Models of individual and group decision-making in the tourism field: controlling for heterogeneity in tastes and decision rules through SP experiments

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Table of Contents

List of Figures

List of Tables

Introduction

This thesis contributes to the analysis of consumer demand by considering individual (and group) decision-making in tourism. The tourism field is characterized by several and interconnected decisions ranging from choices taken before the holiday (such as the length of stay, destination choice, mean of transport to reach the destination, etc.), during holiday (activities to undertake, restaurant choices, mobility at destinations, etc.) or after the visit (make reviews, word of mouth, posting on social media, etc.). Several studies analyze consumer behavior in tourism, but literature in the field is characterized mainly by a large evidence of so-called "variance studies", aiming at identifying observable factors that can logically explain the variability of tourists' choices (Smallman & Moore, 2010) rather than understanding the complexity of the decision making. The decision-making process[1] is affected by a large number of observable and unobservable factors (including as an example external influences, contexts or psychological traits) and despite the fact that consumer behavior is one of the most investigated areas in the field of tourism (Cohen, Prayag & Moital, 2014) there is still a scarcity of studies trying to understand the ontology of decision-making in its complexity, rather than a model to describe relationship between observable variables and choices (Smallman & Moore, 2010). By analyzing more than five hundred articles in three major tourism journals[2], Cohen and coauthors identify the most common key concepts in consumer behavior in tourism, discuss important factors of external influence and propose research contexts for future studies. They suggest that the inclusion of attitudes, perceptions, motivations or satisfactions might help to have a deeper comprehension of the decision-making, which requires considering not only individual decision making but also group and joint decision-making. In addition, they propose some interesting areas of investigation such as the role of emotions in consumer misbehavior, cross cultural issues and ethical consumptions. With the aim of shedding light on the decision-making process in relevant areas of interest for the tourism literature, this thesis includes three studies that show some tools of discrete choice modeling that allow explaining tourists decision-making by considering also unobservable or "latent" factors, elements which might be useful to provide more precise policy implications, managerial indications and guidelines to develop marketing strategies. Among the above-mentioned topics, this thesis will treat three aspects that the author considers particularly relevant not only for academic purposes but also at the local level for the tourism sector in the Canton of Ticino. The thesis consists of three independent articles studying three separate situations that can stand alone but are thematically,

[1] In this case, the decision making process refers to the elaboration of all the relevant information in order to make a choice, rather than a sequence of phases leading to a choice.

[2] At the time of writing, the three journals, referring to "Annals of Rourism Research", "Tourism Management" and "Journal of Travel Research" are still the top 3 journals in the subject of Tourism, Leisure and Hospitality Management as calculated by the Scimago Journal and country rank (https://www.scimagojr.com/journalrank.php?category=1409)

geographically and methodologically linked one to each other, with the hope to provide some intuitions that stakeholders could take into account. In particular, three different types of decisions are investigated: two of them regarding on-site decisions such as mobility at destination (chapter 1) and choice of activity (chapter 2), while the last one referring to accommodation choice (chapter 3). The remainder of the thesis is as follows. The introduction of the thesis comprehends some basic concepts taken from microeconomic theory (referring to the relationship between preferences and choices, the role of utility and decision rules), which the author considers useful to introduce the topic of decision making. Then, the methodology of discrete choice modeling based on random utility models is discussed. Discrete choice modelling is very popular in other research fields, such as marketing, transportation, health or welfare economics, for the explanation and prediction of human-behaviour and is gaining popularity also in tourism. Chapter one considers mobility choice at destination and treats the problem of traffic congestion, which is highly discussed in the Canton of Ticino. Chapter two assesses the concept of group decision making, a very common situation in tourism that requires a deep analysis in order to understand the decision-making process, develop adequate touristic products and generate more effective marketing campaigns. Chapter three considers accommodation choice and assesses the topic of ethical consumption, which recorded an increased number of publications in the recent decades due to a growing awareness by consumers about climate change and sustainability related issues.

Modelling decision-making

Choices, preferences, utility and decision rules

In order to explain human behavior and the decision making process, researchers can deduce people's preferences by observing their choices. To translate choices in preferences, it is important to understand their relations and the tools economists make use of to formally describe them in the so called "preference-based approach" to model individual decision-making.

Choices: Choices are considered as the selected items from a choice set of alternatives X. As an example, if a commuter has the possibility to get to work by car, bus, walking or by bicycle and decides to go by car, it means that he chose the alternative "car" from the choice set X of all the possible alternatives: C(X)=car, where X={car, bus, walking, bicycle}.

Preferences: A preference is a relation across alternatives allowing comparisons and the definition of an order between them. It is expressed by the symbol $\succcurlyeq$ ("at least as good as"). In the example of the commuter, the choice of car means that the alternative "car" is preferred over the other 3 alternatives: car $\succcurlyeq$ bus, car $\succcurlyeq$ walk, car $\succcurlyeq$ bicycle.

Utility function: A utility function *U* is a mathematical tool that assigns a numerical value[3] to goods they buy (or services they use), which can be useful to express consumers' preferences. In the example of the commuter: car → u(car), bus → u(bus), bicycle → u(bicycle)

Decision rule: A decision rule consists in people's strategy to make their choices. One of the most common decision rule is the utility maximization, which relies on the assumption that consumers are rational agents aiming at the maximization of their utility through their choices. In the example, the commuter chose the alternative "car" because it is the one returning him the maximum level of utility: car ⪰ bus <=> u(car) ≥ u(bus), car ⪰ walk <=> u(car) ≥ u(walk), car ⪰ bicycle <=> u(car) ≥ u(bicycle).

Thanks to the presented elements and rationality assumptions, referring to complete[4] and transitive[5] preference relations, it is possible to identify consumers' unobservable preferences through observable choices with the use of discrete choice models.

Discrete choice models

Discrete choice models (DCM) are the most popular toolbox that allows to explain and predict consumers' choices. DCM are used to explain choice situations involving a limited choice set of exhaustive and mutually exclusive alternatives. They have been firstly developed in 1973, when the Nobel Prize Daniel McFadden wrote his "*Conditional logit analysis of qualitative choice behavior*" (McFadden, 1973). The most common DCM in the literature rely on the assumption that consumers are rational agents, which, aiming at the maximization of their utility functions, choose in every choice situation the alternative that returns them the highest utility. The unobservable utility is technically defined as a latent variable, which is measured thanks to observable variables such as people's choices, alternatives' characteristics and individuals' socio-economic variables. Models relying on such assumptions are known as Random Utility Models (RUM), with the adjective "random" indicating that, even if consumers (might) have a clear idea of their preferences, analysts have incomplete information and can predict individuals' utility up to an error term, which is randomly distributed. Based on RUM, individuals involved in a choice task select a generic alternative if the utility attached to that alternative is the highest across all the alternatives of the choice set. Formally, an individual *i* in the choice occasion *t* selects the alternative *l* from a set of J alternatives if $U_{ilt} > U_{ijt}$ $\forall j \neq l$, $j=1,\ldots,J$. The utility function is measured as:

[3] The numerical value attached to goods and services represents the utility that people obtain by choosing them.
[4] Completeness property means that for all x,y alternatives belonging to a choice set X, we have that x is preferred to (at least as good as) y, or viceversa.
[5] Transitivity property means that for every x,y and z belonging to X, if x is preferred to y and y is preferred to z, then x is preferred to z.

$$(1) \qquad U_{ilt} = V(x_{i,l,t}; \beta) + \varepsilon_{ilt}$$

where $V(x_{i,l,t}; \beta)$ represents the deterministic part of the utility (observed by researchers), which depends linearly on a series of observable attributes $x_{i,l,t}$, whose importance for the final choice is determined by a vector of parameters β, representing consumers' preferences. The random component of the utility function, ε_{ilt} follows a statistical distribution assumed by the researcher. Models with extreme value distributed error terms are known as logit models, while probit models in case of normally distributed error terms[6]. In order to derive preferences by observed choices, it is necessary to associate to every alternative a corresponding probability to be selected. Let us consider y as a generic choice observation. The probability of choosing the alternative *l* over a set of J alternatives, for an individual *i,* in the choice occasion *t*, is calculated as:

$$(2) \qquad P_{i,t}(y = l) = \frac{e^{V_{i,l,t}}}{\sum_{j=1}^{J} e^{V_{i,j,t}}}$$

The value of the vector of parameters β representing preferences is obtained by the maximization of the following likelihood function across T choices of N individuals:

$$(3) \qquad L(\beta|y) = \prod_{i=i}^{N} \prod_{t=1}^{T} P_{i,t}$$

which is calculated in its logarithmic transformation. The solution of this maximization problem is a single vector of parameters **β** representing respondents' preferences.

Heterogeneity in tastes

The above mentioned solution has some limitations, in fact, with that formulation, a unique vector of preferences estimates the "average respondent's tastes", and fails to capture heterogeneity in preferences across respondents. In fact, individual preferences might change across people depending on some observable socio-economic variables, which can be controlled by the inclusion of specific parameters, but also on other unobservable factors. In the last decades, researchers developed more flexible and complex models which allow to control heterogeneity in people's preferences and decision rules[7]. In order to control for taste heterogeneity, scholars developed more flexible models with a series of extensions such as: random parameter models, allowing for a distribution across respondents of the β parameters (RPM - Walker & Ben-Akiva, 2002; Train, 2009); latent class models, allowing for different classes of respondents having their own vector of preference β (LC - Greene & Hensher, 2003)

[6] The three articles of this thesis make use of logit models due to their higher tractability with respect to probit model.

[7] Decision rules represents correspondences between dependent and independent variables. One example of decision rule is the utility maximization, but several alternative heuristics might be considered.

or integrated choice and latent variable models, allowing for different individuals to have heterogeneous preferences depending on their attitudes or psychological traits (ICLV - Walker, 2001, Walker & Ben-Akiva, 2002). The first two chapter of this thesis include unobservable variables thanks to an ICLV model, which gives more behavioral insights with respect of the classical multinomial logit model (MNL).

Heterogeneity in decision rules

The most popular choice models are based on the rationality assumption derived by the economic theory, but there is a large evidence from psychology literature showing that people often rely on quick mental processing rule heuristics in order to make choices (Kahneman & Egan, 2011; Leong & Hensher, 2012). In fact, the elaboration of all the alternatives' attributes is a high demanding mental process, which is often replaced by shortcuts or choice heuristics used by the brain in order to minimize the cognitive effort. In the last decades, researchers have proposed several technique to improve choice models, relaxing some assumptions and introducing new ways of considering people's heterogeneity in terms of decision rules. Some examples of decision rules alternative to the classical RUM are represented by: elimination by aspects, in which respondents iteratively eliminates alternatives that does not reach a certain cutoff and choose the last remaining alternative (EBA – Tversky, 1972); lexicography, in which respondents choose the alternative with the best level of the most important attribute and consider other attributes only in case of ex aequo (LEX – Tversky, 1969; Luce, 1978), reference point models based on prospect theory (Kahneman & Tversky, 1979), in which respondents consider changes in levels relative to a status quo (Masiero & Hensher, 2011). In addition, people choices might be driven by emotions instead of rationality, as an example by minimizing the anticipated regret in the so-called regret minimization models (RRM – Chorus, 2010; Chorus & Bierlaire, 2013) or maximizing their short or long term happiness, in the so-called happiness models (Abou-Zeid, Ben-Akiva, & Bierlaire, 2008). In order to include alternative decision rules in discrete choice models, starting from the work of Hess, Stathopoulos, & Daly (2012), researchers started to simultaneously control for taste heterogeneity and decision rule heterogeneity using latent class models. One of the benefits of LC models is that they permit to relax the assumption of considering utility maximization as the unique decision rule, and allow controlling for class-specific decision rules. In the third chapter of this thesis, a lexicographic approach will be considered in a latent class model in addition to an ICLV model.

