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AN INVESTIGATION INTO THE INFLUENCE OF LAND-USE, SOCIAL NETWORKS AND INFORMATION AND COMMUNICATION TECHNOLOGIES ON DESTINATION CHOICE FOR SOCIAL ACTIVITIES

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Abstract

Information and Communication Technologies (ICT) enable individuals to travel more flexibly. The choice of location for social activities has become very flexible. In addition to this, land-use characteristics also play a vital role in the location of social activities. This work aims to analyse the influence of land-use characteristics, ICT use, and social networks in the destination choices for face-to-face social activities of university students during both weekdays and weekends.

Students from the two different campuses of the Instituto Superior Técnico were presented with an online questionnaire, which was intended to collect information about their use of ICT and social networks, in addition to their travel characteristics and socio-demographics. Emphasis was made upon capturing the characteristics of social networks and ICT usage. Information on land-use characteristics was obtained from secondary sources.

Factor analysis was initially carried out to extract factors related to the use of ICT and social networks; these were later used to model the destination choice for social activities. The alternatives considered for destination choice included: home or the vicinity thereof, university or the vicinity thereof, other locations (further away from home and university), and evenly spread locations – having no specific priority for any of the other three locations considered. The analysis was performed separately for travel during weekdays and weekends so that an understanding of the differences and similarities in behaviour during these different time periods could be garnered. A multinomial logit model was estimated to model this choice. The results point to the relevance of land-use characteristics, the location of close friends, and modes of interaction. Individuals residing in more accessible central, and denser areas, were more likely to have activities distributed evenly across the city. These results stress the relevance of accessibility in allowing larger and more diverse spaces to be used for social activities.

Keywords

Destination choice, social travel, multinomial logit model, Information and Communication Technologies, social networks

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1. Introduction

Unlike other forms of travel, travel for social activities (hereafter referred to as social travel), is enriching, in that individuals become socially involved at their destination (Forrest, 1974). The differences that exist between social travel and other types of travel make it essential to understand all the factors that contribute to its existence. Factors influencing socialising and the generation of social travel can be significantly different from those which influence other forms and purposes. In addition to differences in spatial structure and function, social trips are discrete in nature and are conditioned by the availability of residual time as well as by the coupling of restrictions. These aspects make the study of social travel an important subject matter. Social travel improves social interactions that are critical to reducing social exclusion, segregation, and improving liveability, which in turn, is important for the formation of communities (van den Berg, Kemperman, and Timmermans, 2014). The importance of social travel is often underreported in literature.

Destination choice for social activities is often conditioned by the land-use characteristics, as there is a need for areas for social interactions (Handy, 1996). Advancements in Information and Communication Technologies (ICT) have led to the increased penetration of the smartphone into masses and the extensive use of social networking applications such as Facebook, WhatsApp, Instagram. Cumulatively, such processes have increased the potential to make travel, particularly social travel, more flexible. ICT can have substitution, complimentary, neutral or modification effects on travel decisions (Salomon, 2000; Mokhtarian and Salomon, 2002). In addition, technologies can have implications for long-distance social relationships and may increase social interactions (Axhausen, 2007). Their impact is, however, not restricted to frequency, as individuals can also make amendments to travel decisions during their travel. In other words, these advancements have changed travel itself, as predicted by Townsend (2000).

The nature of social interactions and geographical location influence the formation of social networks (Doreian and Conti, 2012). The reduction in travel costs facilitates the maintenance of larger social networks, and this impacts the interactions of their members and the locations known/visited (Axhausen, 2007). Along with the increasing popularity of social networking sites such as Facebook, and Instagram, individuals have created virtual social networks – which liberate individuals from barriers imposed by geography. Individuals are increasingly relying on these platforms to maintain social contacts (Wellman et al., 2001; Cheung, Chiu, and Lee 2011). Increased social contact may or may not eventually lead to participation in social activities and travel (Wellman et al., 2001; Carrasco and Miller, 2006). In this study, we aim to analyse the destination choices for the social activities of university students. Gaining insight into this subject matter may facilitate the better evaluation of transportation control policies, and provide better estimates for travel distances while improving accessibility to various facilities (Pozsgay and Bhat, 2001).

