

Residential relocation as a key event in travel mode shift

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13 September 2023
Netherlands Mobility Panel Symposium



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longitudinal behaviour analysis, neighbourhood effects

Postdoctoral research (Jun. 2023 –)

- Diet and Eating Behaviours across Early Adulthood Transitions (DEBEAT)
- Centre for Diet and Activity Research (CEDAR), MRC Epidemiology Unit, University of Cambridge

PhD research (Nov. 2020 – Jun. 2023)

- A longitudinal analysis of commuting behaviour and subjective wellbeing
- Department of Urbanism, Faculty of Architecture and the Built Environment, Delft University of Technology

Outline

- 1 Timing for travel mode shift
- 2 Relocation as the key event
- 3 Data and results
- 4 Research implications and future direction



1 Timing for travel behaviour intervention

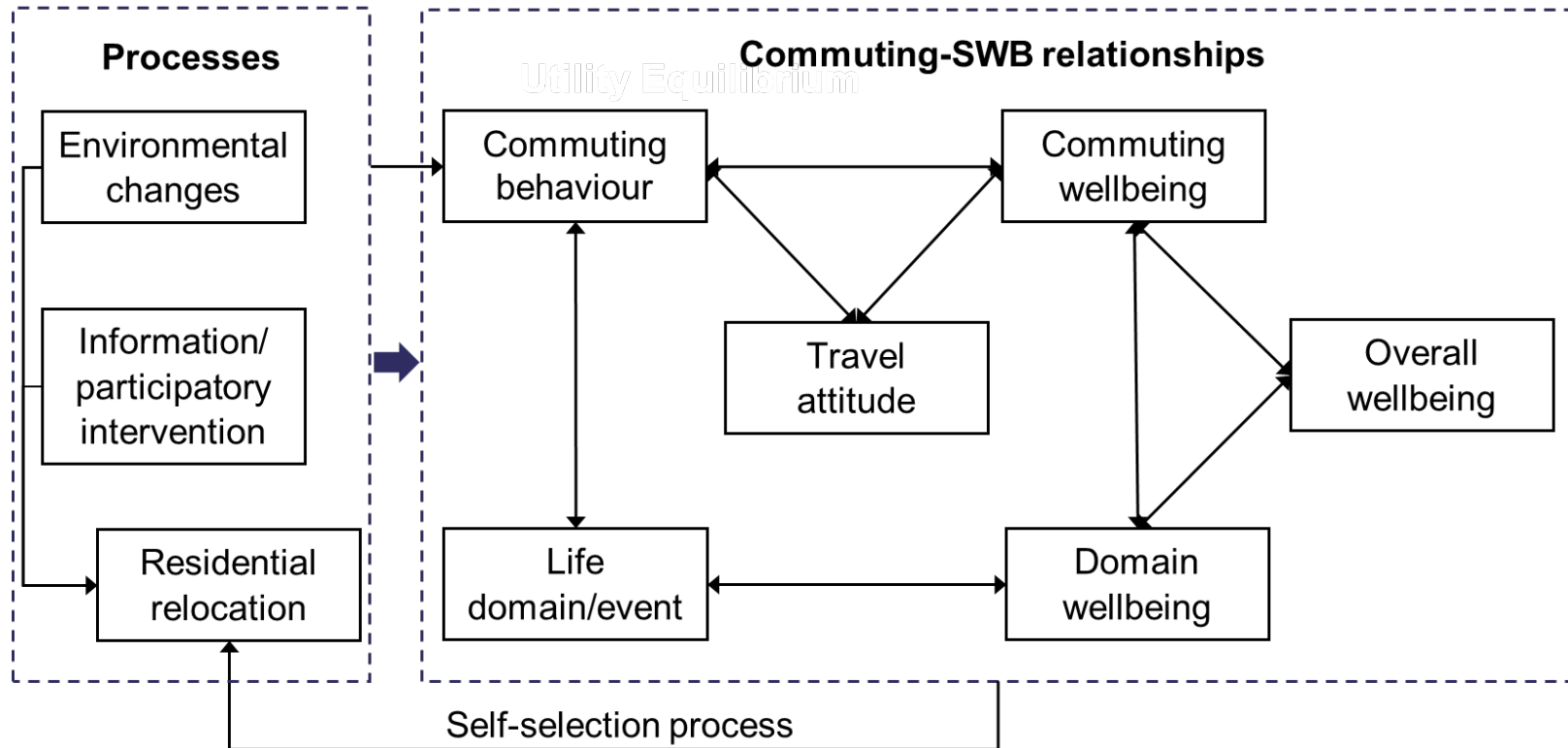


Figure 1. A longitudinal analysis of commuting behaviour and subjective wellbeing

Tao, Y., Petrović, A., & van Ham, M. (2023). Commuting behaviours and subjective wellbeing: A critical review of longitudinal research. *Transport Reviews*, 43(4): 599-621. [10.1080/01441647.2022.2145386](https://doi.org/10.1080/01441647.2022.2145386).

2 Residential relocation as the key event

- Residential determination
- Residential self-selection
- Reverse causality
- Mobility biography

2 Residential relocation as the key event

- Residential determination
 - The independent role of the built environment at residence in travel mode shift (Ewing and Cervero, 2010; Lin et al., 2017)
- Residential self-selection
- Reverse causality
- Mobility biography

2 Residential relocation as the key event

- Residential determination
- (Travel-related) Residential self-selection
 - Travel-related attitude predisposes the way that residents choose the housing locations and travel behaviours (Mokhtarian and Cao, 2008; Cao et al., 2009)
- Reverse causality
- Mobility biography

2 Residential relocation as the key event

- Residential determination
- Residential self-selection
- Reverse causality
 - Changes in residential built environment pre-post relocation not only result in changes in travel behaviours, but also induce changes in travel attitude, which scripts the future travel choice (De Vos et al., 2018; Van Wee et al., 2019).
- Mobility biography

2 Residential relocation as the key event

- Residential determination
- Residential self-selection
- Reverse causality
- Mobility biography
 - Residential relocation is adaptation to other family- and job-related life events, underlying great changes in travel demand and preferences (Scheiner, 2014; Müggenburg et al., 2015).

