



Securing or sacrificing access to a car: Gender difference in the effects of life events



Abu Toasin Md Oakil*

Researcher, Human Geography and Spatial Planning, Utrecht University, The Netherlands

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ABSTRACT

This paper focuses on gender differentiated effects of life events on the decision to change car accessibility. It argues that similar to other choices (e.g. employment) women and men may vary in decisions to the choice of car accessibility, particularly in response to life events. This study aims at exploring this hypothesis. These varying choices may lead to difference in travel demand and thereby may require targeted policy formulation. However, transportation literature has rarely addressed this issue. To address this gap, the paper utilises the data collected through a retrospective questionnaire survey designed for the region of Utrecht in The Netherlands, which provide a unique opportunity to analyse year-to-year change in travel choices. The decision to change car accessibility is assessed in two ways – first, a shift from limited-access to full-access and second, a shift from full-access to limited-access. Depending on the direction of changes, two separate analyses are performed. Within each analysis, two additional mixed logit estimations are run based on the sub-samples of male and female. Comparing the results of these sub-samples, it is found that life events such as birth of the first child, divorce, residential relocation and employer change have significant effect on the decision to get full-access to a car only for the female respondents. No significant effect from life event is observed for the decision to sacrifice full-access of a car for both men and women.

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1. Introduction

Life events that lead to a state of disequilibrium and result in a changed travel behaviour are relevant concepts to understand long-term dynamics of travel behaviour (Lanzendorf, 2003; Oakil et al., 2011a; Van der Waerden et al., 2003). Such events not only influence household decisions but also have impacts on the travel of individual members in the household. However, the impact may not necessarily be similar between individuals. Specially, they might be significantly different between men and women. This paper intends to investigate gender difference in the effect of life events on car accessibility decisions in the Netherlands.

Several studies reported gender differences in travel behaviour (Hanson and Hanson, 1980; McLafferty and Preston, 1991; Root and Schintler, 1999; Rosenbloom and Burns, 1993; Uteng and Cresswell, 2008). Most of the studies revealed that women have shorter work-trip compared to men (Blumen and Kellerman, 1990; Crane, 2007; Hanson and Johnston, 1985) and use of travel mode significantly varies between men and women (Kwan and

Kotsev, 2014; Polk, 2004; Scheiner and Holz-Rau, 2012). Importantly, substantial gender difference in household activity participation is observed (Kwan, 1999) that affect travel choices. According to Wachs (1987), the gender difference in travel behaviour is an outcome of the evolution of separate spheres that delineate the social responsibilities of men and women. Often women are faced with space-time fixity constraints due to non-work household activities (Kwan, 1999, 2000; Schwanen et al., 2008), which are very much related to life-stages. For instance, birth of a child yields more household activities, for which women are more involved than men (Sanchez and Thomson, 1997). Johnston-Anumonwo (1992) found that gender difference exist in work-trip for different types of household including presence of children. Consequently, there are life-stage variations in women's travel behaviour (Rosenbloom, 1993). In line with this argument, life events that affect travel choices and household responsibilities should be gender specific. Therefore, a varied impact of life events on travel decisions between men and women can be argued. Understanding of these varying choices will improve the outcome of travel demand models and will help in targeting audiences for better and equitable policy formulation. However, it is understood that women may have different socio-cultural constraints in

* Tel.: +31 (0) 654315327.

E-mail addresses: abutoasin@gmail.com, abutoasin.oakil@pbl.nl

different context and thereby gender variations may differ based on the context such as racial background (McLafferty and Preston, 1991) and cultural context (Kwan and Kotsev, 2014). None-the-less, women deal with a number of household care and family and social support (e.g. taking care of children, elderly) activities, at least in the Netherlands. Family and household care are largely a female domain in the Netherlands (Fokkema, 2002). Therefore, when a particular life event related to these activities (e.g. birth of a child, cohabitation) occurs, women would make some choices different to men. Studies reported that although women's market share of employment after marriage has increased in the Netherlands, they mostly opt for part-time employment (Fokkema, 2002). Scholars also reported that most women choose to work part-time after the birth of the first child (Van der Lippe, 1993; Van der Vinne, 1998). Thus far, similar to other choices (e.g. employment), women and men may vary in decisions to the choice of car accessibility in response to life events. In transport literature, however, the gender differences in the impacts of life events are often ignored. This paper addresses this gap by addressing gender differences in the effects of life events on the decision to change car accessibility.

Rest of the paper is organised as follows. In Section 2, a brief review on life event literature in travel is presented. Next, Section 3 describes the method of analysis followed by data collection and sample description in Section 4 and 5 respectively. Section 6 describes the results of the model calibration and gives an overview of significant relationships found. Finally, Section 7 draws conclusions based on discussion about the findings.

