#### 3.1 Migrants and children of migrants less mobile

Second- and especially first-generation Dutch individuals are less mobile than individuals without a migration background. They are less likely to travel on the survey day, they tend to make fewer trips when they do travel, and they tend to cover a shorter total distance per day.

The total picture is more nuanced among second-generation Dutch individuals than it is among first-generation individuals. Children of migrants with a Surinamese, Dutch Caribbean or western migration background are closer to individuals without a migration background in terms of how mobile they are, than to the first generation, i.e. their parent(s) with the same country of origin. For instance, children of migrants with a western<sup>3</sup> migration background are just as likely to travel on a given day than individuals without a migration background (see figure 3.1). They also make as many trips per day as individuals without a migration background (see figure 3.2). For instance, if we zoom in on second-generation Surinamese Dutch people, they are significantly less likely to travel on a given day than individuals without a migration background. Yet their likelihood to travel is closer to that of individuals without a migration background than to first-generation Surinamese Dutch people.

Contrary to other groups of individuals with a migration background, second-generation Turkish and Moroccan Dutch people are closer to their parents on all aspects of mobility, than to individuals without a migration background. Like the first generation, second-generation Turkish and Moroccan Dutch people are significantly less likely to travel on a given day, they make significantly fewer trips when they do travel and they cover a significantly shorter total distance. Children of migrants with a non-western migration background other than TMSA are closer to their non-western parent(s) in terms of likelihood to travel, but when they do travel, they cover a distance just as long as individuals without a migration background (figure not shown).

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<sup>3</sup> See section 1.3 for an explanation on why we still make use of the labels “western” and “non-western” in this part of the study.

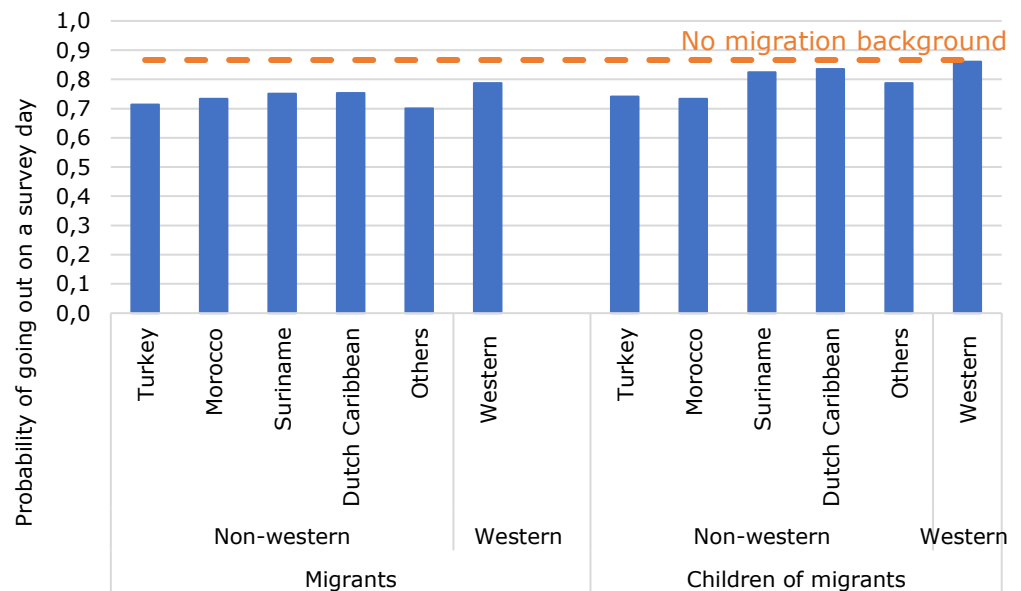
It is also worth noting differences among groups in terms of their mobility. Second-generation Turkish and Moroccan Dutch people are much less likely to travel on a given day than second-generation Dutch Caribbean and Surinamese Dutch people. This observation also applies to the first generation, albeit to a lesser extent.

Female migrants (i.e. first generation) with a Turkish, Caribbean Dutch or other non-western background, are less likely to leave home on a given day than their male counterparts. However, second-generation Dutch women tend to be just as mobile as their male counterparts. These results follow from an additional model (not shown) with an interaction effect between our main explanatory variable and gender.

**Box 3.1 Controlled differences between Dutch individuals with and without a migration background**

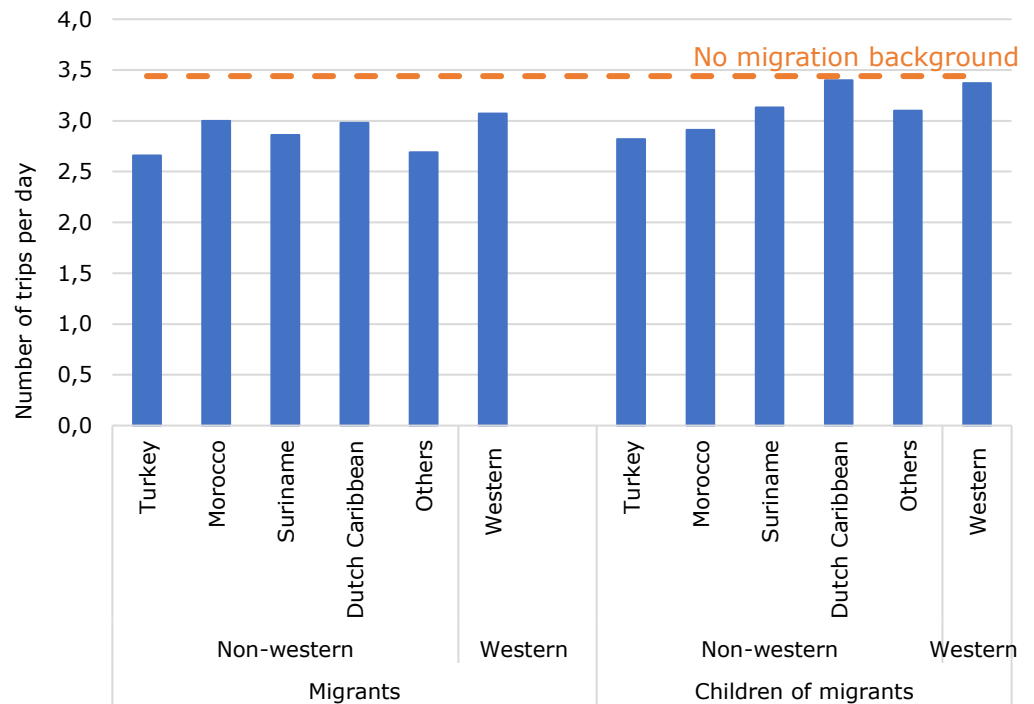
Each travel behaviour model includes a categorical variable that groups individuals by their migration background, i.e. country of origin and generation. The reference category for this variable is the group without a migration background. The differences in travel behaviour between Dutch individuals with and without a migration background can be obtained for by examining the marginal effect of the migration variable in the given travel behaviour model. The marginal effect is a statistical concept that measures the change in the dependent variable associated with a one-unit change in an explanatory variable, while holding all other variables constant. In our case, the marginal effect of the migration variable can tell us how travel behaviour changes when the migration variable changes from “no migration background” to a migration background, while everything else in the model remains the same as average value. The independent variables in each model are displayed under each figure and explained in more details in section 2.1.

**Figure 3.1 Controlled differences between Dutch individuals with and without a migration background in terms of their probability to leave the house on a survey day**



The marginal effect of the migration background variable (interaction of generation and country of origin) represent the differences in likelihood of going out between groups with a migration background and the group without (reference category). In this model we controlled for: age, gender, income, education, social participation, household composition, household cars, driving license, week, month, holiday, OAD, OSR (Open Space Ratio), distance to highway.

**Figure 3.2** Controlled differences between Dutch individuals with and without a migration background for the number of trips per day



The marginal effect of the migration background variable (interaction of generation and country of origin) represent the differences in number of trips travelled per day between groups with a migration background and the group without (reference category). In this model we controlled for: age, gender, income, education, social participation, household composition, household cars, driving license, week, month, holiday, OAD, OSR (Open Space Ratio), distance to highway.

The statistically significant differences in terms of mobility between Dutch individuals with and without a migration background highlights how having a migration background can shape mobility patterns. For example, migration background (country of origin and generation) is just as important as the age variable in explaining the likelihood of leaving the house and the number of trips made per day. Having a migration background, including country of origin and generation, appears to be more important than variables related to work and education in explaining how mobile one is.

### 3.2 Longer distances

#### *Longer commutes*

In general, individuals with a migration background have significantly longer commuting distances compared to individuals without a migration background. This is especially true for first-generation people from the TMSA groups. First-generation Moroccan Dutch (+32%) and Dutch-Caribbean Dutch (+36%) people show the greatest deviation from individuals without a migration background (figure 3.3). Concretely, this means that when an average middle-aged, high-income and highly educated Dutch man without a migration background has a commute of 19 km, a first-generation Moroccan Dutch individual with similar characteristics would have a commute of 26 km. By contrast, a second-generation Moroccan Dutch individual with similar characteristics would have a commute of 23 km.

Second-generation Turkish and Surinamese Dutch individuals have commuting distances that resemble more that of individuals without a migration background (resp. +3% and 7% of commuting distances), than that of first-generation Turkish and Surinamese Dutch individuals. Within children of migrants, Dutch-Caribbean

Dutch individuals have the greatest deviation from individuals without a migration background (+43% of commuting distance). The finding that Dutch individuals with a migration background, and the first generation in particular, has longer commutes, is not new; see box 3.2.

There are multiple potential explanations for such differences in commuting distances. One potential explanation is the use of faster transport options. Those who have access to faster travel options are more likely to accept, and consequently cover, longer distances, as the theory of travel time constants would predict. Nevertheless, commuting times are not alike, but also significantly longer for all groups with a migration background, especially for the first generation. Another potential explanation would be a spatial mismatch between where people live and where they work (see e.g. Preston and McLafferty (1999)). Nevertheless, we lack robust evidence that spatial mismatch of homes and workplaces exist for Moroccan, Turkish, Dutch-Caribbean and Surinamese Dutch individuals.

Another explanation can be found in the discriminations Dutch people with a non-western migration background face on the labour market, as supported by Dutch scientific literature (Andriessen et al., 2010; van den Berg et al., 2017). This is particularly the case among individuals within the TMSA groups (Thijssen et al., 2019; Andriessen et al., 2020; Jongen et al., 2019) – which also tend to be the most investigated groups. Notwithstanding, our study does not allow us to directly draw a link between longer commutes within the TMSA groups on the one hand, and discriminations they face in the labour market on the other hand. Further research would be needed in order to clarify this link.

Note that our estimates with respect to commuting distance and travel time might be an underestimate, or overestimate, due to confounders (see section 2.1). We give an example here. In our models, we control for income as an alternative explanatory variable. Meanwhile, we know that migration background also affects income, as a Dutch person with a migration background is usually paid significantly less compared to a Dutch person without a migration background and similar education levels (Jongen et al., 2019). By controlling for income, the effect of migration background is therefore mitigated. See section 3.5.1 for a discussion on the contribution of migration background to explain commuting distance and other variables.

### Box 3.2 Longer commuting distances among migrants in national and international literature

#### *In the Netherlands*

Already in 2009, a Dutch study already indicated that migrants were more likely to have longer commutes than those without a migration background (Van Ham & Hooimeijer, 2009). The authors showed that both housing and labour markets were playing a role in these longer commutes. More recently, Zijlstra et al. (2018) used an extensive dataset with over 25,000 workers from 35 European countries and also showed that individuals with a migration background have significantly longer commutes than those without a migration background. Again, they controlled for many other factors such as income, age, followed education, sector, gender and workplace characteristics.

Still in the Dutch context, the contracts of individuals in the TMSA communities are shown to be more often short-term or flexible than that of individuals without a migration background (Dagevos et al., 2022). Yet a side effect of flexible labour markets can be lengthy commuting (Laß et al., 2023).

#### *International studies*

Canadian studies published in the past decades have shown that in general, individuals who have migrated within the past five years have longer commute distances than individuals who did not migrate in the previous five years (Axisa et al., 2012; Newbold, 2022). Increasing residential duration was shown to reduce commuting distance. Nevertheless, Newbold et al. (2017) found that some communities (including Black, Filipino, and South Asian communities) commute structurally longer and over longer distances, even after controlling for other factors.

Spanish studies have also found evidence that migrants travel longer and further away for work (Blázquez et al., 2010; Casado-Díaz et al., 2022). Casado-Díaz et al. (2021) concluded that this could be seen as a symptom of residential segregation and difficulties in employment accessibility experienced by migrants.

#### *Longer trips for shopping and leisure purposes, not for education*

Having a migration background is also strongly related to longer distances for (grocery) shopping trips and for leisure trips, as shown in figure 3.3. It is also related to longer travel times for both of these trip purposes (figure not shown). After controlling for all other factors, we find that Dutch individuals with a migration background generally travel longer for (grocery) shopping and leisure activities compared to Dutch people without a migration background. For instance, if a middle-aged, high-income and highly educated Dutch man without a migration background takes 9 mins to reach a (grocery) shopping destination, a first-generation Turkish Dutch person with similar characteristics would need 15 mins. A second-generation Turkish Dutch person with similar characteristics would need 12 min to reach a (grocery) shopping destination.

In general, we observe that children of migrants from the TMSA groups tend to resemble more migrants (i.e. first generation) from the TMSA groups than individuals without a migration background in terms of distances covered and travel times to reach (grocery) shopping and leisure destinations. Differences with individuals without a migration background also remain statistically significant from one generation to another. To name just one example, both first- and second-generation Surinamese Dutch persons travel over significantly longer distances to

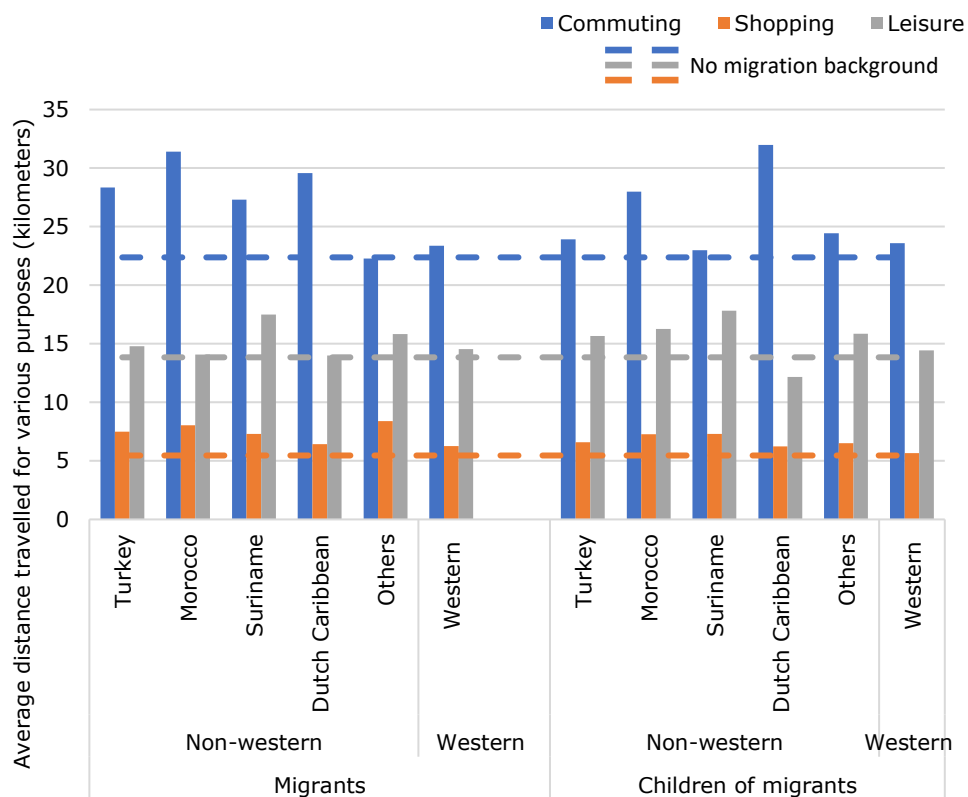


reach leisure destinations than Dutch persons without a migration background (+28%).

Additionally, we found that migration background (country of origin and generation) has a limited effect on the travel time and distances to reach school. This explains why this travel purpose is not shown in figure 3.3. Individuals with a migration background tend to have similar travel times and distances for education-related trips to individuals without a migration background.

Migration background is found to be one of the most important factors impacting (grocery) shopping distance and travel time, as well as leisure distance and travel time. Residential location, weekdays, and age are also important factors. These findings provide new evidence on the existence of extra travel times for Dutch individuals with a migration background. Note that we cannot compare these findings to previous ones; Harms (2006) had not investigated travel times and distances per trip purpose. He had solely investigated the number of trips per person per day when split into travel purposes.

**Figure 3.3** Controlled differences between Dutch individuals with and without a migration, for the travel distances of different travel purposes



The marginal effect of the migration background variable (interaction of generation and country of origin) represent the travel distance differences between groups with a migration background and the group without (reference category). In the commuting model we controlled for: age, gender, income, education, household composition, driving license, province, OAD, MXI (Mixed Use Index), distance to centre. In the (grocery) shopping model we controlled for: age, gender, income, education, social participation, household composition, driving license, week, holiday, province, OAD, OSR (Open Space Ratio), GSI (Ground Space Index), distance to centre. In the leisure model we controlled for: age, gender, income, education, social participation, household composition, driving license, week, month, holiday, province, OAD, MXI (Mixed Use Index), distance to highway.

### 3.3 Lower levels of driving license ownership

#### *First-generation individuals much less likely to have a driving license*

A general observation is that individuals with a migration background have lower rates of driving license ownership than individuals without a migration background. All groups of first-generation individuals are significantly less likely to own a driving license. Migrants with a western and those with a non-western migration background (other than TMSA) have particularly low rates of driving license ownership (figure 3.4). A possible explanation here is that some migrants may have driving licenses from their country of origin that are not registered in the Dutch system.

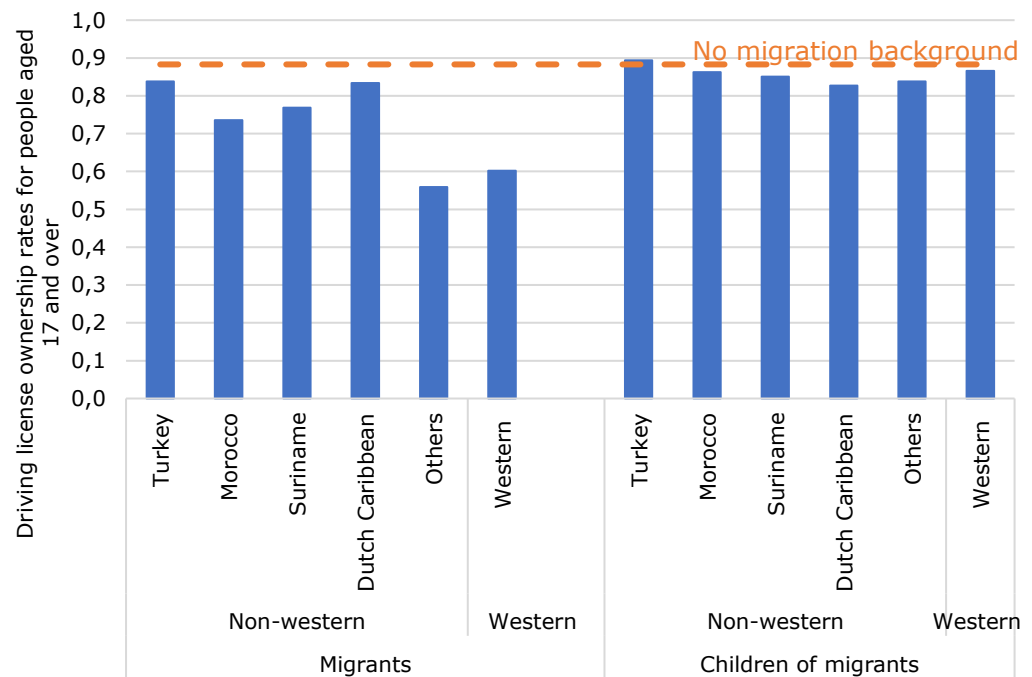
Children of migrants have a higher rate of driving license ownership compared to migrants. For instance, the likelihood of having a driving license is only 64% for first-generation Dutch individuals while it reaches 86% for second-generation Dutch individuals with a comparable socioeconomic background. In comparison, the likelihood of having a driving license is 89% for individuals without a migration background. Second-generation Dutch individuals are therefore closer to individuals without a migration background on this aspect. Second-generation Moroccan and Turkish Dutch persons even have the same rates of driving license ownership as individuals without a migration background.

The stark contrast between the first and second generation is probably linked with the fact that children of migrants have usually a significantly better access to the labour market and better socioeconomic position than their parents (Huijnk, 2020). This is notably due to the increasing education levels of the second generation (Huijnk, 2020; Statistics Netherlands, 2020a). This result about differences between generations confirms our finding from the qualitative analysis that children of migrants are usually strongly encouraged by their parents to get a driving license (see 4.1.2).

