Providing personalised feedback to investigate the role of social influence on travel behaviour

David Palma, Romain Crastes dit Sourd, Chiara Calastri, Stephane Hess, Matthew Beck and Vikki O'Neill

Social influence is the process through which an individual's behaviour, attitudes or beliefs are affected by someone else's.

The last few decades have seen a rising interest in incorporating social influence in models of travel choice.

Theoretical contributions have been made, among others, by Brock and Durlauf (2001), Walker et al. (2011), Maness & Cirillo (2016); applied studies range from those looking at the effect of social influence in illegal bicycle parking behaviour (Fukuda & Morichi 2007) to the adoption of electric vehicles (Rasouli & Timmermans 2016).

Most of the existing studies, though, have a number of limitations.

First of all, several studies are based on stated preferences survey (e.g. Kuwano et al. and 2013; Kim et al., 2014). Even in general applications, stated preference surveys come with a risk of hypothetical bias, but this is likely to be exacerbated when looking at influences of specific clues on behaviour, e.g. the share of friends conducting specific activities.

Secondly, the effect of social influence is generally measured by relating individual behaviour to the number of people in the relevant population who adopt a specific type of behaviour. When people are not provided the information, it is assumed, for example, that all the people in a neighbourhood know how many electric vehicles there are, or how many cars are parked legally. But this assumption is rather strong, and can lead to the fact that the lack of social influence could be confounded with the lack of acknowledgment of others' behaviours. Another side of this is the unawareness of the implications of others' behaviour.

In addition, most studies only focus on the choice (e.g. mode choice) but not on a continuous aspect of it (e.g. miles travelled by each mode in comparison to others). Finally, in order to be able to distinguish the effects of receiving any information at all about travel behaviour and social comparison, it is important to also provide participants with information about themselves and study how that differs from social influence.

In order to be able to capture social influence on travel decision making while overcoming the limitations mentioned above, we designed an innovative data collection framework inclusive or many aspect of respondents' life course and current choices.

The data was collected using an online survey in which people are asked about many present and past life choices and complete a name generator and interpreter about their social network. Crucially, a set of question about their susceptibility to social influence adapted from Bearden's scale (Bearden et al 1989) is presented in relation to environmental friendliness and physical activity.

After completing the survey, respondents use a mobility app for two weeks. The app tracks respondents prompting them to specify their trip purpose, mode, cost (if motorised) and third parties (from the name generator or others) involved in the trip/activity. After the first week, respondents are split into three groups. Respondents in the first group (n=178) keep using the app just as they did in the first week (control group). Respondents in the second group (n=155) start receiving information about their own travel and activity levels, e.g. miles travelled by motorised Vs. non-motorised modes, calories burnt, CO_2 emissions and
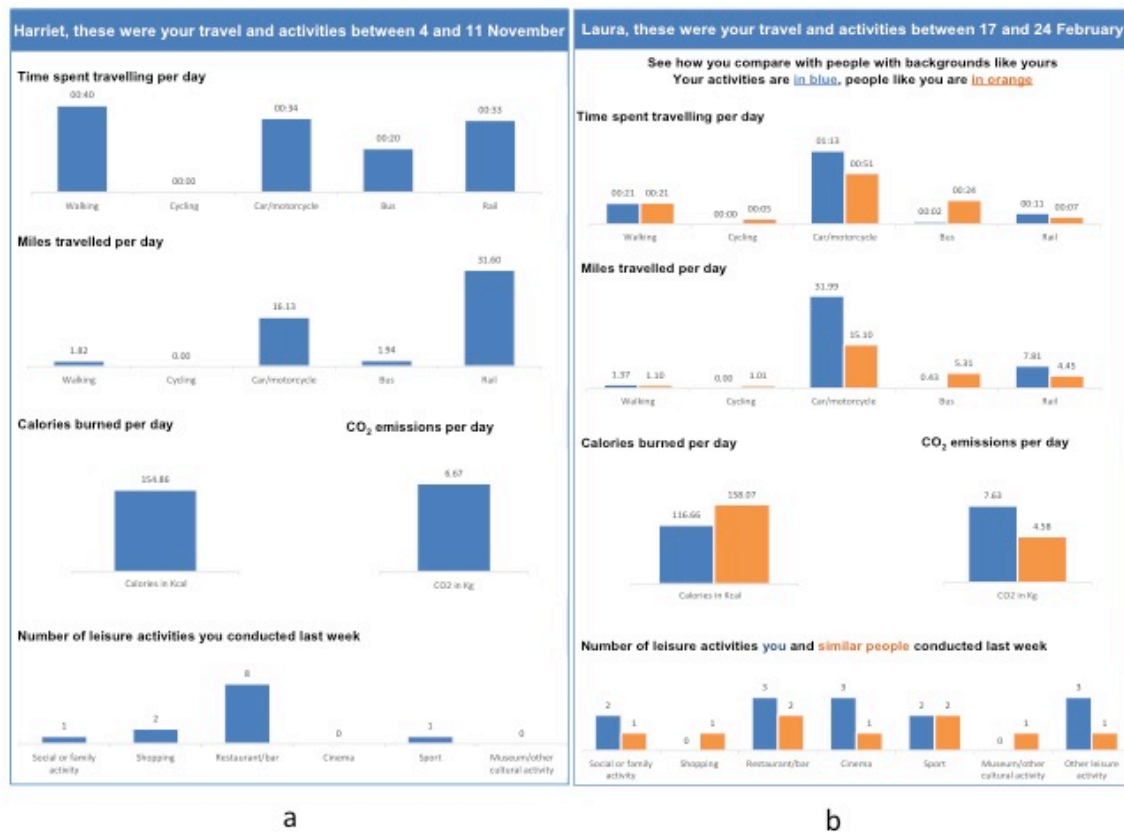
Figure 1