2. Literature on life event and travel

The concept of life events has a long history in the disciplines like demography (Glick, 1947; Wissen and Dykstra, 1999). However, the topic is relatively recent in travel behaviour research. Van der Waerden et al. (2003) argue that *critical incidents* and *key lifecycle events* are relevant concepts for studying the dynamics in travel patterns. Critical incidents are events, such as an accident, that may cause a highly negative experience such that individuals reconsider their current behaviour. In contrast, key lifecycle events are (unavoidable) events in demographic, housing or job careers, such as reaching the age to have a driver's license, marriage, child birth, retirement, new job and new house. They represent structural transitions in an individual's and household's state that may lead to changes in needs and desires, in commitments, and in constraints, which in turn may trigger changes in activity-travel behaviour and/or available resources acting upon travel behaviour (e.g. car possession).

Recently, some studies have examined the effects of life trajectory events on various aspects of travel behaviour, such as travel mode choice (Scheiner and Holz-Rau, 2013; Sharmeen and Timmermans, 2014; Verhoeven, 2010; Verhoeven et al., 2005), Commuting decision (Oakil et al., 2011b), ownership of mobility resources (car, public transport pass, etc.) (Beige and Axhausen, 2008; Beige and Axhausen, 2012; Oakil et al., 2014a; Prillwitz et al., 2006; Yamamoto, 2008; Zhang et al., 2014), vehicle miles travelled (Prillwitz and Lanzendorf, 2006), bicycle use (Chatterjee et al., 2013; Oakil et al., 2014b) and other activities (Sharmeen et al., 2014). Verhoeven (Verhoeven, 2010; Verhoeven et al., 2005), using Bayesian Belief network, modelled the effects of life trajectories on mode choice decisions and found that changes in housing status, car availability, public transport season ticket holdership and income are related to mode choice. Analysing ownership of mobility resources, Prillwitz et al. (2006) found that birth of the first child and residential relocation are related to car ownership growth. Prillwitz and Lanzendorf (2006) showed that birth

of a child, marriage, separation, retirement of the household's head and residential relocation characteristics are related to vehicle miles travelled. Beige and Axhausen (2008), based on hazard models, concluded that changes in residence, education and employment affect the probability of the ownership of mobility resources. Recently, Beige and Axhausen (2012) analysed whether changes in mobility resource ownership are significantly related to changes in employment, education and residential location as well as in household demography. The results indicated significant associations between these events. Similar result is reported for car acquisition and disposal decision by Oakil et al. (2014a). They (Oakil et al., 2011b, 2014b) also investigated change in the commute mode in response to life events and reported significant association of modal shift with life events. Chatterjee et al. (2013) found similar results in terms of changes in bicycle use based on a qualitative in-depth investigation. Although these studies point out the importance of life events in understanding dynamics in activity-travel patterns, gender specific dynamics in the effects of life events are rarely addressed. Only contribution from a gender specific perspective is made recently by Scheiner (2014). He addressed that the birth of a child, entry into the labour market, and changes in spatial context, accessibility and mobility are important determinant in the decision to change travel mode choice. Although he found some gender differences in the effects of life events, he concluded as the effects being limited.

In line with these research, this study contributes to the understanding of the decision to change car accessibility. The contributions are twofold. First, it looks into gender differentiated effects of life events on car accessibility. Important questions will be answered are – which life events are important for getting full access to a car and for sacrificing full access to a car and to what extent are the effects different for men and women? Gender differences in the car accessibility decisions have an implication in understanding intra-household negotiation process since opposite sex partners are still prevalent. Second and finally, this analysis uses unique data that records year-to-year update of life trajectories decisions. Analytically, this may provide better understanding of the car accessibility decisions, since mostly used event-history data may fall short to explain the influence of a particular event on the mobility decision in concern. For instance, comparing travel behaviour before and after an event does not account for the possibility that these changes may occur independently.

3. Method

Since this paper works with different sub-samples of the data based on the objectives, analytical approach is described beforehand to explain the reason behind sub-sampling. This will be followed by data collection section and description of the data based on these sub-samples. Relevant comments about data structure are made along with methodological explanation.

The dependent variable is a binary variable indicating whether a change in car accessibility is made by the respondent or not. The paper considers two types of change in car accessibility based on the direction of change. One considers whether a change leads to full-access of a car from no-access or shared-access of a car. Another represents change in the opposite direction, i.e. whether a change leads to no-access or shared-access of a car from full-access of a car. The dichotomous definition of dependent variable was necessary due to few occurrences of life events and car accessibility changes in the data. Although the repercussion can be different for no-access and shared-access to a car, the applied definition should reveal important information as well. Because, full-access to a car is also significantly different choice compared

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