In addition to the factors discussed above, land-use characteristics also play a very important role in destination choices. The attractiveness of the destination area, defined by its land-use characteristics, has an influence on trip attraction (Thil and Horowitz, 1997; Kitamura, Chen, and Narayanan, 1998). Land-use characteristics, such as green spaces and public facilities, are critical to social interactions and the formation of social networks (Holland et al., 2007; Völker, Flap, and Lindenberg, 2007). Urban policymakers are urged to provide facilities that will improve harmony amongst different communities and bring individuals with different socio-economic characteristics together (Krellenberg, Welz, and Reyes-Päcke, 2014). To better plan for the provision of such facilities, it is important to study why people travel to destinations that possess certain land-use types.

The travel characteristics of university students have been only sparsely represented in existent literature, but are now increasingly gaining attention (Khattak et al., 2011; Whalen, Páez, and Carrasco, 2013). University students travel more compared to the general public (Khattak et al., 2011). However, they pursue fewer home-based social trips (Khattak et al., 2011; Volosin 2014). University students may also have a different temporal distribution of activities (Khattak et al., 2011). Differences in personal characteristics, work/university, and household obligations may contribute to this (Volosin, 2014). University students are also more open-minded and receptive to new ideas (Limanond, Butsingkorn, and Chermkhunthod, 2011), and therefore, can be used to evaluate the impact of new technologies on travel (Khattak et al., 2011). Furthermore, university students are often followed by others in society. Hence, understanding their behaviour could pave the way towards more sustainable travel (Zhou, 2012). We believe it is appropriate to analyse social activities within this group before extending the analysis to the larger population.

Bearing in mind the above-mentioned factors, this study has the following objectives:

- To analyse the influence of land-use characteristics, ICT use and social networks in destination choice for face-to-face social activities by students
- To analyse the similarities and dissimilarities in the factors governing destination choice for activities, pursued during weekdays and weekends by students

This research was carried out using data from 425 students belonging to the two geographically separate campuses of the Instituto Superior Técnico (IST) in Lisbon, collected using an online survey. Data pertaining to land-use characteristics were obtained from secondary sources. Considering the nominal nature of the destination choice, the multinomial logit model was used for estimation of the destination choice for face-to-face social activities during weekdays and weekends. This type of model and its extensions have been extensively used to model destination choices (Adler and Ben-Akiva, 1976; Bowman and Ben-Akiva, 2000).

The paper is divided into six sections. A summary of the literature is presented in the next section. The third section describes the data, and the fourth section discusses the methodology. The fifth section presents the analysis and estimation results. The sixth section presents a summarised discussion of the results and the most important findings from this research.

2. Literature Review

This literature review covers three different aspects relevant to the subject matter of this paper. First, it discusses social travel, then it provides a review of social networks and ICT and their influences on social activities. Finally, it focuses on destination choices for social activities and the differences that exist relative to other travel purposes.

2.1. Social Travel

Social networks generate social activities that eventually generate travel (van den Berg, Arentze, and Timmermans, 2013). Social activities often involve individuals from different households, and travel plays an important role in said social interactions. Analysis of social travel has often been neglected and the research emphasis of existent literature has mostly been on dimensions associated with mandatory activities, such as work and schools, and so on. Social travel involves interaction between geographical areas that are spatially separated, and highlights social interactions within a city (Stutz, 1973a). The timing of social travel is often defined by residual time (Arentze and Timmermans, 2008) and it is mostly distributed during evenings or weekends (Wheeler and Stutz, 1971; Arentze and Timmermans, 2008). Furthermore, social travel is influenced by previous and subsequent activities (Stutz, 1973b). These aspects differentiate social travel from travel for other purposes.

The mandatory nature of commuting obliges individuals to undertake activities irrespective of distance or to relocate to new locations if the costs for said activities are too high. For social travel, individuals have the flexibility to choose between pursuing and not pursuing social travel and hence, the propensity to do so declines as the distance increases (Stutz 1973a, 1973b; Greenbaum and Greenbaum, 1985). Furthermore, individuals participate based on the 'tie strength', i.e. the presence or involvement of relatives or members of their social network (not online social networks) or unrelated neighbours (Stutz 1973a, 1973b; Carrasco and Miller, 2006). In contrast to the findings for trip generation and recreational activities, low-income groups make more social trips (Wheeler and Stutz, 1971; Stutz, 1973b). Household composition, urban structure, familiarity with an area, an individual's social status, the travel time involved and the distance to destinations as well as the latter's spatial characteristics all have an influence on social travel (Wheeler and Stutz, 1971; Stutz, 1973a; Hanson, 1982).