Stated preference (SP) experiments

Discrete choice models aim at understanding real behaviors in order to explain consumer demand, but there are some circumstances in which real data (also known as Revealed Preference data - RP) do not exist or do not allow answering researchers' questions. Some examples can be found in presence of

innovations: development of new products or services, changes in price or other levels of alternatives' attributes. In similar circumstances, the absence of RP data requires the use of surveys or other types of instruments to collect the so called Stated Preference (SP) data. SP data are often collected through choice experiments, in which respondents face a choice set that reproduces a choice scenario (including alternatives and attributes selected by the researcher) that refers to choices that people would make in hypothetical (but realistic) choice situations. In contrast with the mentioned advantages, SP experiments have been criticized in their limitation to express real preferences given that they do not represents real market behavior (Swait, Louviere & Williams, 1994). However, even though there is scarcity of studies understanding external validity of SP experiments, there is evidence of a high correspondence between results of a SP experiment and real behavior from a representative sample in a research conducted recently in the Swiss context (Hainmueller, Hangartner & Yamamoto, 2015).

Contribution of the three articles

This thesis comprehends three articles that study tourists' preferences towards introduction of new alternatives (paper 1) or new attributes (paper 3), and also preferences of different members in a group decision (paper 2), all situations in which RP data are not available and SP data are necessary. In particular, the three SP experiments, generated with the Ngene software (Rose, Collins, Bliemer & Hensher, 2014) have been created with a D-efficient design and recreate choice situations for mode choice (paper 1), activity choice (paper 2) or accommodation choice (paper 3). The three articles are here discussed briefly.

Chapter 1 – Introduction of innovative means of transport as a solution to problems of traffic congestion

Chapter one considers mobility choice at destination and treats the problem of traffic congestion, which is highly discussed in the Canton of Ticino. Taking as a context two of the most visited valleys (Valle Maggia and Valle Verzasca), the paper aims at testing how the introduction of innovative means of transport might affect mode choice and reduce traffic congestion. In order to control for heterogeneity in preferences, the model consider different sensitivities for tourists and residents, including also the impact of their perception of tourism on congestions and the transportation system. The interest of this research is to understand how the introduction of innovative means of transport such as a shuttle service or an electric bike system could help to reduce the number of cars in the valleys. Results of the analysis show that the introduction of new means of transport and a different policy on the price of parking tickets could reduce the share of visitors coming by car. The inclusion of a latent variable (capturing residents perception of the impact of tourism on traffic congestion and the quality of the transport system) is helpful to control for a source of taste heterogeneity and returns

estimates of value of travel time savings (VTTS) that are close to that of another study on VTTS for leisure activities conducted in Switzerland (Axhausen, Hess, König, Abay, Bates, Bierlaire, 2008).

Chapter 2 – The impact of children's preferences on family leisure activity choices

Chapter two assesses the concept of group decision making, a very common situation in tourism that requires a deep analysis in order to understand the decision-making process, develop adequate touristic products and generate more effective marketing campaigns. In fact, even though it is quite common to find families, group of friends or work colleagues traveling together, group decision making in tourism received much less attention as compared to individual decision making (Cohen, Prayag & Moital, 2014). Amongst groups, family decision making is one of the most researched in the literature due to a clearer definition of members' roles that can simplify the analysis. However, despite the importance of families in the tourism industry, which represent around 30% of the total travel demand worldwide (Schänzel, Yeoman & Backer, 2012) and in Switzerland (Bieger & Laesser, 2002), there is a scarcity of studies in which children's voices are taken into account (Poria & Timothy, 2014). Qualitative studies find that children's preferences have a role in family tourism (which depending on the context might be more or less relevant) but studies on children are rare due to the difficulty of finding a systematic way to collect data from them. Children's role, which is quite limited in pre-visit decisions such as the type of accommodation, means of transport or length of stay, has a higher influence during vacation time (Cicero & Osti, 2018). For this reason, chapter two focuses on family activity choices at destination and is the first study to the best of the authors' knowledge including both parents and children's preferences in a choice experiment. Children's preferences have an impact on family activity, but the final decision seems to remain with the parents (Thornton, Shaw & Williams, 1997), which are considered in this study as final decision makers, with children's preferences (collected through pictures and a rating system based on emoticons) being one of the attributes characterizing the alternatives in the choice sets. In order to take into account the heterogeneity of the impact of children's preferences on parents' choices, the degree of permissiveness of the parents is taken into account through a latent variable, which returns a higher impact of children's preferences on the utility of permissive parents and a higher willingness to pay to choose activities they like.

Chapter 3 – Camping guests preferences for ecological procedures

Chapter three considers accommodation choice and assesses the topic of ethical consumption, which recorded an increased number of publications in the recent decades due to a growing awareness by consumers about climate change and sustainability related issues. Motivations and attitudes underlying an ethical consumption are relevant for brand positioning, with companies certified by fair-trade or an ecological label that in some cases are preferred by consumers. The article in chapter 3 refers to the camping sector, whose guests are particularly interested in nature and very sensitive to

sustainability issues, but received much lower attention with respect to the hotel sector. Results of the study show that camping guests seem to appreciate strongly the presence of an eco-label, regardless of their literacy about the necessary criteria to obtain it, and are willing to pay a premium around 1% of their accommodation cost for such a certificate. However, they are not willing to economically sustain an innovation for the provision of 100% green energy. An attempt to include attitudes towards green behavior to explain camping guest's choices has been made, with unsatisfactory results that confirm a so called attitude-behavior gap. Using a latent class, results show that camping guests' behavior is captured better when a lexicographic approach is taken into account, returning a very small percentage of guests choosing always the greenest option, and almost a third of the sample opting always for the cheapest accommodation without considering other attributes. Results of the research suggest that, given a strong preference for eco-labels and unwillingness to sustain economically an ecological improvement when an eco-label is already present, a shift towards a greener behavior might depend more on stricter criteria selected by regulators for the assignment of eco-labels rather than on owners' investments.

	Paper 1	**Paper 2**	**Paper 3**
Type of decision	mobility at destination	activity choice at destination	accommodation choice
Target	tourists and residents	tourists and residents	tourists
Respondents	individuals	families: 1st step children, 2nd step parents	individuals
Latent variable	perception of tourism on congestion and transportation system	degree of parents' permissiveness towards children's complaints	ecological attitude
Decision rule	classical RUM	classical RUM	classical RUM, Lexicography
Location interview	Valle Maggia and Valle Verzasca	ten points of interest in Ticino	camping "Campofelice"
Type of data collection	on site	on site	on line
Final sample	224	172	256

Table 1 Summary of the three articles

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Chapter 1

Can the introduction of innovative and sustainable mobility services reduce traffic congestion in remote touristic areas? Evidence from two Swiss valleys

Curtale R., Sarman I. and Evler J.

Abstract

The development of a sustainable leisure mobility system is one of the main issue for destinations that rely on natural amenities and supply nature-based activities. The topic is particularly relevant for those destinations having remote points of interest that are characterized by a large share of visitors coming by car, with all the negative externalities it brings. An increased traffic congestions, a lower air-quality and the worsening of destination's image perceptions are just some of the undesired short and long-term effect for both tourists and residents. This research aims at studying a possible intervention to reduce the share of car users amongst valleys' visitors by investigating residents and tourists' reaction to a possible introduction of new sustainable alternative means of transport. The study, conducted in two Swiss valleys, through a Stated Preference (SP) experiment shows that the introduction of innovative means of transport such as a special shuttle service or a bike-sharing system might reduce from 65% to less than 20% the share of visitors coming by car in the two Swiss valleys object of analysis.

Keywords:

Discrete choice modelling, SP experiments, over tourism, traffic congestion, sustainability.

1.1 Introduction

Sustainable leisure mobility has been one of the research priorities in the academics' agenda for the last years. Though the interest in the topic is pervasive, it is well known that this has a special importance for those destinations that rely on natural amenities and supply nature-based activities (Orsi & Geneletti, 2014). The expansion of tourism activities is strictly linked to an evolution of transportation demand, with all the consequences this may bring (Dickinson and Robbins, 2008; Albalate and Bel, 2010), and the world is rich of cases in which the expansion of tourism-driven transport demand and related congestion is a source of deterioration of the natural asset and the image of a destination (Saenz-de-Miera and Rossello, 2012; Jo, Kim and Shin, 2016). In this sense, tourism research has mainly investigated the modal preferences of tourists, the determinants of transport preferences and behaviour, and the propensity to adopt sustainable transport alternatives (Bhöler et al, 2006; Orsi & Geneletti, 2014; Prillwitz & Barr, 2011). One non-negligible consequence of traffic expansion, especially for small-scale areas, is the worsening of the residents' perceived image of the destination and a sense of intolerance and frustration towards tourist flows. Crowding in tourism has been subject to recent research (Kaizinger, Burns and Arnberger, 2015; Zehrer and Raich, 2016) with outdoor, nature-based settings and community's tolerance toward congestion being particularly investigated by scholars (Saveriades, 2000). This last aspect is particularly important when it involves residents of pristine areas which, although threatened by massive crowding, are important tourist sites. In fact, an intact natural setting represents the main tourism asset for certain destinations and excessive levels of congestion have the sole effect to deplete this resource (Dickinson & Robbin, 2008; Rendeiro Martin-Cejas & Ramirez Sanchez, 2010).

The present article wants to analyse how the introduction of new sustainable alternative means of transport would change tourists and residents mobility behaviour. From an empirical point of view, it proposes a modelling approach in the form of an Integrated Choice and Latent Variable (ICLV) model, which simultaneously investigates stated mobility preferences and psychological factors hypothesized to be significant determinants of transport choices in addition to standard individual and contextual characteristics. As posited by recent transport and tourism research, the simultaneous investigation of preferences, choices and attitudes is crucial in order to better identify the sources of behavioural intention and change (Johansson, Heldt & Johansson, 2006; Bhöler et al, 2006; Prillwitz & Barr, 2011; Kamargianni & Polydoropoulou, 2013; Beck, Rose & Hensher, 2013).

The empirical analysis is based on a dataset collected in summer 2017 with 224 travel parties in two valleys of Canton Ticino, in southern Switzerland, respectively Vallemaggia and Valle Verzasca. The geographical setting considered in this research allows to compare two close realities suffering of similar traffic-related issues though with their own peculiarities. Data was collected at strategic points

in order to interview private and public transport users but also hikers. Respondents were asked to fill a structured questionnaire in which stated preferences regarding leisure mobility to reach the valleys were elicited in the form of discrete choices. The theoretical and modelling approach proposed in this article may be of interest for those destinations in which leisure activities are nature-based and traffic-generated conflicts between residents and tourists exist. In terms of policy intervention, the consideration of residents' attitudes towards traffic and congestion is an important element in order to develop an integrated transportation system apt at reaching rural areas, supported by on-site specific measures granting an appropriate use of the destination to both tourists and residents.

The paper is structured as follows. Section 2 revises the existing literature about the so-called overtourism and the impact of tourism on traffic congestion and sustainability, section 3 introduces the research framework and the methodology used for the analysis, section 4 shows the main results of the estimations and section 5 comprehends a discussion and conclusions.