Migration background (the interaction of country of origin and generation) is one of the most important variables to help explaining the ownership of a driving license, after age, income, and education level. Harms (2006) had already found that individuals in the MSA groups were less likely to own a driving license after controlling for sociodemographic, socioeconomic and spatial characteristics. Turkish Dutch individuals were found to be an exception, as they were even more likely to own a driving license (men in particular). In our study, we find that this only holds for second-generation Turkish Dutch individuals, not for the first generation. The data Harms (2006) had used did not always allow him to see distinctions between migrants and children of migrants; our study therefore provides new insights into differences between generations.

Last but not least, we observed a gender discrepancy among first-generation Dutch individuals in terms of driving license ownership rates. In general, first-generation Moroccan, Turkish and Surinamese Dutch men have higher rates of driving license ownership compared to their female counterparts. Furthermore, we find that first-generation Dutch women have a lower driving license ownership rate than Dutch women without a migration background.

**Figure 3.4** Controlled differences for driving license ownership



The marginal effect of the migration background variable (interaction of generation and country of origin) represent differences in terms of ownership of driving license between groups with a migration background and the group without (reference category). In this model we controlled for: age, gender, income, education, social participation, household composition, OAD, L (building layers).

*Car ownership rates among those with a license relatively similar*

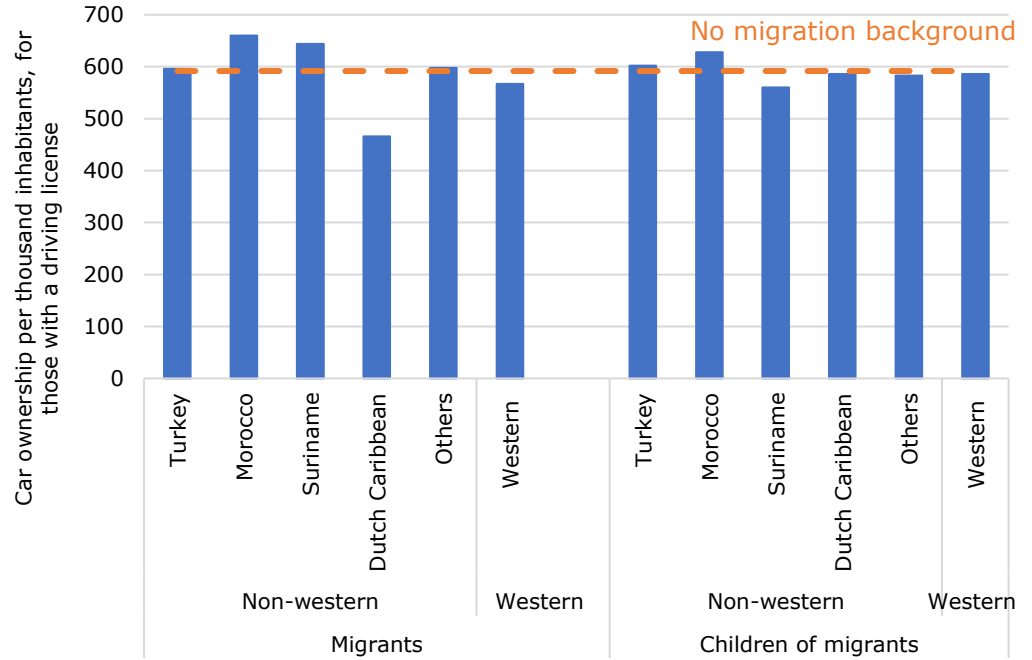
When we only consider people with driving licenses, individuals with a migration background tend to have car ownership rates similar to individuals without a migration background (see figure 3.5). Among those with a driving license, the ownership of a personal car is primarily influenced by variables such as gender, age, social participation, family situation, and income. However, migration background does not play a statistically significant role. Our analysis shows that, all else equal, licensed individuals with a migration background tend to have similar car ownership rates to licensed individuals without a migration background.

We can nonetheless identify a few differences, as shown in figure 3.5. First-generation Moroccan and Surinamese Dutch licensed individuals tend to have slightly higher car ownership rates than those without a migration background, while first-generation Dutch-Caribbean Dutch licensed individuals tend to have lower car ownership rates. In other words, the ownership of a driving license is more likely to lead to the ownership of a car among first-generation Surinamese and Moroccan Dutch persons, and less likely to lead to the ownership of a car among first-generation Dutch-Caribbean Dutch persons (compared with individuals without a migration background). Differences between individuals without a migration background and children of migrants are minimal.

While individuals with and without a migration background generally have similar car ownership rates, there is a gender discrepancy within groups of people with a migration background. First-generation licensed Dutch men have higher rates of car ownership than their female counterparts. Note that they already had higher rates of driving license ownership. On the contrary, second-generation licensed Dutch men tend to have lower rates of car ownership than second-generation licensed Dutch women, while no differences was observed in terms of driving license

ownership. This suggests that second-generation Dutch women tend to get a driving license when they really need to have a car and drive.

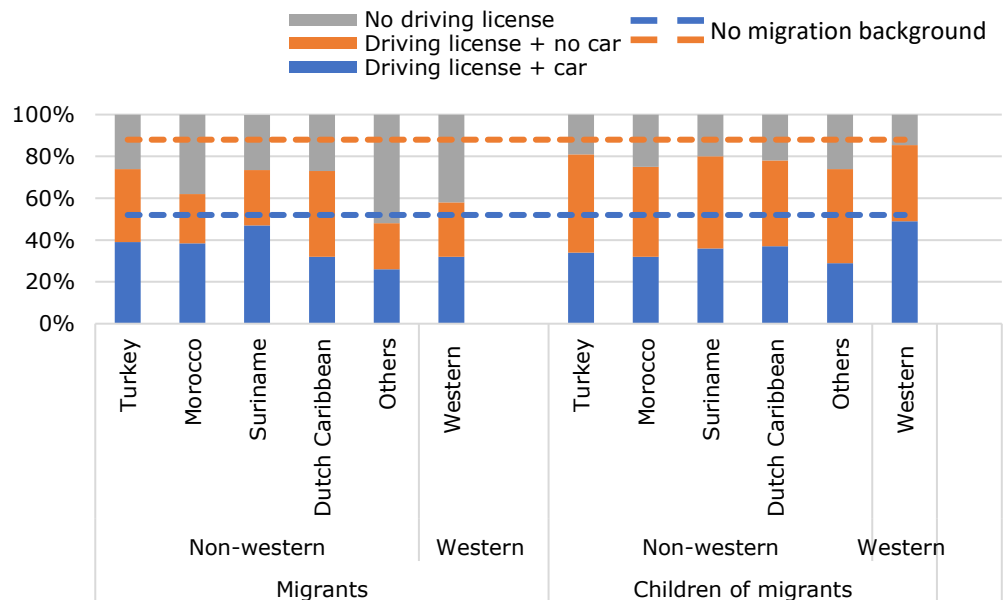
**Figure 3.5** Controlled differences between Dutch individuals with and without a migration background in terms of car ownership, for those with a driving license



The marginal effect of the migration variable (interaction of generation and country of origin) represent the car ownership differences between licensed individuals with a migration background and licensed individuals without (reference category). In this model we controlled for: age, gender, income, education, social participation, household composition, province, OAD, OSR (Open Space Ratio), FSI (Floor Space Index), distance to centre.

Figure 3.6 shows both driving license and car ownership rates across all studied groups. Children of migrants with a western migration background (right-most column) are the individuals closest to people without a migration background.

**Figure 3.6** Driving license ownership and car ownership of Dutch individuals with and without a migration, above 18 years old.



### 3.4 Frequencies of mode use: less biking, more public transport usage

#### *Less frequently on the bike*

Our analysis of bike use frequency reveals a significant impact of migration background on bike usage. Migration background is the second most important variable to explain bike use frequency, preceded only by age. When controlling for all other factors, we find that all individuals with a migration background tend to cycle less frequently than those without a migration background, regardless of generations.

This observation on a lower bike use is particularly pronounced among the TMSA groups. The only exception are second-generation Dutch-Caribbean Dutch individuals. They cycle more than other individuals with a migration background (see figure 3.9). A possible explanation for this exception is that of the four traditional groups, first-generation Dutch-Caribbean Dutch individuals are the most likely to marry a partner without a migration background (around one third of them), followed by Surinamese Dutch individuals (around one fourth of them) (Statistics Netherlands, 2022f). This may contribute to explain why children of migrants with a Dutch Caribbean background are the only children of migrants in the TMSA groups whose cycling behaviour is closer to that of people without a migration background, than to first-generation Dutch-Caribbean Dutch individuals.

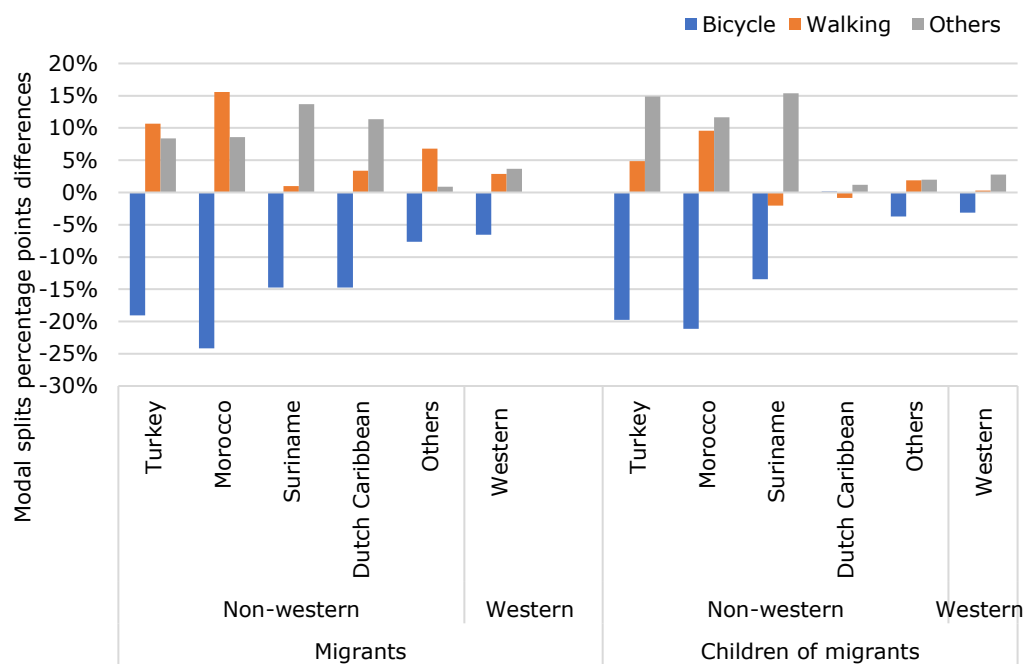
Children of migrants with another non-western migration background than TMSA and children of migrants with a western migration background are also closer to people without a migration background in terms of their cycling frequency (see figure 3.9). Besides, De Haas and Hamersma (2020) showed that the gap in cycling frequency between individuals without and with a migration background has been closing over the past decade.

Furthermore, we observed a gender discrepancy within individuals with a migration background in terms of bike use. In general, first-generation Dutch men from the TMSA Dutch communities tend to bike more often than their female counterparts. Second-generation Turkish and Moroccan Dutch men tend to bike more often than their female counterparts too, but Dutch-Caribbean and Surinamese Dutch men bike just as much as their female counterparts. Harms (2006) had already noted the existence of such gender differences.

Harms (2006) had also already shown that, in general, individuals in the TMSA Dutch communities cycle less than individuals without a migration background (even after controlling for other factors). In addition, he had found that Turkish Dutch individuals were the least likely to cycle of all individuals in the TMSA groups. Our analysis shows that both Turkish and Moroccan Dutch individuals are less likely to cycle.

To understand whether individuals in the TMSA groups substitute their cycling trips for walking, we estimated a separate modal choice model for trips under 2.5 km. Although individuals in the TMSA groups have a higher share of walking trips compared to people without a migration background, this difference does not fully compensate for the lower number of cycling trips. Their bike share for trips under 2.5 km is 20 percentage points lower than individuals without a migration background, but their walking share is only 10 percentage points higher than individuals without a migration background (figure 3.7). Therefore, walking only compensates for half of the low number of cycling trips, while other modes of transportation make up the rest (public transport and the car notably). Besides, individuals with a migration background do fewer trips anyway (see 3.1). Second-generation Dutch individuals tend to walk even less, and prefer to use other transport modes to compensate for the lower number of cycling trips.

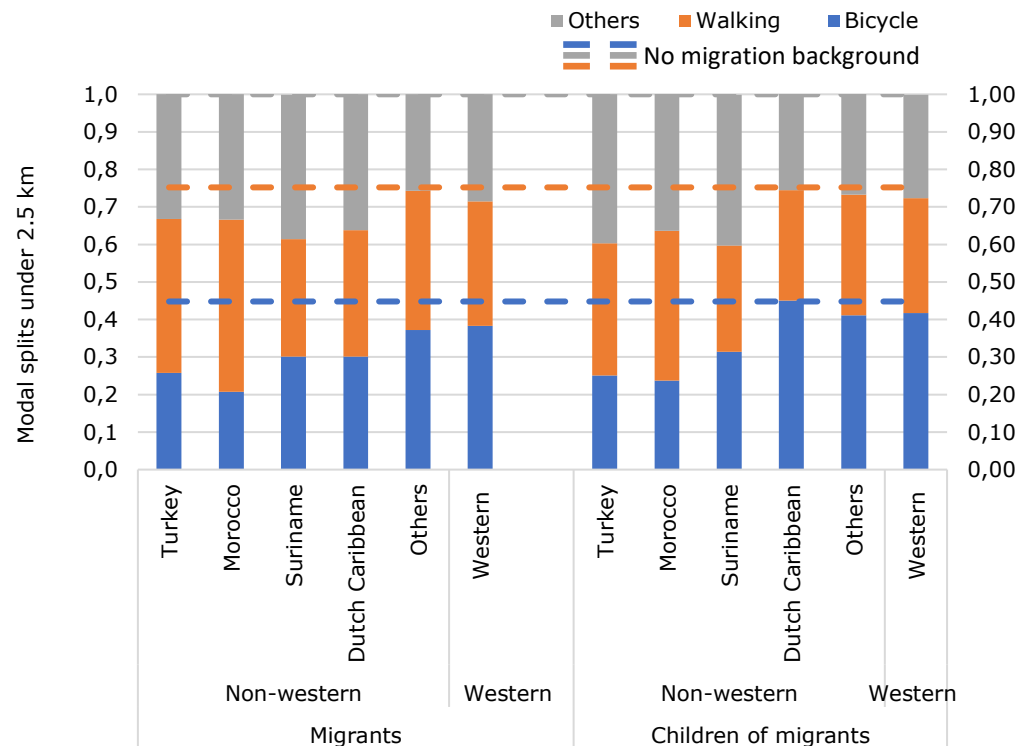
**Figure 3.7** Modal split percentage points difference between individuals with and without a migration background from trips less than 2.5 km



The modal split percentage point differences between individuals with and without a migration are derived from modal share model. In the model we controlled for: age, gender, income, education, social participation, household composition, driving license, household cars, week, month, holiday, province, OAD, MIX (Mixed Use Index), OSR (Open Space Ratio), distance to centre.

Figure 3.8 displays the modal split for all groups of individuals. While differences between groups of individuals with a migration background are statistically significant, differences between generations are minimal. This means that the modal split for trips under 2.5 km does not vary much between the first and second generations. In general, we see that Moroccan Dutch individuals and people with a non-western background other than TMSA tend to substitute most of their cycling trips with walking. Surinamese Dutch individuals show a lower likelihood to walk instead of cycling.

**Figure 3.8 Differences in modal splits between Dutch individuals with and without a migration background, for trips under 2.5 km**



The modal split differences between individuals with and without a migration are derived from our modal share model. In the model we controlled for: age, gender, income, education, social participation, household composition, driving license, household cars, week, month, holiday, province, OAD, MIX (Mixed Use Index), OSR (Open Space Ratio), distance to centre.

#### Using more often public transport

Migration background has a major impact on the frequency of public transport use, particularly on the frequency of bus, tram and metro use. However, its impact on train use is relatively less significant. Factors such as age and employment status still have a greater impact on the use of PT. All groups of individuals with a migration background tend to use PT more often than individuals without a migration background (see figure 3.9). As usual, we control for other factors, including contextual aspects such as the density of addresses in the place of residence. In general, first-generation Dutch individuals tend to use public transport more frequently than second-generation Dutch individuals from the same country of origin. Children of migrants with a non-western migration background other than TMS and those with a western migration background resemble more individuals without a migration background in terms of their PT use. Children of migrants with a western migration background are the closest to individuals without a migration background. In other words, of all of the groups with a migration background, they are the ones with the lowest public transport use.

Zooming in on the TMSA Dutch communities, results indicate that Dutch-Caribbean and Surinamese Dutch individuals tend to use PT more frequently than Turkish and Moroccan Dutch individuals. This finding is true across both generations, but differences in PT use are smaller among children of migrants. Harms (2006) had already observed differences in terms of PT use between Dutch-Caribbean and Surinamese Dutch individuals on the one hand, and Turkish and Moroccan Dutch individuals on the other hand. Additionally, there is no difference in PT use between first- and second-generation Moroccan Dutch individuals. The same applies for

Turkish Dutch individuals. For both countries of origin, children of migrants use PT just as much as migrants.

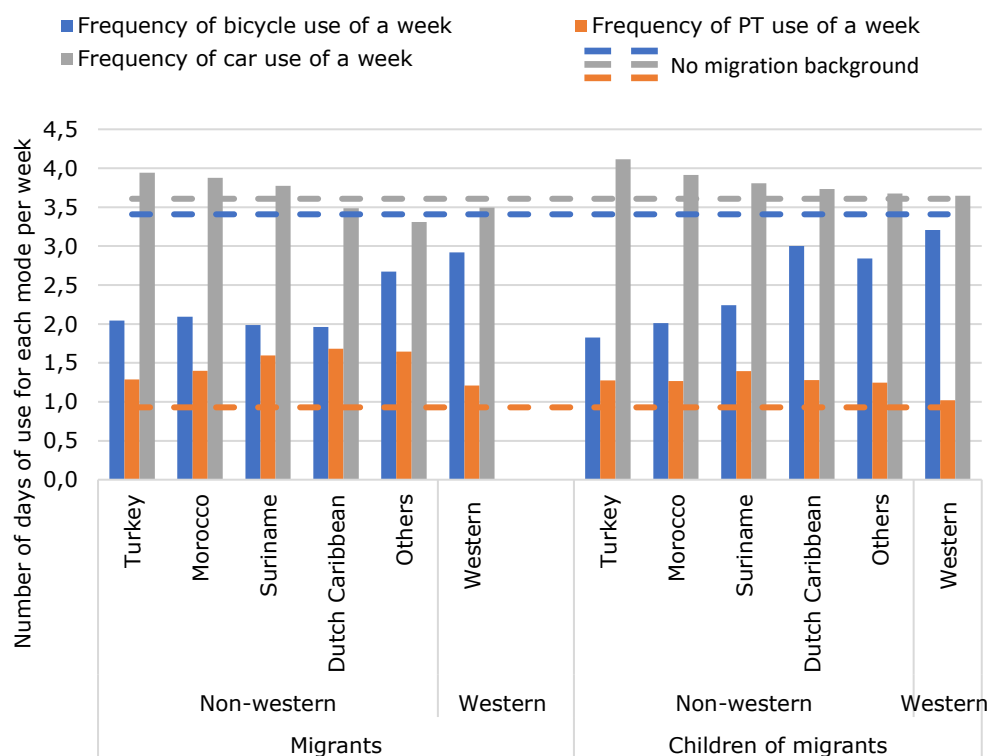
Furthermore, there is a gender discrepancy within migrants and children of migrants in terms of PT use frequency. Unlike bike usage, men in the TMSA groups tend to use PT less frequently compared to women. Again, this finding aligns with the results of Harms (2006).

*Similar levels of car use*

Although we see clear differences in the bicycle and public transport use frequency, the difference in car use frequency is not as marked between people with and without a migration background. In fact, there are hardly any differences. We also do not observe statistically significant gender discrepancies among individuals with a migration background (note that we do not distinguish between car drivers and passengers).

The only statistically significant differences are that Moroccan and Turkish Dutch persons tend to use cars slightly more often than people without a migration background. Harms (2006) had already found that Turkish Dutch persons were more likely to use the car than people without a migration background, after controlling for other factors. However, he had found no differences in car use between Moroccan Dutch individuals and individuals without a migration background.

