Journal of Transport Geography 62 (2017) 265–266

Contents lists available at ScienceDirect

Journal of Transport Geography

journal homepage: www.elsevier.com/locate/jtrangeo

Book review

Bounded Rational Choice Behaviour, Applications in Transport, Rasouli and Timmermans (Eds.) (2015), UK, Emerald, (£77.95 (Hardback)) 9781784410728

In analysing and modelling people's decision and movement over time and space, many travel behaviour researchers have been significantly influenced by the concept of fully rational behaviour which lacks of behavioural realism. This book describes a range of alternative models of activity-travel behaviours, from route and departure time choices, to exploring the behavioural mechanism underlying an individual's mental representation, based on bounded rationality principles. In this respect, the concept underlying the work presented in this book would be of interest to transport geographers in general as we know that an individual's day-to-day decisions and movements are highly influenced by their partial, imperfect, biased knowledge over opportunities that lie in space and time.

This book contains eleven chapters and starts with a review chapter that discusses the history, basic thinking, and early formulation of bounded rationality models in urban planning and transport research. Then, it is followed by a chapter that discusses regret-based models, as an alternative to classic utility maximisation models. In this model, it is assumed that individual minimise regret when they make decisions. Another interesting feature discussed by this chapter is the ability of the model to accommodate different decision rules (behavioural mixing) for different group of individuals. Chapter three features a relative utility model, where, in contrast to the conventional concept of random utility, it is assumed that decision makers derive utility from their choices relative to some thresholds or reference point. When individuals make choices they may have limited information and/or may not have enough time to consider all-possible-alternatives; in such situations, individuals may have to rely on their previous experience and expectations (reference points). Chapter four discusses how to analytically deal with results that contain bias caused by overload of or too much information being given to respondents. Chapter five proposes a modelling framework that tries to capture not only the decision outcome, but also the process involved. A pedestrian shopping and a going-home model was used as an example. The model not only includes the logical heuristic process of choice making, but also the mental effort, space orientation, time allocation, and also the risk perception that this may involve. As a behavioural analyst, I found this model to be very rich and interesting. Further tests with real empirical data would make the discussion more inspiring still.

Chapter six describes a recent development in the study of mental representations underlying individual choices. The mental representation in this case is a temporary representation of individual perception being stored in working memory at the moment of consideration. This includes the individual's experiences and longer term knowledge, situational and contextual variables, which is very relevant to transport geography related research. Chapter seven describes the idea of combining decision trees and Bayesian networks to explore the plausible heuristic decision making processes that may have been developed due to the repetition of the decision over time. Chapter eight shifts the focus on to the implementation of bounded rationality principle to dynamic route assignment. This chapter also provides a thorough literature review of what dynamic route assignment is, which I found very useful. Chapter nine and ten suggested two different specifications of agent-based level analyses that were thought to provide out-of-the-box approaches and designed to be consistent with the behavioural principles adopted. The model discussed on chapter nine may be one of the most complete, human-centred, models that I have read to date, and the most interesting one. But like typical conceptual models, these models cannot be empirically tested yet due to lack of data availability and cannot easily be applied by researchers without up-and-running activity-based-model simulators. Still, these chapters introduced innovative concepts that one need to be aware of. This book is closed with chapter eleven, which provides an excellent overview of prospect theory, and an overview of accumulated research which shows how rational behaviour deviates from the norm expectation under risk and uncertainty.

Overall, I found the knowledge this book offers helps us to accommodate the various different behavioural dilemmas when analysing human travel behaviours and movements over time and space; it provides plausible opportunities, above the given static time-space constraints that many of us refer to. This includes helping us to better understand the impact of uncertainty, adaptation, and inertia of the behaviour and how different approaches can be used to accommodate the dynamic elements of decision making processes, such as instantaneous/unplanned choices made under time pressure.

For readers unfamiliar with such approaches, some of the chapters provide an overview of the background knowledge in bounded rationality concept (chapter 1), dynamic route assignment (chapter 7), and prospect theories (chapter 11). Some chapters, such as chapter 3, provide us with a method to model how different people value their choice differently and how to take into account various unconventional variables, including an individual's mental effort and space and time orientations (as in chapter 5). Many of the equations/specifications, however, become more complicated than usual and I am not sure we have a rich enough dataset to test the concept empirically. But as a concept, the methods discussed are very intriguing and promising.

Chapter 6 is probably the chapter that has the strongest relationship with transport geography. Using causal-network-elicitation-technique (cnet), the complexity that underlies individual's experiences and long-term knowledge, including their mental map, perceived choice sets, situational variables, were constructed in such a way that we can illustrate the mechanism and priorities that underlie the decision making processes. The mental representation is influenced not only by temporal distance, but also by spatial and psychological distances. Traditionally, this method has been used mostly in the qualitative domain. The method described in this chapter tries to bridge the gap between qualitative and quantitative

http://dx.doi.org/10.1016/j.jtrangeo.2017.06.008

Available online 03 July 2017
0966-6923/

domains.

Finally, behavioural-analysis wise, I believe this book would be an interest of the Journal of Transport Geography's audience. It is also fair to note that, whilst the topics are fascinating, the computations involve are not easily understood and the reader may need a strong background knowledge in quantitative modelling in order to be able to follow and implement the concepts.

Yusak O. Susilo
KTH Royal Institute of Technology, Teknikringen 72, 10044 Stockholm, Sweden
E-mail address: yusak.susilo@abe.kth.se