Rationality

Aristotle said that people are rational animals (Mesaroș, 2014) while Pascal (2016) said that there is reasoning in behaviour that seems irrational. Rationality in making choice is often a key assumption in social sciences from economics to transport. The very central model to behavioural economics is *homo economicus* which assumes that agents behave rationally and seek to maximise their utility (Persky, 1995). Bayesian rationality defines being rational as being able to consider uncertainty (Oaksford and Chater, 2009). Oaksford and Chater (2009) argued that people’s reasoning is more often solving probabilistic rather than numerical problems. Elsäßer and Wirtz (2017) gave an example of brand loyalty, being one of the choice determinants which are associated with emotions, not rationality.

Simon (1986, 1990, 1991) argued that due to imperfect and incomplete information it is rather reasonable to assume that rationality is bounded. Bounded rationality was assumed in variety of transport models (Di *et al.,* 2013) in road safety (Sivak, 2002) or transport policy (Marsden *et al.,* 2012) but also route choice (Nakayama *et al.,* 2001). Transport models usually have some uncertainty effects introduced as random variables (Ben-Akiva and Lerman, 1985). The error term as suggested by Daganzo and Sheffi (1979) can be interpreted as the uncertainty of travel time. Throughout the years, different route choice models were proposed based on different assumptions, i.e. that a driver bases the decision to find the least costly route on the weighted average of time from the past (Horowitz, 1984). The microsimulation showed that network does not always converge to user equilibrium. Hyunmyung (2012) implied that drivers’ behaviour and choices tend to be habitual and repetitive. The UE equilibrium models, however, do not take the past experiences into account. For that reason, the UE solution can be more sensitive to changes in the network than drivers actually are. Hyunmyung (2012), therefore proposed an agent-based assignment model with travel time modelled as probability density function. By that it is meant that drivers adopt a strategy that is simpler, i.e. continuing the same route. Kobayashi (1994) implied that the reason for thinking that drivers are rational is that drivers become rational with the learning process. However, Nakayama *et al.* (2001) argued that even after long learning process, there is heterogeneity in driver’s perceptions of routes and therefore their behaviour in the network is heterogenous.

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