2 Residential relocation as the key event

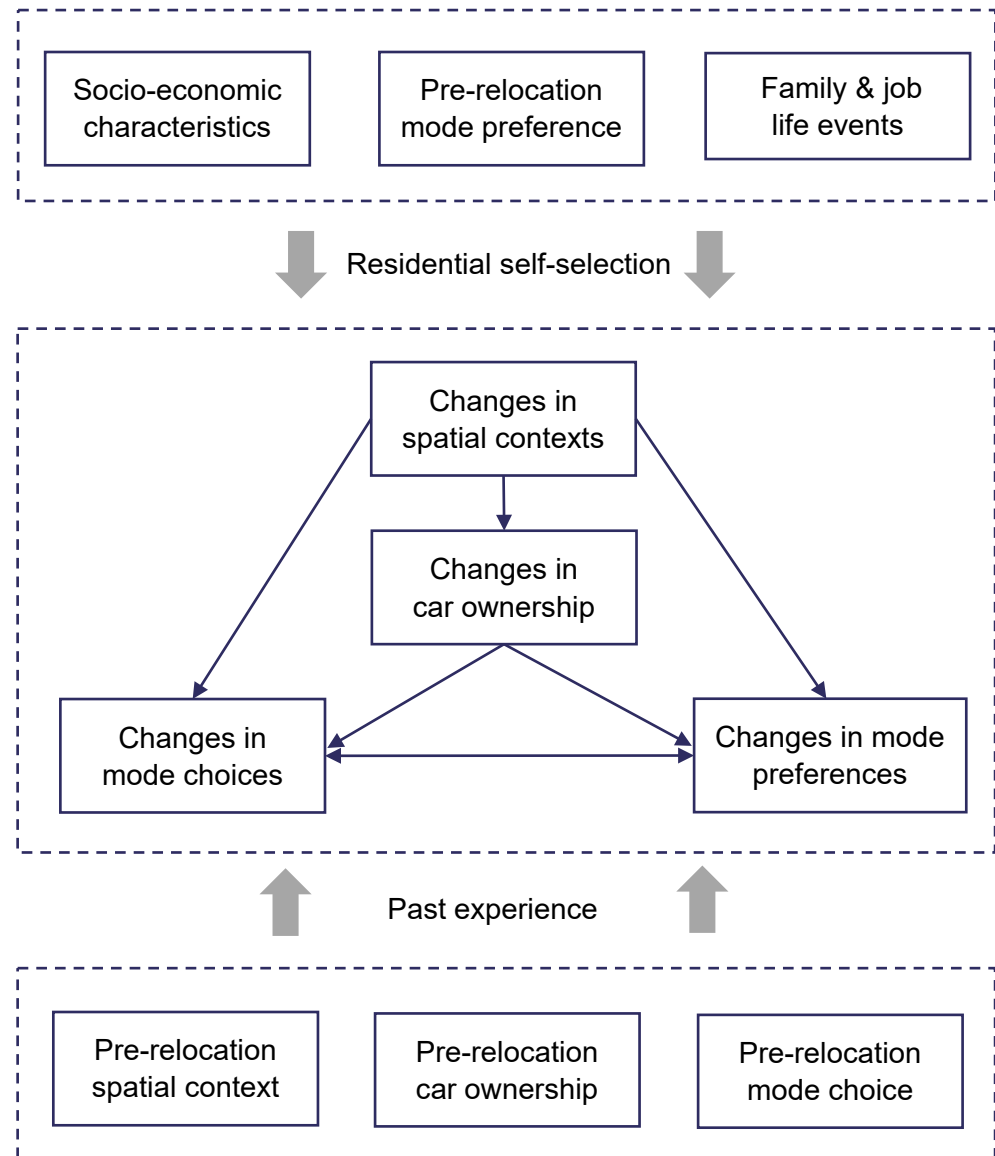


Figure 2. A conceptual model for travel mode shift pre-post residential relocation

3 Data and results

Netherlands Mobility Panel (MPN)

Sample selection

- The MPN respondents aged 18 or above and who reported the event of residential relocation between 2013 and 2019 (N~1000)

The Netherlands context

- More chances of residential self-selection compared with the US and some Asian countries

