TIME ALLOCATION IN TOURISM FOR PEOPLE WITH DISABILITIES

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Abstract: This article analyses the time allocated to tourism activities for people with and without disabilities. Using data at an individual level from the Time Use Survey for Spain in 2002-2003 and the social model of disability as a framework, we estimate a modified count data model called ''Zero Inflated Negative Binomial Model'' to investigate the likelihood of undertaking tourism activities and the intensity of this participation among disabled individuals as compared to their non-disabled counterparts. Although the results show that disabled people who are limited in their daily activities are less likely to participate in tourism activities, the differences in the intensity of this participation by disability status are less evident, particularly among those males with disabilities (limited or not). **Keywords:** time use, disability, Zero Inflated Negative Binomial Model, Spain. © 2012 Elsevier Ltd. All rights reserved.

INTRODUCTION

In recent years, the tourism industry has been paying more attention to the needs and requests of tourists with disabilities, recognising that these persons have the same needs and desires for tourism as others (Yau, McKercher, & Packer, 2004). This growing attention is a reflection of the increasing interest and concerns for the rights of disabled people as a whole. In 2009, the United Nation Convention on the Rights of Persons with Disabilities recognised the rights of these persons in almost all policy fields, i.e. accessibility, employment, education, health, independent living, participation in culture and sport activities and civil rights. With regard to their participation in cultural life, recreation, leisure and sport, Article 30 recognises the right of persons with disabilities to enjoy access to places for cultural performances or services, such as theatres, museums, cinemas, libraries and *tourism services.* In addition, with a view to enabling persons with disabilities to participate on an equal basis with others in recreational, leisure and sporting activities, this article establishes that States Parties should take appropriate measures to ensure that persons with disabilities have access to sporting, recreational and *tourism venues.*

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Along these same lines, the main objective of the European Disability Strategy 2010-2020 (adopted on 15 November 2010) is to empower people with disabilities so as to enable them to enjoy their full rights, create a barrier-free Europe for all, and comply with the international commitments made at the United Nation Convention on the Rights of Persons with Disabilities. The key actions included in this Strategy relevant for the tourism industry are mainly related to accessibility (e.g. the study on the cost benefit of accessibility of goods and services, transport regulations for persons with reduced mobility, and accessibility standardisation mandates) and participation (e.g. obstacles in exercising rights as European citizens, portability of rights such as personal assistance, and the development of standards for accessibility to sports, *leisure*, and recreation organizations, activities, events and venues). However, the introduction of specific legislation aimed at people with disabilities (e.g. the Americans with Disabilities Act, 1990) does not guarantee that disability discrimination will not occur or that industry sectors will proactively address disability access requirements (Grady & Ohlin, 2009).

According to the World Health Organization (WHO), disability affects hundreds of millions of families all over the world. Currently, around 10% of the total world's population, or roughly 650 million people, live with a disability. Furthermore, this number is expected to increase in the coming years, mainly as a result of the growing proportion of older citizens in the population. In the European Union (EU), there are approximately 80 million people who suffer some kind of disability (ranging from mild to severe), who are often prevented from fully taking part in society and the economy because of environmental and attitudinal barriers (European Commission, 2010).

Despite this important potential market, much of the mainstream tourism industry seems to marginalise or even discourage people with disabilities from buying its products (Horner & Swarbrooke, 2004). Furthermore, Burnett and Baker (2001) point out that the attempt to describe and understand the disabled person as a consumer of tourism products and services is a very recent phenomenon. In many cases, the tourism industry ignores the needs of people with disabilities (which leads to overt or subtle discrimination) and considers them as a homogeneous group, no different from non-disabled individuals. According to Shaw and Coles (2004), there has been a reluctance to explore the experiences of the disabled tourist, in addition to a neglect of the broader relationships between disabled people and the tourism industry.

The aim of this study is to analyse the relationship between tourism and disability, particularly the effects of disability on the likelihood of undertaking tourism and travel activities as well as on the frequency or intensity of this participation. We will test two different hypotheses: a) Disabled people, especially those who are limited in their daily activities, are less likely to participate in tourism activities than non-disabled individuals, and b) The intensity of the limited disabled people's participation in tourism activities is lower than that for non-disabled and non-limited disabled counterparts. Using data from the Time

Use Survey for Spain in 2002-2003, a ''Zero Inflated Negative Binomial Model (ZINB)'' was applied for the econometric analysis. The main advantage of this kind of analysis is that it allows us to control for a set of variables (or characteristics) simultaneously, and hence isolate the effect of disability (or other variables related to disability status) on, first, the probability of undertaking tourism and travel activities, and, second, on the intensity of the participation.

An important novelty introduced in this study, as compared to others on disability and tourism, is that it is based on the distinction within the disabled group between those disabled individuals who are limited in their daily activities and those who are not. As we will see later on, this desegregation allows us to embrace the social model of disability (Gannon & Munley, 2009) and, following Shaw and Coles (2004), our study attempts to bring the debate on the social construct of disability into tourism research; control for the heterogeneity of the disabled population in a better way; and detect the existence of a different effect of the disability in each group on our key dependent variable. Furthermore, this study for the Spanish case is especially relevant and of interest due to the fact that Spain is and has been one of the top tourist destinations in recent decades, being by far the most popular foreign destination for residents of the European Union in 2009, with 201 million nights spent in collective accommodations (European Union Statistic Office, 2010). That is, for nearly one out of every five outbound holiday trips, Spain was chosen as a destination by residents from the other 26 European Member States.

The contribution of this study is three-fold. First, this study contributes to a better understanding of the disabled person as a consumer of tourism in general and to increasing our knowledge on the levels of participation of the disabled population within the tourism industry in particular. This study fills a gap in the existing literature on tourism and disability and represents a step forward in the research agenda on disability and tourism activities. As a result of the ageing population and the fact that many disabilities are age-related, a study on the tourism experiences of people with disabilities gains in importance. Second, we use a database (the Spanish Time Use Survey) that contains information from the individuals/consumers themselves which allows us to analyse the relationship between tourism and disability from a demand perspective (as other previous studies have done, but carrying out a quantitative analysis). To our knowledge, this is the first time that this time use survey has been used to examine this important question. Third, the results obtained from this study can contribute to defining, promoting and implementing specific policy actions and measures that increase the accessibility, demand, participation and enjoyment of tourism activities among disabled individuals, especially for those with more severe and limiting disabilities.

