



Contents lists available at ScienceDirect

## Journal of Transport &amp; Health

journal homepage: [www.elsevier.com/locate/jth](http://www.elsevier.com/locate/jth)

## Business car owners are less physically active than other adults: A cross-sectional study



Maarten Koornneef<sup>a,\*,1</sup>, Claire M. Bernaards<sup>b,c,2</sup>, Hedwig Hofstetter<sup>b</sup>,  
Ingrid J.M. Hendriksen<sup>b,c,3</sup>

<sup>a</sup> Ministry of Health, Welfare and Sport, P.O. Box 20350, 2500 EJ The Hague, The Netherlands

<sup>b</sup> Expertise Centre Lifestyle/Expertise Centre Child Health, Netherlands Organisation for Applied Scientific Research TNO, Schipholweg 77, 2316 ZL Leiden, The Netherlands

<sup>c</sup> Body@Work Research Center on Physical Activity, Work and Health TNO-VU/VUmc, Van der Boechorststraat 7, 1081 BT Amsterdam, The Netherlands

### ARTICLE INFO

#### Keywords:

Company car  
Sedentary  
Adult  
Physical activity  
Car use  
Risk group Identification

### ABSTRACT

Active transport contributes to increased daily physical activity (PA). Car ownership is associated with less frequent active transport and less PA. For business car ownership this relation is unknown. Therefore, we explored whether business car owners and their adult household members comply less with the Dutch moderate to vigorous physical activity (MVPA) guideline and are more sedentary than private car owners and persons without a car.

From October 2011 to September 2012 questions about use and availability of cars in the household were included in the survey Injuries and Physical Activity in the Netherlands. Multiple linear regression was used to compare six mutual exclusive groups of ownership and availability of (business and/or private) cars in the household.

Business car owners complied less (15.8 percent points) with the MVPA guideline than the other respondents. They also reported 1.5 h more sitting time during workdays than the other respondents, but after adjusting for covariates, this difference was no longer significant.

We concluded that owners of a business car in the Netherlands are at higher risk of not complying with the MVPA guideline and tend to spend more hours sitting during workdays than other adults. Further research in this group, e.g. with objective instruments to measure physical activity and sedentary behavior, is recommended. Policy makers on transport and fiscal arrangements, employers, employees, occupational health professionals and car lease companies should be aware of this possible health risk.

### 1. Introduction

There is broad consensus that physical activity (PA) has a positive influence on health (Physical activity and health, 1996; Lee et al., 2012). Not only vigorous-intensity activities (those having > 6.0 metabolic equivalents of task, or METs) but also moderate-

\* Corresponding author.

E-mail addresses: [maarten.koornneef@planet.nl](mailto:maarten.koornneef@planet.nl) (M. Koornneef), [c.m.bernaards@hva.nl](mailto:c.m.bernaards@hva.nl) (C.M. Bernaards), [hedwighofstetter@gmail.com](mailto:hedwighofstetter@gmail.com) (H. Hofstetter), [hendriksenijm@gmail.com](mailto:hendriksenijm@gmail.com) (I.J.M. Hendriksen).

<sup>1</sup> Permanent address: Muur 84, 1422 PL, Uithoorn, The Netherlands.

<sup>2</sup> Present address: Amsterdam Research Institute for Societal Innovation, Amsterdam University of Applied Sciences, PO Box 1025, 1000 BA Amsterdam, The Netherlands.

<sup>3</sup> Permanent address: Middenduinerweg 67, 2082 LC Santpoort-Zuid, The Netherlands.

<http://dx.doi.org/10.1016/j.jth.2017.03.006>

Received 21 August 2016; Received in revised form 7 March 2017; Accepted 7 March 2017

Available online 22 March 2017

2214-1405/ © 2017 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

intensity activities (3.0–6.0 METs) are regarded to be effective, assuming that duration and frequency are sufficient (Haskell et al., 2007). In addition, recent research showed that sedentary behavior (SB) – i.e. any waking activity characterized by an energy expenditure  $\leq 1.5$  in sitting or reclining posture (Sedentary Behaviour Research Network, 2012) – is a health risk in itself (Biswas et al., 2015). Although high amounts of moderate-intensity physical activity (i.e., about 60–75 min per day) seem to decrease the risk of death associated with prolonged sitting, there is by now a growing concern about the health risks of SB (Ekelund et al., 2016).

Considering both PA and SB is particularly relevant for the situation in the Netherlands, as European comparison studies showed that the Dutch population not only had the highest proportion of respondents who participated in moderate physical activity but they also reported the highest mean sitting time (ST) on weekdays compared to respondents of the other European countries (Sport and Physical Activity, 2014; Bennie et al., 2013).