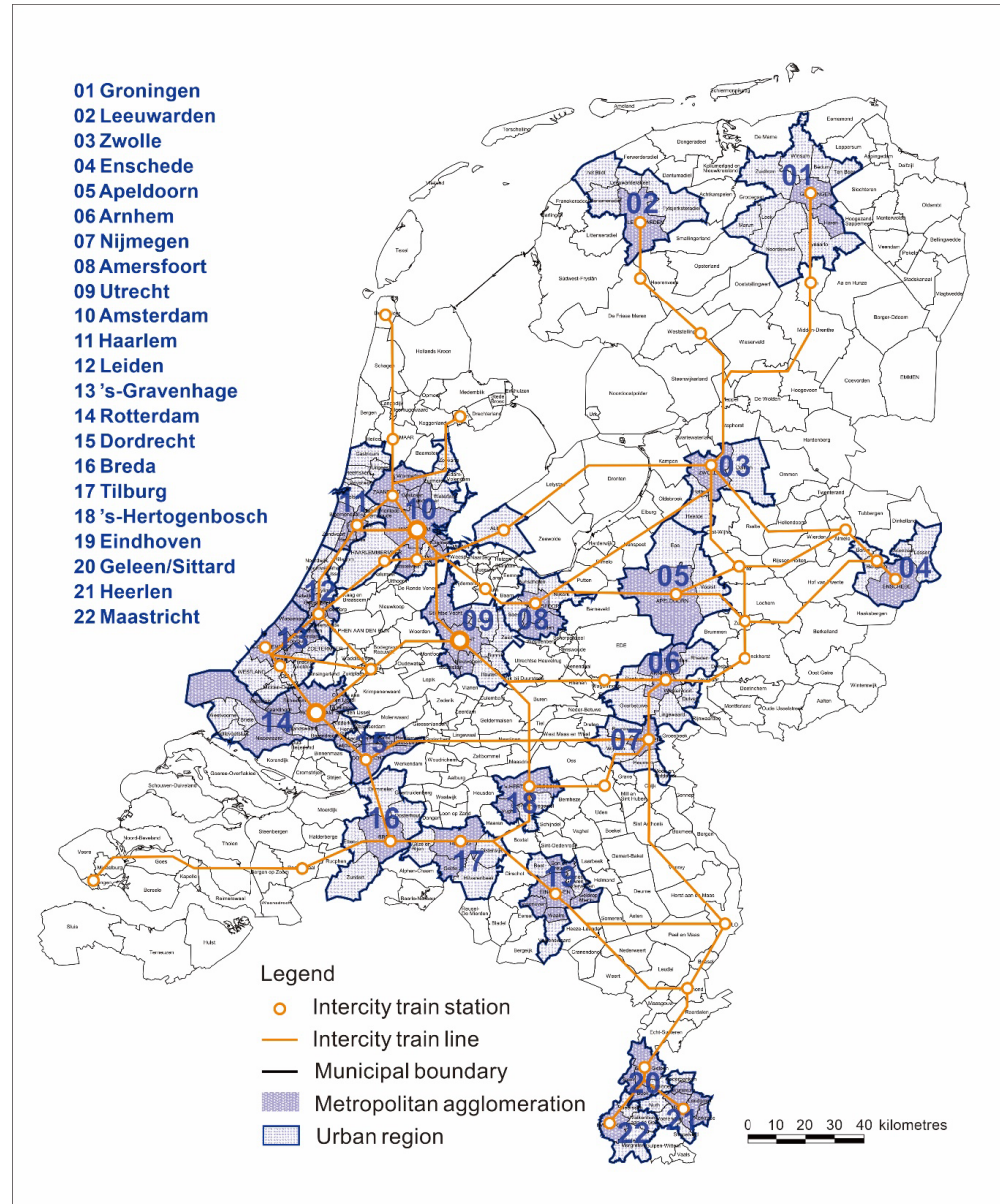


Figure 3. Urban regions and intercity train networks in the Netherlands