**Figure 3.9** Controlled differences between Dutch individuals with and without a migration background for the frequency of use of various modes



The marginal effect of the migration variable (interaction of generation and country of origin) represent the differences in frequency of transport mode use between groups with a migration background and the group without (reference category). In the frequency of bicycle use model we controlled for: age, gender, income, education, social participation, household composition, house cars, province, OAD, MXI (Mixed Use Index), L (building layers), distance to centre. In the frequency of PT use model we controlled for: age, gender, income, education, social participation, household composition, household cars, province, OAD, MXI (Mixed Use Index), L (building layers), OSR (Open Space Ratio), distance to highway, distance to station. In the frequency of car use model we controlled for: age, gender, income, education, social participation, household composition, household cars, province, OAD, MXI (Mixed Use Index), distance to station.



### 3.5 Discussion: migration background does matter

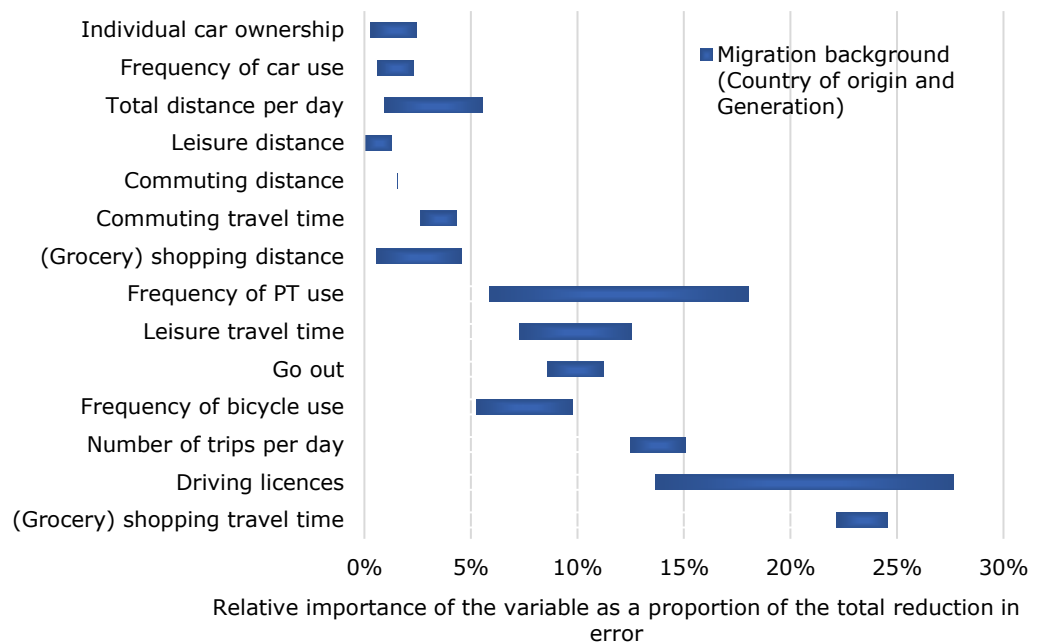
#### *The relative importance of information about migration background*

One's migration background, namely one's country of origin and generation, affects multiple aspects of travel behaviour. In our statistical analyses, migration background regularly emerges as one of the main factors involved. This finding is not new in international literature; see Delbosc and Shafi (2023) and Mattioli and Scheiner (2022) for recent examples. For instance, first-generation Dutch individuals tend to be less mobile, even after controlling for many factors. Harms (2006) had also found that individuals in the TMSA groups were less likely to be mobile than individuals without a migration background. However, upon controlling for socioeconomic, sociodemographic and spatial characteristics, he concluded that many of these differences were disappearing. With our data, we find that this conclusion does not hold.

The importance of information on migration background in travel behaviour highlights the need to consider individuals with a migration background when analysing and making decisions related to travelling and mobility. However, it is important to bear in mind that many factors hide behind this label. Differences in terms of social network and cultural norms could contribute to explaining the stark contrasts we find with respect to some aspects of travel behaviour. This is what we sought to uncover via our qualitative analysis (see chapter 4). Indeed, research in Australia and in the US suggests that socioeconomic factors are not enough to explain travel behaviour differences between individuals with and without a migration background (Hu, 2017; Klocker et al., 2015).

On aspects like a lower mobility, a lack of financial resources may play a role. Even though we controlled for income in our data analysis, we could not control for other financial aspects (received inheritance, debt, contracts, ...). Yet people with a non-western migration background have been shown to be more financially vulnerable than the rest of the Dutch population (Dutch Authority for the Financial Markets, 2021). Poverty has been documented to be between 2 and 5 times higher among adults in the TMSA groups than among adults without a migration background (Netherlands Institute for Social Research, 2019). This can also affect travel behaviour.

The interaction of one's country of origin and generation, what we called here migration background, contributes to explaining some travel behaviour aspects to a great extent. This is particularly the case for driving license ownership, the amount of trips per day, the frequency of use of certain modes of transport and the likelihood of going out. Aspects like individual car ownership and distances to leisure and (grocery) shopping destinations remain relatively unaffected by the fact that someone has a migration background. The relative importance of our migration background variable (generation and country of origin) for each model is shown in figure 3.10. Each bandwidth was determined by examining the contribution of migration background to explain the dependent variable with and without other control variables. The broad bandwidths for certain travel behaviour aspects imply that migration background has an indirect effect on travel behaviour through other control variables, such as labour participation (Jongen et al., 2019). As an example, the frequency of PT use is most heavily influenced by labour participation, a variable which is also related to migration background. As a result, there is a small *direct* impact of migration background on the frequency of PT use when controlling for labour participation in the model. However, this impact is much larger once we do not control for labour participation.

**Figure 3.10 Contribution of migration background to explain various travel behaviour aspects**

*Children of migrants: between migrants and people without a migration background*

On many travel behaviour aspects, we see that migrants show the most differences from those without a migration background, while children of migrants are often in-between. Looking at driving license ownership and car ownership among those with a license, differences between the first and second generations are usually larger than differences between the second generation and those without a migration background. In other words, on such aspects, children of migrants tend to resemble more people without a migration background than their parents (with the same country of origin). This suggests a trend towards so-called "travel assimilation". Travel assimilation refers to the tendency for the travel behaviour of persons with a migration background to become similar to the travel behaviour of people without a migration background over time (Shafi et al., 2022).

Nevertheless, travel assimilation is distributed across groups of individuals with a migration background. As Delbosc and Shafi (2023) write, "different immigrant groups travel differently, have different rates of assimilation, and face different cultural and socioeconomic barriers to use travel modes." (p. 2). Some groups of second-generation Dutch individuals are closer to people without a migration background on some aspects, while remaining closer to first-generation Dutch individuals with the same country of origin on other aspects. In general, second-generation Turkish and Moroccan Dutch individuals have lower rates of travel assimilation than other groups. In the TMSA groups, the second-generation Dutch-Caribbean Dutch individuals show the highest rate of travel assimilation.

Because this chapter has presented results *per category of travel behaviour aspects* so far, we discuss here results *per group of individuals with a migration background*. Note that there is no denying that there is a large diversity of travel behaviours within individuals with a Turkish, Moroccan, Surinamese or Dutch Caribbean background, and also within individuals with a western/non-western background. We present here trends we observe at a group level.

*Second-generation individuals with a western migration background*

On all studied aspects, the travel behaviour of children of migrants with a western migration background is closer to that of individuals without a migration background than to that of migrants with a western migration background. In other words, the second generation is closer to the population without a migration background than to the first generation in terms of travel behaviour. The only exceptions are commuting distances and travel times, and distances to leisure destinations. However, differences between individuals with a western migration background and those without a migration background are not statistically significant on these aspects.

While it can be said that children of migrants with a western migration background have assimilated with the travel behaviour of the largest group in the Netherlands – individuals without a migration background – first-generation individuals with a western migration background show multiple statistically significant differences compared with individuals without a migration background. One example is that first-generation individuals with a western migration background bike significantly less and use PT significantly more than individuals without a migration background. Nevertheless, differences are less pronounced than with other first-generation Dutch groups of individuals.

*Second-generation Turkish Dutch individuals*

Second-generation Turkish Dutch individuals tend to be closer to first-generation Turkish Dutch persons than to individuals without a migration background on many investigated travel behaviour aspects. The exceptions to the rule pertain to driving license ownership and commuting distances. In both of these cases, second-generation Turkish Dutch individuals are comparable to individuals without a migration background.

First-generation Turkish Dutch persons are among the least mobile groups we investigated, and this trend persists across the second generation. As a reminder, mobility encompasses the likelihood to leave home on a given day, and the number of trips and total travelled distance when people do go out. Second-generation Turkish Dutch persons are more mobile than first-generation Turkish Dutch people, but statistically significant differences with individuals without a migration background remain.

Both generations also show relatively similar patterns in terms of frequency of mode use. They both tend to use the car more frequently than other groups with or without a migration background and both generations use public transport just as much on average. Of all of the analysed second-generation groups, Turkish Dutch people cycle the least frequently, on average even less than the first generation.

*Second-generation Moroccan Dutch individuals*

In general, second-generation Moroccan Dutch people tend to be closer to first-generation Moroccan Dutch persons than to individuals without a migration background for the majority of analysed travel behaviour aspects. The only exception pertains to driving license ownership, as second-generation Moroccan Dutch people are just as likely to own a driving license as people without a migration background. The ownership of a driving license is slightly more likely to lead to the ownership of a car among Moroccan Dutch people than among other groups of people with or without a migration background we analysed.

The second generation being closer to the first generation than to people without a migration background, does not necessarily mean that no change is happening. For instance, second-generation Moroccan Dutch people tend to commute less far away than their parents, while maintaining a similar travel time. Note that their parents –

first-generation Moroccan Dutch individuals – are the group of migrants with the highest commuting distances.

The travel behaviour aspects for which no or few changes seem to have happened between both generations pertain to cycling frequency and mobility. Second-generation Moroccan Dutch individuals are among the least mobile groups, a trend that was already visible with first-generation Moroccan Dutch persons. Of all analysed second-generation groups, Moroccan Dutch individuals cycle the least frequently, along with Turkish Dutch individuals.

#### *Second-generation Surinamese Dutch individuals*

The picture is more nuanced among second-generation Surinamese Dutch individuals. They are closer to people without a migration background on some aspects, but remain closer to first-generation Surinamese Dutch persons on others.

The most noteworthy aspect for which second-generation Surinamese Dutch persons are closer to people without a migration background pertains to commuting distances and travel times. In fact, second-generation Surinamese Dutch persons' commutes are just as far and just as long as people without a migration background. Second-generation Surinamese Dutch individuals are also closer to people without a migration background than to first-generation Surinamese Dutch individuals in terms of mobility and in terms of driving license ownership. Nevertheless, on these aspects, we still see significant differences between second-generation Surinamese Dutch persons and people without a migration background. Of all analysed licensed second-generation Dutch groups, Surinamese Dutch have the lowest rates of car ownership.

Second-generation Surinamese Dutch persons cycle more and use public transport less than first-generation Surinamese Dutch persons, but the second generation remains on average closer to the first generation than to people without a migration background.

#### *Second-generation Dutch-Caribbean Dutch individuals*

Same as Surinamese Dutch individuals, Dutch-Caribbean Dutch individuals are closer to people without a migration background on some aspects, but remain closer to the first generation on other aspects.

The most noteworthy aspects for which children of migrants with a Dutch Caribbean background are closer to people without a migration background pertain to mobility and to cycling frequency. While the first generation leaves the house significantly less and does significantly fewer trips per day than people without a migration background, such differences no longer exist between their children and people without a migration background. In addition, children of migrants with a Dutch Caribbean background are the only children of migrants in the TMSA groups whose cycling behaviour is closer to that of people without a migration background, than to the first generation. They still cycle significantly less frequently than individuals without a migration background, but their modal split on trips under 2.5 km is similar to that of individuals without a migration background.

However, second-generation Dutch-Caribbean Dutch individuals remain closer to the first generation in terms of commuting distances and travel times. Among the second-generation groups we investigated, children of migrants with a Dutch Caribbean background tend to show the greatest deviation from individuals without a migration background.

#### *Second-generation individuals with another non-western migration background*

Children of migrants with a non-western migration background other than the ones from the TMSA groups tend to be closer to individuals without a migration

background than to the first generation on multiple aspects. These include driving license ownership rates, frequency of car use and number of trips per day. The most notable exceptions pertain to cycling frequency and likelihood to leave the house.

Individuals with another non-western migration background exhibit some differences compared to the TMSA groups. They tend to have shorter commuting travel times and distances than individuals in the TMSA groups, and much lower driving license ownership rates. However, they show similar mobility levels and transport mode usage to the TMSA groups. Still, they tend to cycle slightly more and use cars slightly less than the TMSA groups. Nevertheless, this group is extremely diverse, which makes it difficult to draw meaningful conclusions about it.

#### *Fewer gender differences among the second generation*

It is worth noting that we sometimes see differences between men and women with a migration background. This is mostly true for the first generation. First-generation Dutch women tend to be less mobile than their male counterparts, but this does not prove true for the second generation. First-generation Moroccan, Turkish and Surinamese Dutch men have higher rates of driving license ownership compared to their female counterparts. First-generation Dutch men from the TMSA groups tend to bike more often than their female counterparts, and this persists across the second generation in the Turkish and Moroccan Dutch communities. On the cycling frequency aspect, it is important to note that some things have changed in the past decades. Between the end of the 1980s and the end of the 2010s, the cycling modal share of women with a non-western migration background has gone from under 4% to almost 20% (van der Kloof & Bek, 2019). Cycling lessons have also been shown to substantially improve their feelings of self-esteem and self-confidence.

As a side note, our analyses often reveal similarities in the travel behaviour of Turkish and Moroccan Dutch individuals. The travel behaviour of Dutch-Caribbean and Surinamese Dutch persons also shows certain similarities.

## 4 Insights from interviews and focus groups

**Multiple aspects play a role in the mobility of Turkish, Moroccan, Dutch-Caribbean and Surinamese Dutch individuals. These range from cultural practices to social norms, gender roles, language barriers, life phases, health and costs. The country of origin itself – Turkey, Morocco, Suriname and the Dutch Caribbean – moderately contributes to explaining some of the differences we observe among migrants and children of migrants.**

In this chapter we successively discuss multiple transport modes: the car, public transport, the bike, walking and shared mobility modes. All quotations are from individuals from the TMSA groups. A short discussion closes the chapter.

### 4.1 A widespread social norm (and pressure) to have a car

#### *The car as a symbol of success*

The interviews and focus groups reveal that the car – and especially a car from a luxury brand – tends to be seen as a symbol of success for migrants and their children in the Netherlands. The interviewed first-generation Dutch individuals were not always able to afford a driving license and even less a car upon arrival. Having a car was therefore not always easy. The difficulty of owning a car has actually been shown to contribute to elevating its status (Gorz, 1973). The car is often described as a symbol that you “made it” as a migrant. This image of the car is potentially instigated by people’s broader social networks. This includes social ties outside of the Netherlands, in countries where having a car is seen as more of a privilege than in the Netherlands.

*“In de biculturele gemeenschap is een auto hebben een luxe. Als nakomeling mag je trots zijn als je een auto op je naam kan zetten. Ook je ouders zijn trots, dat je zoiets kan aanschaffen en ze kan rijden.” / “In the bicultural community, having a car is a luxury. As a descendant, you can be proud when you can have a car in your name. Even your parents are proud, that you can buy such a thing and drive them.” FG8*

*“Ik ben trots op die grote auto die ik speciaal heb gekocht voor mijn vakantie naar Turkije, waar ik geboren ben.” / “I am proud of that big car I bought specially for my holiday to Turkey, where I was born.” FG2*

The KiM study by Olde Kalter (2008) highlighted that many individuals in the four traditional groups enjoy having nice cars, especially men. We find that this observation still partially holds, as our focus group participants explained:

*“Ik denk dat de gemiddelde Marokkaan materialistisch is, we willen graag een mooie grote auto. [...]. Wij Turken ook! [...]. We zijn inderdaad van bling bling, het moet mooi zijn. [...]. Dat zit in ons denken.” / “I think that the average Moroccan is materialistic, we would like a nice big car. [...]. We Turkish people too! [...]. We are indeed bling bling, it has to be beautiful. [...] That's in our thinking.” FG2*

*“Ik heb nu een goedkopere auto, en mensen vragen: ‘Goh wanneer ga je een nieuwe auto kopen?’” / “I have a cheaper car now, and people ask: ‘Gee when are you going to buy a new car?’” FG7*

Still, this observation deserves nuancing. Indeed, we observed that life phase plays an important role. Younger adults seem more status oriented. As individuals age, having the most high-end car becomes less crucial, and there is a growing

preference for one that is functional. This is especially true when there are children. Safety and space become more important, and financial priorities change. Note that our setup might have influenced this conclusion; we have not talked to highly educated migrants over 40, who might be more financially able to combine a high-status car with a family.

*"Ik denk dat vooral de nieuwe generatie trots wilt zijn op een auto, voor ons gaat het meer om vervoer." / "I think that's mainly the new generation wanting to be proud of a car, for us it's more transport." FG1*

A participant reflecting on his car choices in the past: *"Ik besef dat ik al die jaren geld heb weggegooid." / "I realise I have been throwing money away all these years." FG4*

### *The importance of the driving license*

There is undeniably a gender difference in terms of car use among the first generation. This is especially true for the older ones, who arrived in the Netherlands as young adults. To explain this, we must go back to the driving license. When they had the money and language skills for a driving license upon arrival in the Netherlands, the adult in the household with a full-time employment would be given priority. This was usually the man. He would therefore drive the car. This early choice may contribute to explaining why many interviewed older female migrants still mostly depend on their spouse to drive them around. These women usually had care duties or part-time employment. Unless triggered by specific care duties requiring a car or employment far from the household, they were not given priority to learn how to drive. Note that the only older first-generation individuals we interviewed were Turkish and Moroccan Dutch individuals (see section 2.2.2). Nevertheless, this observation aligns well with the findings described in previous chapter (section 3.3.1): first-generation individuals are less likely to have a driving license, and first-generation Moroccan and Turkish Dutch men have higher rates of driving license ownership compared to their female counterparts.

*"Bij mannen is het ondenkbaar om geen auto te hebben. Als ik kijk naar ons cultuur, de vrouwen worden toch wel gebracht en opgehaald door hun mannen of hun kinderen, zoons en dochters. Er is altijd wel een man in de omgeving die dat regelt voor de vrouwen." / "Among men, it is unthinkable not to have a car. If I look at our culture, the women are brought and picked up by their husbands or their children, sons and daughters. There is always a man around who arranges that for the women." I8*

Children of migrants are usually strongly encouraged to get their driving license. This finding aligns with one of the main findings from chapter 3, namely that second-generation Dutch individuals are much more likely to have a driving license than their parent(s) with a migration background. Research in Germany shows that car use of individuals is not directly associated with car use of their adult descendants (Döring et al., 2019). Therefore, the fact that children of migrants have not been brought up with cars does not mean that they won't own a car or drive. However, a positive attitude of parents towards the car is a significant predictor for car availability among their children (Döring et al., 2019). This contributes to explaining why children of migrants are encouraged to get their driving license: the car is seen as a way to be independent and to increase one's chances of success in society. Daughters and sons are equally encouraged to get their license.

*"Je rijbewijs halen is toch iets wat je af moet vinken." / "Getting your driving licence is something you have to tick off anyway." FG6*

Once adult migrants and children of migrants have their driving license, getting a car is seen as logical. Some participants explained that they would even get a car

when there was no need for it. Kampert et al. (2018) showed that Turkish and Moroccan Dutch students are more likely to have a car than students with another migration background. Besides, the expectation to own a car becomes even more salient once couples get children. Nevertheless, our quantitative data analysis did not show that driving license owners with a migration background were particularly more likely to own a car than those without a migration background, except for Moroccan and Surinamese Dutch individuals (and it is a relatively small effect) (see section 3.3.2).

*"Bij ons is het wel zo dat als je een rijbewijs hebt, dat je ook meteen een auto koopt."* / "In our case, if you have a driving licence, you buy a car right away." FG4

*"Kind op komst, dan auto met kinderzitje, fiets gaat niet."* / "Child on the way, then car with child seat, a bike won't do." FG6

Overall, these expectations add up and result in communities that tend to be centred on the car. A participant had lived 10 years in the Netherlands without a car, and decided to eventually buy one:

*"Ik werd beïnvloed door de omgeving. Bijna iedereen had een auto en ik had geen auto. Vrienden gingen overal heen met de auto. Dan krijg je ook het idee om een auto aan te schaffen."* / "I was influenced by my circle of acquaintances. Almost everyone had a car and I didn't have a car. Friends went everywhere by car. Then you also get the idea of buying a car." I5

#### *Costs of the car*

Nevertheless, people acknowledge that owning and using a car is expensive. Some migrants and especially children of migrants reported feeling pressured to buy a car, even when they could not afford it. Such a phenomenon fits in the trend of forced car ownership (Mattioli, 2017; Zijlstra et al., 2022). Besides, the rising costs of the car in the past years are often cited as major drawbacks to own and drive a car. Many participants acknowledged that having a car is a luxury.

