

**No car anymore? A study on the effects of life events on travel behaviour using Dutch MPN data**

***Introduction***

This study focuses on travel behaviour change and the role of life events. Relevant stakeholders can have different motivations to desire a change in the current mobility practice. Firstly, sustainability is a main concern, as the transport sector is accountable for approximately a quarter of the EU's total greenhouse gas (GHG) emissions. Cars alone emit just over 60% of this share (European Commission, 2020, p. 141). Additional motivations for an overall more car-independent mobility system include optimizing land use, road safety and equitable access (e.g. Berger et al., 2014). Additionally, various studies have supported the societal and ecological benefits of encouraging more walking, cycling, and the use of public transport while reducing car usage, with advantages particularly evident in urban settings (Banister, 2011; ITF, 2021; Nieuwenhuijsen & Khreis, 2016).

Despite progress, the planning and implementation of mitigating actions is insufficient for what is needed and a transition to more sustainable mobility should accelerate (IPCC, 2022). Cities are increasingly implementing policies that support non-motorized and zero emission traffic, for instance with car-free walking areas, reallocating road space or by abolishing minimum parking requirement (ITF, 2021). However, the success of these policies and plans depend on their effect on travel behaviour.

***Focus of study***

Travel behaviour and mode choice are largely considered habitual (Verplanken et al., 2008). According to the habit-discontinuity-hypothesis, people are more inclined to change their habitual behaviour when a life event occurs (Verplanken et al., 2018, p. 189). The study presented at this TRAIL conference presentation, aims to describe the effect of three different life events: change in work situation, birth of a child and residential relocation on travel behaviour. Various forms of statistical analysis are used on data from the Mobility Panel Netherlands (MPN).

Unique is the detailed analysis of the effect of various life event characteristics and life event combinations, as well as the large longitudinal dataset. For this study, only adult participants (one per household), that partook in a minimum of 3 consecutive waves where no data on travel behaviour or travel attitude is missing, are considered. This led to a sample of N=3,028 participants and a total of 9,084 observations. 20% of the observed years include a life event, and 49% of all participants experienced a life event at one of the three considered waves.

***Method***

To account for longer term and lagging effects, a Random Intercept – Cross-Lagged Panel model is being developed. In the figure below, a conceptual model is presented that illustrates how different elements may relate and shape travel behaviour over time. Three-day-diary data is used as an indicator for travel behaviour, statements on preferred mode is used to describe travel attitude, and postal code level 6 ('1234 AB') information is used to describe the built environment. This conference abstract briefly presents first exploratory results only.

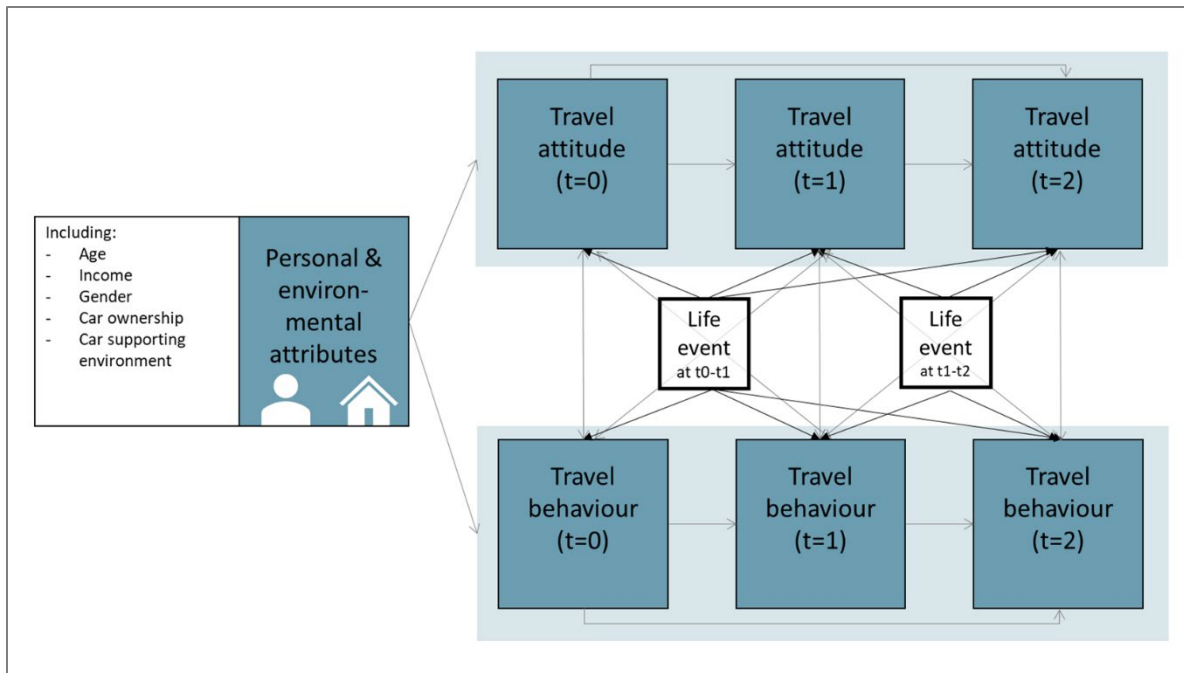


Figure 1 - Conceptual model of life events' effects on travel attitude and travel behaviour and most relevant variables. The model considers 3 moments in time.