number of social activities (figure 1a). The third group (n=147) receives the same type of feedback but not only about their levels: they can also see how they compare to other respondents in a similar socio-economic group (figure 1b).

The data collection (tracking) continues for a second week while individuals keep receiving the informational feedback.

The information collected puts us in the position of investigating whether changes can be achieved by means of informational feedback, assessing whether there are differences in behaviour between the treatment groups. The potential role of social influence will be explored in the context of socially desirable behaviours such as changes to calories burnt and CO2 emitted, wherein it is expected that any changes will be more pronounced among the group that receives information about the behaviours of others. At a more complex level the role of social influence will be examined in the context of behaviours which are relatively more constrained (time spent travelling) versus relatively less constrained (number of leisure activities conducted). In this context we will examine not only if the allocation of time across tasks differs in the pre and post period, but also if the overall "budget" dedicated to travel or leisure changes.

It is envisaged that the results of this study will prove beneficial to the understanding of the determinants to active travel and contribute to the design of policies to encourage healthier transport policies.

References

Bearden, W. O., Netemeyer, R. G., & Teel, J. E. (1989). Measurement of consumer susceptibility to interpersonal influence. *Journal of consumer research*, *15*(4), 473-481.

Brock, W. A. and Durlauf, S. N. (2001). Discrete choice with social interactions. The Review of Economic Studies, 68(2):235–260.

Kamargianni, M., Ben-Akiva, M., Polydoropoulou, A., 2014. Incorporating social interaction into hybrid choice models. Transportation 41 (6), 1263–1285.

Kim, J., Rasouli, S., Timmermans, H., 2014. Expanding scope of hybrid choice models allowing for mixture of social influences and latent attitudes: Application to intended purchase of electric cars. Transportation Research Part A: Policy and Practice, 69, 71-85.

Kuwano, M., Chikaraishi, M., Fujiwara, A., 2013. An analysis of personal mobility promoting factors considering the social network in old Newtown. In: Proceedings of the Eastern Asia Society for Transportation Studies, vol. 9.

Maness, M., & Cirillo, C. (2016). An indirect latent informational conformity social influence choice model: Formulation and case study. Transportation Research Part B: Methodological, 93, 75-101.

Pike, S., 2014. Travel mode choice and social and spatial reference groups. Transport. Res. Rec.: J. Transport. Res. Board 2412, 75–81.

Rasouli, S., & Timmermans, H. (2016). Influence of social networks on latent choice of electric cars: a mixed logit specification using experimental design data. Networks and Spatial Economics, 16(1), 99-130.

Sherwin, H., Chatterjee, K., Jain, J., 2014. An exploration of the importance of social influence in the decision to start bicycling in England. Transport. Res. Part A: Policy Pract. 68, 32–45.

Walker, J. L., Ehlers, E., Banerjee, I., and Dugundji, E. R. (2011). Correcting for endogeneity in behavioral choice models with social influence variables. Transportation Research Part A: Policy and Practice, 45(4):362 – 374. Special Issue: Transportation and Social Interactions