1.2. Literature review

Though the concept of crowding in tourism has been considered for long time, dedicated literature experienced an outburst of attention toward the subject in the last years, mainly following the well-known cases of some notorious destinations afflicted by this phenomenon (Venice, Barcelona and the Great Barrier Reef in Australia to name few). On this regards, the term «overtourism» is commonly adopted both at academic and popular level (Dickinson, 2018; Milano, Cheer and Novelli, 2018; Seraphin, Sheeran & Pilato, 2018) and, more in general, the phenomenon is strictly connected to the concept of environmental and social carrying capacity (Sevaridaes, 2000; Navarro Jurado, Damian & Fernandez-Morales, 2013; Gonzalez, Coromina and Galì, 2018). The definition of the setting in which crowding is taken into account is crucial (Manning, 2001; Neuts & Nijkamp, 2012; Weber, 2018) as causes and effects of the phenomenon are varied and apply differently to destinations (Goodwin, 2017). At the same time, researchers have theorized and empirically verified how the individual level is strictly related to the concept of perceived crowding, "*(…) thought of as an attitude in which a perception of excessive use levels of tourism (…) may (or may not) lead to a negative state, and change behaviour*" (Gonzalez, Coromina and Galì, 2018, pp. 4). On an effort to highlight the strong heterogeneity between individuals, several authors have related individual characteristics such as age, gender, education, income, repeat visiting, length of stay and motivations to perceived crowding (Navarro Jurado, Damian & Fernandez-Morales, 2013; Neuts & Nijkamp, 2012; Jin and Pearce, 2011; Zehrer and Raich, 2016) and the latter to tourist satisfaction, in general determining a negative relationship between these two elements (Ryan & Cessford, 2003; Mudyianselage & Rathnayake, 2015; Zehrer and Raich, 2016).

One form of over-crowding can be associated to tourism-generated traffic congestion. This topic has been touched in tourism literature (Saenz-de-Miera & Rossellò, 2012) but research has only marginally investigated the impact of perceived crowding on individuals' choices concerning transportation solutions (Kelly et al, 2007; Dickinson and Robbins, 2008; Taff et al, 2013) and, more specifically, residents' decisions to alter their behaviour to cope with traffic related-issues. Traffic congestion can be seen as a collateral aspect related to tourism development and (poor) planning, potentially leading to negative perceptions and attitudes manifested by individuals in the long term - sometimes also anticipating a proposed development (Mason and Cheyne, 2000). This is especially true when supply is not aligned to the peak-periods demand levels (Albalate and Bel, 2010) and may lead to sentiments of dissatisfaction and lack of attractiveness for both tourists and residents (Li and Wan, 2013; Dickinson and Robbins, 2008). Thus, excessive congestion, unless treated with appropriate policies aimed at intervening on the transport sector (Aguilò, Palmer and Rossellò, 2012; Orsi and Geneletti, 2014), may result in negative perceptions and this in turn may lead the residents to externalize a sentiment of discomfort toward the tourism sector with a clear support to development restrictions and/or a change in habits (Latkova and Vogt, 2012; Li and Wan, 2013).

Tourism academics are keen to understand the relation between individual characteristics and leisure-related transport behaviour, especially when the aim is pointed toward the "green" practices. As highlighted by Bergin-Seers and Mair (2009, p.112) "*…environmental behaviour results from the general beliefs about the relationship between humans and the environment (world views). These initial general beliefs then lead to awareness of consequences and the view that environmental conditions may threaten things the individual treasures and the idea that specific behaviour can make a difference and reduce impacts*". From this comes the acknowledgment that investigating personality traits, attitudes, values and desires is crucial to fully appreciate an individual's state of mind regarding the conditions of tourism development and the choice mechanisms one adopts to cope with it (Johansson et al, 2005; Taff et al, 2013; Li and Wan, 2013). At the same time, there has been a heightened attention aimed at the impact that tourism-generated congestion has on residents' attitudes toward external visitors. It is clear that inefficient mobility solutions - generally speaking - are one of the major factors determining a sense of frustration and dissatisfaction among people residing in crowded tourist destinations (Dickinson and Robbins, 2008; Saenz-de-Miera and Rossello, 2012), and this is particularly true for those individuals having no direct economic or social interest in the tourism sector (Andereck et al, 2005). Some argue that the decline in a destination competitiveness and profitability coincides with a decline in residents' satisfaction (Diedrich and Garcia-Buades, 2009) because of the propensity of the tourism industry to drastically alter the beauty and liveliness of a place. This said, congestion issues are likely to remain unresolved unless residents and especially

tourists have proper mobility alternatives to consider (Orsi and Geneletti, 2014). If this is not the case, the social carrying capacity will be surpassed (Diedrich and Garcia-Buades, 2009), and a situation of endangered destination's sustainability will trigger residents' negative attitudes toward tourism.

Despite the attention that scholars have dedicated to the topics of tourist mobility behaviour and decision-making in natural areas (Pettebone et al, 2011; Orsi and Geneletti, 2014), tourism literature lacks an in-depth discussion on and a formal representation of resident's tolerance with respect to tourism-generated congestion and the effects that this may have on transport decisions and the shift to more environmental friendly and collective means of transport remains unclear. Though the definition and measurement of the carrying capacity of the area under study is beyond the objectives of this article, with this piece of study we intend to empirically take into account residents' perceived congestion, more specifically the traffic congestion generated by tourists during peak periods of the year.

1.3 Research method

1.3.1 Research context

The study is conducted in the Ticino Canton, the southernmost of the Swiss confederation and one of the most important for the Swiss tourism industry. In fact, despite its relative small contribution in terms of population (4.1% of the resident population nationwide), it registered 8.3% of total hotel overnights during the summer in the year of the experiment[8]. The setting of this study is based in the two most famous valleys: Vallemaggia (VM – Maggia valley) and Valle Verzasca (VV - Verzasca valley). They both belong to the Lepontine Alps in the southern area of the Gotthard massive and their names derive from the comprising rivers (see Figure 1).

The Vallemaggia extends about 40kms to the northwest from the district municipality of Locarno and comprises several hiking and cycling routes. The lower 25kms of the valley have a flat slope, while the higher part splits into three steeper secondary valleys. The presence of charming stone cottages, hundreds of cascades and the deep river canyon near Ponte Brolla makes it a popular destination for outdoor recreation, particularly attractive for its possibilities to perform high diving and climbing but also for tourists looking for a scenic walk. In the Valle Verzasca only few villages are situated along the single valley road with a very crowded point of interest during summer, the so-called "Ponte dei salti", a Roman bridge often pictured in tourism brochures because of: its peculiar architectural style, its symbol of representing the Mediterranean climate conditions of the Ticino Canton and its potential for outdoor sport activities during summer season, running from May until October. The two valleys

[8] Population figures: https://www.bfs.admin.ch/bfs/it/home/statistiche/popolazione.assetdetail.3942289.html. Tourism figures: https://www.bfs.admin.ch/bfs/it/home/statistiche/turismo.assetdetail.3822646.html

often result in being very congested due to limited parking space and narrow streets, mainly during the summer season with heavy peaks during the weekends.

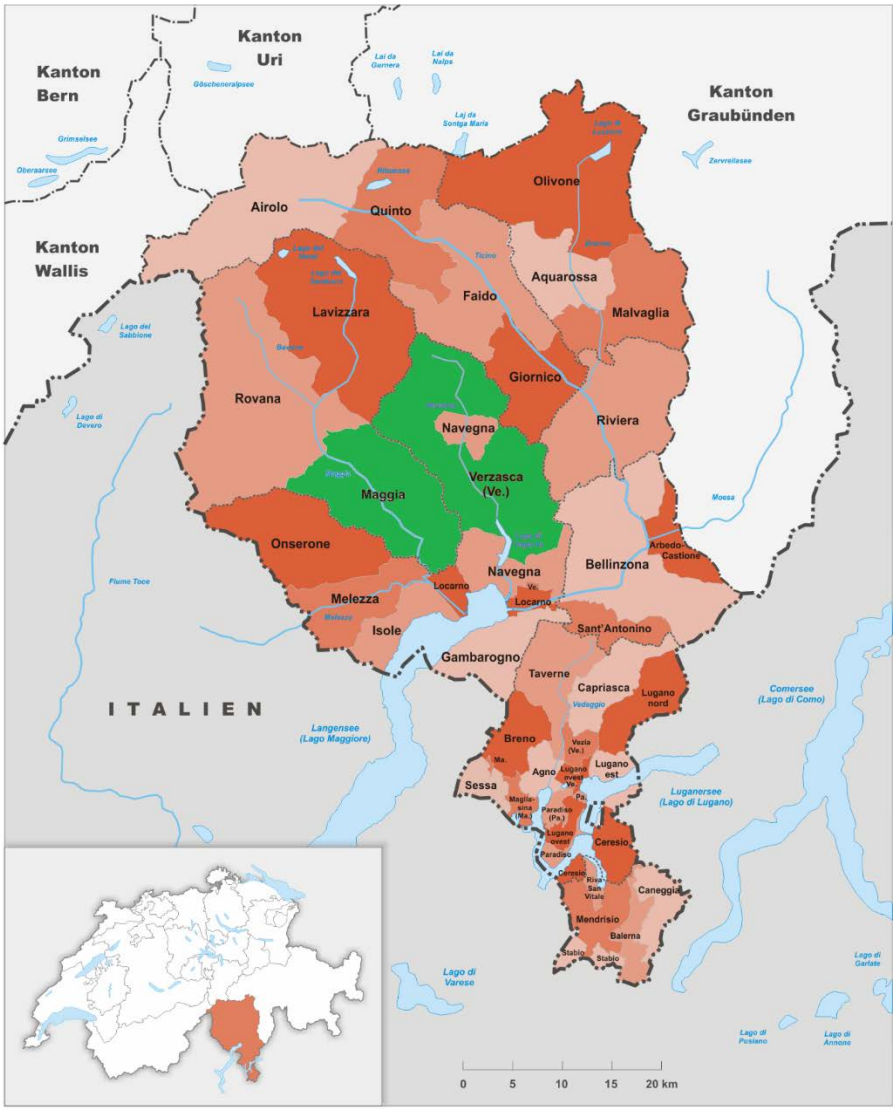

Figure 1 Valleys of Canton Ticino (source: Tschubb - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=57654972, edited by the author)

1.3.2 Questionnaire and choice experiment

The questionnaire was conducted in July 2017 and aimed at understanding tourists' and residents' behaviour in the valleys, with a particular focus on mobility-related behaviour (Evler, 2017). In a time-span of two weeks, outdoor recreationists were surveyed in strategic locations close to the main attraction of each valley – the river canyon in Vallemaggia and the Roman bridge in Valle Verzasca. A total of 224 travel parties (112 in each valley) were questioned on weekdays and weekends about their individual trip and mobility behaviour on-site.

The survey consisted of five separate sections and was available in three different languages: English, Italian and German. Participants were first asked to complete a stated preference experiment (SP) to

be analysed adopting discrete choice models. The choice scenarios were created adopting an efficient D-design considering its better performances compared to orthogonal designs, especially with small samples (Masiero and Qiu, 2018; Rose and Bliemer, 2009). In a first step, the design considered some intuitive a-priori parameters having the purpose to generate the discrete choice scenarios. These scenarios were used for an internal pilot study in which some PhD students were involved. Observations obtained in this way were used for preliminary estimates and the resulting parameters were later adopted as new and more reliable a-priori coefficients for the definitive efficient design. The discrete choice scenarios were distinguished between the two valleys, hence one design was created for Valle Verzasca and one for Vallemaggia. For each setting, the design comprised 8 choice scenarios which were split in 2 blocks of 4 scenarios, hence submitting 4 choice tasks to each respondent. Survey participants were introduced to a hypothetical scenario that offered them a park-and-ride solution at the valley entrance with shuttle bus or e-bike services as an alternative to the existing arrival options via personal vehicle or public transport. The fifth choice alternative was an opt-out option framed as "No visit". The attributes characterizing the alternatives were transport cost, usage attributes (service frequency for public transport and shuttle, search time for parking in the case of personal vehicle) and travel time, as it is possible to see in Figure 2.