REVIEW OF LITERATURE

There are few studies that analyse the relationship between the tourism industry and people with disabilities, and most of them are focused

on accessibility, role of travel agents, transport, hotel accommodation, specific attractions and facilities (e.g. Smith, 1987; Bizjak, Knezevic, & Cvetreznik, 2011; Blichfeldt & Nicolaisen, 2011; Darcy, 1998, 2002, 2010, 2011; Darcy & Daruwalla, 1999; Daruwalla & Darcy, 2005; Darcy, Cameron, & Pegg, 2010; Eichhorn & Buhalis, 2007; Eichhorn, Miller, Michopoulou, & Buhalis, 2008; McKercher, Packer, Yau, & Lam, 2003; Shaw & Coles, 2004; Yau et al., 2004). Most of the previous studies analyse the relationship between disability and tourism from the demand side with the exception of the work of Darcy (2011).

For example, the work of Smith (1987) is one of the first that has analysed the barriers and obstacles disabled individuals face in order to participate in leisure activities. He identifies three main barriers: a) *intrinsic barriers*, resulting primarily from the tourist's own levels of cognitive, physical, and psychological function, b) *environmental barriers*, consisting of externally imposed limitations, and c) *interactive barriers*, relating to skill-challenge incongruities and communication barriers. Darcy (1998) obtains that many of the constraints and barriers faced by disabled people are socially constructed, and the information dissemination on accessible destinations becomes a key factor in increasing tourism opportunities among disabled individuals. Shaw and Coles (2004) also conclude that there is an important segment of disabled people for whom removing the barriers of physical access is only part of the problem. For this group, holidays are not possible because of the financial restrictions which are clearly associated with disabilities in that they restrict access to the world of work.

According to McKercher et al. (2003), travel agents are largely ignorant of the specific needs of people with disabilities, which leads to overt or subtle discrimination. In this sense, the retail travel agency sector is an inhibitor to travel rather than a facilitator. In the same vein, Yau et al. (2004) point out that the process of becoming active tourists for those with disabilities involves more than merely removing physical barriers. Their results reveal that the disabled individuals go through different stages in the process of becoming active tourists, which range from constant reference to participants' understanding and acceptance of themselves as individuals (or families) with a disability, to those decisions and tasks undertaken in order to travel, and to the actual experience. In many cases, tourism represents a metaphor of recovery, wherein the complex process of being a tourist with a disability involves personal initiative, accurate evaluation of one's own capabilities, the ability to collect reliable information, managing the trip, managing oneself, and reflecting upon experiences.

Recently, Eichhorn et al. (2008) analyse accessibility schemes as communication sources and their potential to fulfill the informational needs of tourists with disabilities. Their results show that despite complying with the reliability function at the regional and national level, the existing schemes studied only partly comply with informational requirements. To achieve information satisfaction and fully enable access to tourism for people with disabilities, a more sophisticated understanding of differential needs and appropriate sources, accessi-

ble destination experiences, and the provision of adequate accommodation is needed by tourism operators (Darcy, 2010; Darcy et al., 2010). In addition, education relating to people with disabilities could change attitudes toward people with disabilities within the tourism industry, wherein short educational programs can change employees' attitudes towards people with disabilities (Bizjak et al., 2011). Blichfeldt and Nicolaisen (2011) conclude that taking a vacation is important for disabled individuals, not only because it offers a means of escape from their everyday roles as ''objects of care'', but also because it is a means to an end for them in becoming (or being) self-reliant, independent, confident and ''able'' persons. In addition, they argue for the important role that some disability-organizations play in determining both whether and how a disabled individual takes on the role of tourist. In general, all of these authors confirm the need to carry out more research in this field and to step up the discussion and debate on the needs and demands of the disabled population to become active tourists.

Finally, Darcy (2011) has carried out an investigation into the perceptions of managers toward service provision for people with disabilities and the main result is that all managers recognised that providing high quality customer service required an understanding of their individual needs and that there should be no difference in servicing people with disabilities and the non-disabled.

Overall, most of these previous studies on tourism and disability have used qualitative data mainly (obtained from person-to-person interviews) which have provided the foundation for understanding different experiences by disabled individuals with the purpose of informing the industry regarding necessary changes that must be implemented so as to move forward on an inclusive tourism industry. However, the use of a quantitative analysis would allow us to understand in a better and precise way the factors affecting the participation in tourism of people with disabilities.

Furthermore, the relationship between disability and tourism can be analysed within the broader literature on ''*social tourism*'' which is concerned with barriers and other issues affecting participation, and has lately become a flagship tourism policy in the EU. Recently, a special issue of the journal ''*Current Issues in Tourism*'' (June 2011) analysed these social tourism questions and practices, and overall found that the most important barrier to participation is affordability (e.g. Bélanger & Jolin, 2011; Diekmann & McCabe, 2011; Minnaert, Maitland, & Miller, 2011). Disabled people are more likely to live in poorer households (and depending on state benefits), with low employment and income rates and face social exclusion and higher level of discrimination. Social tourism initiatives offer tourism experiences that are already accessible to a majority of persons to groups who are excluded from them, usually for financial or health reasons (e.g. disabled individuals). However, the product offered is a standard one, the same product which is available to non-social tourism users.

DATA AND METHODS

Sample

The data used in this study come from the Spanish Time Use Survey (STUS), carried out throughout the last quarter of 2002 and the first three quarters of 2003. This survey is a non-periodic dataset that follows the directives published in 2000 by the European Union Statistics Office (EUROSTAT) and which was created with the purpose of developing the Harmonised European Surveys Project on Time Use. The STUS contains a sample of 20,603 households, which obtains information on people's daily activities by means of the completion of a personal diary, as well as household and individual questionnaires. The household response rate is very high, around 86 % of the theoretical initial sample (i.e. 23.880). To attain the survey goals of examining the population's use of time, and so that every day in the year was represented, the sample was distributed uniformly over the fifty-two weeks of the survey period. This uniform distribution of the sample reduces the possible overrepresentation of holiday periods in our final sample. In addition, the original sample gives added relevance to the weekend, considering the population's behaviour is more variable on these days (more information on the sample design is available at: http://www.ine.es/en/metodologia/t25/t2530447_en.htm). The individual questionnaire contains data on 46,774 individuals aged 10 or over.