*"Ik voel me ook een beetje gedwongen om een auto te hebben door mijn omgeving. [...]. Ik ken die druk, ik heb om die reden een auto gekocht die ik niet kon betalen."* / "I also feel a bit forced to have a car by my circle of acquaintances. [...]. I know that pressure, I bought a car I couldn't afford for that reason." FG7

*"Het is een luxe vind ik en is niet voor iedereen weggelegd. Je hebt maandelijkse kosten die erbij komen kijken."* / "It is a luxury I think and it is not for everyone. You have monthly costs that come with it." FG2

Because of perceived rising car costs, participants mentioned that they would sometimes consider travelling with another transport mode. High parking prices are particularly prohibitive. Note that we do have a bias in our data, as half of our participants came from Amsterdam. However, the car is still considered as less expensive than public transport as a family.

*"Het betaald parkeren houdt mij tegen. Als het onbetaald was, zou ik met de auto gaan."* / "The paid parking holds me back. If it was free, I would go by car." FG7

*"Als je met drie kinderen met de trein moet ben je een dief van je eigen portemonnee. Dan is de auto echt goedkoper."* / "If you have to take the train with three children, you are robbing your own purse. The car is really cheaper." FG5



### *Instrumental considerations*

Even with a widespread social norm to have a car, instrumental motives still dominated the conversation around car ownership and use – as they usually do (Steg, 2005). Migrants and children of migrants have multiple practical reasons to own and use a car:

- For families with many children, it is usually cheaper and feels more convenient to have a car. This holds particularly for households with a Moroccan Dutch mother, as Moroccan Dutch women have on average 2.2 children. This is substantially more than for Turkish, Dutch-Caribbean and Surinamese women, but also for women without a migration background; they have on average between 1.5 and 1.7 children (Statistics Netherlands, 2022d).
- Many participants mentioned working jobs that they can only reach with a car. Working in industrial zones, jobs starting or ending at night, living in the outskirts: such conditions are often unfavourable to car alternatives such as the bike and public transport.
- Health might also play a role in choosing to drive. Recent research shows that Turkish, Moroccan, Caribbean-Dutch and Surinamese Dutch individuals often report feeling less healthy than individuals without a migration background (Dagevos et al., 2022). As the age increases, the percentage of individuals who perceive their health to be good decreases sharply in these four traditional groups. Higher prevalences of some diseases among the TMSA groups are also reported in other Dutch studies, such as diabetes (Diabetesfonds, 2022). Some participants mentioned having a preference for the car as it requires less physical effort than walking or cycling.
- Many participants also mentioned the car to be convenient or even essential in case of emergencies, for groceries, during bad weather conditions, when living outside of a city centre, for night trips, for holidays and to drive others. Such reasons are probably not unique to people with a migration background.

## **4.2 Public transport: mostly used for practical considerations**

### *Positive and negative reactions*

Just like in the KiM study from fifteen years ago (Olde Kalter, 2008), public transport elicits very diverse opinions. Many of the complaints voiced by some participants were balanced by positive aspects others put forward. For instance, some mentioned the lack of privacy in public transport, a perceived lack of safety and how long it takes to reach places. Opposed to that, others like the social component of public transport and find it safe, clean and fast. What people were brought up with and used to when growing up is likely to play a role here (Kim, 2009). For example, some migrants explained that they value Dutch public transport because they come from a country with fewer public transport amenities.

Nevertheless, we observed differences within the four traditional groups in terms of experience with public transport. Dutch-Caribbean and Surinamese Dutch individuals seemed more likely to know their way around public transport and use it with the whole family. Despite some criticism about this mode, they use it and value many of its aspects. This results aligns with our quantitative findings; see section 3.4.2.

*“Ik ben blij dat de mogelijkheid om de bus, tram, metro en trein te gebruiken er is. Wat ik jammer vind is dat de aansluiting soms niet goed is. En dat het heel duur is.” / “I am glad that the possibility of using the bus, tram, metro and train is here. What I find unfortunate is that sometimes the connections are not good. And that it is very expensive.” FG1*

### *Perceived lack of coverage and high prices*

The last quote highlights two negative points on which participants agreed: the price of public transport and its perceived lack of coverage. On the first point, migrants and children of migrants mentioned sometimes sharp price increases in the past years. Between 2009 and 2019, public transport prices have increased more than car-related costs (Statistics Netherlands, 2019b; Zijlstra et al., 2022). The high costs of the car were cited just as often as high public transport costs, but the latter seem to be more prohibitive, for people more often mentioned that they had stopped using public transport than the car.

*“Ik zou graag met de bus willen, maar de kosten van buskaartjes zijn verhoogd. Het is tegenwoordig 5 euro terwijl het 2,80 was voorheen.” / “I would like to take the bus, but the price of bus tickets has increased. A ticket is 5 euros these days while it used to be 2.80 before.” I5*

On the second point, migrants and children of migrants bring up their perception that direct connections have decreased and that bus lines are progressively disappearing from residential neighbourhoods and suburbs. This latter complaint fits an already existing stream of dissatisfaction among some Dutch public transport users (Treinreiziger.nl, 2020).

*“De verbinding is vaak slechter dan 10 jaar geleden. Heel veel lijnen en haltes zijn weggehaald.” / “The connection is often worse than 10 years ago. A lot of lines and stops have been removed.” FG5*

Still, public transport can be favoured to the car by urban migrants and children of migrants in specific cases, such as during peak hours or when parking opportunities at the destination are either scarce or expensive. However, public transport use remains conditional upon a good – preferably direct – connection.

### *Public transport versus the car*

Overall, the costs of public transport and its perceived lack of coverage contrast with the perceived low everyday costs of the car and its door-to-door character. This stark perceived difference contributes to explaining why public transport has a more negative reputation than the car, especially in communities where the car has a high status. Children of migrants recalled experimenting with public transport thanks to the student ov-chipcard. Some migrants and children of migrants currently use public transport thanks to the ov-chipcard provided by their employer. Such experiences do not always translate into the use of public transport after their time as a student or for trips outside of work. Costs and lack of convenience are cited as main reasons. These reasons might also apply for people without a migration background.

*“Toen ik een ov-studentkaart had, ging ik overal met het ov. Dan houdt de ov-studentkaart op en ineens realiseer je hoe duur het allemaal is.” / “When I had a discounted public transport student card, I went everywhere with public transport. Then the student card ends and suddenly you realise how expensive it is.” FG7*

*“In Nederland is het wel gebruikelijker om het ov te gebruiken onder de Turkse gemeenschap dan in Turkije. Maar het wordt niet veel gedaan, omdat de auto makkelijker is.” / “The Turkish community uses public transport more in the Netherlands than they do in Turkey. But in the end public transport is not much used here either because the car is easier.” I2*

*“Het ov is wel belangrijk voor degenen die zonder auto zitten. Maar wanneer de auto een optie is, zie je dat dat al een stuk minder is. Het is meer het gemak waar voor gekozen wordt en bij ons Marokkanen is het wel gebruikelijk en gestimuleerd om je rijbewijs te hebben.” / “Public transport*

is important for those without a car. But when the car is an option, you see that it is already a lot less important. We choose more for the convenience and it is common and encouraged among us Moroccans to have your driving licence." I8

#### *Importance of public transport when not having a driving license and biking skills*

As illustrated in this last quote, public transport remains an important and valued mode for some migrants and children of migrants. This is especially the case among women and older adults, who may not possess a driving license, a car, cycling skills or a bike. A discounted or free travel pass seems to be particularly beneficial for these people. All analysed groups of people with a migration background in chapter 3 used public transport more than people without a migration background (see section 3.4.2).

*"In mijn gemeenschap is het gebruik van het ov belangrijk, omdat veel mensen goedkoper kunnen reizen door hun leeftijd. Sommigen hebben geen rijbewijs of kunnen het niet betalen." / "In my community, public transport is important since many can travel cheaper because of their age. Some do not have a driving licence or cannot afford it." FG7*

*"Als ik kijk naar mijn vriendinnen dan is het een beetje net als bij mij. Wij hebben niets anders dan het ov. Ik kan niet rijden. Ik was zo blij toen ik de gratis ov-pas had gekregen. Nu hoef ik niet meer te overwegen of ik ergens wel of niet heen ga vanwege de kosten." / "When I look at my female friends, it's a bit like me. We have nothing but public transport. I can't drive. I was so happy when I got the free public transport pass. Now I don't have to consider whether to go somewhere or not because of the costs." I8*

#### *Lack of language and digital skills*

However, people with a migration background may be confronted with other issues in public transport: the requirement for sufficient language and digital skills. This is particularly salient among first-generation Dutch individuals. In fact, recent statistics show that 1 out of 6 first-generation Turkish Dutch individuals and 1 in 9 first-generation Moroccan Dutch individuals struggle with Dutch (Dagevos et al., 2022). First-generation Dutch-Caribbean and Surinamese Dutch individuals have virtually no language issues. At a more general level, around 40% of the 2.5 million Dutch people aged 16 or older who have low literacy levels are migrants and 7% are children of migrants (all migration backgrounds included) (Netherlands Court of Audit, 2016). As a result, people with limited Dutch skills might either stay close to the places they already know, or not use public transport at all. This can limit them in their job options, for instance. Note that limited Dutch skills can also make it harder to get a driver's license, as already mentioned in section 4.1.2.

*"Mijn moeder was een keer verdwaald nadat ze moest overstappen met de tram. Nu durft ze echt niet meer." / "My mother got lost once after she had to change trams. Now she doesn't really dare using it anymore." FG6*

*"Er was in de jaren 90 voldoende werk in Aalsmeer in de bloemenindustrie, en ben ik vaak gevraagd om daar te gaan werken. Maar dat durfde ik niet aan, omdat ik dan met het ov moest gaan. Als je het Nederlands niet kunt lezen en niet kunt communiceren is dat echt een probleem. [...] Nu blijf ik eigenlijk in mijn eigen omgeving in Oost, en dan alleen met de bus. Ik ga niet verder weg, omdat ik Amsterdam niet ken en dan verdwaal omdat ik de borden niet kan lezen." / "In the 1990s, there was plenty of work in Aalsmeer in the flower industry, and I was often asked to go work there. But I didn't dare to do that because I would have to go by public transport. If you can't read Dutch and can't communicate, it's really a problem. [...]"*

Nowadays I stay in my own neighbourhood in East, and then move only by bus. I don't go further because I don't know Amsterdam and then I get lost because I can't read the signs." I9

Furthermore, limited language skills also make it harder for people to navigate transport applications and websites, tools that have become pervasive in public transport (Durand et al., 2023). This explains why some participants with limited language/digital skills explained they would favour using the bus, where they could easily ask the driver for help if needed.

#### *Public transport as an alternative to cycling*

Public transport can also be used as an alternative to cycling. In fact, a study from 2017 even shows that 37% of Dutch-Caribbean and Surinamese Dutch individuals do not own a bike because they prefer to use public transport (Azaaj & Ait Moha, 2017). This reason was cited by 21% and 24% of Turkish and Moroccan Dutch persons, respectively. Our fieldwork sheds light on a few possible explanations for a preference for public transport over cycling. First, migrants and children of migrants may be less used to biking from a younger age because it was not perceived as safe or suitable enough to cycle to school.

*"Alle witte Nederlanders gingen op de fiets naar school, en ik ging met de bus. Ik snap niet waarom ik niet met de fiets ben gegaan, was goedkoper geweest, maar dat was mijn cultuur. Ik denk dat het komt omdat het in Curaçao niet mogelijk was om met de bus te gaan, en hier wel, dus maak je er gebruik van." / "All white Dutch people went to school by bike, and I went by bus. I don't understand why I didn't go by bike, it would have been cheaper, but such was my culture. I think it's because it wasn't possible to go by bus in Curaçao, and here it is, so you take advantage of it." FG7*

*"Mijn moeder kocht liever een abonnement. Ze vond het ov veiliger." / "My mother preferred to buy a subscription. She found public transport safer." FG8*

Second, 50% of the people from the TMSA Dutch communities live in the 10 largest cities in the Netherlands (Statistics Netherlands, 2022a), where the public transport offer tends to be larger than in other areas. For those urban dwellers who can afford public transport and who are not used to cycling, public transport can become the second-best alternative to the car, before the bike. We have not specifically asked participants about the motor scooter, but the latter was often named as an alternative to the bike (see section 4.3.2).

*"Auto eerste keus als je die hebt, anders ov, het blijft tweede keuze." / "Car first choice if you have one, otherwise public transport, it is still the second choice." FG6*

### **4.3 The bike as a fallback option rather than a default mode**

#### *The bike does matter...*

The bike has a place in the mobility of migrants and children of migrants. Two observations show this. First, migrants and children of migrants value the bike. Participants mention that it is convenient for short trips, there are no parking costs, it allows for flexibility and independence, it is a door-to-door transport mode and it can be quicker than the car. For some people, the bike is used out of necessity, as public transport and the car might be unaffordable. Second, almost all migrants want their children to learn how to bike. They highlight that it is important for them to be included among their peers. A few women revealed that their children knowing how to bike motivated them to learn how to cycle as well, so that they could cycle as a family.

*"Ik wilde dat ze het gingen leren net als de Nederlandse kinderen, zodat ze niet achterbleven." / "I wanted them to start learning it just like the Dutch kids, so they wouldn't be left behind." I2*

*"Fietsen moet je gewoon meekrijgen net zoals zwemmen. Stel dat je geen auto hebt of je hebt de mogelijkheid niet om het te financieren dan heb je altijd de fiets." / "Cycling is something you have to learn just like swimming. Suppose you don't have a car or you don't have the ability to finance it, then you always have the bike." FG5*

*... until other transport modes become available*

Nevertheless, the previous quote illustrates that the bike is not seen as a primary mode of transport, but rather as a fallback option. This explains our somewhat paradoxical observation: the fact that children of migrants have more biking skills than their parents does not automatically translate into them cycling much more than them as adults. In fact, this observation is supported by our quantitative analysis (see section 3.4.1). The bike is not necessarily used in a structural way to go from home to work for instance, even among people who have learnt how to bike young. Instead, we see that the bike remains associated with childhood, and with a more recreative and sportive usage. Other transport modes, such as the motor scooter, then public transport (via the discounted student travel card) and later the car come to replace the bike. Not having a bike or no longer having one as an adult is not seen as abnormal. Our results align with recent quantitative research on the bike use among the four traditional groups (Azaaj & Ait Moha, 2017).

*"Als kind hoort fietsen er echt bij, niet iets wat je blijft doen." / "Cycling is really something you do as a child, not something you keep doing." FG7*

A mother with a Turkish background on her children: *"Als kinderen hebben zij gefietst, maar zodra zij oud genoeg warden, werd dat snel ingeruild voor een scooter of auto." / "As children they did cycle, but as soon as they got old enough, that was quickly traded in for a scooter or car." I6*

*"Twee keer in de week gebruik ik de scooter. En de fiets gebruik ik meer om te bewegen, één keer in de week." / "Twice a week I use the scooter. And I use the bike more for exercise, once a week." I5*

*Lack of role models*

Besides the appeal of the motor scooter and then the car, another explanation for a low bike appropriation is a lack of role models. This is particularly true among first-generation Dutch women. Many of them do not cycle much, or at all. This is especially true for those who arrived as (young) adults in the Netherlands. In their country of origin, women are not expected to cycle. Upon arrival in the Netherlands, they might have been afraid to try cycling or even actively discouraged to do so. Some have learned along the way in order to be able to bike as a family. Others explained that they still wished to learn.

*"Mijn ouders hebben mij niet gestimuleerd om te fietsen om eerlijk te zijn." / "My parents did not encourage me to cycle, to be honest." I6*

*"Fietsen was een beetje een taboe als vrouw met een hoofddoek. [...] Maar als één vrouw het durft, durven de anderen het ook. [...] Het is normaler geworden om te fietsen. Mijn zus is ook fors en heeft ook een hoofddoek maar doet alles op de fiets." / "Cycling was a bit of a taboo as a woman with a headscarf. [...] But if one woman dares, the others dare too. [...] It has become more normal to cycle. My sister is also big and has a headscarf but does everything by bike." FG1*

*"Ik zou wel willen leren fietsen." / "I would like to learn how to ride a bike."*

I1

We observed that this low bike use among first-generation Dutch women can have an impact on their daughters. Many of them also lacked role models to some extent. Therefore, they have a preference for the car when they can afford it, and public transport otherwise. The conclusion of Olde Kalter (2008) still holds some truth: "Many older women do not dare to cycle and many younger women do not want to cycle." (p. 13).

*"Ik heb mijn tantes en oma's nooit op de fiets gezien." / "I never saw my aunts and grandmothers on bicycles." FG3 & FG7*

### *Safety concerns*

Learning how to bike is one thing, but applying these skills on the sometimes busy streets is another. Migrants and children of migrants frequently voiced their concerns pertaining to the lack of perceived safety while biking. Such a concern is not new (Olde Kalter, 2008). In fact, migrants are particularly sensitive to a lack of or sub-optimal biking infrastructure, more than people without a migration background (van Boggelen & Harms, 2006). Van Boggelen & Harms (2006) drew this conclusion based on a complementary analysis of the data used by Harms (2006). They found that improvements in cycling infrastructure and living in a municipality with a strong cycling culture had a positive effect on cycling among individuals in the TMSA groups.

Safety concerns start from the moment children know how to bike. Migrants as well as their adult children share feeling concerned about the safety of their children when they are biking to school. Multiple participants even recalled their own parents asking them to stop cycling after they or a sibling had been involved in a bike accident, even minor. Note that we may have a bias in our data regarding cycling safety concerns, as half of our participants were from Amsterdam. Bicycle paths there are known to be particularly busy (Groot-Mesken et al., 2015). Research in Denmark shows that stress and a lack of knowledge about formal and informal rules increases the perception of lack of safety among individuals with a migration background (Basaran et al., 2021). Learning how to bike after the age of 6 also contributed significantly to an intensified perception of a lack of safety.

*"Ik mocht niet meer fietsen, want mijn broer had een ongeluk gehad. Dus toen kregen wij een kaart voor de tram." / "I wasn't allowed to cycle anymore because my brother had had an accident. So then we got a card for the tram." FG2*

*"Ik vind het eng met een dochttertje van 2. Op een scooter heb ik dat wat minder, het lijkt me zo gevaarlijk op de fiets." / "I find it scary with my little daughter of 2. On a scooter I have that a bit less, it seems so dangerous on the bike." FG7*

### *Sensitive to adverse weather conditions and long distances*

On top of safety conditions, many stated that they tended to be more sensitive to adverse weather conditions and long distances than people without a migration background. We did not explicitly ask for such a comparison; they made it themselves. Regarding long distances, participants explained that they do not want to have to wear special clothes to bike, nor do they want to arrive sweaty at their destination. Health reasons can also play a role for some of them, as already reported in section 4.1.4.

*"In mijn jeugd fietste ik veel, maar nu ben ik een volwassen vrouw. Ik hou niet van fietsen. Ik ga zweten, het kost veel energie, ik kom ik moe aan*

*waar ik moet zijn. Ik loop liever naar het ov.*" / "In my youth, I cycled a lot, but now I am a grown woman. I don't like cycling. I get sweaty, it takes a lot of energy, I arrive where I need to be tired. I'd rather walk to public transport." FG3

*"Je moet zo nadenken over je kleding als je fietst, wat een gedoe."* / "You have to think so much about your clothes when cycling, what a hassle." FG4

Adverse weather conditions can also deter them from cycling, especially for those who have never been used to cycling in cold or rainy circumstances. The need for special clothes was also cited as a disadvantage here.

*"Fietsen geeft mij een lekker gevoel. Lekker fris. Maar alleen als het droog is."* / "Cycling makes me feel good. Nice and fresh. But only when it's dry." FG5

*"Je ziet wel het verschil, witte Nederlanders die met een kind door weer en wind fietsen. Ik zou dat nooit doen. [...] Nee, dat zouden wij nooit doen. Ik fietste met mooi weer, ik kan me niet heugen dat ik met de herfst en winter heb gefietst. Mijn moeder is ook snel bezorgd, doe een jas aan, sjaal."* / "You do see the difference, white Dutch people cycling through all weathers with a child. I would never do that. [...] No, we would never do that. I cycled in nice weather, I can't remember cycling in autumn and winter. My mother is also quickly worried, put on a coat, a scarf." FG7

#### *Financial barriers*

Although the bike is seen as a relatively cheap mode, the costs of (repeatedly) buying a new one can be prohibitive. Besides, maintenance and repair costs are also factored in – especially if one does not have the skills to do some of the repairs themselves. In families with multiple children, the costs associated with bikes can therefore quickly add up. Participants also reported getting their bikes repeatedly stolen and having issues storing them safely and sheltered from weather conditions. Such issues are not only found among migrants and children of migrants. However, half of the four traditional groups live in the 10 largest Dutch cities (Statistics Netherlands, 2022a) and bike theft and bike storage issues are known problems in (large) cities (Kuppens et al., 2020; Royal Dutch Touring Club ANWB, 2021, n.d.; Venverloo et al., 2023).