	Personal Vehicle	Public Transport	Navette/ Shuttle	eBike Rental	NoVisit
Travel Time	10min to VM 20min to VV	15min to VM 30min to VV	10min to VM 25min to VV	20min to VM 45min to VV	
Usage attributes	Search time for parking: ***5, 10, 15min***	Frequency of service: ***every 30, 60min***	Frequency of service: ***every 10, 15, 20min***	Network density: ***1, 3, 5 stations***	
Travel Cost	Parking per hour: ***CHF 2, 4, 6***	Daily ticket price: CHF 9.20 to VM CHF 13.20 to VV Excl. Half-fare and Reduction Cards	Daily ticket price: ***CHF 4, 8, 12 to VM*** ***CHF 5, 10, 15 to VV***	Hourly fee: ***CHF 1, 2, 3***	
Your Choice					

Figure 2 – Alternatives, attributes and associated levels in the choice experiment

In the second part of the survey, individuals that had indicated to be residents in the Locarno district (i.e. in the proximity of the two valleys) were requested to evaluate regional tourism development by stating their agreement towards eight selected sentences. Two statements each covered three dimensions of sustainable development (a balance of social, economic and ecological well-being), whereas two were centred on the development of the transport infrastructure in the region. The third section gathered information on trip origin, intended activities in the valley and their frequencies. The fourth section comprised questions concerning revealed preference data (RP) about respondents'

mobility behaviour to the site and their perceived quality of the local transport infrastructure. Respondents' socioeconomic characteristics were registered in the final part of the survey.

1.3.3 Sample of respondents

The data sample features a slight overrepresentation of male respondents in both valleys, which may be explained by the fact that interviewers registered the socioeconomic background of only one person from each travel party. Among these parties, a tendency towards smaller companionships can be observed in Vallemaggia (lone travellers, couples), whereas Valle Verzasca is more popular for groups (especially large groups with 5+ people). There is no age difference between the two samples. Participants in Vallemaggia earn on average an equivalent of about CHF 8.000 more per year than their counterparts in Valle Verzasca, although the Verzasca sample counted a larger number of respondents with higher academic degrees. In terms of trip origin, the descriptive statistics reveal that 21.4% of respondents in Vallemaggia has its residency in the Locarnese region, whereas only 5.4% of Valle Verzasca respondents is resident. Most of tourists to both valleys have their residence in the German part of Switzerland, which corresponds to the general distribution of visitors to Ticino. International visitors to Vallemaggia are mainly from Swiss-neighbouring countries and represent about 25% of tourists. Valle Verzasca, on the other side, has a rather global catchment area with one quarter of visitors being Italian and another 20% being from regions such as Asia, Central Europe or Scandinavia. Car proved to be the most popular means of transportation to arrive to the valleys throughout all segments (Table 3), but especially for one-day excursionists to Valle Verzasca. Public transport users were largely observed to hold reduction cards, so that only 18% had paid the full daily fare in Vallemaggia (4% in Verzasca) and 53% had full fare reduction (83% in Verzasca). On the opposite, more than 60% of all car users did not possess any kind of reduction cards for public transport usage.

Location Respondents	Valle Maggia 112		Val Verzasca 112		Total 224	
	observ.	observ. %	observ.	observ. %	observ.	observ. %
GENDER						
Male	58	51,8%	60	53,6%	118	52,7%
Female	54	48,2%	52	46,4%	106	47,3%
AGE						
15-24	15	13,4%	19	17,0%	34	15,2%
25-34	32	28,6%	42	37,5%	74	33,0%
35-44	13	11,6%	18	16,1%	31	13,8%
45-54	29	25,9%	15	13,4%	44	19,6%
55-64	16	14,3%	11	9,8%	27	12,1%
65+	7	6,3%	7	6,3%	14	6,3%
EDUCATION LEVEL						
Secondary school	8	7,1%	13	11,6%	21	9,4%
Matura	20	17,9%	21	18,8%	41	18,3%
Professional Apprenticeship	45	40,2%	29	25,9%	74	33,0%
University degree	37	33,0%	43	38,4%	80	35,7%
High accademy degree (PhD)	2	1,8%	6	5,4%	8	3,6%
COMPANIONSHIP						
Couple	49	43,8%	38	33,9%	87	38,8%
Parent(s) with child(ren)	21	18,8%	22	19,6%	43	19,2%
Group	32	28,6%	45	40,2%	77	34,4%
Alone	10	8,9%	7	6,3%	17	7,6%
INCOME						
up to 25'000 CHF	22	19,6%	23	20,5%	45	20,1%
25'001-50'000 CHF	12	10,7%	22	19,6%	34	15,2%
50'001-75'000 CHF	19	17,0%	16	14,3%	35	15,6%
75'001-100'000 CHF	22	19,6%	14	12,5%	36	16,1%
101'001-125'000 CHF	3	2,7%	7	6,3%	10	4,5%
125'001-150'000 CHF	5	4,5%	4	3,6%	9	4,0%
more than 150'00 CHF	4	3,6%	0	0,0%	4	1,8%
no response	25	22,3%	26	23,2%	51	22,8%
TOURISTS						
Residents	24	21,4%	6	5,4%	30	13,4%
Tourists	88	78,6%	106	94,6%	194	86,6%

Table 2 Sample statistics

	Valle Maggia		Val Verzasca		Total	
ARRIVAL MODE IN THE VALLEY (RP)	Residents	Tourists	Residents	Tourists	Residents	Tourists
Car	14	56	2	73	16	129
Public transport	3	14	1	21	4	35
Coach bus (organized tour)	0	0	0	2	0	2
Motorbike	5	3	1	7	6	10
Bike	1	6	2	0	3	6
On foot (hiking)	1	9	0	3	1	12

Table 3 Arrival mode in the valleys

1.3.4 Econometric modelling

Multinomial logit (MNL)

Residents and tourists' mobility preferences to reach the valleys have been analysed adopting discrete choice models (DCMs). DCMs are commonly used in situations in which the nature of the choice is discrete and refers to exhaustive and mutually exclusive alternatives, they are called binary logit

models when only two possible options are available and multinomial logit (MNL) when more than two options are available. DCM relies on the random utility theory (RUT, McFadden, 1973), whose underlying assumption is that consumers are rational agents aiming at maximizing their utility function with their choices. In this specific study, the decision respondents face is the choice of mean of transport to reach the valleys. The available alternatives are car, public transport, shuttle, e-bike and "no choice", the latter indicating that respondents would not visit again the valley considering the available alternatives. Respondents choose their most preferred alternative at each choice task and every option is associated to a utility function. The utility function for respondent *i* in the choice occasion *t* for the alternative *j* is given by $U_{i,j,t}$, composed of a deterministic value $V_{i,j,t}$ and a stochastic, extreme value-distributed term $\epsilon_{i,j,t}$. In particular, the utility functions are expressed as in equations 4 and 5:

$$U_{i,j,t} = V_{i,j,t} + \epsilon_{i,j,t} \quad (4)$$

$$V_{i,j,t} = ASC_j + \beta_{COST} * COST_{i,j,t} + \beta_{TT} * \text{TRAVEL TIME}_{j,t} + \beta_{USAGE} * USAGE_{i,j,t} + \beta_{AGE} * AGE_i + \beta_{EDUCATION} * EDUCATION\ LEVEL_i + \beta' INTERACTIONS \quad (5)$$

The alternative specific constant (ASC) represents the baseline preference of respondents for the specific alternative *j* (*j* = car, public transport, shuttle, e-bike). COST is the alternatives' associated cost to get to the valley, it includes parking fee for car, ticket price for public transport (free for those owning a Ticino Ticket card or a general abonnement) or shuttle, renting fare for e-bike. TRAVEL TIME is the total travel time to get to the valley (for car there is also a parking time, independently identified). USAGE is the frequency of rides for public transport and shuttle (expressed in number of minutes between one ride and the following), while it counts the number of available stations for e-bike. AGE and EDUCATION LEVEL are the only statistically significant socio demographics variables found in the estimations. INTERACTIONS includes potential interaction terms between socio demographics variables and choice attributes. Once the utility functions have been defined, it is necessary to calculate the probability that each alternative is chosen, considering their utility functions. The probability of choosing a specific travel option *k* among the alternatives is expressed in equation 6:

$$P(y_{i,t} = k) = \frac{\exp(\lambda V_{i,k,t})}{\sum_{j=1}^{5} \exp(\lambda V_{i,j,t})} \quad (6)$$

Where $y_{i,t}$ is the choice of individual i in the choice task t and $V_{i,k,t}$ represents the deterministic part of the utility function expressed in equation 5. The scale parameter λ allows to combine the two different datasets (collected in the two different valleys) and to obtain more accurate estimations of individuals' preferences. The value of λ is set equal to one for Vallemaggia for identification, while it is estimated for Valle Verzasca. The inclusion of the λ parameter increases the model fit by minimizing the error

variances, which would be higher without considering differences in the scale of the two samples (Train, 2009). The specific role of the scale parameter is to capture a source of heteroscedasticity (different variance in the error term) between the samples of respondents specific for the two valleys. Given the formulation of probability as in equation 6, the parameters are estimated through the maximization of the loglikelihood function, expressed in equation 7:

$$(7) \qquad logL(\theta) = \sum_{i=1}^{N} \sum_{k=1}^{4} \ln(P_{i,k_i}(\theta))$$

Where θ = ($ASC_{car}, ASC_{public\ transport}, ASC_{shuttle}, ASC_{e-bike}, \beta_{COST}$, …) is the set of parameters. More details on the maximum likelihood estimation can be found, between others, in the works of McFadden (1973) or Ben-Akiva, Lerman & Lerman (1985).

Integrated Choice and Latent Variable model (ICLV)

With the Integrated Choice and Latent Variable model (ICLV), it is possible to include psychological characteristics of the respondent as predictors of their choices. In our case, the perception of the impact of traffic congestion is considered as the latent variable. To move from a classic DC framework to a ICLV model, two further components are necessary, namely a measurement equation (necessary to measure the latent construct), and a structural equation (aimed at identifying individuals' socio-demographics determinants of the latent variable). For a comprehensive treatment of ICLV models, the reader may want to refer to Walker (2001).

Measurement equation. The latent variable, being an intangible characteristic, needs to be measured using some indicators, three in this specific case. The psychographic indicators are assumed to be influenced by the latent variable in a linear relationship, as described in equation 8:

$$(8) \qquad I_{r,i} = z_r * CONGESTION\ PERCEPTION_i + \sigma_r * v_i$$

where *r = (1,2,3)* is the specific indicator, z_r represents the effect of the latent variable on the r^{th} indicator, and σ_r is the standard deviation of the v_i normally distributed error term. The indicators used for the measurement of the latent variable are measured on a Likert scale from 1 (strongly disagree) to 5 (strongly agree) and are the following: "Because of tourism, there is better transport and leisure infrastructure in the Locarnese", "Tourists greatly add to the traffic congestion, noise and pollution in the Locarnese" and "This valley has problems of car traffic and parking congestion".

Structural equation. In order to identify the profile of people with a certain congestion perception, the latent variable is expressed as function of socio-demographic characteristics of the respondents, plus an error term. In this case, the structural equation for the latent variable is specified as follows:

(9) $$CONGESTION\ PERCEPTION_i = \gamma_{AGE} * AGE_i + \gamma_{EDUCATION} * EDUCATION_i + \gamma_{WORK\ IN\ TOURISM} * (WORK\ IN\ TOURISM == 1)_i + \omega_i$$

where γ_{AGE} and $\gamma_{EDUCATION}$ capture the impact of age and education level, respectively, on the level of perceived congestion, $\gamma_{WORK\ IN\ TOURISM}$ captures the impact of working in the tourism field and the error term ω_i is a realization of a random draw extracted from a simulated standard normal distribution.

Likelihood formulation. The final probability of choosing a certain alternative is calculated by integrating the probability expressed in equation 6, in the domain of the latent variable.