Measures

We construct our measure of disability from two questions that have been used in previous studies on disability issues (e.g. Gannon, 2005; Gannon & Munley, 2009; Jones, Latreille, & Sloane, 2006; Pagán, 2011) and which are included in the health section of the STUS individual questionnaire: ''Do you suffer from any chronic physical or mental illness or any chronic disability or problem? (*Yes/No*)''. Those who answer ''*Yes*'' can be defined as people with disabilities. In addition, the follow-up question, ''Does this chronic physical or mental illness or chronic disability or problem impair your day-to-day activities? (*Yes, severely/Yes, to some extent/Not limited*)''. Following Gannon (2005), it is possible to distinguish two groups within the disabled group: a) those reporting a chronic illness or disability and saying that it limits them severely in their daily activities or those who report a chronic illness or disability and saying it limits them but not severely (to some extent); and b) those who report such a condition but state that it is not one which limits them in their daily activities.

The first group can be considered people with disabilities who are limited in their daily activities, whereas the second is a group of people with disabilities who are not limited in their daily activities (either because of the low degree of severity of their disabilities or because they have compensated their disabilities with different technological devices or both). Since many European countries are obliged by law to make reasonable accommodations for those affected by disability,

in a survey a person may respond as not limited in daily activities but without adaptation it is possible that this person would be classified as severely limited (Gannon, 2005).

We must bear in mind that this measure of disability is a self-evaluation and it does not refer to an ''objective'' definition of disability. For example, Chirikos and Nestel (1984) and Kreider (1999) have argued that self-classification may lead to overestimation (when the individuals try to justify situations of inactivity or limited work activity) or underestimation (when the disability is regarded as a stigma) of the prevalence of disability rates. However, the questions of the STUS contain the main objective of the WHO definition which relates disability to limitations on daily activities. Furthermore, this definition of disability is a standard measure used in many developing countries and is based on the newer social model of disability, whereby disability is seen as a consequence of social, attitudinal and environmental barriers that prevent people from participating in society (Gannon & Munley, 2009).

Traditionally, the two most frequently mentioned models of disability throughout the last few years have been the social and the medical models of disability. In the social model, disability is not an attribute of an individual, but rather a complex collection of conditions, many of which are created by the social environment. Disability is understood as an unequal relationship within a society in which the needs of people with impairments are often given little or no consideration. The social model implies that the removal of disabling barriers serves to improve the lives of people with disabilities, giving them the same opportunities as others. These barriers prevent them from gaining equal access to information, education, employment, public transport, housing and social/recreational opportunities. The denial of opportunities, the restriction of choice and self-determination and the lack of control over the support systems in their lives lead disabled people to question the assumptions underlying the traditional dominance of the medical model (Carson, 2009). The strength of the social model lies in its focus on societal change and not on the individual adapting to the disabling environment.

In the tourism sense, the social model equates very strongly the identification and rectification of the constraints to travel for people with disabilities, and the ''hostile social attitudes'' that these persons contend with on a daily basis (Darcy, 2011). Furthermore, the actual European Disability Strategy 2010-2020 has adopted this new social model to design and implement actions and policies aimed at achieving the full economic and social participation of people with disabilities across Europe. According to Gannon and Munley (2009), this new model has arisen from a major shift in thinking about disability.

Previously, disability was viewed in terms of a medical model that focused on people's impairments and considered disability as a problem of the person, directly caused by disease, trauma, or other health condition requiring sustained medical care provided in the form of individual treatment by professionals. Within this model if a person has, for example, a visual, mobility or hearing impairment, her inabil-

ity to see, walk or hear is understood as her disability (Carson, 2009). The medical model is also sometimes known as the ''personal tragedy model'' because it regards the difficulties that people with impairments experience as being caused by the way in which their bodies are shaped and experienced. In this medical model, management of the disability is aimed at a ''cure,'' or the individual's adjustment and behavioural change that would lead to an ''almost-cure'' or effective cure. In this sense, it is important to distinguish between the concept of disability from ''impairment'' and disability from ''functional limitation'', two terms that are often incorrectly used as synonyms for disability.

An impairment is a physiological or anatomical loss or other abnormality. An impairment may or may not cause a functional limitation, that is, a restriction of sensory, mental, or physical capacities. A disability occurs when a functional limitation restricts the ability to perform activities such as working, attending school, housework, leisure or tourism (Baldwin & Johnson, 2000; Nagi, 1969; WHO, 1980). As noted earlier, Shaw and Coles (2004) argue that research on the disabled tourist must form part of the studies of disability that encompass the social model of disability. Despite the growing interest in disabled people within the tourism industry, they conclude that there are still missed opportunities which, if corrected, could lead to a far better understanding of the problems faced by the disabled tourist. However, some authors as, for example, Shakespeare (2008), have offered a critique of this social model of disability, wherein the main argument is based on the failure to account for heterogeneity and multiple experiences. In any case and according to Thomas (2004), achieving clarity and consistency on a social relational conceptualization of disability within disability studies would illuminate the real divide between it and medical sociology—a divide associated with the fact that, to date, medical sociologists have not been prepared to acknowledge that disability is associated with social oppression or systematic social exclusion.

In order to investigate the participation and intensity of individuals (disabled or not) in tourism activities and to test our hypotheses, we have used two key questions included in the STUS questionnaire. First, the individuals are asked: ''In the past four weeks, have you undertaken or attended any of the following arts or leisure activities?''. The possible options include cinema, theatre, concerts, sport events, library, conferences, and *tourism and travel* (wherein ''*travel*'' excludes trips for work and commuting), among others. In our case, we are particularly interested in the option ''*tourism and travel*''. Second, for those individuals who answered ''Yes'' to this option, they are asked: ''How many times in the last four weeks?''. The answers to this question allow us to measure the number of times or frequency of the individual's participation (disabled or not) in tourism and travel activities in the last four weeks. This count variable is called ''*frequency*'' in our model and takes a value equal to zero if the individual has not participated in tourism and travel activities, and greater than zero otherwise.