2.2. Social Networks and ICT

Social context and opportunities for the development of networks are critical (Huckfeldt, 1983). Interactions within social networks are enriching, as they facilitate the exchange of information and thus influence travel

decisions and vice-versa (Arentze and Timmermans, 2008). The location of social activities depends on the location of the individual and the location of the social contacts, as the location must be convenient for everybody involved in the activity. Living in the same neighbourhood as one's social contacts reduces the need to travel for social interactions. However, more distant work locations result in individuals choosing locations far away from home for social interactions (Tilahun and Levinson, 2009).

Technological developments allow people to circumvent some of the difficulties associated with the distances that affect social travel. ICT aid the formation and maintenance of social networks and eventually influence travel decisions (Aguiléra, Guillot, and Rallet, 2012). A large network often leads to an increase in the use of ICT; however, the increased use of ICT does not necessarily result in a larger social network (van den Berg et al., 2013). Phone calls and messages, which are often preferred for short-distance communications, may substitute face-to-face meetings, facilitate organisation, and help in making amendments to activity locations and timings (Larsen, Axhausen, and Urry, 2006; van den Berg, Arentze, and Timmermans, 2012). These influences remain unchanged across different age groups and social temporal orders (Yuan, Raubal, and Liu, 2012). Emails travel further, and are preferred over other means of communication (Larsen et al., 2006; van den Berg et al., 2012). Emails facilitated changes to activity locations prior to the widespread popularity of smartphones (Lee-Gosselin and Miranda-Moreno, 2009). The internet facilitates the maintenance of large social networks by ensuring frequent communications, though the size of such networks decreases as distance increases (Mok and Wellman, 2007; Dijst, 2009). ICT fragments non-work trips and the nature of fragmentation may be spatial or temporal depending on the specific ICT device used (Ben-Elia et al., 2014). Mobile phones and computers enable individuals to accomplish some tasks without having to travel (Dal Fiore et al., 2014). Research by van den Berg and Timmermans (2014), Sharmeen (2015), van den Berg, Weijs-Perrée and Arentze (2016) has mostly focussed on the frequency of social activities. Destination choice is influenced by the characteristics of the social networks. Specifically, the location of the members of the social networks and the characteristics of the relationships with these members influence the choice (Carrasco, Miller, and Wellman, 2008). Recent advancements in the analysis of social networks have also been well described by Kim, Rasouli and Timmermans (2017).

2.3. Destination Choice

Destination choice has been the subject of considerable research in travel demand modelling. In the destination choice of usual work and school tours, destinations are assigned to already known work/school locations (Bradley, Bowman, and Griesenbeck, 2010). In destination choices for other activities, the socio-demographics of individuals, such as gender, age and race, play an important role (Hammadou et al., 2008; Auld and Mohammadian, 2011; van den Berg and Timmermans, 2014). Some of the household characteristics that influence destination choices, as reported by other researchers, include income, availability of vehicles, household type and household composition (Thil and Horowitz, 1997; Hammadou et al., 2008; van den Berg and Timmermans, 2014).

Travel characteristics, such as duration, travel cost, the mode used, travel distance and destination accessibility, are some of the other determinants of destination choices (Adler and Ben-Akiva, 1976; Koppelman and Hauser, 1978; Hammadou et al., 2008). Population, population density, land-use characteristics, such as the presence of commercial establishments, land-use type, accessibility, number of jobs, retail employment and other employment realities, also influence destination choice (Thil and Horowitz, 1997; Kitamura et al., 1998). The geographic context of the zone, specifically retail areas and non-retail areas, the attractiveness of the destination, the quality of experience offered and the interaction of zonal characteristics (such as frequency of bicycle lanes, restaurants, household population) with socio-demographics, also affect destination choices (Koppelman and Hauser, 1978; Pozsgay and Bhat, 2001; Eluru et al., 2010).