### 1.1. Commuting behavior and physical activity

Active transport (i.e. walking and cycling) contributes to daily PA (Norwood et al., 2014; Donaire-Gonzalez et al., 2014; Hendriksen, 1996) and has positive health effects (Cavill et al., 2008; Hartog et al., 2010; Wanner et al., 2012; Saunders et al., 2013). Research (Engbers and Hendriksen, 2010) showed that 26% of the Dutch commuter cyclists met the international PA guideline for adults (Haskell et al., 2007) merely by cycling to work. This PA guideline requires moderate-intensity aerobic (endurance) physical activity for a minimum of 30 min on five days each week or vigorous-intensity aerobic physical activity for a minimum of 20 min on three days each week, or a combination of both moderate- and vigorous-intensity activities. In more recent research on Dutch mobility data, the physical load (intensity and duration) of the mode of transport was converted into MET-minutes (Fishman et al., 2015). The authors calculated that 38% of the Dutch adult population complied with the MET-hour standard (10 MET-hours of moderate- to vigorous-intensity PA per week, or 1.43 MET-hours per day), solely through active travel – either with or without the additional usage of public transport. This standard was derived from the requirement of engaging in PA at a weekly basis for at least 150 min at an intensity of 4 METs (Haskell et al., 2007). The latter study on Dutch mobility also revealed that the mere availability of a personal car was associated with less PA during transport (Rissel et al., 2012), thereby complementing other research showing that transport by car was associated with less total daily PA (Rissel et al., 2012; Wener and Evans, 2007).

### 1.2. Business car ownership

In the Netherlands, in 2015, 11.8% of all passenger cars (935,000 out of 7.95 million) were owned by a company, of which 615,000 cars were being leased (Association of Dutch vehicle leasing companies (VNA, 2016)). About 8% of the Dutch households (HH) had access to a business car (Van Beuningen et al., 2012). Car ownership was positively associated with income, age, household size and male gender. Business car owners – i.e. main users (holders) of a car that has been made available by their company for an agreed period of time – had a higher income than private car owners (spendable yearly HH income € 37,000 and € 23,000 respectively) (Van Beuningen et al., 2012). Besides, compared to private car owners, business car were younger, were more frequently male, had a higher level of education, lived in bigger HH and had to cover more distance for commuting (Korver et al., 2007).

Business car owners have to pay extra income tax for the private use of the business car and sometimes also accept a fixed salary reduction to compensate the company for a more expensive car than standard and/or for fuel costs for private trips (Kingham et al., 2001). The consequence is that, after having accepted those fixed costs, the variable costs for the actual use of the business car are usually very low.

Literature on the relation between the availability of a business car, active commuting and PA or SB is scarce. A study in the United Kingdom suggested that access to a business car was negatively associated with active commuting (Kingham et al., 2001), but no measurement of PA or SB was reported in that study. Other preliminary evidence comes from a pilot study (Koornneef et al., 2014), that used the same monitoring survey and method as the current study, but data were slightly older and were collected over a shorter period (only one quarter instead of one year). In that pilot study, business car owners showed a lower rate of compliance with the Dutch MVPA guideline compared to private car owners: 26% and 46%, respectively (Koornneef et al., 2014). The Dutch MVPA guideline requires at least 30 min of at least moderate-intensity PA on at least five days per week, during both summer and winter (Kemper et al., 2000).

### 1.3. The current study

We explored whether business car owners (and their adult HH members) comply less with the Dutch MVPA guideline and are more sedentary than private car owners (and their adult HH members) and/or persons without a car in the HH.

We hypothesized that business car owners – and possibly also those with the availability of a business car in the HH – have a higher risk for less daily PA than private car owners, since the actual use of a business car is cheap and almost free in case the employer also pays the fuel expenses for private trips, which is common in the Netherlands (Korver et al., 2007). The almost free actual car use might result in more frequent use, or habitual use, of the business car, including short distance trips which otherwise possibly would have been covered by bicycle or on foot. Because habitual behavior might be more important than reasoned behavior in the choice for mode of transport (Aarts et al., 1998; Verplanken et al., 1997), the availability of a business car could work as an incentive or ‘nudge’ (Thaler et al., 2008) in the direction of less PA. Besides, symbolic and affective motives are associated with car use (Steg, 2005; Holland et al., 2002) and possibly these motives play an even bigger role in. business car users, because they often

Download English Version:

<https://daneshyari.com/en/article/5117663>

Download Persian Version:

<https://daneshyari.com/article/5117663>

[Daneshyari.com](https://daneshyari.com)