Econometric Model

The empirical strategy adopted in this study to take into consideration the count data nature of our dependent variable "*frequency*" (which takes non-negative integer values) is based in the use of a modified Poisson regression model called "*Zero Inflated Negative Binomial Model* (ZINB)", originally introduced by Lambert (1992). The main reason for using this model is that real-life count data are frequently characterised by overdispersion and excess zeros (in our case, around 82% of the total are zeros). According to Long (1997) and Greene (1994), the ZINB models allow us to manage this type of situation by changing the mean structure to explicitly model the production of zero counts. This is done by assuming that zeros can be generated by a process other than positive counts. In particular, for each observation, there are two possible data generation processes: one generates only zeros (process one), and the other is a negative binomial data-generating process (process two). For observation i, process one is chosen with probability γ_i, and process two with probability $1- \gamma_i$, wherein γ_i is an unknown parameter that has to be estimated. For example, a disabled person who will never participate in tourism activities, perhaps because of the nature of disability (e.g. mental or psychological disorders), would be in the first process (or group). On the other hand, a disabled person who does not participate in tourism activities (due to some physical barriers or discrimination) but tries to do so would not be in this first process. We do not know whether the disabled person with zero participation in tourism activities is in the first or the second process or group. Therefore, the distinction between the two groups is a form of discrete, unobserved heterogeneity (Long, 1997).

In general:

$$y_i \sim \begin{cases} 0 \text{ with probability } \gamma_i \\ g(y_i|x_i) \text{ with probability } 1 - \gamma_i \end{cases} \tag{1}$$

where y_i is the response variable of interest (i.e. *frequency*), and the probability of [$Y_i = y_i \,|x_i$] is:

$$P[Yi = y_i|x_i, z_i] = \begin{cases} \gamma_i(\beta' z_i) + [1 - y_i(\beta' z_i)]g(0|x_i) & \text{if } y_i = 0 \\ [1 - \gamma_i(\beta' z_i)]g(y_i|x_i) & \text{if } y_i > 0 \end{cases} \tag{2}$$

where the probability γ_i depends on the characteristics of observation i, γ_i is written as a function of $z_i'\beta$, where z_i' is the vector of zero-inflated covariates and β is the vector of zero-inflated coefficients to be estimated. The function F that relates the product $z_i'\beta$ (which is a scalar) to the probability γ_i is called the zero-inflated link function, and can be specified as either the logistic or probit function (in our case, we choose the logistic function). To obtain all estimation results we have used STATA 10 and the command "*zinb*". The mean and variance of the zero-inflated negative binomial model are:

$$E(y_i|x_i, z_i) = \mu_i(1 - \gamma_i)$$
$$V(y_i|x_i, z_i) = \mu_i(1 - \gamma_i)(1 + \mu_i(\gamma_i + \alpha))$$

We restrict our sample to those individuals aged 16 or over. Namely, we include in our sample those individuals who are of working age (aged 16 and 64), as well as older people (aged 64 and over) who are also important consumers of tourism and travel activities. After dropping those individuals with missing information, the final samples used in the estimation process for individuals without and with disabilities are 33,596 and 9,739 (of which 3,017 are not limited in daily activities and 6,722 are limited in daily activities), respectively. With regards to the covariates used in the estimation process, we create a variable called ''female'' that is equal to 1 if the person is a woman, and zero otherwise. To measure the individual's educational level, we create a dummy variable with three categories: primary, secondary and superior. We also include in our model dummy variables concerning the respondent's age (six age groups) and marital status (i.e. married, single, widowed, and divorced/separated). The dummy variable ''foreigner'' equals 1 if the individual does not have Spanish nationality, and zero otherwise. The variable ''existence of children'' is a continuous variable measuring the number of children living in the household by two different age groups (0-5 and 6-12). To identify the employment status of the individual, we use the answers to the question: *What was your current job situation last week?* According to the answers, we create the dummy variable ''employment status'' which has three different categories: employed, unemployed, and out of labour force. To take into account the levels of monthly household incomes, we include a dummy variable categorised into eight income intervals (in US$ intervals). Finally, we create a dummy variable measuring the quarter of the interview to control for the seasonal nature of the Spanish tourism demand (especially high during the school holiday and the summer months).

We include the same explanatory variables in the binary (which contains the coefficients estimated from the logistic regression) and count (which includes those obtained from the negative binomial regression) equations that are estimated in the ZINB model. Finally, the descriptive analysis included in the next section has been obtained using the sample weight available in the STUS in order to reflect population characteristics and correct for the possible lack of representativeness of the sample.

RESULTS

Descriptive Analysis

To start with, Fig. 1 shows the frequency distribution of individuals according to the number of times they had undertaken tourism activities in the past four weeks. Although there is a high proportion of extra zeros in all our samples, we find some differences by disability status. The highest proportion of zeros is found in the limited disabled sample (around 91%), followed by the non-limited disabled (83.3%) and non-disabled samples (81.3%). That is, those individuals who are limited in their daily activities are less likely to be an active tourist in the past four weeks as compared to non-limited disabled and
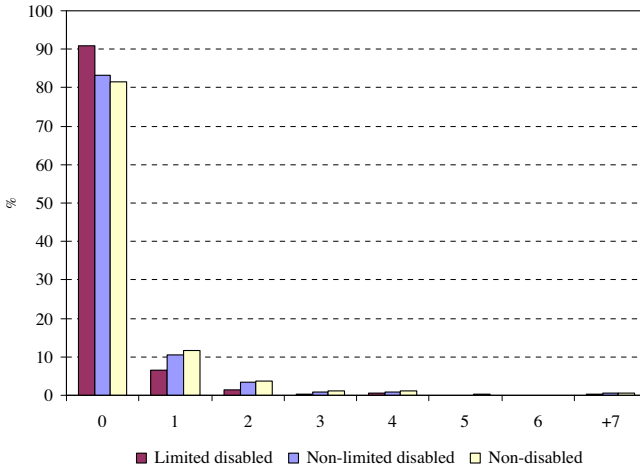
Figure 1. The Number of Times Individuals Undertake Tourism Activities in the Past Four Week by Disability Status. Note: Individuals Aged 16 or Over. Weighted Data (N = 43,335 Observations)

non-disabled individuals. This result is in line with our first hypothesis. According to the previous literature, the main participation constraints faced by disabled tourists are associated with the lack of accessible accommodation, provision of accessible accommodation that did not comply with the access standards; a lack of importance attributed to the role of accommodation in terms of overall trip satisfaction trip; problems locating accessible accommodation even when it did exist; and the inadequate level, detail and accuracy of information (Darcy, 2010).