In addition to the aforementioned factors, destination choices for social activities are influenced by individual physical fitness levels, distance to various facilities, satisfaction with places of entertainment, meeting places and cultural facilities, working hours, school hours, the number of face-to-face interactions that have occurred in the past, the number of ICT contacts in the past, and the frequency of contact with neighbours (van den Berg et al., 2014). The propensity for social interactions has been observed to be high in dense urban centres (Farber et al., 2014). Furthermore, the destination choice for social activities may differ during weekdays and weekends.

3. Data Description

The questionnaire is available online (https://tinyurl.com/Social-Networks-Questionnaire) and a detailed description of the survey methodology can be found in de Abreu e Silva, de Oña, and Gasparovic (2017). After removing records with inconsistencies, the resulting data contained observations from 425 students and the analysis and statistics presented below were limited to this sample.

In contrast to the common practice of using a single-day activity diary, information on the destination choices for social activities during the previous week was collected separately during weekdays and at weekends. This helped to eliminate any potential misrepresentation associated with the use of a single-day activity diary, particularly for social travel. As social travel is not undertaken on a daily basis, the use of single-day activity diary could result in the under-representation of social travel. The dependent variable has four alternatives, defined as the most frequent destination for individual respondent's social activities during weekdays and weekends:

- Home or the vicinity thereof, defined as an area equivalent to 10 mins walking or 800 metres radius centred on the respondent's residence
- University or the vicinity thereof, defined as an area equivalent to 10 mins walking or 800 metres radius centred on the university
- Other locations, farther away from both home and university
- Evenly spread, having no specific priority for any of the three locations considered in this research (base alternative for the analysis).

Figure 1 shows that, during weekdays, social activities were mainly concentrated around university campuses. The significantly low percentage of social activities near residences during weekdays could be an indication of the composition of the social networks of the respondents. However, during weekends, social activities tended to take place away from both residences and the university. This could be because Lisbon's nightlife establishments are located at distances far from both IST campuses as well as from the main residential areas of the city and metropolitan area.

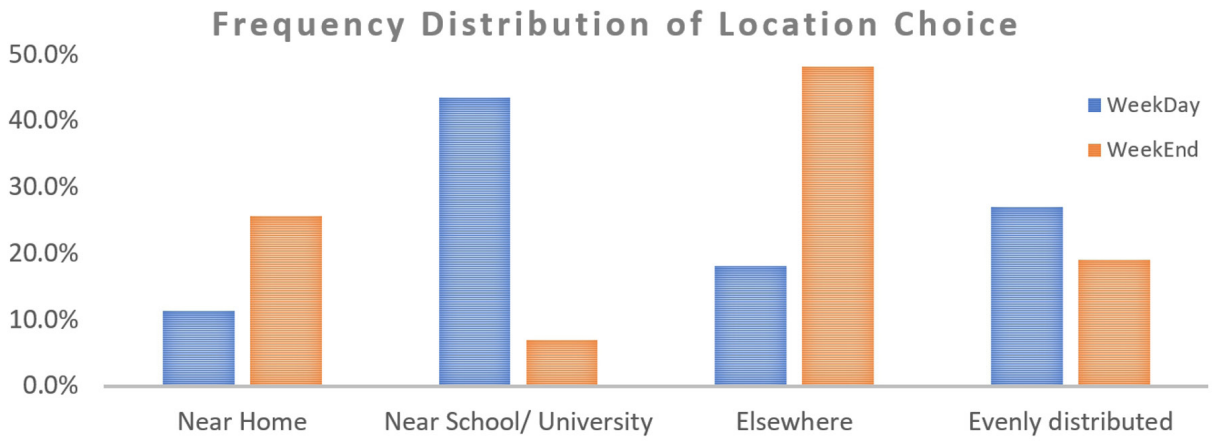

Figure 1 - Frequency Distribution of Location Choice

In addition to the socio-demographic characteristics of students, the dataset contains information on the use of ICT and social media (the number of social media contacts), social networks characteristics (such as size, transitivity and propinquity) and social travel (frequency and approximate destination). The survey collected information on the postal codes of the respondents' places of residence, with the land-use data obtained from secondary sources being assigned to the respondents in the dataset. The study did not register the exact location of the destination choices for all the social activities.