(10) $$P_i(y, I^{CP}|X, X^{CP}, CP; \beta, \tau, \lambda, \sigma, \gamma) = \int P_i(y|X, CP; \beta, \tau) * P_i(I^{CP}|CP; \lambda, \sigma) * f(CP|X^{CP}; \gamma)\, dCP$$

The final estimates are those values of the parameters that maximize the likelihood of the realization of the observed data, considering the probability expressed in equation 10. The integral expressed has no closed form, so the estimates are obtained with the maximization of a simulated maximum likelihood. This is done by extracting random realization of the latent variable's error terms and using a Monte Carlo simulation technique that approximates the results of the integration. The reader might want to refer to Train (2009) for a deeper understanding of simulated maximum likelihood.

1.4 Results

In order to understand respondents' mobility preferences, four models have been estimated in R (https://www.r-project.org/). Model 1 is a basic multinomial logit model (MNL) estimating the effect of alternatives' characteristics and respondents' sociodemographic variables on mode choices. Model 2 is another MNL model that adds a parameter (b_tt_resid) to differentiate between tourists and residents' travel time preferences[9]. In model 3, parameters identifying alternative specific constant preferences for residents (b_asc_car_resid, b_asc_pt_shut_resid and b_asc_bike_resid) are introduced, resulting in being not statistically significant[10]. Model 4 is an Integrated Choice and Latent Variable (ICLV) model in which the effect of residents' perception of traffic congestion is considered. In the ICLV model, 3000 Modified Latin Hypercube Sampling (MLHS) random draws are used for the

[9] Different specification have been estimated in order to test which attributes present statistically different parameters between residents and tourists, with only travel time being statistically different for the two classes.
[10] They have been reported only for comparison purposes in order to show the benefits of the introduction of the latent variable in model 4. In fact, the inclusion of the latent variable allows to split residents' preferences in a baseline component and a marginal preference component given by the value of the latent variable, and they are both statistically significant.

estimation of the latent variable. The choice of MLHS draws is justified by greater accuracy and simplicity with respect to Halton draws (Hess, Train and Polak, 2006).

Model estimates	model 1			model 2			model 3			model 4		
	est	rob.se	signif	est	rob.se	signif	est	rob.se	signif	est	rob.se	signif
Choice model												
asc_car	1,815	0,805	*	1,852	0,763	**	1,867	0,764	**	1,848	0,798	**
asc_pt	1,992	0,844	**	2,034	0,804	**	2,062	0,813	**	2,020	0,838	**
asc_shut	2,458	0,791	**	2,500	0,755	**	2,522	0,755	**	2,545	0,785	**
asc_bike	2,182	0,940	**	2,219	0,894	**	2,266	0,933	**	2,168	0,937	**
b_cost_car	-0,062	0,016	**	-0,061	0,016	**	-0,060	0,016	**	-0,065	0,017	**
b_cost_pt_shut_bike	-0,086	0,020	**	-0,085	0,021	**	-0,085	0,021	**	-0,091	0,022	**
b_tt	-0,024	0,013	*	-0,026	0,012	*	-0,027	0,014	*	-0,023	0,013	*
b_tt_resid				0,030	0,011	**	0,035	0,019	*	0,035	0,013	**
b_pkgtime_car	-0,008	0,009		-0,008	0,009		-0,008	0,009		-0,009	0,010	
b_freq_pt_shut	0,083	0,028	**	0,083	0,028	**	0,082	0,028	**	0,088	0,030	**
b_station_bike	0,069	0,040	*	0,069	0,040	*	0,068	0,041	*	0,075	0,043	*
b_age_car	-0,021	0,013	*	-0,020	0,012	*	-0,020	0,012	*	-0,020	0,013	*
b_age_pt_shut_bike	-0,029	0,013	**	-0,029	0,012	**	-0,029	0,012	**	-0,031	0,013	**
b_education_no	-0,322	0,128	**	-0,300	0,122	**	-0,294	0,122	**	-0,315	0,126	**
lambda	1,212	0,452	**	1,274	0,474	**	1,286	0,502	**	1,122	0,435	**
b_asc_car_resid							0,153	1,005				
b_asc_pt_shut_resid							0,051	1,018		-18,051	8,333	*
b_asc_bike_resid							-0,030	1,149				
tau_lv_asc_pt_shut										3,525	1,584	*
Measurement equations												
zeta_transp1										0,585	0,084	***
zeta_transp2										0,629	0,104	***
zeta_transp3										0,656	0,083	***
sigma_transp1										1,219	0,087	***
sigma_transp2										1,317	0,205	***
sigma_transp3										0,903	0,132	***
Structural equation												
gamma_lv_transp_educ										0,882	0,156	**
gamma_lv_transp_age										0,024	0,014	*
gamma_lv_transp_work										1,309	0,489	**
Model statistics												
Number of decision-makers	224			224			224			224		
Number of choices	896			896			896			896		
Number of parameters	14			15			18			26		
Number of parameters (choice)	14			15			18			17		
LL (final)	-1162,006			-1155,455			-1155,285			-1282,014		
LL (choice)	-1162,01			-1155,46			-1155,285			-1137,47		
AIC (final)	2352,012			2340,91			2346,57			2616,028		
BIC (final)	2419,183			2412,88			2432,933			2740,774		
AIC (choice)	2352,012			2340,91			2346,57			2308,944		
BIC (choice)	2419,183			2412,879			2432,933			2390,509		
VTTS_car (CHF)	23,14			25,36			26,64			21,39		
VTTS_pt_shut_bike (CHF)	16,61			18,11			19,00			15,23		

Table 4 Main results

Model statistics

In terms of log-likelihood of the choice model, model 4 shows the highest fit with a value of -1137.47. The improvement of the goodness-of-fit does not seem to justify the introduction of the additional parameters using the Akaike (AIC) and Bayesian information criteria (BIC) for the final model, which

are higher than the other three, but presents more accurate results for the choice model (AIC=2308.94, BIC=2390.51). In addition, the inclusion of the latent variable is helpful to extract some missing information that cannot be captured by a standard MNL model, as an example it allows to estimate values of travel time savings (VTTS) that are closer to those found in another study on the VTTS in Switzerland (Axhausen et al., 2008). In the next paragraph, important results from different models are reported, while the final discussion and related comments in the last chapter are based on market shares, elasticities and value of travel time savings calculated from the results of model 4.

Main results

In model 1 (MNL) the effect of alternatives' characteristics and respondents' sociodemographic variables on mode choices is estimated. Cost and time attributes have a significant impact in determining respondents' preferences in line with the economic theory; in fact, higher costs and estimated travel times for a certain alternative negatively affect its associated utility and consequently the probability of choosing it. Sensitivity to changes in travel time is constant across different means of transports (b_tt = -0.024), while price sensitivity depends on the specific mean of transport. The unitary increase of travel cost has a weaker impact on the reduction of car demand with respect to public transport, shuttle and e-bike (b_cost_car = -0.062 and b_cost_pt_shut_bike = -0.086), meaning that the proposed alternatives have different demand elasticities with respect to price changes. Frequency of shuttle services and public transport have a positive and significant impact on the choice of such alternatives (b_freq_pt_shut = 0.083) and the same applies for density of e-bike stations (b_station_bike = 0.069). Estimated parking time seems to have a negative impact on the choice of car (b_pkgtime_car = -0.008), but the result is not significant at a 10% level. The positive and significant lambda parameter (lambda = 1.212) shows that there are scale differences between the two valleys. The larger scale parameter in the Valle Verzasca sample indicates a smaller error variance in describing Valle Verzasca respondents' behaviour and a higher randomness in the explanation of Vallemaggia's ones. Age and education are the only socio demographic variables resulting in a significant impact on respondents' preferences. Ceteris paribus, respondents with a higher education level report a higher probability to revisit the valley, while an increase in respondent's age is associated to a lower propensity to revisit and a greater relative preference towards car (-0.021) with respect to public transport, shuttle and e-bike (-0.029).

Model 2 investigates differences between residents and tourists preferences, with the only difference found in travel time's sensitivity[11]. In fact, while travel time has a negative effect for tourists (-0.027),

[11] In Model 1, travel time sensitivity is estimated as expressed in equation (5) by $\beta_{TT} * \mathrm{TRAVEL\ TIME}_{j,t}$. In model 2 the difference in travel time sensitivity between tourist and residents is estimated as follows:

it has no impact for residents (H0: b_tt + b_tt_resid=0, p.value=0.232). These result finds analogies with the distance decay theory (McKercher, Chan & Lam, 2008), which shows that there is a correlation between the volume of people visiting a place and the distance between the destination and people's origin. The classical decay curve is increasing until a certain threshold and then starts decreasing, meaning that in general the increase in the distance between origin and destination impacts negatively on the volume of visitors, but this is true only when the distance is higher than a certain threshold. Considering that theory, it is not so strange that for residents, living closer to the destination and within a range that very likely falls in the non-decreasing interval of the decay curve, there is no statistically impact of travel time on their utility, while there is a statistically negative impact on tourists' one. More on this point, from a micro-economic interpretation, tourists and residents are both rational agents aiming at maximizing their utility, but the utility obtained with the movement is not the same across all people. In fact, as Mokhtarian & Salomon (2001) and Redmond & Mokhtarian (2001) enunciate, it is possible to consider the utility derived from movement simply as moving to reach the destination or as moving to enjoy the movement, having also the chance to perform other activities, as will be pointed out in the discussion.

Model 3 shows that the inclusion of alternative specific constants for residents does not improve model's fit nor add significant parameters. Results of model 3 are reported in order to explicitly show differences with model 4. In fact, the inclusion of a latent variable in model 4 allows disentangling the effect of alternative specific constant for public transport and shuttle, identifying statistically significant differences between respondents with low and high values of the latent variable.

Perception of congestion: a problem and an opportunity.

In model 4 (ICLV model) a latent variable capturing respondents' perception of congestion is included as a regressor. The latent variable is measured through the manifestation of three indicators: "Because of tourism, there is better transport and leisure infrastructure in the Locarnese" (I1), "Tourists greatly add to the traffic congestion, noise and pollution in the Locarnese" (I2) and "This valley has problems of car traffic and parking congestion" (I3). A positive value of the zetas parameters (zeta_transp1 = 0.585, zeta_transp2 = 0.629, zeta_transp3 = 0.656) indicates that respondents with a higher value of the latent variable return on average higher results on the indicators' Likert scale with respect to those having a low value of the latent variable. Thus, respondents with a high value of the latent variables are people who perceive tourism has having an impact of traffic congestion but also a positive effect

$(\beta_{TT} + \beta_{TT_{RESID}} * (residents == 1)) * \text{TRAVEL TIME}_{j,t}$. Thus a significant estimate of $\beta_{TT_{RESID}}$ identifies a difference between residents and tourists' sensitivity. In order to identify whether time sensitivity for residents is significant or not, it is necessary to test if the sum of β_{TT} and $\beta_{TT_{RESID}}$ is different from 0.

for a better transport infrastructure[12]. The gamma parameters identify the profile of respondents with a high value of the latent variable, who on average are older (gamma_lv_transp_age = 0.024), better educated (gamma_lv_transp_educ = 0.882) and with a higher probability of working in a tourism-related job (gamma_lv_transp_work = 1.309) with respect to those with a lower value of the latent variable. In the explanation of respondents' choices, the latent variable helps better describing residents' behaviour. In fact, while in model 3 no difference between tourist and residents' preferences towards public transport and shuttle was found, considering the latent variable allows to find that residents with a high value in the latent variable have a significantly higher preference for public transport and shuttle compared to others (tau_lv_asc_pt_shut = 3.525). It is important to specify that the socio-demographic specificities concerning the preferences for public transport and shuttle could not be identified without the use of the latent variable.