Looking at the non-zeros cases, we observe that only 6.5% of the limited disabled individuals have been active tourists just once in the past four weeks, whereas this proportion increases up to 10.6% and 11.7% for non-limited disabled and non-disabled individuals, respectively. The same pattern by disability status is found for the remaining cases (two, three,.., +seven). Overall, the limited disabled tourists undertake a lower number of tourism and travel activities in the past four weeks as compared to non-limited disabled and non-disabled counterparts. As noted earlier, it seems quite evident from Fig. 1 that the ZINB model outlined previously can be adequate to manage this type of distribution with extra zeros and simultaneous overdispersion.

Table 1 summarises the proportion of individuals having undertaken tourism and travel activities according to a set of socio-demographic characteristics of the respondents by disability status. In line with Fig. 1 and 18.7% of the non-disabled individuals have been tourists in the past four weeks. For the disabled population, this percentage falls slightly for the non-limited disabled (16.7%) and with higher intensity for the limited disabled (9.1%). We only find significant gender differences for the limited disabled sample (9.5% of males *versus* 8.6% of females). The more educated the individuals, the higher the likelihood is to undertake tourism and travel activities. These

Table 1. The Proportion of Individuals Having Undertaken Tourism and Travel Activities in the Past Four Weeks by Disability Status

	Non-disabled (%)	Non-limited disabled (%)	Limited disabled (%)
All	18.7	16.7	9.1
Gender			
Male	18.7	17.0	9.5
Female	18.7	16.7	8.6
Education			
Primary	12.4	11.2	7.5
Secondary	23.9	23.1	17.8
Superior	34.8	34.2	26.6
Age			
16-24	20.1	22.1	14.0
25-34	22.8	24.7	14.4
35-44	19.8	21.4	13.7
45-54	19.6	18.2	12.9
55-64	16.5	18.1	11.7
>64	10.7	8.8	5.4
Foreigner	14.4	9.5	4.9
Existence of children 6-12			
Yes	17.9	19.7	12.5
No	18.8	16.5	8.9
Existence of children 0-5			
Yes	18.7	13.0	13.9
No	18.6	17.3	8.7
Household size			
1	18.3	12.4	6.5
2	17.1	13.9	7.8
3	20.1	20.5	10.8
4+	18.6	17.4	10.2
Marital status			
Married	17.7	16.1	10.5
Single	21.6	21.5	8.5
Divorced/separated	20.0	21.1	7.4
Widowed	10.1	10.8	5.2
Employment status			
Employed	21.1	22.1	16.6
Unemployed	16.4	15.0	10.4
Out of labour force	15.7	13.0	7.4
Monthly household income[a]			
Under $487.47	8.6	5.4	3.9
$487.47-$962.94	13.1	11.9	7.2
$962.95-$1,444.41	15.1	12.9	8.1
$1,444.42-$1,925.89	18.9	18.8	12.4
$1,925.9-$2,407.36	22.1	24.6	14.2
$2,407.37-$2,888.84	24.6	21.5	21.1

(*continued on next page*)

Table 1 (*continued*)

	Non-disabled (%)	Non-limited disabled (%)	Limited disabled (%)
$2,888.85–€4,814.74	31.2	33.1	20.6
$4,814.75 and over	32.5	35.7	18.9
No response	23.0	11.5	12.4
Quarter of interview			
4 quarter 2002	17.1	15.6	7.0
1 quarter 2003	14.4	12.6	6.6
2 quarter 2003	17.7	17.7	8.3
3 quarter 2003	26.2	21.8	14.7

Note: Sample consists of individuals aged 16 or over. 2002-2003 = 1.0385. Weighted data (N = 43,335 observations).
[a] Average exchange rate $/€ in 2002-2003 = 1.0385.

percentages of participation by educational level are very similar in the non-disabled and non-limited disabled samples, whereas in the limited disabled sample the levels of participation are lower than before, particularly for those individuals located in the upper level of education.

There is a negative relationship between age and participation in tourism and travel activities in all samples. Those individuals (disabled or not) aged 25 to 34 have the highest levels of participation in tourism activities, whereas the oldest individuals (over 64) register the lowest ones. For this latter age group, the proportion of tourists is 10.7% and 8.8% for non-disabled and non-limited individuals, respectively. For the limited disabled sample, this percentage is lower than that for the other two samples (5.4%). Foreigners who are limited disabled in their daily activities are less likely than non-disabled and non-limited disabled individuals to be tourists. The existence of children in the household with ages between six and twelve increases the likelihood of being tourists but only for the disabled population (limited or not). On the contrary, the existence of children aged five or under in the household reduces the likelihood of being tourists for the non-limited disabled sample, whereas for the limited disabled sample the opposite result is found. Concerning the latter result, we have to take into account that the number of children aged five or under is relatively lower for limited disabled individuals as compared to that for non-limited disabled ones.

The differences in the proportion of non-disabled individuals having undertaken tourism activities by household size are less evident as compared to, for example, the frequency distribution for limited disabled individuals. For this latter group, there is a clear and positive relationship between household size and the likelihood of being a tourist. In many cases, those limited disabled individuals who live alone or with a smaller number of members in the household face more difficulties and obstacles in planning and undertaking tourism activities due to their limitations in daily activities. With regard to marital status, non-disabled and non-limited disabled singles have the highest likelihood

of being tourists in the past four weeks (21.6% and 21.5%, respectively). For limited disabled individuals, those who are married have the highest levels of participation in tourism activities (10.5%).

As we expected, individuals who are employed are more likely to be tourists as compared to unemployed or inactive (i.e. out of labour force) ones. In general, individuals with disabilities are often excluded from the labour market. Even when included, people with disabilities often work fewer hours and in lower-paying or lower-skilled positions (Atkins & Guisti, 2004). In the same vein, the existence of higher monthly income (expressed in US$) in the household increases the likelihood of having undertaken tourism activities in the past four weeks. These results are in line with the main goals of the ''*social tourism*'' which (and according to the earliest definition of social tourism) is characterised by the relationships and phenomena in the field of tourism resulting from participation in travel by economically weak or otherwise disadvantaged elements in society (Hunziker, 1951). Finally, we detect differences of participation in all samples depending on the quarter of the interview. Those individuals who were interviewed in the third quarter of 2003 (i.e. during the school holiday and summer) are more likely to be tourists as compared to those interviewed in the other quarters.