3 Data and results

Spatial contexts of relocation

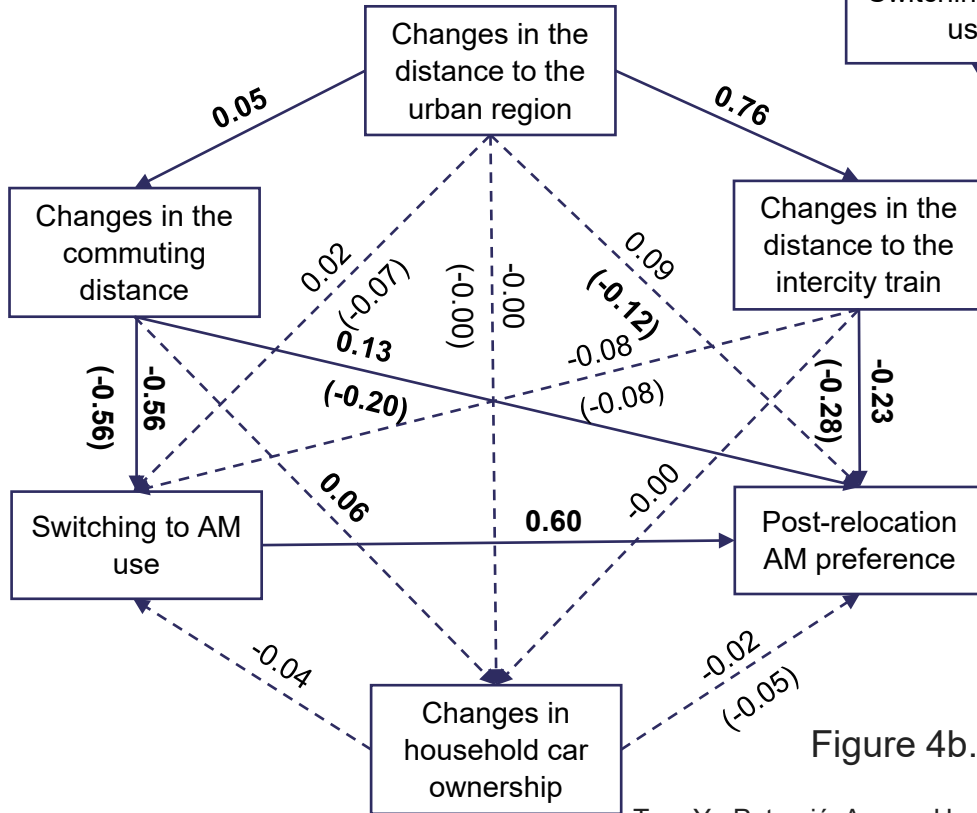


Figure 4b. Switching to active commuting model