*"De fietsen zijn gewoon op straat. Dat zorgt er voor dat ze worden gestolen, maar belangrijker is dat ze snel roesten en niet heel lang goed blijven. Ik had graag gehad dat ik mijn fiets in een box of zo zou kunnen zetten."* / "The bikes are just on the streets. That causes them to be stolen, but more importantly they rust quickly and don't last very long. I wish I could put my bike in a box or something." I10

*"Mijn fiets was vier keer gestolen, dus nu ben ik klaar met fietsen. Ik mis soms dat ik kon fietsen in plaats van lopen."* / "My bike was stolen four times, so now I'm done with cycling. I sometimes miss being able to cycle instead of walking." FG5

Most participants had been noticing more and more e-bikes on the streets and among their family and friends, but they almost unanimously found them too expensive. On the one hand, they mentioned that the e-bike makes long-distance cycling possible, that it would require less physical effort and that it was appealing in the context of high petrol prices. On the other hand, the price of the e-bike, its perceived lack of safety and the possibility to it being stolen were clearly deterring participants from seriously considering purchasing one. One participant reported having his e-bike stolen after only five weeks. Participants mentioned other types of bikes (fatbikes, bakfietsen) or bike brands (e.g. vanmoof) they would be interested

in owning. The barriers are, however, similar to the e-bike. Nevertheless, the few e-bike owners and those who wished to have one mentioned being proud of owning a bike with such high value.

*"Ik zou er wel graag een e-fiets willen. Het is super handig en snel, maar het probleem is dat ik hier in een flat woon. Dan moet ik de e-fiets in de stalling voor de deur plaatsen. De kans dat die blijft staan en niet wordt gestolen is klein... Dus dat is geen optie." / "I would love an e-bike. It's super convenient and fast, but the problem is that I live in a flat here. Then I have to put the e-bike in the shed outside the door. The chances of it staying there and not being stolen are slim.... So that's not an option" I10*

After discussing expensive cars: *"Je hebt ook elektrische fietsen van 3,000 euro's, die zijn luxe. Ik zou er trots op zijn met een fiets van 3,000 euro's." / "You also have 3,000-euro electric bikes, that's a luxury. I would be proud with a 3,000-euro bike." FG2*

#### *A changing status of the bike?*

These discussions on bike types hint at a possible shift in how the bike is perceived by migrants and children of migrants. At the same time, the bike does not seem to have completely lost its relatively lower status as reported in Olde Kalter (2008), even among children of migrants. A regular bike is not seen as something particularly special or to be proud of. Participants whose main transport mode was the bike mentioned getting comments from their community about their lack of other transport options.

*"Ja ik denk dat de fiets te min voor mijn kinderen is. Daarom gebruiken ze het niet." / "Yes I think the bicycle is too low-status for my children. That's why they don't use it." I7*

*"Ik houd meer van wandelen en lopen dan fietsen. Misschien als ik een fiets had. Niemand fietst in mijn omgeving, ziet er raar uit." / "I like walking more than cycling. Maybe if I had a bicycle. Nobody bikes in my area, looks weird." FG7*

#### *Communities that do not bike much?*

This last quote refers to an important concept in literature on the travel behaviour of migrants in general: that of ethnic enclaves. Ethnic enclaves are neighbourhoods where immigrant populations, usually from the same (group of) region(s) of origin, tend to live together (Nguyen, 2004). A recent study using data from the Netherlands has shown that individuals living in neighbourhoods with a higher share of people with a non-western background are less likely to cycle (Haustein et al., 2020). According to the researchers, this can be partly explained by the fact that the nationally predominant cycling culture is less salient in such neighbourhoods.

## **4.4 Walking: functional for short distances and the ultimate fall-back option**

### *Walking for short distances*

Walking is mostly used for short distances in urban areas or for recreational purposes. For short distances, migrants and children of migrants explained that they sometimes prefer walking to cycling, and this is confirmed by our quantitative analysis (see section 3.4.1). The preference for walking is especially strong in dense and busy urban spaces. Nearly all seemed to value walking for recreational purposes.

*"Mijn keuze is altijd om te lopen. Als ik met de fiets ga dan is dat omdat ik geen tijd heb. Lopen duurt toch iets langer dan met de fiets. Misschien omdat ik niet een heel oplettend persoon ben." / "My choice is always to*



walk. If I go by bike it's because I don't have time. Walking takes a bit longer than cycling. Maybe because I am not a very careful person in traffic." FG5

*"Ik loop kleine afstanden wel. Want mijn fiets wordt vaak gestolen."* / "I do walk small distances. Because my bike often gets stolen." FG6

#### *Walking when there is no other option*

Nevertheless, focus group participants often described walking as too slow of a mode. In general, walking tended to be more prevalent among the older first-generation Dutch individuals we interviewed one-on-one, and among people who have no other choice at all. These included, among others, people who may have balance issues that prevent them from cycling or those without a driving license. Older first-generation Dutch women, who mostly arrived in the Netherlands as young adults, more frequently reported walking as a main mode. They tended to have less often access to other modes such as a car or a bike. The issue with walking as a sole transport mode is that people's range of action may be limited.

*"Lopen is het allerbeste. En een tramkaartje is gewoon erg duur. Fietsen kan ik niet. En een rijbewijs heb ik niet. Lopen is het enige vervoersmiddel dat ik heb. Ik zou wel verder weg willen, bijvoorbeeld naar de stad. Maar dat is te ver lopen voor mij, dus ik beperk mij tot mijn omgeving, een boodschapje of naar de moskee."* / "Walking is the very best. And a tram ticket is just very expensive. I can't cycle. And I don't have a driving licence. Walking is the only means of transport I have. I would like to go further, to the city, for example. But that's too far to walk for me, so I limit myself to my surroundings, an errand or going to the mosque." I6

*"Vroeger had je niets anders, ik denk wel dat de oudere generatie Marokkanen veel lopend doet. Mijn kinderen lopen niet zoveel, tenzij het in de directe nabije omgeving is."* / "You used to have nothing else than walking, I do think that the older generation of Moroccans does a lot of walking. My children don't walk that much unless it's in the immediate area." I8

As the above quotation illustrates, second-generation Dutch individuals are often less enthusiastic about walking than first-generation Dutch individuals. This is confirmed by our quantitative analyses too. Unlike cycling, everyone has access to walking provided that their health condition allows for it. Yet this may be the very reason why walking is seen as a low-status mode; there is nothing special about it.

*"Lopen wordt gezien als een teken van armoede. Ga je met de benenwagen? Ga je met de lijn 11? [spottende toon]"* / "Walking is seen as a sign of poverty. Do you go by foot? Do you go by line 11? [mocking tone]" FG7

#### **4.5 Shared mobility: used by children of migrants, for fun or as back-up**

Second-generation Dutch individuals from the TMSA groups reported using shared mobility modes like shared cars, bikes and scooters much more than the first generation. The latter is often not familiar with these modes and have little interest in trying them. However, even among users, shared mobility modes are seen as vehicles for fun trips or "just in case". The possibility to park scooters everywhere for free, the door-to-door character of shared cars and the fact that bike theft is no longer a personal issue with a shared bike were all named as strong advantages. Nevertheless, these modes are not seen as long-term replacements for a personal bike, car or scooter.

*"Die deelingen zijn gemaakt om een keer gebruik te maken als nood."* / "Those shared things are made to be used once as an emergency." FG6

*“Kun je er toch beter zelf een [fiets] kopen?” / “Wouldn't it be better to buy one [bike] yourself?”* FG4

When people want to use a flexible form of transport, they may even think about “snorders” before shared mobility modes, especially at night. Snorders are unlicensed private taxi drivers whose services are occasionally used as alternative transport to public transport and the car. Note that we did not ask participants about car renting.

#### **4.6 Discussion: the role of culture in people’s travel behaviour**

Our findings shed light on the role of culture in people’s travel behaviour. Culture is a very general term though, and we attempt to clarify it here. We observe that past travel behaviour – what people grew up with – can still have an influence on current travel behaviour (see also Baslington (2008), Haustein et al. (2009), Smart and Klein (2018) and Berveling et al. (2018)). We also see that initial choices made upon migrants’ arrival in the Netherlands (e.g. regarding who would get a driving license) play a role in explaining the travel behaviour of first-generation Dutch individuals in particular, even decades after their arrival. Gender roles probably played a part in such choices. Additionally, we observe that culture in individuals’ country of origin may contribute to explaining their attitudes towards travel modes (notably the car) and subsequently influences their travel behaviour in the Netherlands. People’s current conditions in the Netherlands also play a role in explaining travel behaviour. Social networks in the Netherlands contribute to instigating cultural practices: for instance, never seeing family or friends on the bike is unlikely to foster bike use. A recent international literature review on migrants’ travel behaviour confirms that all of the factors named in this paragraph contribute to explaining travel behaviour differences between individuals with and without a migration background (Delbosc & Shafi, 2023).

In this discussion around the role of culture in travel behaviour, it is also important to take into account the broader societal practices in the Netherlands. Here, we take the car as an example. Fifteen years ago, KiM concluded that the car was a status symbol among migrants and children of migrants (Olde Kalter, 2008). This conclusion was based on focus groups. In 2022, this observation still partially holds as explained in section 4.1.1 but it warrants contextualisation. Indeed, the car is a status symbol in society in general (Zijlstra et al., 2022). It has been the case for a long time (Baslington, 2008; Gorz, 1973). A recent study in Germany shows that many still aspire to own (larger) cars, no matter their migration background (Humpel et al., 2022). In general, the car remains an important mode of transport to be able to reach many destinations (Bastiaanssen & Breedijk, 2022). In this context, it is hardly surprising that the car has become a symbol of success and modernity among migrants and their descendants.

Our analyses hint at the existence of a cycling paradox, and this may be the best example to illustrate the role of culture in travel behaviour. The paradox can be explained as followed. On the one hand, the analyses presented in chapter 3 reveal that second-generation Dutch individuals usually cycle more than first-generation Dutch individuals. Besides, our qualitative fieldwork shows that individuals in the Dutch TMSA communities find it important that their children know how to cycle. On the other hand, our analyses in chapter 3 show that second-generation Dutch individuals still tend to cycle significantly less than people without a migration background. Children of migrants in the Turkish and Moroccan Dutch communities even tend to cycle less frequently than the first generation.

A lack of perceived safety while cycling, a sensitivity to cycling in adverse weather conditions and a lack of role models among women are explanations that we may partly attribute to culture and cultural differences. Namely, they may be related to

how people were brought up, to gender roles and in general to what their social network directly or indirectly passed on to them. Shafi et al. (2022) also observed the importance of culture to explain the travel attitudes and behaviour of South Asian migrants who had settled in Australia. Even as they tended to gradually assimilate towards the travel behaviour of Australians without a migration background, the researchers noted that “a cultural element may remain when it comes to attitudes, as participants still held distinct views towards mobility choices not discussed adequately in literature beforehand.” (p. 22)

Culture alone cannot explain everything though. The place of residence of individuals with a migration background is likely to be another explanation for a lower cycling frequency. While cycling is potentially easier in a denser area due to shorter distances, cities are also places where bike theft is more prominent, and where bicycle paths tend to be busy.

## 5 Conclusion and discussion

### 5.1 Conclusions per research question

The main research question of this study is:

#### **What is the current travel behaviour of migrants and children of migrants in the Netherlands?**

To address this research question, we considered three more specific sub-research questions:

1. How does travel behaviour differ between (children of) migrants from various migration backgrounds (with a special focus on the TMSA groups), and to what extent does their travel behaviour contrast with that of people without a migration background?
2. What are the underlying reasons for the travel behaviour of the TMSA groups in particular?
3. To what extent have changes happened within fifteen years in terms of the travel behaviour of the TMSA groups?

By answering each of these sub-research questions, we provide an answer to the main research question.

*Sub-question 1: How does travel behaviour differ between (children of) migrants from various migration backgrounds (with a special focus on the TMSA groups), and to what extent does their travel behaviour contrast with that of people without a migration background?*

Migration background is an important determinant of travel behaviour in the Netherlands. In other words, even when controlling for variables such as age, gender, income, education level, address density in the place of residence and labour participation, the country of origin of a person (or of their parent(s)) and their generation contribute to explaining observed travel behaviour differences. Yet there is no such thing as “the travel behaviour of individuals with a migration background”, as there is a mosaic of travel behaviours among first- and second-generation Dutch individuals. Concise conclusions are therefore not straightforward to draw. We shortly highlight our main takeaways on differences and similarities between the travel behaviour of people with and without a migration background in five points.

1. First-generation Dutch individuals are **less mobile** compared to people without a migration background. They are less likely to leave home on any given day and when they do, they make fewer trips and cover a shorter total distance. This conclusion still holds for some groups of second-generation individuals. This is especially true for second-generation Moroccan and Turkish Dutch people, who are the only analysed groups of children of migrants to be closer to first-generation Moroccan and Turkish Dutch people respectively in terms of mobility, than to people without a migration background. Note that first-generation Dutch women tend to be less mobile than their male counterparts.
2. First-generation Dutch individuals from the TMSA groups have significantly **longer commuting distances** than people without a migration background. This is especially true for Moroccan and Caribbean Dutch migrants. Their commuting distances are respectively 32% and 36% longer compared to people

without a migration background. This trend persists into the second generation, but differences with people without a migration background become less pronounced, with the exception of children of migrants with a Dutch Caribbean background. Second-generation Turkish and Surinamese Dutch individuals have commuting distances similar to individuals without a migration background. Our finding about longer commuting distances may seem contradictory with our earlier point about lower levels of mobility. However, this is because commutes are only relevant for those who do have a job and therefore exclude children, older adults, stay-at-home adults, etc. And even within the group of commuters with a migration background, we see fewer trips for other purposes on working days compared to people without a migration background. Besides, individuals with a migration background usually cover larger distances for their leisure and shopping trips too.

3. First-generation Dutch individuals are **much less likely to have a driving license** than individuals without a migration background, and this is even more true among first-generation Dutch women. Children of migrants have a higher rate of driving license ownership compared to migrants. In fact, second-generation Dutch individuals are generally closer to individuals without a migration background in terms of driving license ownership, than to their parent(s) with a migration background. Looking at car use, either as a passenger or as a driver, differences between individuals with and without a migration background are limited. Additionally, migrants and children of migrants are less likely to own a car, but this difference mostly disappears when controlling for driving license ownership. First-generation Moroccan and Surinamese Dutch licensed individuals tend to have slightly higher car ownership rates than those without a migration background but in general, individuals with a migration background are not necessarily more likely to own a car *once* they have a driving license.
4. Individuals with a migration background, and particularly those in the TMSA Dutch communities, **cycle less frequently** than individuals without a migration background. This relatively modest use of bicycles is partly compensated by more walking trips, and partly by travelling less, using public transport or the car. Second-generation Turkish, Moroccan and Surinamese Dutch individuals remain closer to first-generation individuals with the same migration background in terms of cycling frequency. First-generation Dutch women from the TMSA groups tend to bike less often than their male counterparts, and this persists across the second generation in the Turkish and Moroccan Dutch communities. In contrast, children of migrants with a Dutch Caribbean, western and other non-western migration background are closer to people without a migration background in terms of cycling frequency.
5. Second- and especially first-generation Dutch individuals **use public transport more frequently** than individuals without a migration background. This conclusion already takes into account the fact that individuals with a migration background tend to live in more urbanised areas. Dutch-Caribbean and Surinamese Dutch individuals tend to use PT more frequently than Turkish and Moroccan Dutch individuals. Differences in public transport use between individuals with and without a migration background are less pronounced than differences in bike use.

*Sub-question 2: What are the underlying reasons for the travel behaviour of the TMSA groups in particular?*

Because the label "migration background" captures a wide diversity of cultural and social aspects, we explored the reasons for the travel behaviour of the TMSA groups in particular in greater depth using interviews and focus groups.

There is an interplay of reasons explaining the travel behaviour of the TMSA groups. In general, **cultural norms directly instigated or mediated by parents and the community** contribute to explaining (persisting) travel behaviour patterns. Cycling behaviour offers an illustration of this. Although first- and second generation TMSA Dutch individuals find it important that their children know how to cycle, bike use has not dramatically increased between the first and second generation. Children of migrants with a Dutch Caribbean background are the only exception. Our qualitative analysis reveals that the way individuals were brought up, gender roles as well as expectations and norms conveyed by social networks are possible underlying reasons for this persisting trend. Even as cycling has increased among women with a non-western migration background in the past decades, many first- and second-generation Dutch women still lack role models of other women like them cycling. Multiple interviewed individuals perceive a strong lack of safety when cycling and seem sensitive to cycling under adverse weather conditions; such views were usually not only formed around personal experiences, but they were also conveyed by their social network. In addition, a recent study in the Netherlands showed that individuals living in neighbourhoods with a higher share of people with a non-western background are less likely to cycle. The researchers explain this finding by the fact that the nationally prevalent cycling behaviour is less salient in such neighbourhoods.

The **place of residence of individuals in the TMSA groups** also contributes to explaining their travel behaviour. 50% of them live in the 10 most populated cities in the Netherlands against 16% of the population without a migration background. While we could control for the density of addresses and some other spatial differences in our quantitative analysis, focus groups and interviews revealed the presence of at least two other factors we could not control for in our data analysis. First, cycling traffic is usually busier in cities, which can intensify concerns over traffic safety. Second, bikes can be harder to store safely in densely populated areas and bike theft is more widespread in urban areas. These aspects can contribute to cycling usually being a less attractive option among individuals within the four traditional groups. A more detailed analysis of spatial differences would help to pinpoint them more specifically (see section 5.4).

**Norms and (contemporary) expectations within Dutch society and among networks in individuals' country of origin** also contribute to explaining the travel behaviour of individuals with a migration background. The car is one illustration of this. Not all migrants can get access to a car upon arrival in the Netherlands. They usually need to get a driving license first, then to purchase the car itself. Some interviewed migrants mentioned social ties within their country of origin upholding the contemporary expectation to have a car. Additionally, the car fulfils an important function to reach jobs and activities in Dutch society. As a result of this combination, the car has acquired a symbolic meaning among migrants and their descendants, representing success and modernity. As such, children of migrants are usually strongly encouraged to get their driving license. This results in considerable differences in terms of driving license ownership rates between the first and second generations of Dutch individuals.

**Choices made upon migrants' arrival in the Netherlands** can still impact their mobility decades later. This holds particularly for the access to a car. When the family breadwinner – traditionally, the man – is given priority to get a driving

license upon arrival in the Netherlands, low rates of driving license ownership among first-generation Dutch women within the TMSA groups come as no surprise. Cultural norms around gender roles and driving may play a role in such early choices.

**Language barriers** and **health issues** also help to explain the travel behaviour of the TMSA groups. Language barriers justify why public transport may hardly be an option among some first-generation Turkish and Moroccan Dutch individuals. Health issues frequently came up in focus groups and interviews as a reason not to cycle (too far) or to make a limited number of trips. While physical difficulties are not specific to people with a migration background, Dutch literature shows that individuals in the TMSA groups, especially older generations, are less likely to be in good health than people without a migration background. The cause of such a difference goes beyond this study.

Besides, we see **hints at other mechanisms** influencing the travel behaviour of the TMSA groups. Longer commutes and longer travel times for other trip purposes suggest that people with a migration background may face difficulties in both the housing and labour markets. A spatial mismatch between where people live and work as well as discriminations on the labour market might contribute to explaining our findings, but our study does not allow us to directly draw a link between longer commutes and these potential explanations. Additionally, while we controlled for income in our quantitative data analysis, we could not control for other financial aspects (debts, reimbursement of commuting expenses, ...). Poverty has been documented to be between two and five times more frequent among adults in the TMSA communities than among adults without a migration background. This can therefore also affect travel behaviour.

*Sub-question 3: To what extent have changes happened within fifteen years in terms of the travel behaviour of the TMSA groups?*

Before answering this sub-research question, it is worth noting that observed differences between our study and those conducted fifteen years ago (specifically, Harms (2006) and Olde Kalter (2008)) are partly the result of choices in terms of methods and data:

- Harms (2006) had 4,000 observations (TMSA groups and individuals without a migration background), we now have 93,500 observations of the TMSA groups and people with a migration background. Besides, the representativeness of our sample is relatively good.
- We covered more countries of origin than Turkey, Morocco, Suriname and the Dutch Caribbean in the quantitative part of our study; we have an additional 17,000 observations of individuals with another migration background (therefore around 110,500 observations in total).
- Although we still only focused on these four countries of origin in the qualitative study, a main difference with the previous KiM study (Olde Kalter, 2008) is that we interviewed a more diverse panel of respondents, notably in terms of education levels, ages and Dutch literacy.
- We also conducted new analyses and added new information compared previous work in this field. For instance, we studied commuting distances and e-bike use.

