Modeling Heterogeneous Decision Processes and Joint Decision-Making in Travel Demand Models

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There is substantial interest in encouraging changes to travel behavior with a view to accomplishing more sustainable mobility patterns. The underlying and often unquestioned assumption in the majority of the analysis done in this area is that people respond to incentives and will alter their behavior according to relative costs and benefits of different behavioral alternatives. At present, utility-theoretical discrete-choice models have become central tools to model behavior and forecast travel behavior changes. Despite a strong behavioral underpinning, this methodology still assumes that people use utility maximization to choose courses of action, act only on measurable choice dimensions and are unaffected by other decision-makers.

This talk presents research examining instances where such standard modeling assumptions fail. As illustrated by several empirical examples, current methodological frameworks can be improved upon by allowing travelers to differ in terms of referencing, behavioral rules, survey engagement and by accounting for the joint choice context of transport and housing choices. It is shown that transport users are highly influenced by attitudinal, decision-strategic or social layers in their experiences, aspirations and reactions to system changes. Developing new methodologies to collect data and specifying econometric models to account for these additional layers of motivations is an area of primary relevance in improving understanding and prediction of travel behavior. Taken together, the presented approaches help us bridge the gap between observed behavioral complexity in the real world and the use of formal models of decision-making.

Amanda Blomberg Stathopoulos is currently research associate in the Transport and Mobility laboratory at the Swiss Federal Institute of Technology (EPFL) in Lausanne, Switzerland, since 2012. She concluded her PhD at University of Trieste, Italy (Department of Economics, Business, Mathematics and Statistics "Bruno de Finetti") and was a visiting scientist at the Institute for Transport Studies (ITS), Leeds University, UK. Her research interests include exploring behavioral findings at odds with standard random utility models to improve realism and robustness of decision making models. Methodologically she uses discrete choice techniques drawing on choice experiment data applied in transportation settings. To date she has published eight international peer-reviewed journal papers and one book chapter along with numerous conference proceedings on the themes of freight, passenger and residential choice behavior. She has participated in various research projects related to travel behavior and demand modeling in Europe, such as the Swiss national science foundation and is a regular reviewer for peer-reviewed journals and conferences.

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