Table 2 shows the frequency or number of times that the individuals have undertaken tourism and travel activities in the past four week by disability status, but only for participants (i.e. taking into account only those individuals who have answered *Yes* to our first question). In general, we found the lowest frequency or intensity of participation in tourism activities among those individuals who are limited in their daily activities (1.78). In contrast, non-disabled individuals have the highest levels of participation (2.04), followed by non-limited disabled ones (1.82). This finding seems to be consistent with our second hypothesis.

Males participate more intensely in tourism and travel activities than do females in all samples, particularly in the limited-disabled sample (0.38 percentage points). By education, there is not a common pattern among all samples. For non-disabled individuals, those with secondary education report the highest intensity of participation (2.1), whereas for non-limited and limited disabled individuals this fact is found in the lower level of education (1.93 and 1.84, respectively). Those non-disabled and non-limited disabled individuals aged 45-54 report the highest intensity of participation (2.2 and 2.27, respectively), whereas those with ages over sixty-four have the lowest ones. Being a foreigner has a different effect on the number of times that individuals undertake tourism activities in each sample. Once again, the existence of children in the household affects the intensity of the individual's participation. For the limited disabled sample, the presence of children aged six-twelve reduces the number of times by 0.15 percentage points, and by 0.21 percentage points if there are children aged five or under.

We find a positive relationship between the number of times individuals undertake tourism and travel activities and the household size, particularly for the limited disabled sample. Widowed individuals (non-disabled and limited disabled) undertake a lower number of tra-

Table 2. Average Number of Times the Individual has Undertaken Tourism and Travel Activities in the Past Four Weeks (Only Participants)

	Non-disabled	Non-limited disabled	Limited disabled
All	2.04	1.82	1.78
Gender			
Male	2.12	1.88	1.99
Female	1.96	1.76	1.61
Education			
Primary	1.98	1.93	1.84
Secondary	2.10	1.60	1.58
Superior	2.04	1.84	1.68
Age			
16-24	2.15	2.16	2.06
25-34	2.01	1.57	1.73
35-44	1.92	1.53	1.53
45-54	2.20	2.27	1.78
55-64	2.06	1.84	2.01
>64	1.83	1.60	1.66
Foreigner	1.97	1.20	1.38
Existence of children 6-12			
Yes	1.90	1.70	1,64
No	2.06	1.83	1,79
Existence of children 0-5			
Yes	1.89	1.97	1.59
No	2.07	1.80	1.80
Household size			
1	1.92	1.59	1.23
2	1.91	1.59	1.52
3	2.01	1.88	1.71
4+	2.11	1.93	2.19
Marital status			
Married	2.03	1.83	1.78
Single	2.07	1.84	1.66
Divorced/separated	2.22	1.70	1.40
Widowed	1.64	1.67	2.00
Employment status			
Employed	1.99	1.99	1.90
Unemployed	2.22	1.31	1.58
Out of labour force	2.07	1.65	1.73
Monthly household income			
Under $487.47	1.91	1.27	1.10
$487.47-$962.94	1.94	1.91	1.35
$962.95-$1,444.41	1.89	1.56	1.90
$1,444.42-$1,925.89	2.21	2.07	2.25
$1,925.9-$2,407.36	2.01	2.05	1.64
$2,407.37-$2,888.84	1.79	1.41	1.81

Table 2 (*continued*)

	Non-disabled	Non-limited disabled	Limited disabled
$2,888.85–€4,814.74	2.20	1.79	2.55
$4,814.75 and over	2.45	2.08	1.82
No response	0.22	1.20	1.64
Quarter of interview			
4 quarter 2002	2.08	1.89	1.98
1 quarter 2003	1.90	1.68	2.04
2 quarter 2003	1.89	1.70	1.39
3 quarter 2003	2.21	1.96	1.80

Note: Sample consists of individuals aged 16 or over. Weighted data (N = 7,377 observations).

vel activities/trips in the past weeks, whereas for the limited disabled the opposite result is found. Being unemployed increases the frequency of participation among the non-disabled. However, the highest intensity of participation for the disabled group (non-limited and limited) is found among employed individuals (1.99 and 1.9, respectively). Finally, higher monthly incomes within the household increase the probability of participating more intensely in tourism activities, and there are temporal differences in the degree of participation according to the quarter of the interview (in particular in the third quarter, except for the limited disabled sample).

Econometric Analysis

Turning to the econometric results, Table 3 presents the results obtained from the estimation of the ZINB model, which include a logit and a negative binomial regression. We must keep in mind that the original setup of the logit model is to predict the probability of being in the non-participation group. First, we have calculated the Vuong (1989) test in order to check out the validity and appropriateness of our ZINB model. The Vuong test compares the zero-inflated model with an ordinary negative binomial regression model. In our case, the Vuong test shows a z-value equal to 9.94 (the last rows in Table 3), indicating that the ZINB model is a better fit.

In the logit model, we obtain that only the coefficient of the dummy variable "limited disabled" is positive and statistically significant at the 1% level as compared to the reference category (i.e. *non-disabled*). That is, limited disabled individuals are more likely than the non-disabled to be non-participants in tourism and travel activities. The probability of being non-participants in tourism activities among limited disabled individuals is 58.25% (=exp 0.459) higher than that among non-disabled counterparts. On the contrary, there are not significant differences in the probability of non-participation between non-disabled and non-limited disabled individuals. These results support our first hypothesis, but only partially because of the existence of non-significant differences in terms of participation between non-disabled and