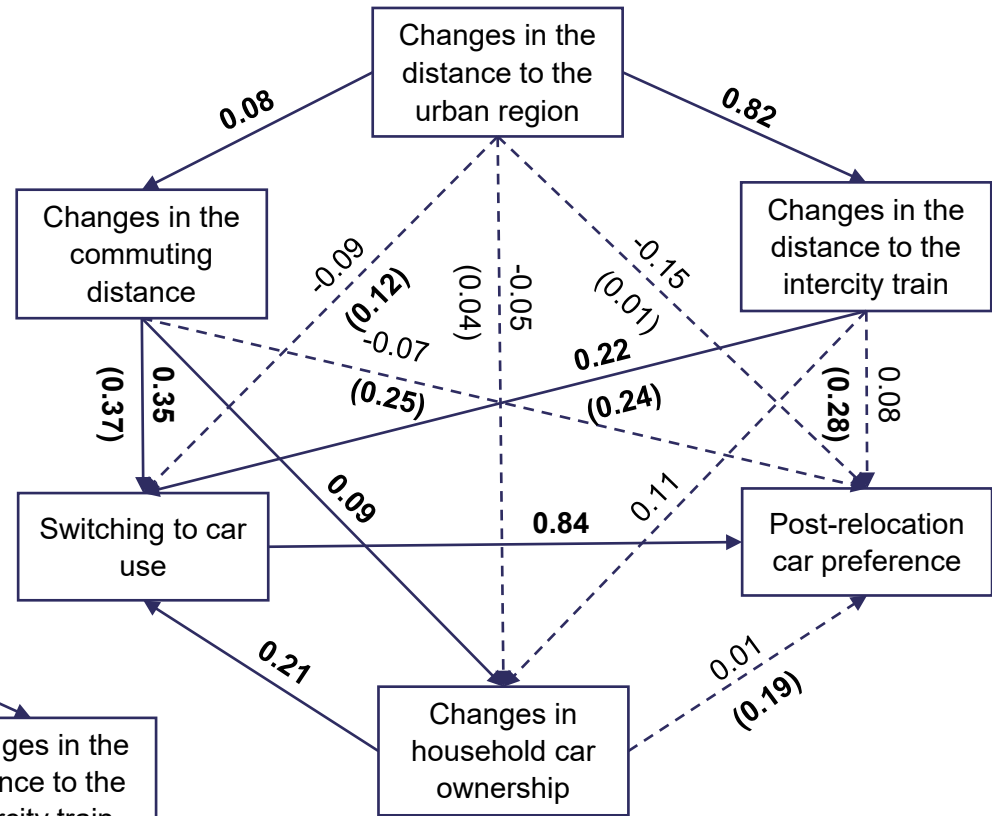


Figure 4a. Switching to car model

3 Data and results