The socio-demographic characteristics of the respondents are presented in Table 1. Each of the statistics generated as part of the study was evaluated separately for each of the two IST campuses. As the statistics were

essentially similar for the two campuses, the values for the overall population are presented. Almost 90 percent of the students responding to the survey belonged to the Alameda campus. The majority of the students were aged between 20 and 25. As expected, very few students were older than 35. The dataset has a slightly higher representation (55%) of male students and master's students than both doctoral and undergraduate students. During the week, public transport was the most preferred transport mode (35% of students), while cars were the most preferred mode during weekends. Most students had less than the minimum wage at their disposal for their monthly expenses.

Table 1: Socio-demographic Characteristics of the Respondents

VARIABLE		OVERALL (%)
Campus	Alameda	89.18
	Tagus Park	10.82
Age is younger than 20		15.06
Age is between 20 and 24		55.53
Age is between 25 and 35		24.47
Age is older than 35		4.94
Percentage of male students		56.47
Role at university	Bachelor's student	33.97
	Master's student	56.22
	Doctoral student	9.81
During weekdays, the most preferred mode for social activities in the previous week	Car	25.53
	Public transport	34.59
	Bike	8.71
	Walk	23.06
During weekends, the most preferred mode for social activities in the previous week	Car	37.88
	Public transport	17.41
	Bike	7.53
	Walk	18.12
Money available for monthly expenses	Less than or equal to minimum wage (€557*)	66.59
	Between minimum wage and twice minimum wage	12.47
	More than twice the minimum wage	6.12
	Don't know or no response	14.82

* Minimum wage in Portugal in 2017

Table 2 presents the use and characteristics of the respondents' ICT devices. Most of the students used social networking sites every day, on weekdays (70%) and at the weekends (60%). Only 20 percent of students contacted acquaintances daily. A significant proportion of students used chatting/video calls as a substitute for face-to-face interactions or for maintaining contact with people living far away. The results also show that a fair number of students used chat or video calls to maintain networks that involve close friends/acquaintances/family members.

Table 2: ICT Use and Characteristics

VARIABLE		OVERALL (%)
Uses social networking sites on a daily basis, on weekdays		71.11
Uses social networking sites on a daily basis, at weekends		60.00
Contacts acquaintances daily		20.00
Engaged in chatting/video calls to keep in contact with friends/ acquaintances	Never	23.29
	Sometimes	43.76
	Around half of the times	11.76
	The majority of times	14.35
	Every time or almost all times	6.82
Engaged in chatting/video calls to keep in contact with family members	Never	36.47
	Sometimes	34.35
	Around half of the times	9.41
	The majority of times	10.59
	Every time or almost all times	9.18
Chat/video call because a face-to-face meeting was not possible	Never	31.76
	Sometimes	30.82
	Around half of the times	10.35
	The majority of times	11.53
	Every time or almost all times	15.53
Chat/video call with people living far away	Never	23.06
	Sometimes	31.29
	Around half of the times	9.41
	The majority of times	16.94
	Every time or almost all times	19.29

Table 3 presents the social network characteristics. The size and location of the networks, as well as the interactions that occur within them, are discussed. The average number of close friends, other than family members, was 8.72. The number of acquaintances, other than family members, was 14.99. Intimate friends of nearly 40 percent of respondents lived in the same municipality, but not in the same neighbourhood. Similarly, acquaintances of nearly 35 percent of respondents lived in the same municipality. This indicates that distance may play an important role in the formation and maintenance of a close network of friends. Roughly 90 percent of individuals had face-to-face meetings for social activities during weekends and on weekdays.

Table 3: Social Network and Characteristics

VARIABLE		OVERALL (%)
Number of close friends, other than family members		8.72
Number of acquaintances, other than family members		14.99
Where do your friends live?	Close friends live nearby	24.90
	Close friends live in my city/municipality but not nearby	40.16
	Acquaintances/not so close friends live in my city/municipality	34.94
Frequency of face-to-face social activities, involving friends or acquaintances (during weekends)	No travel	10.12
	Undertakes 1 or more social activities during weekends	89.88
Frequency of face-to-face social activities, involving friends or acquaintances (on weekdays)	No travel	11.11
	Undertakes 1 or more social activities during weekdays	88.89

A review of the literature indicates that land-use characteristics influence destination choices for social activities. Accordingly, we collected data on the characteristics of the students' two main spatial anchors (residence area and campus area); these were also part of the choice set of locations for social activities. A summary of the statistics related to land-use characteristics near to respondents' homes and the university is presented in Table 4. The average values indicate that most areas are urbanised and have a higher percentage of access to

bus transport. Most areas are, however, not easily accessible by motorways or heavy transit (mainly rail and ferries). The average distance to the Central Business District (CBD) and to the university from the homes of respondents was around 8 km.