Table 3. Results from a "*Zero Inflated Negative Binomial*" Regression Model

	Logit *Coef.*	Negative Binomial *Coef.*
Disability status		
Non-disabled (reference)	–	–
Limited disabled	0.459***	−0.157*
Non-limited disabled	−0.164	−0.147
Female	−0.212**	−0.163***
Education		
Primary (reference)	–	–
Secondary	−0.979***	0.075
Superior	−2.725***	0.103
Age		
16-24 (reference)	–	–
25-34	0.045	−0.074
35-44	0.406**	0.020
45-54	0.387***	−0.061
55-64	0.487***	−0.163
>64	1.223***	−0.185
Foreigner	0.874***	−0.266
Existence of children 6-12	−0.481***	−0.098
Existence of children 0-5	−0.072	−0.175**
Household size	0.374***	−0.018
Marital status		
Married (reference)	–	–
Single	0.285**	0.157
Widowed	0.492**	0.050
Divorced/separated	0.586**	
Employment status		
Employed (reference)	–	–
Unemployed	0.262	0.157
Out of labour force	−0.220*	0.050
Monthly household income		
Under $487.47 (reference)	–	–
$487.47-$962.94	−0.600***	0.142
$962.95-$1,444.41	−0.650***	0.329*
$1,444.42-$1,925.89	−0.795***	0.495***
$1,925.9-$2,407.36	−1.064***	0.519***
$2,407.37-$2,888.84	−1.929***	0.416**
$2,888.85-€4,814.74	−1.673***	0.716***
$4,814.75 and over	−1.402***	0.884***
No response	−0.503	0.792*
Quarter of interview		
4 quarter 2002	−0.227**	0.216***
1 quarter 2003 (reference)	–	–
2 quarter 2003	−0.320***	0.129
3 quarter 2003	−0.858***	0.457***
Constant	0.273	−0.919***

Table 3 (*continued*)

	Logit *Coef.*	Negative Binomial *Coef.*
Ln (alpha)	0.833***	
Vuong test of ZINB versus NB	9.940***	
Chi²	476.54***	
Zero observations	35,958	
Number of observations	43,335	

Note: The regression model also includes regional dummy variables; *, **, *** imply significance at the 10%, 5% and 1% levels, respectively. The standard errors are robust.

non-limited disabled individuals. As for the intensity of the participation among those individuals who have participated in tourism and travel activities in the past four weeks, the results from the negative binomial model show that limited disabled individuals have a lower probability of participating more times than the non-disabled (*reference group*). Once again, no significant differences in intensity of participation are found between non-disabled and non-limited disabled individuals. Therefore, these results support our second hypothesis.

Overall, these findings suggest that one of the most important questions regarding the relationship between disability and the participation in tourism and travel activities is determining to what extent the disability limits individuals in performing their daily activities. If there is not this kind of limitation, our results show these disabled people have the same probability as non-disabled counterparts, first, of being active participants within the tourism industry and, second, of doing so with the same intensity as non-disabled individuals. Disabled people are a heterogeneous group of individuals whose disabilities affect their lives in different ways and intensity. They have different needs and face diverse obstacles and problems depending on their degree of disability (e.g. mobility problems, sight and hearing impairments, specific medical conditions, etc). In this sense, the distinction between non-limited and limited disabled individuals used in this study introduces an innovative way to better analyse the particular social and economic situation of the disabled population in general and their participation in tourism and travel activities in particular.

Regarding the rest of explanatory variables included in our ZINB model, we find that females are less likely to be non-participants in tourism and travel activities than males. The expected non-participation among females decreases by a factor of 0.81 (=exp (-0.212)), holding all other variables constant. On the other hand, the intensity of females' participation is lower than that for males. Although more educated individuals are less likely to be non-participants, we do not find significant differences in the intensity of the participation in tourism and travel activities by educational level. Age has a positive effect on the probability of being a non-participant, especially at older ages (over

Table 4. **Results from a "*Zero Inflated Negative Binomial*" Regression Model by Gender**

	Males		Females	
	Logit	NB	Logit	NB
	Coef.	*Coef.*	*Coef.*	*Coef.*
Disability status				
Non-disabled (reference)	–	–	–	–
Limited disabled	0.594***	−0.052	0.357**	−0.217*
Non-limited disabled	−0.321	−0.125	−0.022	−0.163
Education				
Primary (reference)	–	–	–	–
Secondary	−1.076***	0.043	−0.915***	0.101
Superior	−2.742***	0.104	−2.207***	0.177*
Age				
16-24 (reference)	–	–	–	–
25-34	0.266	0.042	−0.266	−0.165
35-44	0.958***	0.312	−0.157	−0.221
45-54	0.943***	0.102	−0.054	−0.157
55-64	1.072***	0.150	0.079	−0.369**
>64	1.665***	0.026	1.054***	−0.208
Foreigner	0.752	−0.259	1.080***	−0.183
Existence of children 6-12	−0.472**	−0.162	−0.436**	−0.031
Existence of children 0-5	−0.156	−0.208	0.065	−0.151
Household size	0.338***	−0.008	0.412***	−0.025
Marital status				
Married (reference)	–	–	–	–
Single	0.673***	0.071	−0.098	0.039
Widowed	0.024	−0.375	0.532**	0.085
Divorced/separated	0.527	0.452*	0.707**	0.375**
Employment status				
Employed (reference)	–	–	–	–
Unemployed	0.278	0.102	0.332	0.292**
Out of labour force	−0.379	−0.157	−0.236	0.179**
Monthly household income				
Under $487.47 (reference)	–	–	–	–
$487.47-$962.94	−0.610*	0.042	−0.616**	0.185
$962.95-$1,444.41	−0.649**	0.233	−0.611**	0.410*
$1,444.42-$1,925.89	−0.913***	0.365	−0.693**	0.593**
$1,925.9-$2,407.36	−1.168***	0.416	−1.028***	0.571**
$2,407.37-$2,888.84	−1.795***	0.268	−2.000***	0.551**
$2,888.85-€4,814.74	−1.693***	0.530**	−1.688***	0.871***
$4,814.75 and over	−1.966***	0.363	−1.152**	1.274***
No response	−1.189**	0.106	−0.278	1.092**
Quarter of interview				
4 quarter 2002	−0.350	0.150	−0.133	0.264***
1 quarter 2003 (reference)	–	–	–	–
2 quarter 2003	−0.272	0.106	−0.416***	0.115
3 quarter 2003	−0.831***	0.415***	−0.902***	0.480***
Constant	−0.098	−0.942***	0.405	−1.142***

Table 4 (*continued*)

	Males		Females	
	Logit	NB	Logit	NB
	Coef.	*Coef.*	*Coef.*	*Coef.*
Ln (alpha)	0.941***		0.666***	
Vuong test of ZINB versus NB	8.300***		7.070***	
Chi^2	216.66***		350.65	
Zero observations	16,557		19,401	
Number of observations	20,010		23,325	

Note: The regression model also includes regional dummy variables; *, **. *** imply significance at the 10%, 5% and 1% levels, respectively. The standard errors are robust.