Value of Travel Time Savings

The ratio between any non-monetary parameter and the β_{COST} parameter allows to determine respondents' willingness to pay (WTP) for a specific attributes' levels. One of the most important WTP measures is represented by the ratio β_{TT}/β_{COST}, the result of which is the value of travel time saving (VTTS). In this study, a general parameter for travel time and alternative-specific travel cost parameters were estimated. VTTS slightly changes depending on the estimated model, with more conservative values obtained in model 4, considered as the most accurate relying on the goodness-of-fit statistics. Results show that tourists VTTS is 21.39 CHF/hour when traveling by car and 15.23 CHF/hour when traveling by public transport, shuttle or e-bike. This results are slightly greater than those calculated by Axhausen et al. (2008) who estimated a VTTS of 18.83 CHF/hour using car for leisure purposes[13] and 11.90 CHF/hours using public transport[14].

Market shares and elasticity

Calculating market shares for the alternatives presented in the questionnaire allows to predict how people would behave in case of introduction of innovative transportation modes. In order to make comparisons, it is interesting to compare RP data, meaning real market shares (Table 5) of transportation modes to reach the valley with those predicted by the ICLV model (Table 6).

[12] The perception of the positive effect is considered higher during low-season by residents (Vargas-Sánchez, Porras-Bueno, & de los Ángeles Plaza-Mejía, 2014)

[13] In the cited paper, leisure purposes were not specifically specified for tourism activities but includes all the trips that cannot considered for business, commuting and shopping.

[14] The inflation rate considered consumer price index remained quite stable (CPI_2017/CPI_2007 = +0.8%) between the years of the two studies, the values of Axhausen's study are equal to 18.99 CHF for car VTTS and 12.00 CHF for public transport considering prices of 2017 (https://www.bfs.admin.ch/bfs/en/home/statistics/prices/consumer-price-index.assetdetail.6286147.html).

	car	public transport	coach	bike	hiking	motorbike
RP market shares	64,73%	17,41%	0,89%	4,02%	5,80%	7,14%

Table 5 RP market share

The majority of the respondents reached the valleys by car (around 65%), followed by public transport (17%) and motorbike (7%), almost 10% of the respondents arrived with zero-emission (6% by hiking, 4% by bike) and a small proportion of respondents arrived by coach (less than 1%). In Table 6 it is possible to see how those market shares might change (second row of the table) in the case of the introduction of a shuttle service and an e-bike system applying the average cost presented in the experiment for the alternatives (expressed in the first row of Table 6).

	car	public transport	shuttle	e-bike	no choice
average cost	10,4 CHF	7,6 CHF	8,4 CHF	5,2 CHF	-
estimated SP market shares	18,93%	14,83%	42,55%	19,58%	4,10%
elasticity wrt cost	-0,550	-0,619	-0,458	-0,379	-
cross-elasticity (cost_car)	-	0,105	0,277	0,139	0,029
cross-elasticity (cost_pt)	0,137	-	0,314	0,139	0,029
cross-elasticity (cost_shut)	0,144	0,121	-	0,159	0,033
cross-elasticity (cost_bike)	0,087	0,072	0,200	-	0,020

Table 6 Market shares and elasticities

Respondents would react positively to the introduction of innovative means of transports. In fact, a park and ride solution with shuttle service at a cost of 8.40 CHF would be chosen by the 43% of the respondents, while an electric bike with a cost of 5.20 CHF would be chosen by around 20% of them. Another important aspect would be the reduction of people arriving by car, dropping from 65% to around 19%, with an estimated parking fee of 10.40 CHF. There would be a 15% of respondents coming by public transport and around 4% of them that would not come with those possible alternatives. Another important aspect to consider is the demand elasticity with respect to changes in alternatives' attributes, with cost elasticity being one of the most important. Cost elasticity measures the percentage change in demand for an alternative, per marginal percentage change in the travel cost of that alternative (Mas-Colell et al, 1995). Values lower than 1 identify an inelastic demand, meaning that a price increase of 1% would induce a reduction in demand smaller than 1%. Cost elasticities are estimated for all the available alternatives[15], readers interested in the estimation of elasticities in discrete choice models might want to refer to Ben Akiva & Lerman (1985). All the alternatives are quite inelastic to travel cost, with public transport being the most sensitive to a change in price (-0.619) while e-bike is the most inelastic (-0.379). Making a practical example, an increase of parking fee of 10%

[15] The individual elasticity for alternative j with respect to a change in price is calculated as:
$(1 - P_{ijt}) * COST_{ijt} * \beta_{COST}$
The individual cross elasticity with respect to an increase in price of another generic alternative k is calculated as: $-P_{ijt} * COST_{ikt} * \beta_{COST}$

would reduce the demand of car by 5.50%, the same increase in the ticket of public transport or shuttle would reduce their demand of 6.19% and 4.58% respectively, while an increase in e-bike rent of the same amount would reduce its demand by 3.79%. Still, an increase of travel cost for each alternative would not impact only in the demand of the alternative itself, but also on the demand of other alternatives, becoming relatively more convenient. Cross-elasticities are reported in rows 4-7. In row 4 it is possible to notice the cross elasticity of other alternatives with respect to an increase in the cost for car: a 10% increase in the cost of car would increase by 1.05% the demand of public transport, by 2.77% the demand of shuttle, by 1.39% the demand of e-bike and by 0.29% the share of people not choosing one of the proposed alternatives. Same applies for the other alternatives in rows 5-7. In order to understand how to reduce traffic congestion using a price policy, two strategies are available: the first consists in the rise of parking fee, with an estimated elasticity of -0.550, while the second consists in the decrement of the price of other alternatives, which though would impact with lower strength on the reduction of car demand (cross-elasticity of car with respect to public transport = 0.137, shuttle = 0.144, e-bike = 0.087). Table 7 reports the estimated market shares in the scenarios of an increase of parking fee. Results show that a progressive increase of the parking fee would reduce the market share of people choosing car as mean of transport to reach the valleys, with shuttle gaining the highest increase in market shares. It is also important to notice that the "no choice" alternative has a really low cross-elasticity with respect to other means of transport, meaning that an increase in price would induce people to switch to other means rather than not coming, and the "no choice" market shares remain stable[16].

Market shares (MS) scenarios	car	public transport	shuttle	e-bike	no choice
MS(10% increase in cost_car)	17,83%	14,89%	43,46%	19,73%	4,09%
MS(20% increase in cost_car)	16,74%	14,96%	44,35%	19,87%	4,08%
MS(50% increase in cost_car)	13,55%	15,14%	46,97%	20,30%	4,04%
MS(100% increase in cost_car)	8,48%	15,43%	51,13%	20,98%	3,98%

Table 7 Market shares scenarios

1.5 Discussion and conclusions

Destinations whose main resources are nature-based have the priority to preserve the territory and embrace a sustainable mobility able to deal with an increase of tourism demand. This would allow to maintain untouched both the natural landscape and residents' attachment to their territory. The aim of this paper is to understand if it is possible to reduce traffic congestion and develop a sustainable transport system in highly congested areas. In order to do that, it is necessary for destination management organizations to induce a change in both tourist and residents' behaviour. This is possible

[16] The decrease of the market share for the "No choice" option is due to an aggregation bias, a distortion that comes from the use of the parameter estimated as representative for the "average" individual and applied to the entire sample.

by introducing policy interventions that incentivize the use of alternative means of transport and discourage the use of car. In particular, in order to obtain a long-term sustainable mobility, it is necessary to understand how different resident and tourists' preferences are and then develop adequate marketing campaigns. The present discussion elucidates on empirical differences found in tourist and residents' behaviour and illustrates which are the characteristics that innovative means of transport should have. Furthermore, the importance of price strategies is assessed and new possible research avenues are put forward for researchers to investigate the psychology affecting people's behaviour. Tourists and residents have different approaches towards mobility in the valleys and this is probably due to the way they consider the experience in the valley itself. In particular, it is necessary to reflect on the meaning of travel time for both tourists and residents. What has been empirically found in this research is their different perception of travel time to reach the destination. In fact, they do not have the same travel time sensitivity, with tourists perceiving more negatively travel time with respect to residents. This said, before creating a unique standard transportation system, it is necessary to understand that some innovations might be effective for tourists but not for residents or vice versa, mainly because of different constraints that residents and tourists are subjected to. In fact, residents, living relatively closer to the point of interest with respect to tourists, have the chance to get to the valley more often, having in this way less time constraints than tourists. On the other side, tourists, who can visit the valleys only during their holiday, have less time availability to enjoy the destination and this translates to a higher opportunity cost for travel time. Regarding the introduction of innovative means of transport that could help to reduce the congestion generated by cars, this research shows that a shuttle service and an electric bike system would be accepted positively by a large share of respondents. In fact, almost 61% of the stated choices corresponds to one of the abovementioned means of transport to get to the valley, reducing from 65% to 19% the share of people choosing the car. In particular, the introduction of the electric bike system, a zero-emission solution, could potentially double the number of people choosing a zero-emission mobility (normal bike or hiking in the RP data) and also increase the interest to revisit the valley for residents who want to try a different experience. In order to be effective, the e-bike system should offer a sufficient number of stations, allowing people to freely move along the valley and leave the bikes in several places. Also, the e-bike system should give the possibility of pausing the rental fee in every station, being in this way significantly different from a classical rental bike. Although the introduction itself of innovative means of transport might reduce the share of people using car, this policy is complementary to a price strategy. In fact, any change in the price of the alternatives has an impact in shaping market shares and it is important to understand what the relationship between a change in price and final choices is. It is interesting to notice that e-bike, the most eco-friendly alternative, has the lowest elasticity, this is probably due to a demand composed by people who are less sensitive to price changes and whose

choice could more likely be driven by a strong attitude towards an active lifestyle, a sustainable behaviour, or a new way of experiencing the valley. However, this point could be better investigated in future studies with adequate latent variables. Looking at existing alternatives, it is possible to notice that car has a lower cost elasticity with respect to public transport. Thus, any percentage increase in the price for the public transport ticket would reduce its demand by a larger factor of the same change applied to car parking ticket, any policy should take into consideration this aspect. To conclude, it is important to guarantee a long term shift to a more sustainable transportation system, but in order to obtain that, it's incomplete to focus only on tangible aspect such as the introduction of new mean of transports or policies on travel time and cost. Thus, a strong understanding of people's attitudes and how they have an impact on preferences might lead to the development of a more consistent and durable sustainable transportation system. In this research, attitudes have been measured through a latent variable, whose higher or lower value reflects on different preferences. The identified latent variable does not represent a unique separable attitude but is composed of two different dimensions: resident's intolerance toward tourism-generated congestion and a consideration of the positive impact of tourism for the development of a better transport infrastructure. The evidence is that a higher presence of tourists increase both the perception of congestion and the consideration of the benefits that tourism bring for the transportation system, with a higher probability for more educated people and people working in the tourism sector to recognize this double effect of tourism. People with a higher perception of traffic congestion have stronger preferences towards public transport and shuttle alternatives in the proposed choice tasks. Positive attitude towards a more sustainable mobility could be broadcasted also to other people by a marketing campaign stressing on the externalities of traffic congestion or an educational campaign, as an example by slogan on advertising board in the surroundings of the valleys or reminders on parking tickets explaining that the actual choice is not a sustainable one and if everybody chose to reach the valley by car, the travel time would increase by far. The role of people's attitude in the explanation of final choices is an important evidence that authorities and tourism practitioners need to recognize in order to maintain a sustainable level of development of the destinations. These have to be proactive in managing the situation before that a sense of frustration grows and leads to more extreme attitudes of repulsion towards external visitors and the tourism industry. To conclude, it is necessary to report some limitations of this study and suggestions for future research. The absence of official statistics regarding people traveling to the valleys analysed does not allow to state whether the sample is representative or not. Thus, some outcome such as the parameters and the estimated market shares might suffer of distortions from the real ones. Concerning the data of the questionnaire, this research shows that there is an unobservable latent variable, which shows statistically significant impact on final choices. This is an important evidence for the definition of future research: the impact of latent variables might be useful in order

to understand better how people make choices. A careful revision of the literature would allow the identification of other attitudes that would give a more accurate description of their behaviour and consequently the development of a more efficient strategy for destinations aiming at developing a more sustainable transportation system. As an example, latent variables could be used to understand why the e-bike has a lower cost elasticity or differences in perception of travel time for both residents and tourists. Results of the research show that they have different time sensitivity and this might be due to the differences in the utility they attach to travel time, which might be considered as a cost for those who want to reach the point of interest quickly while as a resource for those who want to enjoy the trip.