The added value of the present study lies in the comparison between first- and second-generation Dutch individuals. In general, second-generation Dutch individuals in the TMSA groups show **travel behaviour patterns in-between their parents and individuals without a migration background**. However, there are strong variations depending on the analysed travel behaviour aspects. In terms of mobility – leaving the house, number of trips per day and total travelled

distance – only Dutch-Caribbean and Surinamese Dutch individuals are closer to people without a migration background than to their parents. Looking at commuting distances, second-generation Turkish and Surinamese Dutch individuals tend to be closer to people without a migration background than to their parents. Children of migrants with a Dutch Caribbean background are the only ones in the TMSA groups whose cycling frequency (and to a lesser extent, PT use frequency) is closer to that of people without a migration background. However, they are also the only ones in the TMSA groups whose driving license ownership tends to remain closer to that of their parents' – who had in fact some of the highest rates of driving license ownership among first-generation Dutch individuals. It is also worth noting that although **gender differences** still exist among individuals with a migration background, they appear to be much less pronounced and sometimes even no longer visible among second-generation Dutch individuals in the TMSA groups.

The expectation that **differences in terms of cycling frequency** between the TMSA groups and individuals without a migration background would remain, as suggested by Olde Kalter (2008), proved mostly right. Second-generation Dutch individuals in the TMSA groups have a significantly better socioeconomic position compared with their parents and have therefore more means to afford a bike. Besides, our focus groups hint at the fact that the second generation is less likely to have issues with basic biking skills. Yet these changes have not triggered a dramatic increase in bike use, apart from children of migrants with a Dutch Caribbean background. A possible explanation to this exception is that Dutch Caribbean migrants are more likely to marry someone without a migration background.

We see similarities in terms of results between our study and the work published seventeen years back. Many of the **underlying reasons** for the travel behaviour of the TMSA groups (sub-research question 2) remain. In addition, individuals in the TMSA groups are still **more likely to use public transport** than individuals without a migration background, and **less likely to cycle**. Second- and especially first-generation individuals in the TMSA Dutch communities are still significantly **less likely to own a driving license**, although the gap has closed for second-generation Turkish and Moroccan Dutch individuals. There is still a **limited difference in terms of car use** (as passenger or driver) between individuals with a Moroccan or Surinamese background and individuals without a migration background. Besides, our findings show that this conclusion now also applies to the Dutch-Caribbean Dutch community and, albeit to a lesser extent, to the Turkish Dutch community.

## 5.2 Implications

As the composition of the population in the Netherlands changes, so will mobility patterns. One of the main conclusions of our study is that migration background does matter, in line with the conclusion from other international studies on the same topic (Delbosc & Shafi, 2023) and previous Dutch studies (Harms, 2006; Olde Kalter, 2008). As immigration is estimated to play a major part in the future and the population of the Netherlands is forecasted to be more and more diverse (Statistics Netherlands, 2022g), **transport outlooks and forecasts** could gain in quality and accuracy by explicitly taking migration background into consideration. As Delbosc and Shafi (2023) put it: "If we choose not to consider where people come from, we risk further excluding potentially vulnerable groups" (p. 1). Statistics Netherlands already observed that a change in how respondents are recruited for participation in the Dutch national travel survey impacts some aggregate travel behaviour statistics for Dutch individuals with a non-western migration background. These changes subsequently impact the same aggregate travel behaviour statistics for all Dutch individuals (Statistics Netherlands, 2019a).



Differences between individuals with and without a migration background are not necessarily an issue from the outset. Nonetheless, our study sheds light on the fact that some **policy decisions are likely to impact differently** individuals with a migration background and individuals without a migration background. For instance, because second- and especially first-generation Dutch individuals use public transport more than people without a migration background, higher prices and a lower level of service in urban public transport are likely to have a relatively larger impact on individuals with a migration background. The qualitative part of this study already hints at the fact that individuals in the TMSA groups are experiencing dissatisfaction due to a perceived reduction in network coverage and a perceived (and objective) increase in PT prices. Nevertheless, we cannot exclude that this is not also the case among people without a migration background. Still, being aware of such asymmetric impacts can contribute to shaping policy choices.

At various points, we see **barriers to using certain transport modes**. For example, language and digital barriers can make it harder to use public transport. Bicycle theft and a lack of safe parking facilities can deter people from relying on the bicycle for their everyday mobility. Still, these barriers are not necessarily specific to people with a migration background. Recent KiM studies show that people usually find ways to cope when facing such barriers (Durand et al., 2023; Krabbenborg & Uitbeijerse, 2023), but that such coping strategies do not always offer a permanent or a socially desirable solution.

Should there be a wish for more transport policies targeting people with a migration background, these could prioritise issues where local and national governments already have **existing policy goals and where there is currently an untapped potential** for individuals with a migration background. Cycling classes (for children or adults) could be an example of such instrument. After all, there are targets in place to get more people on bicycles, and there are potential gains yet to be realised in the area among second- and especially first-generation Dutch individuals.

Last but not least, many solutions to the potential difficulties discussed above are **not necessarily found in the transport domain**. Bike shelters and attention for service levels in public transport is one thing, but language courses or tackling poverty is another. A number of issues can be addressed through transport policy, but a majority of changes will arguably have to be enacted elsewhere. The same line of reasoning applies for accessibility poverty in general; see Krabbenborg and Uitbeijerse (2023) for more details.

### 5.3 Limitations of this research

To fully understand the strengths of a study, one also needs to be aware of its weaknesses. Below we list the most important limitations in our study:

- Data from Statistics Netherlands (CBS) for the quantitative part was from **2018 and 2019 only**. Yet public transport patronage has not fully recovered after the COVID-19 pandemic. We do not know to what extent populations that used to be more dependent on public transport have changed their mobility practices. There is an ongoing KiM study on this topic; however, it does not focus explicitly on individuals with a migration background.
- ODiN, which we relied on for our quantitative data analysis, is **online and in Dutch only**. The invitation to participate and explanations are in participants' mother tongue though, and the representativeness of our sample in terms of age and gender (per generation) is reasonable (see appendix A). Still, the interviews allowed us to capture the voices of people who are not in ODiN. They showed more vulnerabilities than other participants, for instance in terms of a smaller social network, language

issues, health issues and a lower labour participation. Therefore, we probably underestimate the (already lower) mobility of the first generation.

- We do not have **data at the level of neighbourhoods**, so we could not control for some things like the share of people without a migration background in the same neighbourhood or the presence of sub-optimal bike infrastructure. These aspects have been found to explain the relatively low cycling frequencies among individuals with a migration background in earlier studies, but we could not control for these factors ourselves.

#### 5.4 Possibilities for future studies

We have listed a few possibilities for future studies, should researchers want to explore this topic in greater depth.

- **Spatial equity.** Investigating differences at the level of neighbourhoods could be an interesting research avenue. With data such as public transport availability, cycling infrastructure, and share of individuals with a (non-western) migration background per neighbourhood, it could be possible to examine spatial differences at a more fine-grained level between neighbourhoods.
- **More diversity of individuals with a migration background.** There is an increasing diversity in terms of countries of origin in the Netherlands. Therefore, it could be interesting to have travel behaviour insights pertaining to individuals with other migration backgrounds in the future. For example, Azaaj and Ait Moha (2017) took Polish migrants into account in their research on bicycle use. Besides the TMSA groups and people with a Polish background, a recent SCP study also investigated people whose countries of origin are Iran or Somalia (Dagevos et al., 2022). They chose these countries of origin in particular because migrants from both of these countries are considered refugees, but with very different integration results in the Dutch society (Huijnk & Andriessen, 2016). Delbosc and Shafi (2023) also suggest this avenue of research, investigating the travel behaviour of migrants with a more diverse lens. Linked to the diversity of countries of origin, is a diversity in terms of migration purposes. The relevance of some of the migration purposes has changed over recent years (Statistics Netherlands, 2020c). For example, the group of knowledge and skilled migrants ("kenniswerkers") is increasing in size in the Netherlands (Statistics Netherlands, 2020c). Their commuting patterns as described in Raspe et al. (2014) revealed distinct housing choices and commuting preferences when compared with knowledge workers without a migration background. In large cities, such a group form a crucial part of the local economy (Raspe et al., 2014; van Haelst & Emans, 2015). Another group increasing in size and for whom insights in terms of mobility are missing are refugees.

It is important to bear in mind that data quality and quantity may be bottlenecks to conduct research on these specific topics.

- **Investigating potential interventions and measuring their effects**, for instance of bike lessons or campaigns to change the image of the bike across different age groups. Research in the area of Nieuw-West Amsterdam has shown that the low image towards cycling among boys with a migration background starts from the age of 10 (de Gijt et al., 2018; Fietsberaad, 2012; van der Kloof et al., 2014). In that area, cycling is low despite a relatively good cycling infrastructure. The research found that especially Moroccan boys in the area think that cycling to school is not "cool" anymore. Investigating potential interventions and their effects could contribute to informing policymakers on ways to reach policy goals (see also section 5.2).

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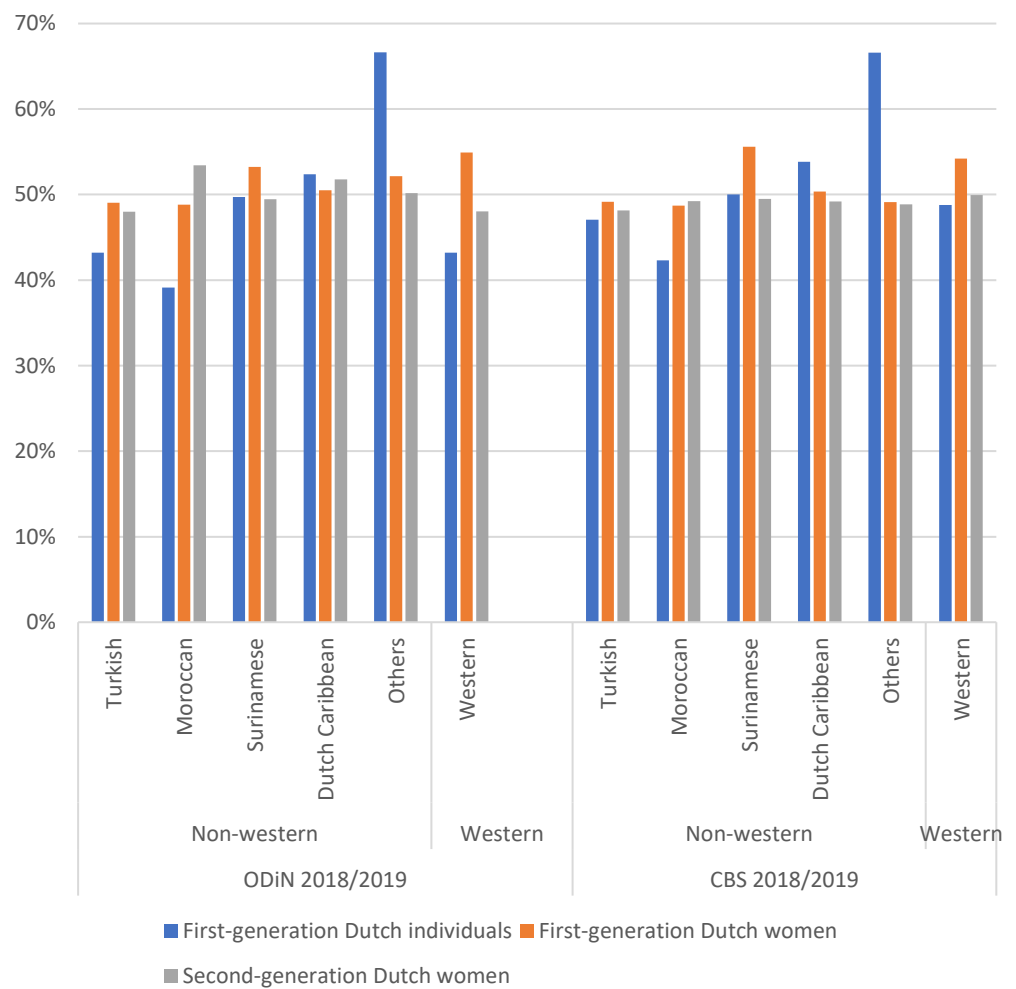
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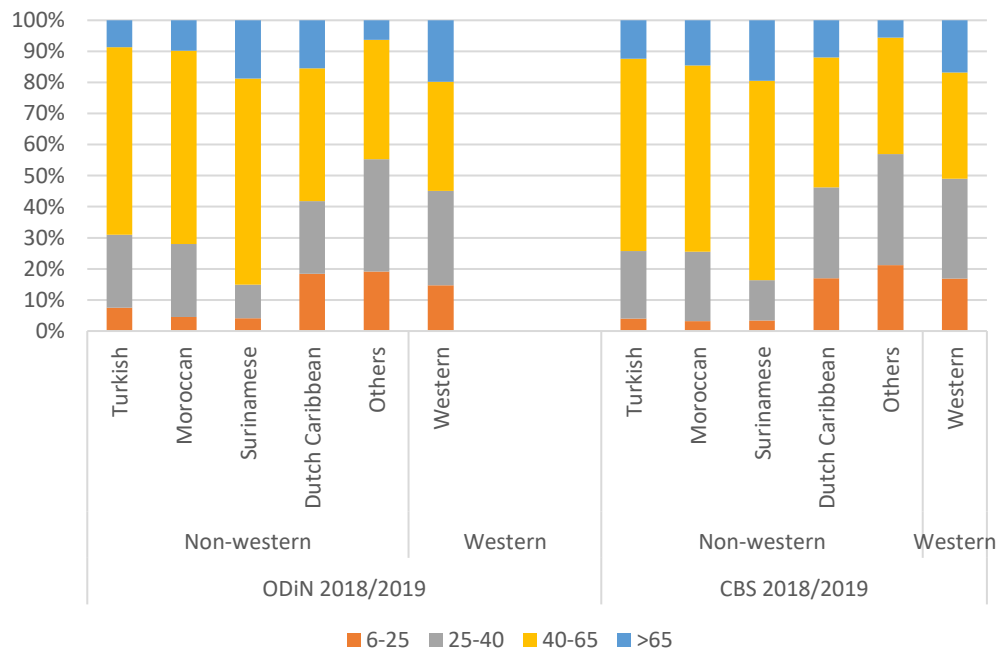


## Appendix A: ODiN sample characteristics

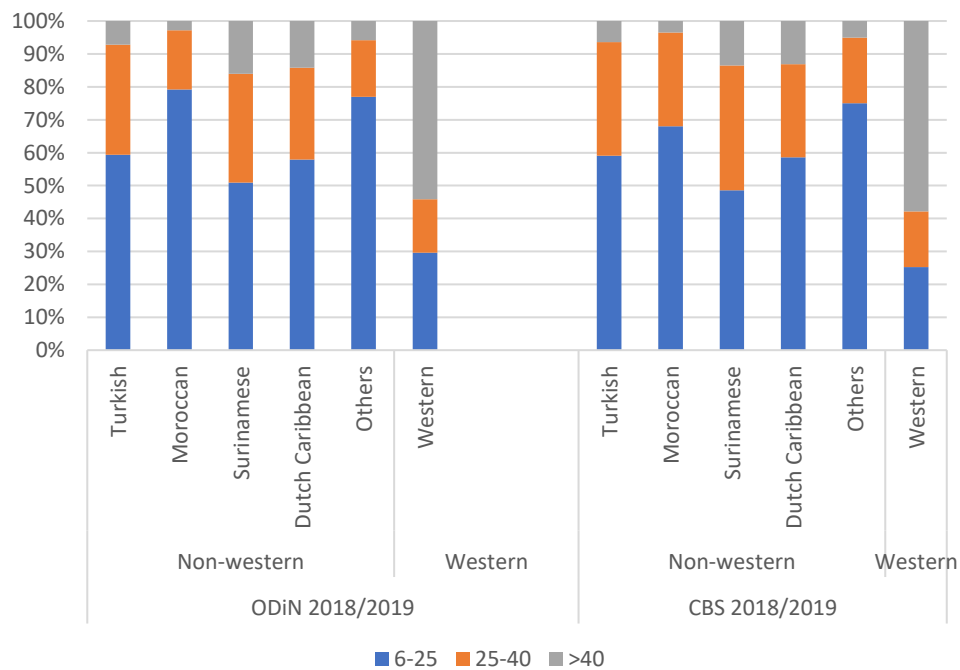
**Figure A.1 Differences in terms of sample composition: ODiN 2018/2019 versus register data from Statistics Netherlands (CBS) 2018/2019 in terms of first-generation Dutch individuals, first-generation Dutch women and second-generation Dutch women**



**Figure A.2** Differences in terms of sample composition: ODiN 2018/2019 versus register data from Statistics Netherlands (CBS) 2018/2019 in terms of age groups among first-generation Dutch individuals



**Figure A.3** Differences in terms of sample composition: ODiN 2018/2019 versus register data from Statistics Netherlands (CBS) 2018/2019 in terms of age groups among second-generation Dutch individuals



## Appendix B: Model estimates

**Table B.1 Model estimations for travel behaviour aspects in Category 1, "Mobility", including the likelihood to leave the house on the survey day, the total number of trips per person per day, and total distance travelled per person**

		Go out		Number of trips per day		Total distance per day	
		Estimate	p-value	Estimate	p-value	Estimate	p-value
	(Intercept)	1,85	0 ***	1,02	0 ***	1,76	0 ***
Age	12-17	-0,44	0 ***	-0,11	0 ***	0,42	0 ***
	18-24	-1,12	0 ***	-0,18	0 ***	0,63	0 ***
	25-29	-1,25	0 ***	-0,12	0 ***	0,5	0 ***
	30-39	-1,23	0 ***	-0,06	0 ***	0,43	0 ***
	40-49	-1,39	0 ***	-0,05	0 ***	0,46	0 ***
	50-59	-1,54	0 ***	-0,11	0 ***	0,43	0 ***
	60-64	-1,71	0 ***	-0,13	0 ***	0,37	0 ***
	65-69	-1,95	0 ***	-0,18	0 ***	0,34	0 ***
	70-79	-2,29	0 ***	-0,22	0 ***	0,25	0 ***
	>79	-2,80	0 ***	-0,32	0 ***	-0,08	0,03 *
	Reference: 6-11						
Gender	Man	-0,16	0 ***	-0,06	0 ***	0,15	0 ***
	Reference: woman						
Income	Low	0,07	0,05 *	-0,02	0,03 *	-0,01	0,78
	Middle	0,22	0 ***	0,02	0,07 '	0,03	0,11
	High	0,32	0 ***	0,04	0 ***	0,07	0 ***
	Highest	0,30	0 ***	0,04	0 ***	0,11	0 ***
	Unknow	-0,07	0,31	-0,03	0,11	0,07	0,07 '
	Reference: lowest						
Education	Middle	0,42	0 ***	0,08	0 ***	0,15	0 ***
	High	0,54	0 ***	0,12	0 ***	0,34	0 ***
	Reference: low						
Social participation	Student	0,12	0 **	-0,03	0 ***	0,12	0 ***
	Unemployed	-0,36	0 ***	-0,01	0,18	-0,22	0 ***
	Retired	0,23	0 ***	0,02	0,14	0,04	0,12
	Part-time job	0,54	0 ***	0,002	0,75	0,11	0 ***
	Full-time job	0,55	0 ***	-0,1	0 ***	0,41	0 ***
	Reference: Others						
Household composition	Couple household	-0,15	0 ***	-0,03	0 ***	-0,02	0,11
	Couple with 1 or 2 children under 12 years old	-0,22	0 ***	0,02	0,01 **	-0,16	0 ***
	Couple with more than 2 children under 12 years old	-0,16	0 **	0,11	0 ***	-0,17	0 ***
	Single household with 1 or 2 children under 12 years old	-0,26	0 ***	0,04	0 ***	-0,06	0 **
	Single household with more than 2 children under 12 years old	-0,43	0 ***	0,08	0 **	-0,07	0,25
	Others	-0,43	0 ***	-0,02	0,27	-0,01	0,83
	Reference: single household						
Household cars	Household with a car/cars	0,06	0,04 *	0,01	0,04 *	0,25	0 ***
	Reference: household without a car						
Driving license	Person with driving license	0,42	0 ***	0,09	0 ***	0,29	0 ***
	Reference: person without a driving license						
Week	Monday	0,72	0 ***	0,19	0 ***	-0,06	0 ***
	Tuesday	0,84	0 ***	0,2	0 ***	0,01	0,44
	Wednesday	0,77	0 ***	0,23	0 ***	0,03	0,07 '
	Thursday	0,88	0 ***	0,23	0 ***	0,05	0 **
	Friday	0,87	0 ***	0,26	0 ***	0,06	0 ***
	Saturday	0,53	0 ***	0,22	0 ***	0,03	0,09 '
	Reference: Sunday						
Month	February	0,15	0 **	-0,001	0,94	0,01	0,77
	March	0,06	0,15	0,02	0,01 **	0,02	0,33
	April	0,24	0 ***	0,01	0,26	0,06	0 **
	May	0,11	0,01 *	0,02	0,05 *	0,1	0 ***
	June	0,07	0,11	0,01	0,35	0,1	0 ***
	July	-0,15	0 ***	-0,03	0 **	0,07	0 ***
	August	-0,36	0 ***	-0,05	0 ***	0,05	0,01 *
	September	0,09	0,04 *	0,03	0 **	0,07	0 ***
	October	0,13	0 **	0,01	0,34	0,07	0 ***

Multicultural diversity in mobility

	November	0,13	0 **	0,01	0,12	0,04	0,02 *
	December	-0,05	0,26	-0,02	0,01 *	-0,01	0,64
	Reference: January						
Holiday	Yes	-0,6	0 ***	-0,14	0 ***	0,07	0,03 *
	Reference: No						
Province	Friesland					0,11	0 **
	Drenthe					0,08	0,02 *
	Overijssel					0,02	0,55
	Flevoland					0,24	0 ***
	Gelderland					0,05	0,08 '
	Utrecht					0,12	0 ***
	Noord-Holland					0,09	0 ***
	Zuid-Holland					0,07	0,01 **
	Zeeland					-0,04	0,28
	Noord-Brabant					0,01	0,63
	Limburg					-0,07	0,02 *
	Reference: Groningen						
Contextual aspects	OAD	0,004	0 ***	0,005	0 ***	-0,01	0 ***
	Ground Space Index (GSI)						
	Mixed Use Index (MXI)					0,11	0 **
	Open Space Ratio (OSR)	-0,02	0 ***	0,001	0,66	0,01	0,02 *
	FSI (Floor Space Index)						
	Layers (L)						
	Distance to station (m)						
	Distance to centre (m)					0,02	0,01 **
	Distance to highway (m)	-0,04	0 **	-0,001	0,66		
Country of origin and generation	Suriname 1st	-0,76	0 ***	-0,18	0 ***	-0,06	0,18
	Suriname 2nd	-0,32	0 **	-0,1	0 ***	0,06	0,13
	Dutch Caribbean 1st	-0,75	0 ***	-0,14	0 ***	-0,08	0,24
	Dutch Caribbean 2nd	-0,25	0,11	-0,01	0,67	-0,03	0,66
	Morocco 1st	-0,85	0 ***	-0,14	0 ***	-0,22	0 ***
	Morocco 2nd	-0,86	0 ***	-0,17	0 ***	-0,08	0,09 '
	Turkey 1st	-0,95	0 ***	-0,26	0 ***	-0,24	0 ***
	Turkey 2nd	-0,82	0 ***	-0,2	0 ***	-0,2	0 ***
	Other non-western 1st	-1,02	0 ***	-0,25	0 ***	-0,21	0 ***
	Other non-western 2nd	-0,56	0 ***	-0,1	0 ***	-0,04	0,2
	Western 1st	-0,56	0 ***	-0,11	0 ***	-0,12	0 ***
	Western 2nd	-0,05	0,25	-0,02	0,01 **	-0,01	0,66
	Reference: no migration background						
Type of model	Binary logit			Poisson		OLS	
Number of obs.	110588			94228		94228	
R-squared	McFadden 0,12			McFadden 0,02		Multiple 0,15	
	's R squared			's R squared		R-squared	
	maximum 0,10			maximum 0,07		Adjusted 0,14	
	Likelihood Pseudo R-squared			Likelihood Pseudo R-squared		R-squared	

Signifiant codes: 0: \*\*\*, 0,001: \*\*, 0,01 \*, 0,05: '.

