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The relation between travel behaviour, ICT usage and social networks. The design of a web based survey

João de Abreu e Silva ^{a*}, Juan de Oña ^b, Slaven Gasparovic ^c

^a CERIS/CESUR – Instituto Superior Técnico, Universidade de Lisboa, Portugal

^b TRYSE Research Group, University of Granada, ETSI Caminos, Canales y Puertos, Spain

^c University of Zagreb, Faculty of Science, Department of Geography, Croatia

Abstract

The relatively recent developments in Information and Telecommunication Technologies (ICT) arose the interest of both researchers and policymakers about how these technologies could shape travel. Several hypotheses have been put forward relating the use of ICT and travel behaviour. These include substitution of travel; complementarity or induction; modification or neutrality. This topic has been the subject of relevant research efforts, with a strong focus on the role of telecommuting as a way to reduce travel and its negative environmental impacts. The relation between ICT usage and other motives of travel have not been so thoroughly researched. One of these is social travel. More recent technological developments, in particular the development of the Web 2.0 and social media, as well as the dissemination of smartphones and related web applications increase the potential usefulness of ICT to influence social travel behaviour. Particularly relevant in this context is the study of the role of social networks and their characteristics in influencing mobility patterns. The work presented here is the design of a web-based survey aimed at studying the relations between ICT and social media usage, social networks and social travel. The survey was designed to be applied to university students, because they are stronger users of social media and ICT devices. Specifically, it aims to investigate a series of potential research questions related with the effect of ICT on social travel, its interaction with social networks, and, how the perception of its usefulness influences its usage. The survey structure and its relations with the previous literature in these subjects are presented. Finally, the results from a pilot already implemented in 3 cities – Lisbon, Granada and Zagreb are presented and its role on the validation of the survey structure is discussed.

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1. Introduction

The development of Information and Telecommunication Technologies (ICT), which became apparent in the 1990's with the dissemination of mobile phones, personal computers and the Internet, continued its fast pace during the first two decades of the XXI century aided by development of the Web 2.0, social media and smartphones. These new technologies captured the interest of both researchers and policymakers about its potential to shape and possibly reduce travel and its negative impacts. The first studies with a strong emphasis on telecommuting were published in the early 1990's (e.g., Mokhtarian, 1990; Kitamura et al. 1991; Pendyala et al., 1991). Several hypotheses have been put forward relating the use of ICT and travel behaviour. These include

* Corresponding author. Tel.: +351-218-418-302; fax: +351-218-409-884.

E-mail address: jabreu@tecnico.ulisboa.pt

substitution of travel; complementarity or induction; modification or neutrality (Salomon, 2000; Mokhtarian and Salomon, 2002; Aguilera et al., 2014). Consequently, this topic has been the subject of continuous research efforts. The relation between ICT usage and other travel purposes have not been so thoroughly researched. One of these is social travel. Recent technological developments increase the potential usefulness of ICT to influence social travel behaviour. Particularly relevant in this context are the concepts of activity fragmentation and multitasking, greatly supported by the dissemination of ICT devices and internet access, and the study of the role of social networks and their characteristics in influencing mobility patterns. Here we present the design of a web-based survey aimed at studying the relations between ICT and social media usage, social networks and social travel. The survey was designed to be applied to university students. They are stronger users of social media and ICT devices and constitute a convenient sample without requiring relevant resources to be surveyed. Specifically, the survey aims to investigate a series of potential research questions related with the effect of ICT on social travel, its interaction with social networks, and, how the perception of its usefulness influences its usage. This paper is organized as follows: in the second section a literature review is offered, followed by the research questions aimed to be addressed by the survey; the survey structure and the results from a pilot already implemented in 3 cities – Lisbon, Granada and Zagreb are presented; and finally, its role on the validation of the survey structure is discussed in the conclusions.

2. Literature review

In general, the hypothesis relating travel behaviour and the use of ICT comprehend the following relations (Salomon, 2000, Mokhtarian and Salomon, 2002; Aguilera et al., 2014):

- Substitution;
- Generation, either by complementarity or by stimulation;
- Modification;
- Neutrality.

The conclusions attained so far portray a more complex picture. Tilahun and Li (2015) found effects of substitution, more contacts by mail, phone or other communications reduce face-to-face meetings. Kamargiani and Polydoropoulou (2014) found that a more intense use of social media leads to more social travel. Wang and Law (2007), Nobis and Lenz (2009) and Van der Berg et al. (2012) found evidences of a complementary relationship between contact frequencies by different modes. More recently Van der Berg et al. (2013) found evidences of substitution. Yuan et al. (2012) found that people with higher cellphone usage have a larger activity spaces and their spatial behaviour is more random. Kenyon (2010) found no evidence of a link between virtual and physical mobility. Schwanen and Kwan (2008) found that internet and mobile phone enhance spatial flexibility, although ICT seems to create some constraints. Carrasco and Miller (2009) found that the effect between social activities and the use of ICT is mode specific, telephone is complementary but email appears to have no effect; they argue that it could have a substitution effect for long distance social contacts. Thulin and Vilhelmon (2005) found that ICT usage complements both physical contacts and phone calls. Lee-Gosselin and Miranda-Moreno (2009) found that mobile phone usage was positively associated with activity and trip levels and internet usage had the opposite effect. Zhang et al. (2005) found simultaneous effects of complementarity and substitution between travel and ICT usage, although the former were dominant.

These mixed results support the argument that ICT affects travel in different manners, since some travel determinants are not influenced by ICT, or are influenced in ways that do not reduce travel (Aguilera et al. 2012). Focusing specifically on leisure activities, Mokhtarian et al. (2006) argue that the primary effect of ICT is to expand individual choice sets. They've found several dimensions of leisure activities which ICT could impact, e.g. location, dependence/independence both location and temporal, fragmentation, planning horizons, multitasking, solitary versus social. ICT use reflects also gender roles, as Ren and Kwan (2009) and Schwanen and Kwan (2008) found. Contrary to women, men take advantage of the Internet to perform more new activities and they show a complementarity between Internet leisure usage and leisure travel (Ren and Kwan, 2009).

More recently, Pawlack et al. (2015) presented a series challenges about the relations between ICT usage and travel. These include issues related with:

- Causality, in a society where ICT is becoming omnipresent, the decision to use ICT devices could be strategic to increase the efficiency of travel, thus muddling the causal relations between ICT and travel behaviour;
- ICT as a moving target, the way that ICT technologies change and evolve and the way that they are available in different social and spatial contexts, change its relations with travel;
- Measurement issues, it is not clear what would be the best ways to measure ICT usage;
- Context specificity, there is a low number of cross national studies, and since different social groups and different countries will relate ICT and travel differently, socioeconomic, cultural and geographical contexts matter and transferability of results might be problematic;
- Time use and activity planning of activities, ICT allows for quicker, more accurate and personalized travel arrangements, although it's not making travel planning more spontaneous.

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