Temporal variations in travel mode choices and preferences

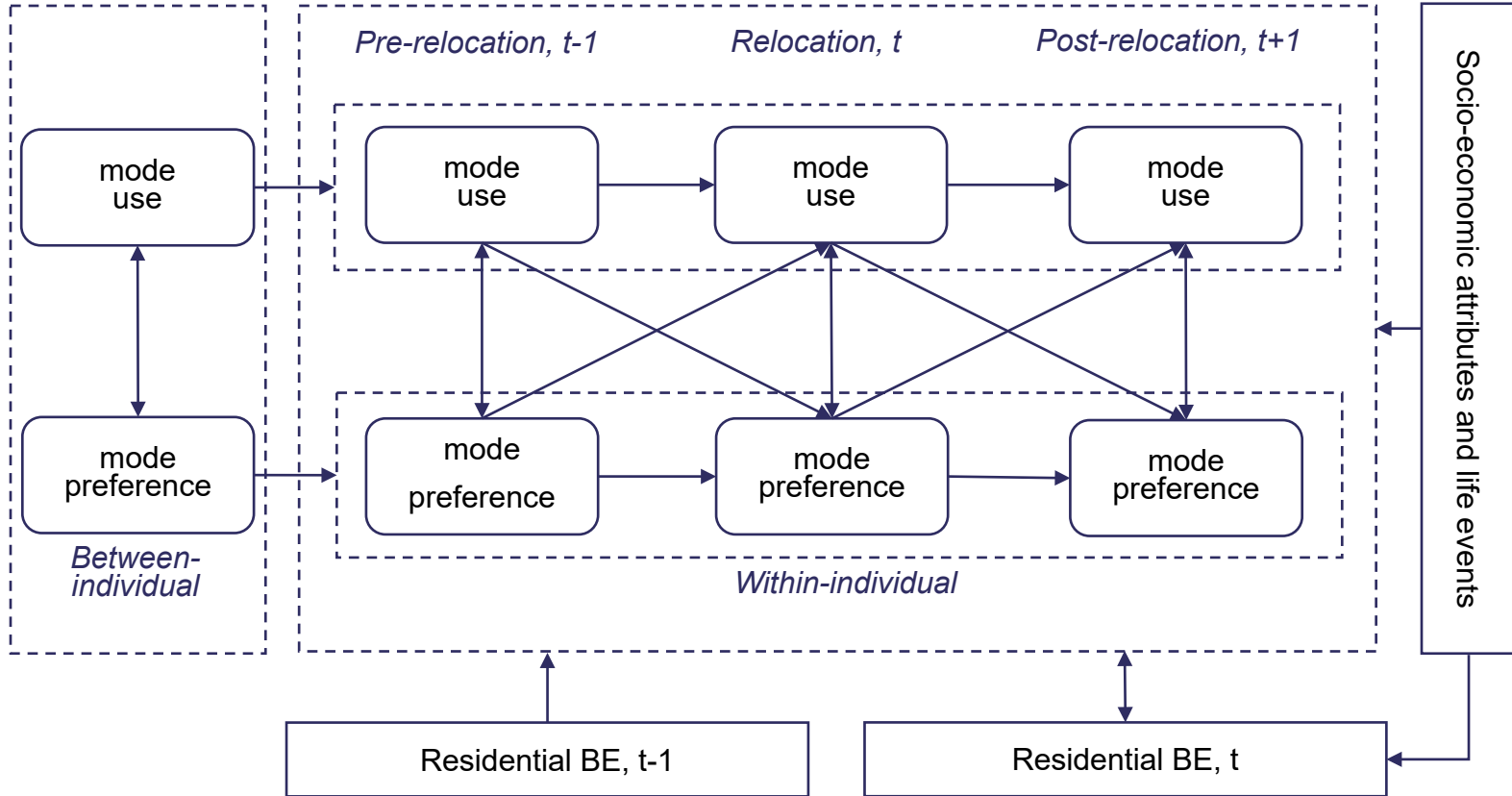
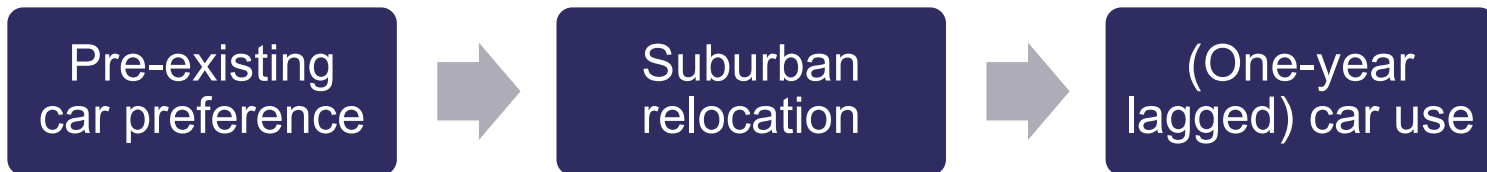