**Table B.2 Model estimations for travel behaviour aspects in Category 2, "Travel distance and time", including the commuting distance, (grocery) shopping distance, and distance to leisure activities**

		Commuting distance		(Grocery) shopping distance		Leisure distance	
		Estimate	p-value	Estimate	p-value	Estimate	p-value
	(Intercept)	0,06	0,74	1,93	0 ***	1,52	0 ***
Age	12-17			0,11	0,07 '	0,2	0 ***
	18-24	0,74	0 ***	-0,11	0,11	0,44	0 ***
	25-29	0,92	0 ***	-0,21	0 **	0,41	0 ***
	30-39	0,91	0 ***	-0,28	0 ***	0,37	0 ***
	40-49	0,9	0 ***	-0,21	0 **	0,32	0 ***
	50-59	0,82	0 ***	-0,18	0 **	0,39	0 ***
	60-64	0,78	0 ***	-0,07	0,27	0,49	0 ***
	65-69	0,6	0 ***	-0,06	0,4	0,52	0 ***
	70-79			-0,06	0,38	0,51	0 ***
	>79			-0,17	0,03 *	0,3	0 ***
	Reference: 6-11						
	* Reference: 12-17, excluding 70+						
Gender	Man	0,27	0 ***	0,05	0 **	0,13	0 ***

Multicultural diversity in mobility

	Reference: woman					
Income	Low	0,13	0 **	-0,003	0,94	0,01 0,65
	Middle	0,14	0 ***	-0,01	0,84	-0,01 0,71
	High	0,15	0 ***	0,06	0,09 '	-0,01 0,67
	Highest	0,18	0 ***	0,04	0,32	0,02 0,48
	Unknow	0,07	0,4	0,03	0,74	0,28 0 ***
	Reference: lowest					
Education	Middle	0,09	0 ***	0,01	0,61	0,02 0,32
	High	0,37	0 ***	-0,11	0 ***	0,05 0,01 *
	Reference: low					
Social participation	Student			-0,1	0,02 *	0,002 0,93
	Unemployed			-0,02	0,66	-0,1 0 **
	Retired			0,06	0,12	0,08 0,02 *
	Part-time job			-0,03	0,44	-0,07 0,01 **
	Full-time job	0,39	0 ***	0,05	0,12	0,01 0,63
	Reference: Others					
Household composition	Couple household	0,07	0,01 **	0,18	0 ***	0,13 0 ***
	Couple with 1 or 2 children under 12 years old	-0,05	0,09 '	0,22	0 ***	-0,01 0,65
	Couple with more than 2 children under 12 years old	-0,15	0 ***	0,08	0,08 '	-0,11 0 ***
	Single household with 1 or 2 children under 12 years old	-0,05	0,21	0,07	0,09 '	0,01 0,8
	Single household with more than 2 children under 12 years old	-0,08	0,76	0,004	0,98	-0,09 0,3
	Others	-0,001	0,99	0,11	0,21	0,01 0,85
		Reference: single household				
Household cars	Household with a car/cars					
	Reference: household without a car					
Driving license	Person with driving license	0,32	0 ***	0,2	0 ***	0,15 0 ***
	Reference: person without driving license					
Week	Monday			-0,48	0 ***	-0,58 0 ***
	Tuesday			-0,4	0 ***	-0,5 0 ***
	Wednesday			-0,35	0 ***	-0,44 0 ***
	Thursday			-0,35	0 ***	-0,47 0 ***
	Friday			-0,26	0 ***	-0,34 0 ***
	Saturday			-0,12	0 ***	-0,01 0,54
		Reference: Sunday				
Month	February					0,003 0,92
	March					-0,01 0,74
	April					0,08 0,01 *
	May					0,08 0,01 *
	June					0,12 0 ***
	July					0,22 0 ***
	August					0,17 0 ***
	September					0,06 0,04 *
	October					0,07 0,02 *
	November					0,02 0,51
	December					0,04 0,15
		Reference: January				
Holiday	Yes			0,17	0,02 *	0,39 0 ***
	Reference: No					
Province	Friesland	0,18	0,01 **	-0,01	0,85	0,005 0,92
	Drenthe	0,23	0 **	0,1	0,16	-0,06 0,23
	Overijssel	0,08	0,14	-0,04	0,51	-0,09 0,04 *
	Flevoland	0,48	0 ***	0,05	0,44	0,09 0,09 '
	Gelderland	0,2	0 ***	-0,07	0,21	-0,07 0,06 '
	Utrecht	0,33	0 ***	-0,15	0,01 **	-0,01 0,77
	Noord-Holland	0,28	0 ***	-0,002	0,97	0,02 0,67
	Zuid-Holland	0,23	0 ***	0,1	0,05 *	-0,03 0,37
	Zeeland	-0,04	0,64	-0,02	0,84	-0,1 0,08 '
	Noord-Brabant	0,14	0,01 **	-0,09	0,09 '	-0,1 0,01 *
	Limburg	-0,002	0,97	-0,01	0,82	-0,18 0 ***
	Reference: Groningen					
Contextual aspects	OAD	-0,01	0 ***	-0,02	0 ***	-0,01 0 ***
	Ground Space Index (GSI)			-0,82	0 ***	
	Mixed Use Index (MXI)	0,49	0 ***			0,3 0 ***
	Open Space Ratio (OSR)			0,02	0 **	
	FSI (Floor Space Index)					
	Layers (L)					
	Distance to station (m)					
Distance to centre (m)	0,03	0,03 *	-0,03	0,02 *		

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						-0,04	0 ***	
	Distance to highway (m)							
Country of origin and generation	Suriname 1st	0,2	0,01 *	0,29	0 ***	0,23	0 **	
	Suriname 2nd	0,03	0,75	0,29	0 **	0,25	0 ***	
	Dutch Caribbean 1st	0,28	0,02 *	0,16	0,22	0,01	0,92	
	Dutch Caribbean 2nd	0,36	0,01 *	0,13	0,34	-0,13	0,18	
	Morocco 1st	0,34	0,01 **	0,39	0 ***	0,02	0,87	
	Morocco 2nd	0,22	0,07 '	0,29	0,01 **	0,16	0,04 *	
	Turkey 1st	0,24	0,02 *	0,32	0 **	0,07	0,5	
	Turkey 2nd	0,07	0,47	0,19	0,1 '	0,12	0,11	
	Other non-western 1st	-0,005	0,92	0,43	0 ***	0,13	0 **	
	Other non-western 2nd	0,09	0,24	0,17	0,02 *	0,14	0,01 **	
	Western 1st	0,04	0,31	0,14	0 **	0,05	0,16	
	Western 2nd	0,05	0,15	0,04	0,32	0,04	0,13	
	Reference: no migration background							
	Type of model	OLS	OLS	OLS				
Number of obs.	23416	22206	50764					
R-squared	Multiple R-squared	0,09	0,11	0,07				
	Adjusted R-squared	0,09	0,10	0,07				

Signifiant codes: 0: \*\*\*, 0,001: \*\*, 0,01 \*, 0,05: '.

**Table B.3 Model estimations for travel behaviour aspects in Category 2, "Travel distance and time", including the commuting travel time, (grocery) shopping travel time, and travel time to leisure activities**

		Commuting travel time		(Grocery) shopping travel time		Leisure travel time	
		Estimate	p-value	Estimate	p-value	Estimate	p-value
	(Intercept)	2,29	0 ***	3,12	0 ***	2,99	0 ***
Age	12-17			0,04	0,31	-0,02	0,48
	18-24	0,44	0 ***	-0,02	0,66	0,25	0 ***
	25-29	0,50	0 ***	-0,09	0,05 *	0,27	0 ***
	30-39	0,48	0 ***	-0,13	0 **	0,31	0 ***
	40-49	0,48	0 ***	-0,15	0 ***	0,3	0 ***
	50-59	0,46	0 ***	-0,09	0,02 *	0,41	0 ***
	60-64	0,47	0 ***	-0,02	0,62	0,49	0 ***
	65-69	0,31	0 ***	0,03	0,46	0,52	0 ***
	70-79			0,07	0,12	0,47	0 ***
	>79			0,11	0,02 *	0,33	0 ***
	Reference: 6-11						
Gender	Man	0,10	0 ***	-0,03	0,02 *	0,08	0 ***
	Reference: woman						
Income	Low	0,03	0,34	-0,03	0,15	-0,01	0,8
	Middle	0,03	0,22	-0,07	0 **	-0,07	0 **
	High	0,03	0,31	-0,04	0,11	-0,11	0 ***
	Highest	0,04	0,14	-0,08	0 **	-0,13	0 ***
	Unknow	0,03	0,52	-0,08	0,13	0,25	0 ***
	Reference: lowest						
Education	Middle	0,07	0 ***	-0,02	0,26	-0,02	0,19
	High	0,27	0 ***	-0,06	0 ***	-0,01	0,57
	Reference: low						
Social participation	Student			-0,07	0,02 *	-0,04	0,03 *
	Unemployed			0,04	0,15	0,04	0,1
	Retired			0,06	0,03 *	0,06	0,03 *
	Part-time job	Reference		-0,02	0,36	-0,06	0 **
	Full-time job	0,18	0 ***	-0,01	0,8	-0,06	0 ***
	Reference:	* Reference: Part-time job			Others	Others	
Household composition	Couple household	0,04	0,01 *	0,06	0 ***	0,12	0 ***
	Couple with 1 or 2 children under 12 years old	-0,02	0,27	0,07	0 ***	0,02	0,19
	Couple with more than 2 children under 12 years old	-0,09	0 ***	-0,01	0,68	-0,03	0,22
	Single household with 1 or 2 children under 12 years old	-0,04	0,15	0,01	0,78	0,05	0,06 '
	Single household with more than 2 children under 12 years old	0,04	0,82	-0,03	0,75	0,01	0,87
	Others	-0,001	0,99	0,003	0,96	0,04	0,48
	Reference: single household						
	Household cars	Household with a car/cars					

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	Reference: household without a car						
Driving license	Person with driving license Reference: person without driving license	-0,06	0 **	-0,04	0,01 **	-0,1	0 ***
Week	Monday Tuesday Wednesday Thursday Friday Saturday Reference: Sunday			-0,24 -0,21 -0,17 -0,16 -0,15 -0,05	0 *** 0 *** 0 *** 0 *** 0 *** 0,01 *	-0,29 -0,25 -0,23 -0,25 -0,19 -0,07	0 *** 0 *** 0 *** 0 *** 0 *** 0 ***
Month	February March April May June July August September October November December Reference: January					0,06 0,04 0,15 0,12 0,14 0,21 0,21 0,09 0,08 0,03 0,04	0,01 * 0,09 ' 0 *** 0 *** 0 *** 0 *** 0 *** 0 *** 0 *** 0,2 0,1
Holiday	Yes Reference: No			0,11	0,01 *	0,17	0 ***
Province	Friesland Drenthe Overijssel Flevoland Gelderland Utrecht Noord-Holland Zuid-Holland Zeeland Noord-Brabant Limburg Reference: Groningen	0,06 0,1 0,05 0,25 0,13 0,21 0,24 0,19 -0,05 0,07 -0,07	0,16 0,02 * 0,19 0 *** 0 *** 0 *** 0 *** 0 *** 0,25 0,02 * 0,04 *	0,05 0,07 -0,02 0,06 0 -0,01 0,06 0,12 0,08 -0,03 -0,01	0,23 0,1 ' 0,58 0,15 0,99 0,85 0,06 ' 0 *** 0,09 ' 0,38 0,69	-0,02 -0,05 -0,08 -0,002 -0,06 -0,05 -0,002 -0,03 -0,04 -0,09 -0,08	0,6 0,25 0,01 * 0,96 0,04 * 0,11 0,94 0,33 0,32 0 ** 0,02 *
Contextual aspects	OAD Ground Space Index (GSI) Mixed Use Index (MXI) Open Space Ratio (OSR) FSI (Floor Space Index) Layers (L) Distance to station (m) Distance to centre (m) Distance to highway (m)	-0,003 0,33	0 *** 0 ***	-0,004 -0,52 0,01	0 *** 0 *** 0,23	0,001 0,18	0,05 * 0 *** 0 ***
Country of origin and generation	Suriname 1st Suriname 2nd Dutch Caribbean 1st Dutch Caribbean 2nd Morocco 1st Morocco 2nd Turkey 1st Turkey 2nd Other non-western 1st Other non-western 2nd Western 1st Western 2nd Reference: no migration background	0,12 0,06 0,2 0,22 0,2 0,2 0,15 0,09 0,08 0,06 0,02 0,04	0,01 * 0,25 0,01 ** 0,01 ** 0,01 ** 0,01 ** 0,01 * 0,1 0,01 ** 0,23 0,4 0,06 '	0,29 0,22 0,13 -0,03 0,42 0,33 0,45 0,29 0,41 0,13 0,16 0,06	0 *** 0 *** 0,13 0,7 0 *** 0 *** 0 *** 0 *** 0 *** 0,01 ** 0 *** 0,02 *	0,08 0,11 0,05 -0,11 0,3 0,39 0,4 0,29 0,33 0,14 0,17 0,04	0,14 0,03 * 0,55 0,13 0 *** 0 *** 0 *** 0 *** 0 *** 0 *** 0 *** 0 *** 0,06 '
Type of model		OLS		OLS		OLS	
Number of obs.		23416		22206		50764	
R-squared	Multiple R-squared	0,07		0,05		0,06	
	Adjusted R-squared	0,07		0,05		0,06	

Signifiant codes: 0: \*\*\*, 0,001: \*\*, 0,01 \*, 0,05: ' .

**Table B.4 Model estimations for travel behaviour aspects in Category 3, "Car Access", including driving license ownership and car ownership**

		Driving license		Car ownership	
		Estimate	p-value	Estimate	p-value
	(Intercept)	0,02	0,83	-2,07	0 ***
Age	12-17 (excluded)				
	18-24 (ref. group)				
	25-29	0,79	0 ***	0,92	0 ***
	30-39	1,12	0 ***	1,24	0 ***
	40-49	1,49	0 ***	1,35	0 ***
	50-59	1,66	0 ***	1,5	0 ***
	60-64	1,71	0 ***	1,56	0 ***
	65-69	1,4	0 ***	1,5	0 ***
	70-79	-0,25	0 ***	1,73	0 ***
>79	-0,25	0 ***	2,03	0 ***	
Gender	Man	0,52	0 ***	0,94	0 ***
	Reference: woman				
Income	Low	0,13	0 ***	0,45	0 ***
	Middle	0,46	0 ***	0,46	0 ***
	High	0,75	0 ***	0,42	0 ***
	Highest	1,02	0 ***	0,4	0 ***
	Unknow	-1,38	0 ***	-0,43	0 ***
	Reference: lowest				
Education	Middle	0,71	0 ***	0,21	0 ***
	High	1,12	0 ***	0,19	0 ***
	Reference: low				
Social participation	Student	0,17	0 **	-1,19	0 ***
	Unemployed	-0,30	0 ***	0,21	0 ***
	Retired	0,60	0 ***	0,65	0 ***
	Part-time job	0,59	0 ***	0,48	0 ***
	Full-time job	0,86	0 ***	0,61	0 ***
Reference: Others					
Household composition	Couple household	0,20	0 ***	-0,72	0 ***
	Couple with 1 or 2 children under 12 years old	-0,02	0,64	-0,62	0 ***
	Couple with more than 2 children under 12 years old	0,33	0 ***	-0,73	0 ***
	Single household with 1 or 2 children under 12 years old	-0,23	0 ***	0,30	0 ***
	Single household with more than 2 children under 12 years old	-0,21	0,36	0,40	0,09 '
	Others	-0,16	0,06 '	-0,76	0 ***
Reference: single household					
Province	Friesland			-0,01	0,84
	Drenthe			-0,04	0,56
	Overijssel			0,05	0,41
	Flevoland			-0,05	0,44
	Gelderland			0,05	0,37
	Utrecht			-0,09	0,09 '
	Noord-Holland			-0,09	0,07 '
	Zuid-Holland			0,04	0,39
	Zeeland			-0,01	0,85
	Noord-Brabant			0,12	0,01 *
	Limburg			0,16	0,01 **
Reference: Groningen					
Contextual aspects	OAD	-0,01	0 ***	-0,01	0 ***
	Ground Space Index (GSI)				
	Mixed Use Index (MXI)				
	Open Space Ratio (OSR)			-0,01	0,16
	FSI (Floor Space Index)			-0,14	0 ***
	Layers (L)	-0,11	0 ***		
	Distance to station (m)				
	Distance to centre (m)			0,07	0 ***
Distance to highway (m)					
Country of origin and generation	Suriname 1st	-0,82	0 ***	0,22	0,01 **
	Suriname 2nd	-0,28	0,01 **	-0,13	0,15
	Dutch Caribbean 1st	-0,41	0 ***	-0,51	0 ***
	Dutch Caribbean 2nd	-0,46	0 **	-0,02	0,87
	Morocco 1st	-0,99	0 ***	0,29	0,01 *
	Morocco 2nd	-0,18	0,17	0,15	0,25
	Turkey 1st	-0,38	0 ***	0,02	0,85



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	Turkey 2nd	0,11	0,31	0,04	0,69
	Other non-western 1st	-1,61	0 ***	-0,1	0,62
	Other non-western 2nd	-0,16	0 ***	-0,02	0,68
	Western 1st	-1,78	0 ***	0,03	0,02 *
	Western 2nd	-0,38	0 ***	-0,04	0,49
	Reference: no migration background				
Type of model		Binary logit		Binary logit	
Number of obs.		93209		78537	
R-squared	McFadden's R squared	0,26		0,13	
	maximum Likelihood Pseudo R-squared	0,20		0,17	

Signifiant codes: 0: \*\*\*, 0,001: \*\*, 0,01 \*, 0,05: '.

