

Transport and emotion: the contribution of neurosciences

Stéphanie Souche

University of Lyon

Abstract:

With the exception of fear felt due to the insecurity of making a trip or stress linked to driving, the link between transport and emotion is not something that immediately comes to mind. Transport has long been reduced to the utility that can be derived from travelling. However, this vision now appears out of date. One not only travels because of the utility of his destination but also because one is motivated by psychological criteria (Dittmar, 1992; Mokhtarian and Salomon, 2001; Allen, 2002; Steg 2005; Anable and Gatersleben, 2005; Lois and Lopez-Saez, 2009; Ory and Mokhtarian, 2009).

This psychological motivation and the role of context are also at the heart of behavioural economics. The field has become very popular over the past few years and has given rise to interest in the field of transport (Metcalfe and Dolan, 2012; Avineri, 2012). Using the limits of standard economic models, behavioural economics studies the role and the place of nudges and context via affects in the agents behaviour (Kahneman and Tversky, 1979, 2002; Camerer et al., 2003; Thaler and Sunstein, 2003, 2008). This growing interest in affects can also be seen in the field of transport (Geurs et al., 2009; Paez and Whalen, 2010; Jakobsson-Bergstad et al., 2011; Abou-Zeid and Ben-Akiva, 2012; Eterna et al., 2012; Vella-Brodrick and Stanley, 2013; Friman et al., 2013; Morris and Guerra, 2014). For Metcalfe and Dolan (2012), affects are emotional responses to images, words and events that can lead individuals to change their behaviours. Among these affects, particular attention is given to the role of emotions in trips (Eterna and Verschuren, 2007; Eterna et al., 2012; McQuoid and Dijst, 2012) and especially in risk behaviour (Mesken et al., 2007; Hu et al., 2013).

These advances leads to deeper questioning on the best way of foreseeing and evaluating the satisfaction of individuals and, finally, their well-being. In particular, emotions allow considering the quest for and the satisfaction of subjective well-being, which designates an individual evaluation of one's experiences, positive or negative, regarding affect, happiness, and satisfaction with life (Easterlin, R., 1995; Diener et al., 1999; Dolan et al., 2008; Stutzer, 2004; Delbosc and Currie, 2011; Metcalfe and Dolan, 2012; Eterna et al., 2012). Underlying the individual score indicated by a person, it involves a cognitive evaluation to know whether their quality of life is judged good or not (Stutzer, 2004).

But to our knowledge none of these works has referred to another innovative contribution of behavioural economics, that of the use of neurosciences. The basic principle of neurosciences is that it focuses more on investigating the brain directly rather than the person (Camerer et al., 2004; Fehr and Rangel, 2011). In economics, two paths are therefore given priority: on the one hand that of identifying the neural processes involved in decision-making that standard economic models manage to explain and predict relatively well, and on the other hand, studying the anomalies which the predictions of standard models fail to identify.

On the basis of a literature analysis, the objective of this paper is to take stock on taking emotions into account in transport and to show how the use of neurosciences could permit going further in gaining new knowledge about them. Even if it implies very costly research and their own problem of interpretation, neurosciences allow not only a more precise analysis inside the brain but also a helpful means to identify brain zones activated by emotion generated by transport. This is a way for capturing emotion effect more easily translated into aggregated understanding of the actors' behaviors' than psychometric questions. It is clear that this path of investigation opens up a wide range of new opportunities for research. We therefore propose an agenda for research into the relation between emotions and transport that could benefit greatly from the toolbox offered by neuroscience. We organize this agenda by identifying the main issues currently facing the area of transport and in which emotions should be taken into account. For example, we show that emotion, identify by insula activation, can be taken into account in modelling transport demand.