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Chapter 2

What is the importance of children's preferences on family leisure activity choices? Exploring impact heterogeneity through parents' permissiveness.

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Abstract

In this paper, we investigate the role of children's preferences on parents' leisure-related decisions applying discrete choice modelling on stated preferences data. In our specific framework, we consider children as decision influencers through their level of satisfaction (expressed by emoticons) for different leisure alternatives, while the parents act as decision makers. In order to explore a source of heterogeneity in the impact of children's preferences on parents' choices, we focus our attention on a permissive parental attitude, hypothesizing that children's positive and negative feelings towards leisure activities have different impacts on the utility of the decision maker and that this impact is also function of parental attitude. An Integrated Choice and Latent Variable model is presented in order to take into account the heterogeneity of parents' level of tolerance to children's negative responses.

Keywords:

Discrete choice modelling, SP experiments, tourism activities, family tourism, children's preferences, group decision-making.

2.1 Introduction

For some tourist destinations, the role of family tourism and the demand it generates assumes a crucial importance in the definition of leisure activities and marketing projects. In fact, destinations that consider the family as a fundamental generator of tourism demand, spend their organizational and marketing efforts in order to create and promote an offer of leisure activities aimed at such a market segment (Carr, 2011; Fodness, 1992). In this respect, attention is paid to the role of young children in the family unit. Modern tourism literature highlights how children represent one of the main influences on family leisure choices considering the relevance of their role in family decisions (Carr, 2006; Carr, 2011; Nanda, Hu & Bay, 2006; Thornton, Shaw, & Williams, 1997). Children's satisfaction or dissatisfaction in leisure activities generate contrasting feelings on parents and hence they will take decisions based on the outcome on children's sentiments. Notwithstanding the relevance of kids' influence and parents' willingness to accommodate their preferences, the impact of children's feelings related to leisure alternatives on parents' decisions may vary drastically with a series of factors. For example, the influence of kids may be mediated by the weight that parents assign to their opinions or interests. At one extreme there are parents totally devoted to fulfil children desires and at the other there are parents completely uninterested in their kids' wishes. Furthermore, parenting style determines the parents' attitudes towards children's negative reactions when they are refused something or are not allowed to do something they want or, on the opposite, parents' eagerness to fulfil kids' whims. In addition to the role assumed by children, in considering leisure activities involving the entire family, one aspect that cannot be omitted regards the level of interest shown by the parents themselves. In this sense, one may conceptualize parents' decisions as a trade-off between individual preferences of the decision maker and children's feelings or emotions expressed towards the leisure activity itself (e.g. satisfaction, interest, approval or the lack of these). The present article aims at investigating the role of children's preferences on parents' leisure-related decisions. In our specific framework, we do not assess a direct interaction between different decision-makers (children and parents); rather, we consider the children as decision-influencers (through their levels of satisfaction for the different choice alternatives) while the parents act as decision-makers. Despite the presence and role of children is gaining attention in tourism literature, the number of quantitative studies assessing the interaction between children emotions and parental choices is still very limited (Poria & Timothy, 2014). To fill this gap, we propose a theoretical framework supported by an empirical investigation aimed at relating children's preferences and parenting style to choices of leisure activities, a type of decision in which children's involvement is high. The importance of assessing the effect of parents' attitudes in the evaluation of kids' satisfaction is crucial when considering the specific framework of family leisure activities. In fact, these represent a moment of joy and relaxation aimed at creating good memories and strengthening family relationships (Schänzel & Yeoman, 2015), and

children's feelings affect the experience of the whole family. Children's importance may vary within families, so the study takes into consideration a possible source of heterogeneity coming from the degree of permissiveness[17], which we consider in this context as the most interesting of the parenting styles proposed by Baumrind (1968). In fact, permissive parents consider themselves as a resource for children and tend to glorify with their actions children's egoistic desires (Baumrind, 1968, 1978). Permissive parents act in order to fulfil children's requests and this makes them potentially the most sensitive segment to children's requests. In this specific setting, in which the choice of a leisure activity is at the center of investigation, involvement of children is high, making of particular interest the consideration of parents' degree of permissiveness and its influence on decision making process. We adopt data derived from a stated preferences (SP) experiment and apply discrete choice modelling (Crouch & Louviere, 2000; Train, 2003) in order to test two hypothesis concerning the impact that children satisfaction has on parental decisions and how their heterogeneity can be explained by parental attitude. In order to integrate parental attitudes into the choice model, we propose an Integrated Choice and Latent Variable model (ICLV), also known as Hybrid Choice model (Ben-Akiva et al., 2002; Fleischer et al, 2012; Sarman et al, 2016; Walker, 2001). Data was collected in Ticino, the Italian-speaking Canton of Switzerland, and a tourist region counting more than 2 million hotel overnights every year. A total number of 172 families, both tourists and residents, were interviewed. The remainder of the article is structured as follows. Section 2 reviews the relevant literature concerning the role of children on modern family decision-making, the relationship between children and parents and the concept of parenting style. Section 3 presents the research method, including hypothesis formulation, model framework and data collection strategy. Section 4 presents data analysis while section 5 include a discussion and conclusions, with some guidelines for future research.

2.2 Literature review

The role of family tourism in the travel industry covers a role of utmost importance, reaching almost 30% of the total travel demand worldwide (Schänzel, Yeoman & Backer, 2012) and in Switzerland (Bieger & Laesser, 2002), a size that is estimated to grow more than other segments in the near future (Schanzel et al, 2012). There exists a large amount of literature dedicated to family leisure and family holidays sustaining that leisure experiences provide the context in which most individuals establish and develop relationships with each other (Siegenthaler and O'dell, 2000). Not surprisingly, a large majority of leisure researchers agree on the positive impact of leisure time spent together on the family cohesion. Even if families have less time to spend together, tourism is seen as facilitator of quality time. Works like the one of Orthner and Mancini (1990) or the relatively more recent one by Zabriskie and McCormic (2003) demonstrate that combining everyday homebased family activities

[17] Throughout the dissertation we refer to degree of permissiveness or indulgent parental attitude.

with less common, away from home, family leisure activities has a positive influence in the levels of family functioning. Furthermore, several scholars (Mannell and Kleiber, 1997; Saw and Dawson, 2001) highlighted that children's development of values and lifelong skills is positively related with the amount of family leisure time. However, it is important to mention that there are also several research evidences showing that family leisure activities may also be, in some situations, a negative experience for one or more of the family members. Harrington (2001), for example, describes the pressure that parents feel to put their children first at the expense of their own preferences. For parents, family leisure activities involve work as well as fun and Shaw's (2010) study highlights how, in some cases, these moments are seen as an obligatory aspect of parental responsibility. Furthermore, according to Carr (2011), the romanticized version of the "happy family" on holiday is not realistic because of the differences between children' and parents' needs and desires. Actually, the author explains that being in closer contact for longer periods than the usual routine may increase the probability of conflicts. In such a context, researchers have begun investigating the family dynamics and in particular they have recognized the influence that children have on decision making process of the family unit, especially when the decisions are in the framework of travel and vacation (Jenkins, 1979; Martensen and Gronholdt, 2008). This said, several studies posited that the impact that children have on family choices is not the same across all tourism related decisions and across families, hence representing an important source of heterogeneity in family behaviour. As an example, their influence is higher in the choice of the leisure activity or in the choice of the restaurant, while for other decisions, such as the type of accommodation or the mean of transport to reach the destination, decisions are relegated to parents (Jenkins, 1978; Jenkins, 1979; Xu, 2001; Hsu et al., 2002; Litvin et al., 2004; Wang et al., 2004; Bronner and De Hoog, 2008; Kim et al., 2010). In choice situations in which children feel emotionally involved, their claims to be considered for the final choice are stronger (Martensen and Gronholdt, 2008) and the difficulties to describe the heuristics leading to the final choice increase notably because further elements of complexity are added to the decision making process. In fact, family is a complex system and the decision making process leading to a final common choice differs on the basis of various elements. In particular, family members might share the same preferences and choose with general consensus, or different subunits with distinct preferences may be observed (Olson, Cromwell and Klein, 1975), resulting in different decision making processes. These subunits can be of various nature, they can be made up of only parents, only children or a mix between a parent and one or more children. In some situations, children's influence could become determinant as a consequence of imposing their preferences or giving more power to a parent by creating a majority (Filiatrault & Ritchie, 1980). In the case of young children, the difference in preferences between parents and kids tend to be bigger, often leading to situations in which children's and parents' desires collide. In these situations, the final choice is a balance of children and parents' preferences, with parents involved in

a situation of trade-off between their preferences and children's requests. In fact, despite children's preferences in certain choice situations are particularly relevant, in general they are not considered as real decision makers but rather as decision influencers (Thornton et al., 1997). Thus, parents are the final decision makers and the influence their kids exerts on the final choice may depend on the type of choice situation and their influential power. In particular, their influential power might be affected by different factors such as the education they received, their past experiences or their age. Undoubtedly children's age is one of the principal determinant of their influential power, in fact they are totally dependent of their parents' will when they born (Bao, Fern & Sheng, 2007) and by growing up they start socializing with decision making process. In addition to age, there is also a strong influence of other aspects in determining it, such as interactions with the environment and the influence of peers, teachers, mass media but most of all the education received by parents (Ward, 1974) and the power they let exercise to their children. In general, there is an inverse relation between parent's and children's power, meaning that less parental power leads to more children's influential power (Bao, Fern & Sheng, 2007) and vice versa. In order to better understand this relationship and the heterogeneity between different families, a possible deepening can be obtained by the study of several ways of education, also known as parenting style (Baumrind, 1968, 1971, 1978, 1991).

Parenting style

In the literature the most popular description of parenting style concerns the combination of two dimension: responsiveness and demandingness (Baumrind, 1968, 1971, 1978). Responsiveness is the affective warmth that parents exert in educating children. Parents with a high level of responsiveness tend to encourage, support and involve children for the decisions. The demandingness dimension reflects parents' propensity to control children, supervise their choices, give discipline and confront them when they disobey. The high or low level for each dimension allows to identify four different parenting styles with the combination of the two dimensions (Figure 3).