Figure 5. A three-wave cross-lagged panel analysis of travel mode choices and preferences pre-post residential relocation

4 Research implications and future direction

- Finding 1: Strong residential self-selection for motorized means of transport, especially for car use



- Implications: The short period after the relocation to intervene in residents' mode choices, and more awareness campaigns in the long term to destabilise favourable attitude toward car use.

4 Research implications and future direction

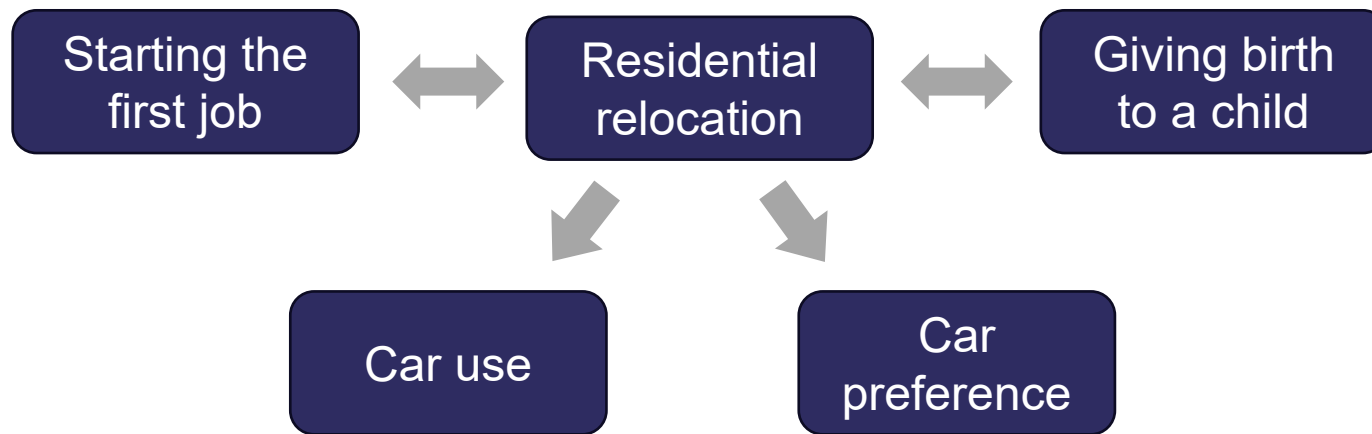
- Finding 2: Little residential self-selection but clear evidence of reverse causality for active travel



- Implications: The structural effects of residential built environment in travel mode use, as well as mode-specific preferences

4 Research implications and future direction

- Finding 3: Family- and job-related life events often coincided with the relocation event and jointly contributed to greater demand for car use.



- Implications: Targeted interventions for residents at different life stages (e.g., the preconception stage and the year before entering the job market)

4 Research implications and future direction

▪ Future research direction using MPN

- Travel behaviour trajectories over time and underlying socioeconomic gradients
- Early-life neighbourhood environment and later-life travel behaviours
- Multimodal versus unimodal travel groups: Differences in travel attitude and changes in travel behaviours

Thank you 😊

1. Tao, Y. (2023). Linking residential mobility with daily mobility: A three-wave cross-lagged panel analysis of travel mode choices and preferences pre–post residential relocation in the Netherlands. *Urban Studies*, [10.1177/00420980231181049](https://doi.org/10.1177/00420980231181049).
2. Tao, Y., Petrović, A., van Ham, M., & Fu, X. (2023). Residential relocation as a key event in commuting mode shift. *Transportation Research Part D: Transport and Environment*, [10.1016/j.trd.2023.103772](https://doi.org/10.1016/j.trd.2023.103772).