Table 4: Land-Use Characteristics Near Home and University

VARIABLE	MINIMUM	MAXIMUM	AVERAGE	STD. DEV.
Percentage of urban area (residence area)	1.962	100.000	81.842	25.981
Compactness index (residence area)	1.143	16.852	1.954	1.558
Density of population (residence area)	11.178	422.121	150.144	106.030
Mixed land-use (residence area)	0.124	9.772	0.820	0.896
Percentage of residents 400 m away from a bus stop (residence area)	0.224	100.000	76.771	26.462
Percentage of residents 400 m away from a heavy transit station (residence area)	0.000	100.000	27.949	27.865
Percentage of residents 1000 m away from a motorway node (residence area)	0.000	100.000	38.565	33.165
Distance to CBD (m) from home	290.187	37089.419	8519.567	7352.909
Percentage of urban area (university area)	54.849	100.000	95.208	13.907
Distance to university from home	495.070	36959.850	8214.831	7535.717

4. Methodology

This study pursues two objectives. The first is to identify the role of land-use patterns, social networks and ICT in the destination choices of students for social activities. With this goal in mind, several variables depicting these characteristics were included in the model specification. Destinations are relative to an individual's main spatial anchors, i.e., residence and university. Considering the nominal nature of the dependent variable, a Multinomial Logit (MNL) model was used for the estimation.

The second objective is the identification of the similarities and dissimilarities in destination choices between weekdays and weekends. The difference in social travel characteristics on weekdays and at the weekends has already been discussed in Section 2. The frequency distribution in Figure 1 indicates significant differences in the destinations chosen for social activities during the week and at weekends. This difference may be due to differences in the characteristics of the individual respondents, land-use, ICT use, and social networks, or it could be dependent on residual time (not addressed in our study). The estimation results are expected to provide insight into this.

5. Model Estimation and Discussion of Results

The definition and distribution of the dependent variable have been discussed above in Section 3. MNL, a trusted estimation technique in travel demand analysis, was used for estimation of the destination choice model. The model is based on the principle of utility maximisation. Its simplicity of use, estimation, and interpretation has significantly contributed to making this one of the most popular discrete choice models. The principle, theory and practice of model estimation have been comprehensively characterised in Ben-Akiva and Lerman (1985) and Koppelman and Bhat (2006).

Table 5: Estimation Results of Factor Analysis

VARIABLE	FACTOR_1	FACTOR_2
KMO Statistic	0.736	
Name of factor	F_Chat_Call_Expe_Far	
Engages in chatting/video calls to keep in contact with friends/acquaintances	0.695	
Engages in chatting/video calls to keep in contact with family members	0.719	
Chat/video call because face to face meeting was not possible	0.841	
Chat/video call with people living far away	0.860	
KMO Statistic	0.837	
Name of factor	F_Cent_Urb_Comp_Bus	F_Den_Mix_HT
Percentage of urban area (residence area)	0.934	
Compactness Index (residence area)	-0.745	
Density (residence area)	0.459	0.812
Mixed land-use (residence area)		0.747
Percentage of access to bus (residence area)	0.859	0.329
Percentage of access to heavy transit (residence area)	0.488	0.730
Percentage of access to motorways (residence area)	0.457	-0.727
Distance to CBD (m) from home	-0.865	-0.346

Various aspects related to the use of ICT and social media were covered in the questionnaire. For better estimation and to ensure parsimony, principal component analysis using varimax was used to construct the factors and thus reduce the number of variables tested in the models. This also minimised potential collinearity problems. Varimax maximises the sum of the variances of the squared loadings (Kaiser, 1958). The resulting factors were tested for their meaningful representation, communalities and their Kaiser-Meyer-Olkin measure (KMO). The factors were later attached to the original dataset, for inclusion in the model. Estimation results, along with the factor loadings, are presented in Table 5. The factor named "using chat and calls when social contacts were at a significant distance, or communication was expensive (F_Chat_Call_Expe_Far)", captures the role of video calls/chats in the maintenance of social networks. Particularly when face-to-face communication is expensive or difficult, this acts as a substitute for face-to-face interactions. The factor, "living in a central, compact area accessible by bus (F_Cent_Urb_Comp_Bus)" represents respondents living in central, highly urbanised and compact areas with high accessibility to bus transport. The factor "living in a dense and mixed area, with good accessibility by heavy transit (F_Den_Mix_HT)" represents individuals living in dense and mixed areas highly accessible by heavy transit.