**Table B.5 Model estimations for travel behaviour aspects in Category 4, "Mode Use Frequency", including the frequency of transport mode use per day, such as the bike, the car and public transport (PT)**

		Frequency of car use		Frequency of bicycle use		Frequency of PT use	
		Estimate	p-value	Estimate	p-value	Estimate	p-value
	(Intercept)	-1,38	0 ***	0,38	0 ***	-2,87	0 ***
Age	12-17	-0,32	0 ***	0,53	0 ***	1,22	0 ***
	18-24	-0,12	0 ***	-0,34	0 ***	1,86	0 ***
	25-29	0,06	0,16	-0,55	0 ***	1,11	0 ***
	30-39	0,12	0 **	-0,56	0 ***	0,82	0 ***
	40-49	0,09	0,02 *	-0,53	0 ***	0,63	0 ***
	50-59	-0,04	0,25	-0,54	0 ***	0,66	0 ***
	60-64	-0,1	0,01 *	-0,51	0 ***	0,69	0 ***
	65-69	-0,15	0 **	-0,6	0 ***	0,7	0 ***
	70-79	-0,28	0 ***	-0,81	0 ***	0,79	0 ***
	>79	-0,28	0 ***	-1,68	0 ***	0,38	0 ***
	Reference: 6-11						
Gender	Man	0,08	0 ***	-0,01	0,36	-0,1	0 ***
	Reference: woman						
Income	Low	0,02	0,55	0,01	0,83	0,19	0 ***
	Middle	0,03	0,36	0,08	0 **	0,18	0 ***
	High	0,08	0,01 **	0,08	0,01 **	0,17	0 ***
	Highest	0,11	0 ***	0,08	0,01 **	0,19	0 ***
	Unknow	-0,16	0,01 **	0,09	0,09 '	0,07	0,31
	Reference: lowest						
Education	Middle	0,09	0 ***	0,07	0 ***	0,19	0 ***
	High	-0,003	0,87	0,3	0 ***	0,43	0 ***
	Reference: low						
Social participation	Student	-0,11	0 ***	0,14	0 ***	0,71	0 ***
	Unemployed	-0,11	0 **	-0,37	0 ***	-0,13	0,02 *
	Retired	0,01	0,66	0,11	0 **	0,01	0,89
	Part-time job	0,22	0 ***	0,01	0,8	0,13	0 **
	Full-time job	0,43	0 ***	-0,33	0 ***	0,26	0 ***
	Reference: Others						
Household composition	Couple household	-0,15	0 ***	0,14	0 ***	0,07	0,02 *
	Couple with 1 or 2 children under 12 years old	-0,18	0 ***	0,16	0 ***	0,11	0 ***
	Couple with more than 2 children under 12 years old	-0,21	0 ***	0,33	0 ***	-0,12	0,02 *
	Single household with 1 or 2 children under 12 years old	-0,02	0,49	-0,03	0,41	0,19	0 ***
	Single household with more than 2 children under 12 years old	0,07	0,43	0,1	0,28	0,09	0,45
	Others	-0,14	0,04 *	-0,02	0,71	0,01	0,87
	Reference: single household						
Household cars	<b>Household with a car/cars</b>	<b>1,28</b>	<b>0 ***</b>	-0,36	0 ***	-0,65	0 ***
	Reference: household without a car						
Province	Friesland	-0,01	0,86	0,02	0,7	-0,004	0,96
	Drenthe	0,03	0,54	-0,11	0,04 *	0,17	0,05 '
	Overijssel	0,05	0,25	0,11	0,01 **	-0,03	0,63
	Flevoland	0,08	0,11	-0,3	0 ***	0,52	0 ***
	Gelderland	0,07	0,1 '	0,002	0,96	0,19	0 **
	Utrecht	-0,01	0,76	0,03	0,55	0,45	0 ***
	Noord-Holland	0,06	0,13	-0,14	0 ***	0,55	0 ***
	Zuid-Holland	0,12	0 **	-0,28	0 ***	0,54	0 ***
	Zeeland	0,003	0,96	-0,09	0,14	0,08	0,45
	Noord-Brabant	0,17	0 ***	-0,17	0 ***	0,08	0,21
	Limburg	0,24	0 ***	-0,42	0 ***	0,06	0,39

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Reference: Groningen							
Contextual aspects	OAD	-0,01	0 ***	0,01	0 ***	0,003	0 ***
	Ground Space Index (GSI)						
	Mixed Use Index (MXI)	0,24	0 ***	-0,09	0,07 '	0,18	0,01 *
	Open Space Ratio (OSR)					0,001	0,89
	FSI (Floor Space Index)						
	Layers (L)			-0,1	0 ***	0,15	0 ***
	Distance to station (m)	0,04	0 ***			-0,07	0 ***
	Distance to centre (m)			0,03	0 ***		
	Distance to highway (m)					-0,03	0,01 **
Country of origin and generation	Suriname 1st	0,09	0,15	-0,87	0 ***	0,66	0 ***
	Suriname 2nd	0,12	0,07 '	-0,7	0 ***	0,48	0 ***
	Dutch Caribbean 1st	-0,07	0,5	-0,89	0 ***	0,72	0 ***
	Dutch Caribbean 2nd	0,07	0,48	-0,23	0,02 *	0,38	0 ***
	Morocco 1st	0,16	0,08 '	-0,8	0 ***	0,49	0 ***
	Morocco 2nd	0,18	0,01 *	-0,86	0 ***	0,37	0 ***
	Turkey 1st	0,19	0,01 *	-0,83	0 ***	0,39	0 ***
	Turkey 2nd	0,29	0 ***	-0,99	0 ***	0,37	0 ***
	Other non-western 1st	-0,07	0 ***	-0,43	0 ***	0,69	0 ***
	Other non-western 2nd	0,02	0,44	-0,33	0 ***	0,35	0 ***
	Western 1st	-0,17	0,05 *	-0,28	0 ***	0,31	0 ***
	Western 2nd	0,04	0,45	-0,12	0 ***	0,11	0 **
		Reference: no migration background					
Type of model		Fractional Logit model		Fractional Logit model		Fractional Logit model	
Number of obs.		110588		110588		110588	
R-squared	McFadden's R squared	0,13		0,09		0,14	
	maximum Likelihood Pseudo R-squared	0,16		0,12		0,08	

Signifiant codes: 0: \*\*\*, 0,001: \*\*, 0,01 \*, 0,05: ' .

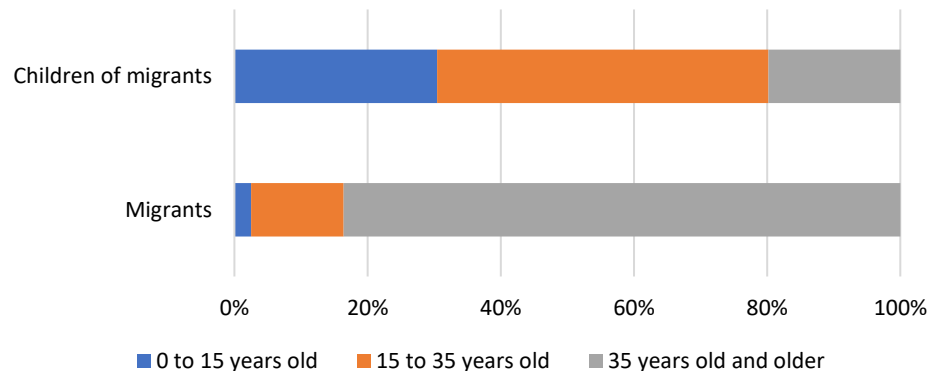
## Appendix C: Selection of participants for the qualitative part: education levels

It is generally recommended that focus groups' participants be somewhat homogenous in order to allow for a safe discussion environment. This is why we decided against mixing people with higher and lower education levels within the same focus group. This meant we had to choose which education level(s) would be most relevant to select for migrants and for children of migrants, respectively.

At the time of selection of focus group participants, statistics on the education level of migrants and children of migrants (first and second generation) separately were not openly available. Therefore, we used two types of tables published by CBS in order to determine the education levels to select for migrants and children of migrants, respectively.

In 2022, an usual cut-off age to differentiate between migrants and children of migrants in the TMSA groups in the Netherlands is 35 years old. Looking at the adult population, a majority of migrants is indeed above 35 years old, while a majority of children of migrants are between 15 and 35 years old; see Figure C.1. Statistics Netherlands only uses increments of 5 years on this type of data, which explains why we take 15 years old as a start age for adults.

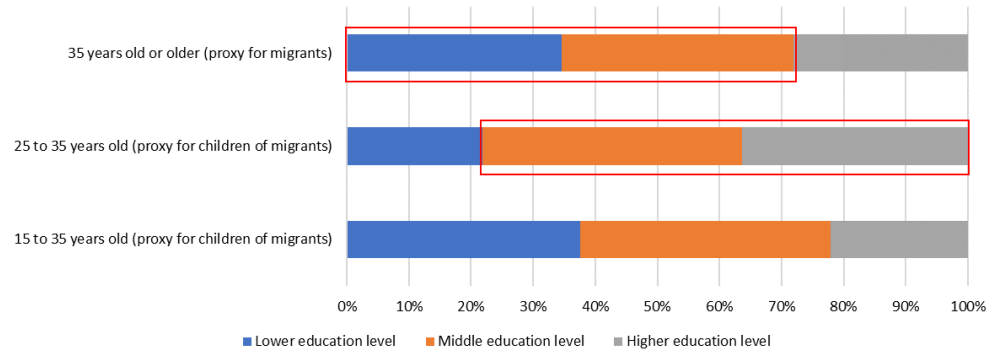
**Figure C.1** Distribution of the TMSA groups across various age ranges



Source: Statistics Netherlands (2022a)

Once we know this cut-off age, we are able to get the distribution of education levels among the TMSA groups for the age group 15-35, and for the age group 35 and older; see figure C.2. They are proxy age ranges for second- and first-generation Dutch individuals, respectively. We also added the age group 25-35 since the age group 15-35 may be biased towards a lower educational level. 55% of the age group 15-35 has a lower or middle education level, but 55% of the age group 25-35 has a middle or higher education level. We also know that children of migrants within the TMSA groups has increased education levels compared with their parents (Huijnk, 2020; Statistics Netherlands, 2020a). 52% of the age group 35 and older has a lower or middle education level.

**Figure C.2** Distribution of education levels among the TMSA groups across various age ranges



Source: Statistics Netherlands (2022b)

Based on this data, we decided to select first-generation Dutch individuals with a lower or middle education level and second-generation Dutch individuals with a middle or higher education level.

## Appendix D: Discussion guide for focus groups and interviews (in Dutch)

### 1. Introductie

- Introductie Motivaction (anoniem, geen goede/foute antwoorden, eigen mening is belangrijk, opnames, meekijkers, mobiele telefoon uit)
- Onderwerp: Mobiliteit van biculturele Nederlanders, daarom zitten we met mensen bij elkaar met een andere culturele achtergrond
- Voorstelrondje: naam, leeftijd, gezinssituatie, baan, hobby's en interesses, et cetera.
- Hoe lang wonen jullie al in Nederland?

### 2. Gedrag vervoersmiddelen

Vertel eens wat meer over jouw reisgedrag:

- Van welke vervoersmiddelen maak je allemaal gebruik? Hoe vaak (dagelijks/wekelijks)?
- Reis je vaak alleen of met anderen? Met wie en waarheen?
- Hoe kies je voor welk vervoersmiddel? Op basis waarvan maak je een keuze?
- Hebben jullie een vervoersmiddel waar je het liefst mee reist? Welke en waarom? (*ranking maken*)
- Wanneer je thuis bezoek ontvangt, hoe reizen zij doorgaans naar jullie toe?

### 3. Houding t.a.v. vervoersmiddelen

*Vervoersmiddelen ranking erbij pakken en behandel vervoersmiddelen van meest naar minst populair.*

#### Auto

*Houding*

*Noteren op flip-over 'vervoer per auto' en vraag om associaties, woorden en gevoelens die dit oproept. Laat associaties toelichten. Geldt niet voor de single-interviews.*

Voor autogebruikers:

- Waarom kiezen jullie voor vervoer per auto?
- Wat zijn typische momenten daarvoor?
- Wat zijn voordelen van vervoer per auto?
- Wat zijn nadelen?
- In hoeverre is een eigen auto/een auto in het huishouden belangrijk voor jullie?
- Wat vinden jullie belangrijk aan een auto? Waar moet die aan voldoen?
- Stel: je kunt niet meer met de auto reizen, wat dan?

Voor niet-autogebruikers:

- In hoeverre zouden jullie ooit een eigen auto willen bezitten? Waarom wel/niet?
- Wat zou dit jullie opleveren?

### *Omgeving*

- Als we naar jullie directe omgeving kijken, naar jullie familie en vrienden/vriendinnen en anderen die dichtbij jullie staan. Welke rol speelt de auto in hun leven? Gaan zij met de auto?
- In hoeverre speelt jullie culturele achtergrond een rol in hoe jullie een auto gebruiken? En in jullie ideeën over de auto?
- Zo ja, welke invloed(en) zie je? In hoeverre is dit altijd zo geweest? Zie je hier nog veranderingen in?

### *In het verleden*

- Zijn jullie opgegroeid met een auto?
- Hoe belangrijk was de auto toen jullie opgroeiden?
- Reden jullie ouders ook in een auto?
- Voor migranten en kinderen van migranten die boven de 30 zijn: Pakten jullie als jongere volwassenen ook de auto? Waarom maakten jullie die keuze? Welk gevoel gaf jullie dat?

### Voor autobezitters:

- Op welk moment in je leven besloot u om een auto te kopen?
- Wat waren de belangrijkste beweegredenen dat te doen?

## **Openbaar vervoer (trein, tram, bus, metro)**

### *Houding*

*Noteren op flip-over 'reizen met het OV – bus-trein-metro-tram' en vraag om associaties, woorden en gevoelens die dit oproept. Laat associaties toelichten. Geldt niet voor de single-interviews.*

### OV-gebruikers

- Waarom kiezen jullie voor reizen met het OV? Hebben jullie een favoriet OV-vervoersmiddel? Welke?
- Wat zijn voordelen van reizen met het OV?
- Wat zijn nadelen?

### Niet-OV-gebruikers

- Hebben jullie ooit het OV gebruikt?
- Zo ja, welk type? Hoe hebben jullie dat ervaren? Waarom bent u ermee gestopt?
- Zo nee, wat houdt jullie tegen?

### *Omgeving*

- Als we naar jullie directe omgeving kijken, naar jullie familie en vrienden/vriendinnen en anderen die dichtbij jullie staan. Welke rol speelt het OV in hun leven? Gaan zij met het OV?
- In hoeverre speelt jullie culturele achtergrond een rol in of je (vaak) met het OV gaat? En in jullie ideeën over vervoer met het OV?
  - Zo ja, welke invloed(en) zie je? In hoeverre is dit altijd zo geweest? Zie je hier nog veranderingen in?

### *In het verleden*

- In hoeverre was het gebruikelijk toen jullie zelf kinderen of tieners waren om met het OV te gaan? Waarom?
- In hoeverre werd dit gestimuleerd?
- Gingen jullie ouders met het OV? Waarom wel/niet?

### Voor migranten en kinderen van migranten die boven de 30 zijn:

- Maakten jullie als jongvolwassenen gebruik van het OV?
- Waarom wel/niet?

## **Fietsen**

### *Houding*

*Noteren op flip-over 'fietsen' (met de fiets gaan) en vraag om associaties, woorden en gevoelens die dit oproept. Laat associaties toelichten. Geldt niet voor de single-interviews.*

Voor fietsers:

- Vertel eens wanneer kies jullie voor de fiets? En waarom?
- Hoe ervaren jullie het om te fietsen in uw woonplaats?
- Wat maakt dit prettig?
- Wat maakt dit eventueel onprettig? Wanneer en waarom?
- Wat zijn voordelen van fietsen?
- Wat zijn nadelen?
- In hoeverre vinden jullie het belangrijk om te kunnen fietsen?
- Hoe ging het leren fietsen?
- Hoe oud was je?
- Wat was de aanleiding?
- Wie heeft je leren fietsen?

Voor niet-fietsers/niet-fietsbezitters:

- Waarom fietsen jullie niet meer? Was er een aanleiding? Welke?
- Hoe hebben jullie leren fietsen?

Voor niet-fietsbezitters:

- In hoeverre overwegen jullie toch een fiets kopen? Waarom wel/niet?
- Onder welke omstandigheden wel/niet?

### *Omgeving*

- Als we naar jullie directe omgeving kijken, naar jullie familie en vrienden/vriendinnen en anderen die dichtbij jullie staan. Welke rol speelt de fiets in hun leven? Fietsen zij?
- In hoeverre speelt jullie culturele achtergrond een rol in of je wel of niet (vaak) fietst? En in jullie ideeën over fietst?
- Zo ja, welke invloed(en) zie je? In hoeverre is dit altijd zo geweest? Zie je hier nog veranderingen in?
- Wat vinden jullie van de fietscultuur in Nederland?
- In hoeverre voelen jullie je verbonden met de fietscultuur in Nederland? Licht toe.

### *In het verleden*

- Zijn jullie thuis opgegroeid met fietsen?
- Fietsten je moeder en vader?
- In hoeverre werd fietsen gestimuleerd door hen?

Mensen met kinderen:

- Hoe belangrijk is/was het om je kinderen te leren fietsen?

Voor migranten en kinderen van migranten die boven de 30 zijn:

- Fietsten jullie als jongvolwassenen even vaak/ook niet? Waarom?

### *E-bike*

- Hoe denken jullie over de e-bike?
- Wat zijn voordelen van de e-bike? En nadelen?
- In hoeverre overwegen jullie een e-bike te kopen?
- In hoeverre zou het hebben van e-bike, een verschil maken in hoeveel jullie fietsen, of waar jullie naartoe gaan met de fiets?
- Heeft iemand in je familie of in je vrienden/vriendinnen een e-bike?
- Wat vind je daarvan?

## **Lopen**

### *Houding*

*Noteren op flip-over 'lopend ergens heengaan' en vraag om associaties, woorden en gevoelens die dit oproept. Laat associaties toelichten. Geldt niet voor de single-interviews.*

- Hoe ervaren jullie het om lopend ergens naartoe te gaan in jullie woonplaats? Het gaat hier niet om ommetjes maar dat je echt een bestemming hebt om naartoe te gaan.
- Wanneer lopen jullie wel? Wanneer niet?
- Wat zijn voordelen van lopen?
- Wat zijn nadelen?

Voor de fietsgebruikers:

- Als jullie moeten kiezen tussen lopen en fietsen naar een bestemming, waarvoor kiezen jullie dan? Waar hangt dit van af?

Voor diegenen die niet of weinig fietsen:

- Lukt het jullie om alle afstanden lopend af te leggen? In hoeverre is het handig of gewenst om alles te voet te doen, zonder fiets?
- Welke uitdagingen komen jullie hierbij tegen?

#### *Omgeving*

- Als we naar jullie directe omgeving kijken, naar jullie familie en vrienden/vriendinnen en anderen die dichtbij jullie staan. Welke rol speelt ergens lopend naartoe gaan in hun leven? Doen zij dit ook?
- In hoeverre speelt jullie culturele achtergrond een rol in of je wel of niet ergens heen loopt ipv een ander vervoersmiddel? En in jullie ideeën over lopen?
- Zo ja, welke invloed(en) zie je? In hoeverre is dit altijd zo geweest? Zie je hier nog veranderingen in?

#### *In het verleden*

- Toen jullie kinderen of tieners waren, was het toen gebruikelijk om te lopen om naar een bestemming te komen?

#### **Andere vervoermiddelen**

- Gebruikt u andere vervoermiddelen die hier nog niet aan de orde zijn gekomen?
- Wat zijn voordelen/nadelen van deze andere vervoermiddelen?

#### **4. Houding t.a.v. toekomstige mobiliteitstrends**

*Individuele oefening, respondenten noteren antwoorden individueel in steekwoorden op papier. Voor de single-interviews: vragen mondeling bespreken.*

#### **Deelfietsen**

Als ik zeg deelfietsen, waar denken jullie dan aan, wat komt er in jullie op? Noteer jullie associaties op papier.

Plenair inventariseren en bespreken van alle antwoorden.

- Per associatie: wat bedoel je hiermee? Wat is je gedachte hierachter?
- Wat zijn volgens jullie voordelen van deelfietsen?
- Wat zijn nadelen?

#### **Deelscooters**

Als ik zeg deelscooters, waar denken jullie dan aan, wat komt er in jullie op? Noteer jullie associaties op papier.

Plenair inventariseren en bespreken van alle antwoorden.

- Per associatie: wat bedoel je hiermee? Wat is je gedachte hierachter?
- Wat zijn volgens jullie voordelen van deelscooters?
- Wat zijn nadelen?



*Indien er tijd over is, ook focussen op elektrische auto's.*

### **5. Afsluiting**

- Ophalen eventuele vragen van meekijkers voor focusgroepen
- Overall: hoe kijkt u nu tegen uw eigen mobiliteit aan? Zijn er dingen veranderd n.a.v. dit gesprek?
- Zijn er nog vragen of laatste opmerkingen?

## About this report

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