### Exploratory results

Within the sample, 558 life events were observed between t=1 and t=2, and 588 life events were observed between t=2 and t=3. Of all observed life events, the a change in work situation was found to occur most often: in around 14% of the sample each year. Only 6% identified a relocation, and 2-3% welcomed a new child in their household.

The occurrence of life events is strongly related to age. The majority of life events are experienced by people aged 18 to 50, with a peak between 25 and 29 years when around half of the sample experienced a life event. The graph below indicates that childbirth in particular occurs within a particular age range: around 70% of the child births in our sample occurred for parents aged 30-39 years.

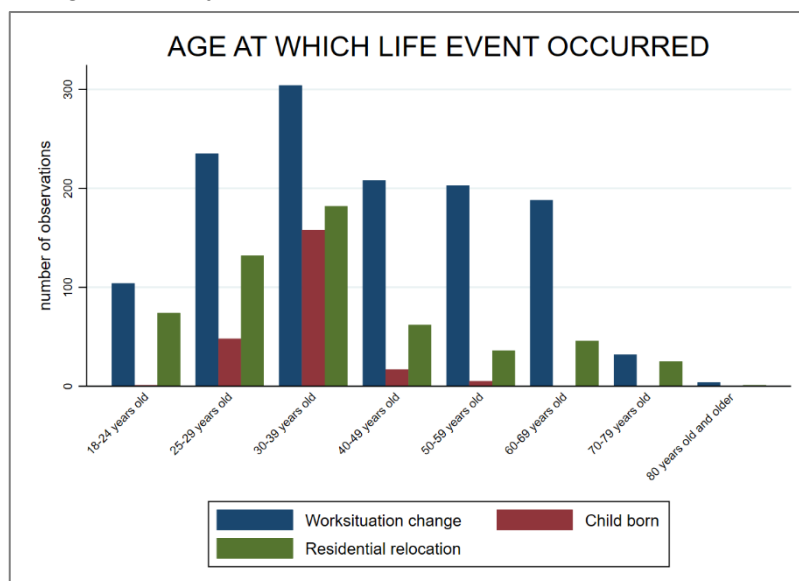


Figure 2 – Age group and life events

When comparing the total sample to the three subsamples with experienced life events, various observations can be made.

- Differences between income, car ownership and built environment can also be observed – all in logical directions. New parents are more likely to live in relatively lower urban areas, tend to own a car and have a higher income compared to the total sample. Alternatively, those experiencing a relocation or change from work situation tend to live in more urban areas, have a lower income and lower car ownership.
- The relationships directions of travel behaviour (measured in trips by car) and attitude with the built environment are as expected. All three indicators score in the logical direction: higher address density ('OAD'), paid parking and larger distances to an intercity station all have a negative relationship. Where the link with an intercity station is weakest for both car use and attitude.
- New parents clearly have a larger car preference compared to the three other subsamples, with an average score of 0.729 (out of 1) compared to the total sample with 0.567 and on average 5.57 car trips registered in their travel diary compared to 4.77 in the sample. Also their use of other modes is much smaller than on average: only 2.85 trips by non-car modes were registered on average by new parents, compared to 4.65 in the whole sample.

The large majority (88%) of life events within a year do not occur in combination with another life events, see pie chart on the left below. When considering all observations per participant however, this number reduces to 65%, indicating that life events may often occur in close proximity to one another.

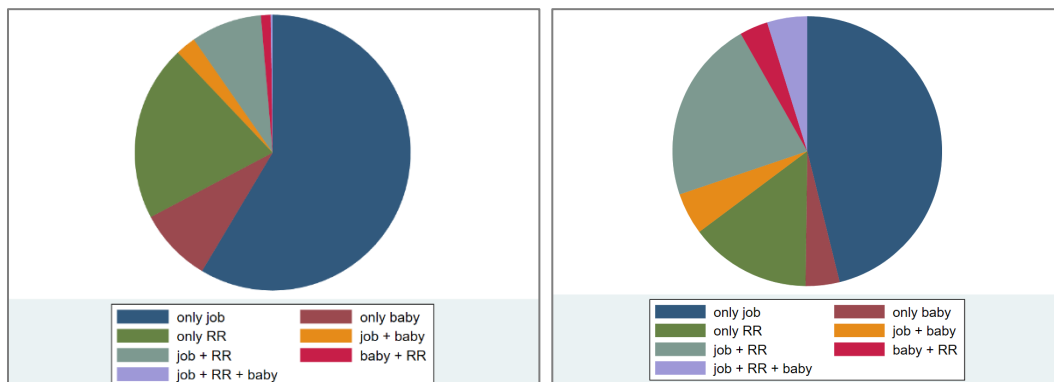


Figure 3 - number of participants whom experienced a (combination of) life event(s). Left: life events within a year; right: life events over all 3 waves considered.

### **Effect on travel behaviour change**

At the time of writing of this abstract, no detailed results of the RI-CLPM are available yet.

### **Study implications**

Various applications of these studies' findings are foreseen. A shorts selection:

- The coming years, many new homes are being developed. Particularly urban developments increasingly include sustainable mobility concepts. These can only be successful if the new residents' travel behaviour and car ownership change

accordingly. More knowledge can help create (car-reduced) neighbourhoods to support sustainable mobility and attractive cities.

- Generally: a better understanding of what types of life events may lead to behaviour change, can help policy makers or other stakeholders support more sustainable travel and/or try and prevent certain changes.

Further research may look into:

- The effects on car ownership. Especially when using all 7 waves.
- Socio-demographic effects

## **Bibliography**

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