64). Once again, no significant differences are found in the intensity of the participation in tourism and travel activities by age group.

For foreigners, the odds of being a non-participant increase by a factor of 2.4 (=exp (0.874)), holding all other variables constant. Being a foreigner has no affect on the intensity of participation. The existence of children aged six-twelve in the household reduces the odds of being a non-participant, whereas the existence of children aged five or under reduces the intensity of the individual's participation in the tourism industry. The increase in the household size only has a positive and significant effect on the probability of being a non-participant. For marital status, there are significant effects on the non-participation in tourism and travel activities. For example, widowed and divorced/separated individuals have a higher probability of being non-participants than married ones (*reference group*). Looking at the negative binomial model, we only find significant differences in the intensity of the participation among divorced/separated individuals as compared to the reference group. Regarding employment status, those individuals who are out of the labour force or inactive are less likely to be non-participants.

As we expected, there are significant differences in the probability of participation and the intensity of this participation by household income. Taking as reference the category ''*under $487.47*'' per month, we find a monotonic effect for this income variable. Having a higher household income determines a lower probability of being a non-participant in tourism and travel activities. This household income variable also has a positive effect on the intensity of this participation, i.e., the richer the household, the higher the probability of participating more times in tourism and travel activities in the past four weeks. Finally, the quarter in which the interview was carried out has effects on both sides of the ZINB model. Those individuals interviewed the third quarter of 2003 are less likely to be non-participants than those interviewed in the first quarter of 2003. In addition, the intensity of the participation of these individuals interviewed during the third quarter of 2003 is significantly higher than that for the reference group (*first quarter of 2003*).

To shed further light on the significant differences by gender detected in Table 3, in the last part of the paper we have reestimated our ZINB model but now separating the male and female samples (Table 4). In particular, we are interested in identifying the existence of different effects of our disability dummy variables by gender on the levels of participation in tourism and travel activities. Once again, the Vuong test shows a significant z-value in both samples, indicating the superiority of our ZINB model.

Limited disabled individuals are more likely to be non-participants with respect to the reference group (non-disabled) in the male and female samples. For both samples, no significant differences in the probability of being a non-participant and in the intensity of this participation are found between non-limited disabled and non-disabled individuals. However, for the male sample we find there are no differences in the intensity of participation by disability status, i.e., once males have undertaken tourism and travel activities in the past four weeks, their levels of less or more participation do not depend on their disability status. In other words, the problem is not located in the intensity of the participation but in the entry tourism and travel activities. For males, this result contradicts our second hypothesis. On the contrary, for the females sample we find higher odds of being a non-participant among the limited disabled as compared to the non-disabled, as well as a lower intensity of participation (and in line with our two hypotheses). In this case, the disability that limits the performance of daily activities negatively affects both the entry and intensity of use for the female sample. With regard to the remaining variables included in the ZINB model, we also detect some different effects of these variables on the dependent variable in each sample as, for example, for the variables age, marital status and employment status.

CONCLUSIONS

This study has analysed the determinants of participating in tourism and travel activities and the intensity of this participation among non-disabled and disabled individuals. We have tested two hypotheses: a) disabled individual, especially those who are limited disabled, are less likely than non-disabled ones to be participant, and b) the intensity of this participation is lower for limited disabled individuals as compared to that for their non-limited disabled and non-disabled counterparts). Using the microdata taken from the Time Use Survey (2002/2003) for Spain, we have estimated a modified count model data (ZINB) to analyse the participation and its intensity in tourism and travel activities among disabled individuals as compared to their non-disabled counterparts.

The descriptive analysis has shown a higher non-participation of limited disabled individuals in tourism and travel activities as compared to their non-limited and non-disabled counterparts. The estimation results show that limited disabled people are more likely to be non-participants in the tourism industry than their non-disabled counterparts. Also, the limited disabled participants undertake tourism and travel activities with

a lower intensity, but only for the female sample. No difference in the intensity of participation by disability status is found among males. This finding suggests that although tourism decision-making is far more complex for the disabled tourist than for other tourists, this complexity is reduced as the male disabled tourist becomes more experienced (Yau et al., 2004). Experience in tourism and travel activities may well help to increase self-esteem, confidence, self-recognition and well-being among disabled individuals.

According to our results, limited disabled individuals live on lower incomes and are more likely to be unemployed as compared to their non-limited and non-disabled counterparts. In addition, disabled people incur additional costs which directly relate to their disability (e.g. insurance, medical expenses, equipment, personal assistance support). All these circumstances can account for the lack of participation in tourism activities and reduce the development of disability as a market segment. In this sense, public policy on tourism can be linked to more general social policies on disability and exclusion in order to facilitate the full integration of disabled people into society. The existence of a greater convergence of tourism policies across Europe and the definition of measures and tools that increase knowledge, competitiveness and sustainable development of the tourist industry are key factors in the near future for the industry (European Disability Forum, 2001).

The European Commission has identified eight main areas for improving the situation of people with disabilities (through the Europe 2020 strategy): accessibility, participation, equality, employment, education and training, social protection, health, and external action. Accessibility is defined as meaning that people with disabilities have access, on an equal basis with others, to the physical environment (e.g. hotels and tourism installations), transportation (e.g. by train, airplane, bus, coach), information (e.g. accessible accommodation information), and communications technologies and systems, and other facilities and services. With regards to employment, the EU action will support national efforts to fight those disability benefit cultures and traps that discourage people with disabilities from entering the labour market; help their integration in the labour market and increase their level of income and satisfaction; develop active labour market policies; make workplaces more accessible; and develop services for job placement, support structures and on-the-job training.

Within this context, travel and access tourist activities must be conceived as a fundamental social right for disabled workers and their families. Many barriers faced by disabled tourists are due to the negative attitudes of staff working in the industry. It is necessary to provide training to upgrade the skills of workers in their roles as advisors on accessible services. Information on accessibility of premises, facilities and services must be made fully available in accessible formats and take into account the wide range of user requirements. In addition, the tourism industry should gather data on the levels of satisfaction of clients with disabilities and their families regarding the product and services providers by the tourism operator. The important demographic changes all over the world are increasing the prevalence of disability, and the

demand for accessible facilities and services by much older people will irremediably rise in the future. This fact in itself justifies the need to carry out further research, discussion and debate on the relationship between disability and tourism industry. ◢

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