The models obtained were evaluated based on goodness-of-fit measures, nature, magnitude and the statistical significance of the estimated coefficients. The estimation results are tabulated in Table 6. It should be mentioned that the goodness-of-fit measures for the two models are reasonable. From an initial log-likelihood value of -589.175, the model for weekday travel, improved to a value of -497.627 (ρ^2 value of 0.155) and the model for weekend travel improved to a value of -484.561 (ρ^2 value of 0.178). In the case of the model for weekends, the market shares model itself appeared to be a good predictor and the improvement over this model was nominal.

Table 6: Estimation Results for the Destination Choice Model

	WEEKDAY	WEEKEND
VARIABLE	**COEFF**	**COEFF**
Near Home		
Constant		1.15***
Master's student	-0.56*	
Number of close friends, other than family members	-0.22***	
F_Chat_Call_Expe_Far	-0.39**	
F_Cent_Urb_Comp_Bus		-0.28**
Age is between 20 and 24		-0.82***
Close friends living in my city/ municipality but not nearby		-0.55**
Undertakes 1 or more social activities during weekends		-0.73**
Disposable income for monthly expenses is less than or equal to minimum wage		0.75**
Near School		
Constant	1.10***	
Age is between 20 and 24		-0.85**
Age is between 25 and 35	-1.00***	-0.95*
Age is more than 35	-1.47*	
Uses social networking sites on a daily basis, during weekdays		-0.73*
F_Cent_Urb_Comp_Bus	-0.36***	
F_Den_Mix_HT	-0.74***	
Percentage of urban area near university/distance to university	1475.81***	
Master's student	-0.45**	
On weekdays, the most preferred mode for social travel was the car	-0.65**	
Number of acquaintances, other than family members	-0.12*	
Elsewhere		
Constant		1.04***
Age is between 20 and 24		-0.71**
Age is more than 35	0.90***	
Disposable income for monthly expenses is less than or equal to minimum wage		0.50*
Contacts acquaintances daily	-1.26***	
Goodness-of-fit measures		
Initial loglikelihood	-589.175	-589.175
Loglikelihood (constants only)	-537.345	-502.115
Loglikelihood (final)	-497.627	-484.561
Rho-squared value (w.r.t. constants)	0.074	0.035
Rho-squared value (w.r.t. initial)	0.155	0.178
Note: ***, **, * ==> Significance at 1%, 5%, 10% level.		

5.1. Weekdays

The socio-demographic characteristics of individuals play important roles in their travel decisions. Students above the age of 25 are more likely to perform social activities at destinations away from the university or their place of residence. Individuals pursuing master's degree are less likely to pursue activities near home or the university. Individuals commuting by car are more likely to have their destinations for social activities evenly distributed across the city. Increased mobility through having greater access to a car could be a contributing factor in this. Land-use characteristics near individual residences and the university play a very important role

in the choice of destinations for social activities. Improvements to land-use factors near individual residences are likely to result in social activities being more evenly distributed across the city. Students with residences in central, highly urbanised and compact zones with good accessibility to bus transport are less inclined to undertake social activities near the university. The same is the case for students from dense and mixed areas that are highly accessible by heavy transit. For them, there may not exist a clear preference for locations and there may be an even distribution of activities across the city. Students enrolled in the urban campus and living close to it are more likely to choose areas close to the campus for their social activities.

Social networks' characteristics are a strong driver of destination choices for social activities. The size of a social network, the location of its members, and the modes of communication that the network members use are all likely to influence destination choices. Individuals with a large number of close friends are more likely to have their destinations evenly distributed across the city. This is because individuals may have to undertake activities across the city to maintain social interactions. The same is true for individuals with a large number of acquaintances. Individuals contacting acquaintances daily are likely to maintain a good social network and this may result in an even distribution of activities across the city. Similarly, individuals using video calls or chats for the maintenance of their social networks, specifically with people with whom face-to-face contact is either not possible or difficult, are also likely to distribute activities across the city. They may also be using activities as a substitute for face-to-face interactions or for communication with individuals who are based further away.

5.2. Weekend

As mentioned earlier, there is a difference in destination choices between weekdays and weekends. Individuals aged between 20 and 35 are less likely to choose destinations near their residences or the university. They are more likely to have their social activities evenly distributed across the city. Students with a disposable income of less than or equal to the minimum wage are more likely to choose locations close to their individual residence – this is probably because of the desire to save the expense that would be incurred by travel. They may also choose affordable destinations for their social activities, which may be away from their home or residence. Individuals living in central, highly urbanised and compact areas with high accessibility to bus transport are more likely to have most of their activities distributed evenly across the city, possibly due to the higher accessibility of their residential areas. Since the university is closed during weekends, the land-use characteristics near the university are irrelevant in the destination choice for social activities at weekends.

The characteristics of the social network are also important for destination choices during weekends. Students with close friends living in the same municipality have the flexibility to plan and undertake activities in different parts of the city. This becomes more relevant for social activities. With the widespread popularity of social networking platforms, individuals are increasingly relying on social networks to maintain their social interactions with friends and acquaintances. These interactions may be undertaken in order to plan future activities and may, as a result, involve decisions relating to timing, destination, participating individuals, and so on. The findings show that individuals who use social networking websites daily during the week have an even distribution of destinations, which could be an indication of the existence of just such a phenomenon. Individuals undertaking more social travel during weekends are less likely to choose locations close to the university and are, as a result, more likely to have them evenly distributed across the city instead.

5.3. Comparison between Weekdays and Weekends

One of the most significant differences between weekdays and weekends was the choices themselves. During weekdays social travel was mostly concentrated around the university. However, at weekends individuals preferred destinations that were located away from the university or their residences for social activities. During weekends and on weekdays, the next preferred choice was having them evenly distributed across the city. Very few activities were pursued near the university during weekends.

The factors that influence destination choice differ between weekdays and weekends. Only the age of the students was observed to influence their destination choices on both weekdays and at the weekends. All other variables were different for weekdays and weekends. In the case of weekday travel, the characteristics were

mostly related to the size of the social network and the use of instant chats or video calls on a regular basis. However, in the case of weekend travel, the location of other members of the social network and the spending capacity of individuals emerged as decisive factors.

6. Conclusion

This research analysed the destination choice for social activities of university students from two Instituto Superior Técnico campuses in Lisbon. The factors influencing destination choice on weekdays and during the weekends were identified. Furthermore, the difference in travel patterns and the factors influencing the choice of destinations were analysed. It should be highlighted that individuals were asked to report the preferred destinations for the majority of their social travel on weekdays and at weekends. While the preferred destinations for social travel on weekdays were close to the university, destinations away from both the university and individual residences were preferred during weekends. This finding confirms the need to analyse these choices separately.

The explanatory variables in the specification were also different for the two cases, with the exception of the age of the individuals. The socio-demographic characteristics of individuals, size (number of acquaintances, number of close friends) and characteristics (location of close friends) of their social networks and modes of interaction (frequency of contact, method of contact, etc.) all influenced the choice of destinations for social travel. Furthermore, individuals relying more on chats and video calls for maintaining contact with friends, family and acquaintances were more likely to have an even distribution of activities across the city. The same trend was observed among individuals relying on chats and video calls for maintaining their social networks and is likely to have been the result of spatial separation or other factors hindering face-to-face interactions.

Land-use characteristics of the university and places of residence, along with travel characteristics such as the ability to use a car for social travel, also influenced choices of destination. Individuals residing in central, highly urbanised and compact areas with good accessibility to bus transport were more likely to have activities distributed evenly across the city. The same was true for individuals living in dense and mixed areas that are highly accessible by heavy transit. These results stress the importance of accessibility for allowing the proliferation of greater and more diverse spaces for social activities.

Considering the current penetration of smartphones and the internet amongst the general population, it would be interesting to extend this research using data that is not limited to students. Furthermore, the identification of the influence of ICT and social networking sites on destination choice for social travel would indicate a need to analyse these factors further.

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