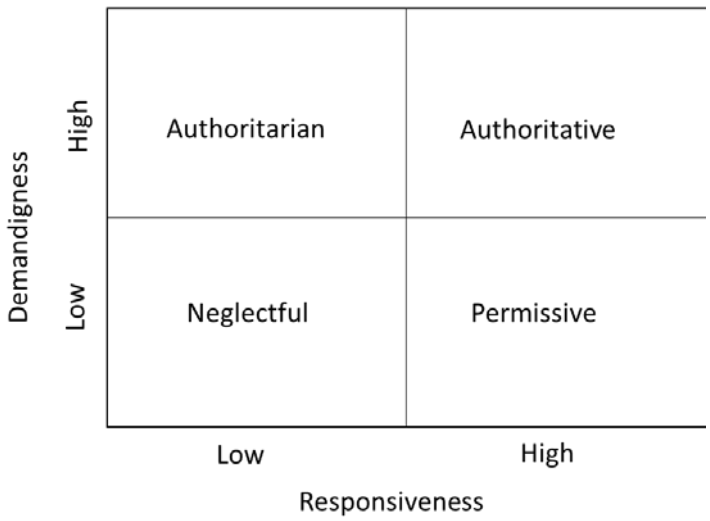

Figure 3 Parenting styles – adapted by the author on Baumrind's theory

Parents with high level of both demandingness and responsiveness are called *authoritative*. They control their children expecting discipline but at the same time are supportive, warm and not restrictive. A high level of demandingness but low level of responsiveness identifies *authoritarian* parents, who limit their children's autonomy by strictly controlling them, discourage the dialogue and punish disobediences. Parents with a high level of responsiveness and low level of demandingness are called *permissive* (or indulgent). They support their children, show emotional warmth and have a child-centered orientation when taking decisions, they're not demanding and show a lack of parental control. Parents who are neither responsive nor demanding are called *neglectful*, they do not monitor their children and do not encourage their decisions. They consider that no parenting attention is needed for children's education, a no-supervising behavior that often falls into a general lack of involvement in children's decisions and behavior. Thus, different parenting styles influence in distinct ways the decision making process and represent an important source of heterogeneity in the propensity to consider children's preferences for the final choice. Parenting style can be context dependent, so during holiday parents might have a different approach with respect of everyday life. As an example, authoritative parents in everyday life perceive less guidance duties during holidays while permissive and authoritarian parents do not show significant differences (Ram, Uriely, & Malach-Pines, 2014). Due to the characteristics of permissive parents and the stability of such a parenting style during everyday life or holiday, we consider a source of heterogeneity coming from parent's degree of permissiveness[18].

[18] In the only quantitative study that investigate the differences in parenting style between holiday and everyday life (Ram, Uriely, & Malach-Pines, 2014), results indicate that permissive parents do not change their behaviour during holiday. Built on the results of Ram et al, our approach focus on permissive parents as identified in their everyday life. Given that there is no way to categorize deterministically parents as being permissive or not,

2.3 Research method

Given the above mentioned theoretical framework, we aim at empirically testing if children's satisfaction is relevant in the choice of leisure activities when permissive parents know the stated emotions of children towards activities. In particular, we pose the following research hypothesis:

H1: Children's satisfaction has a non-linear effect on parental choices, hence different levels of satisfaction related to a specific leisure activity lead to different marginal utilities for the parents.

We posit that parents evaluate differently the level of satisfaction shown by children when taking it into account in their decision-making process. This means that, when moving from low to high levels of satisfaction, the individual's sensitivity - and hence marginal utility - toward the attribute varies in magnitude. In this sense, a non-linear contribution of children satisfaction to individual utility is formalized in the next section.

H2: Permissive parental attitude influences parents' perception of children satisfaction when taking leisure-related decisions; more specifically, permissive parents show greater sensitivity towards children satisfaction.

We posit that permissive parental attitude is an important determinant of leisure activity choice and we hypothesize that the role of attitude is made explicit when evaluating children satisfaction. In this sense, a latent variable capturing parental attitude is interacted with the choice attribute representing children's satisfaction, as formalized in the next section.

Survey and choice experiment

A stated preference (SP) experiment was adopted to test the relevance that children's preferences have on leisure activity choices. In the experiment, both parents and children's preferences have been collected. Children's preferences, measured as their satisfaction in undertaking some activities, is an aspect that parents might consider for their choice, but is not considered an indicator for the final choice according to Thornton et al. (1997), who consider parents as the final decision makers. In particular, in the questionnaire, parents had to state their favorite activity to participate in with their children, by considering different features of the activities, including price, distance and children's stated satisfaction towards that possible choice[19]. The choice set was limited to three alternatives: a

instead of using a categorical variable, we measure through a continuous latent variable their degree of permissiveness. In this way we are able to estimate the relationship between an increase in the degree of permissiveness and the importance that children's preferences have on parents' choices.

[19] The influence that children have on the decisional process and the final choice does not depend only on the parenting style, but also on their communications skills, which can be categorized in two different strategies: unilateral or bilateral (Falbo & Peplau, 1980). Unilateral strategies consist in one direction communication, so in the example of a family, children might communicate their preferences to parents by playing on emotions or making requests. Instead, bilateral strategies, are more active and include bargaining, persuasion or reasoning

boat trip around the lake, a funicular ride for the mountains and the entrance to a lido with access to lake and a swimming-pool. A conservative number of alternatives in the choice set has been decided in order to reduce the effort required to children, with the three selected alternatives corresponding to the most frequently chosen by tourists, according to the analysis of a touristic card. Every alternative shown to parents was characterized by three different attributes: the cost of the activity (expressed in Swiss Francs), the distance of the activity from the point of interview (expressed in travel time), and children's stated satisfaction towards the choice of that specific activity (expressed with a numerical scale from minus five, when children totally dislike the alternative, to plus five, when children totally like the alternative). In SP experiments, the state of art is to show a series of choice tasks to each respondent, with small changes in attribute's levels, in order to estimate respondents' sensitivities for every single attribute characterizing the alternative. Thus, six different choice tasks have been shown with a tablet to each respondent, with a change in attributes' levels in every choice task. In order to guarantee realistic levels of the attributes, costs and distances have been pivoted to the real ones, with a random variation in the levels applied in every choice task for estimation purposes. The inclusion of children's preferences in the experiment has been obtained with a two-step procedure. In a first step, children's preferences have been collected through a paper and pencil questionnaire. In this phase, a simplified approach based on pictures and emoticons has been applied in order to make children feel more comfortable in evaluating the activities. In the second step, children's preferences have been converted into a numerical eleven-point scale, ranging from minus five (children strongly dislike the activity) to five (children strongly like the activity), as it is possible to see in Appendix. The scale ended up in forming the "children's satisfaction" attribute in the discrete choice experiment. An example of choice task is depicted in Table 8.

(Falbo, 1977, Falbo & Peplau, 1980, Bao, Fern & Sheng, 2007). Unilateral strategies are more commonly used by the strongest member of a group, while bilateral ones are more often used by the lower power members, who do not have the authority to use unilateral ones (Falbo & Peplau, 1980). Within the family, children are supposed to be the low power member, and that should induce them to use more often a bilateral strategy, though, this kind of communication is particularly complex for young children in the majority of the cases. For these reasons, kids tend to use unilateral strategies more often when they are young and a change in their communication strategy only happens when they grow up, after the realization that a bilateral strategy could be more effective (Bao, Fern & Sheng, 2007). Aware of this, in order to have a common structure of decision-making process which allows to test our hypotheses and to include young children in the experiment, we consider a unilateral type of interaction. This means that in the experiment, children express their preferences and parents choose the activity to undertake after receiving information of children's preferences, without other possibility of interaction.

	Funicolar Cardada	Boat Trip Lago Maggiore	Lido di Locarno
Distance	40 min	30 min	10 min
Cost	120 CHF	100 CHF	76 CHF
Children's satisfaction	5	-3	0
Choice	0	0	0

Table 8 Example of choice task

Sample

The final sample is composed of 172 families, including residents (40%) and tourists (60%). The average age of the respondents is between 39 and 40 years old, while the average income is 78'000 Swiss francs. The 70% of families has two or more children and the 65% of children that participated in the questionnaire are younger than 8 years old. The majority of the sample has a Swiss nationality, with Italians and Germans being the other most represented nationalities. Given the presence of daily tourists and the absence of official statistics for this category, the representativeness of the sample is limited only to some characteristics, such as the nationality of tourists who stay overnight and the size of Swiss families (see Table 9).

Variables	Levels	Frequency	percentage
Age (Respondent)	< 30	7	4,1%
avg=39.43	31 to 40	82	47,7%
sd=8.26	41 to 50	74	43,0%
	> 50	5	2,9%
Income (’000 CHF)	< 30	11	6,4%
avg=78’409	30-50	33	19,2%
sd=36’905	50-70	25	14,5%
	70-100	41	23,8%
	100-130	30	17,4%
	> 130	14	8,1%
Number of children	1	53	30,8%
	2	90	52,3%
	3 or more	29	16,9%
Infant (< 4 years old)[i]	Yes	45	26,2%
	No	127	73,8%
Average age of respondent kids	Childhood (4-7)	112	65,1%
	Juvenility (8-11)	45	26,1%
	Adolescence (> 11)	15	8,8%
Tourist/Resident	Tourists	103	59,9%
	Residents	69	40,1%
Nationality	Swiss	98	57,1%
	Italian	35	20,3%
	German	14	8,1%
	Other	25	14,5%

Table 9 Sample statistics

Model formalization

An ICLV model is adopted to take into account for parental attitude and its interaction with children preferences. In a classical discrete choice model (McFadden, 1973; Train, 2003), $U_{i,j,t}$ represents the utility that the individual *i* derives from choosing the alternative *j* at time *t*. In our case, the choice alternatives are three distinct leisure activities: a ride on a cable car, a boat trip on the lake and the access to a lido. Individual utility (that the individual is supposed to maximize) is function of choice attributes and individual-specific variables. In the following formalization of the utility, only the variables which turned out to be significant are report, with non-significant variables being discussed in chapter 2.4.

(11) $$U_{i,j,t} = ASC_j + \beta_{COST} * COST_{j,t} + \beta_{DISTANCE} * \text{DISTANCE}_{j,t} + \beta_{LOCATION} * LOCATION_{j,t} + \beta_{SATISFACTION} * SATISFACTION_{i,j,t} + \beta_{TOURIST} * TOURIST_i + \beta_{MEMBERS} * MEMBERS_i + \beta_{EXPERIENCE} * EXPERIENCE_{i,j} + \epsilon_{i,j,t}$$

COST, DISTANCE, LOCATION and SATISFACTION are choice attributes presented in the experimental choice scenarios while TOURIST, MEMBERS and EXPERIENCE are individual-specific determinants having a statistical impact on the choice. $\epsilon_{i,j,t}$ is a classical Gumbel-distributed error term with mean equal to 0 and scale parameter equal to 1, hence resulting in a multinomial logit model. The dependent variables appearing in our choice model have the following characteristics:

COST represents the cost of the alternative considering the total amount for the entire family (price levels for each alternative are based on the number of family members);

DISTANCE is the travel time to reach the activity location from the point where the observation was collected, hence travel time levels are different for sets of observations depending on where the survey was taken;

LOCATION is the specific destination where the activity is located. The destination is specified as part of the activity label but was not captured in the ASC, rather a dummy variable was used to distinguish between two macro-destinations, Sopraceneri and Sottoceneri which represent the northern and southern part of the Ticino region separated by Mount Ceneri;

SATISFACTION is the level of happiness shown by children for each activity. In the design of the choice experiment, the levels of this attribute were tailored to previously assessed children preferences for each activity and then transformed in a numerical scale from -5 to 5;

TOURIST is a dummy variable indicating whether the respondent is a tourist (as opposed to resident);

MEMBERS relates to the number of family members carrying out the activity;

EXPERIENCE is a dummy variable indicating whether the specific activity was already undertaken by the respondent.

The levels for the SATISFACTION attribute range from -5 to +5 (with 0 being the midpoint). In order to test the hypothesis of a non-linear effect of children satisfaction on parental choices (1st research hypothesis), we introduced a piecewise specification for this attribute in the model. In particular, we split the attribute at the median level of children satisfaction in every choice task, corresponding to the level of the activity ranked as the second best by children. In this way different parameters can be assigned to higher or lower satisfaction levels, hence specifying a non-linearity in parameters in the

utility function. It is important to notice that with a piecewise transformation the continuity of the attribute is not sacrificed as in the case of a categorization of the attribute's levels, hence parameter interpretation refers to unitary increases of the variable. More specifically:

(12) $\beta_{SATISFACTION} * SATISF_{i,j,t} = \beta_{NEG_{SATISF.}} * NEG\_SATISF_{i,j,t} + \beta_{POS\_SATISF} * POS\_SATISF_{i,j,t}$

where:

(13) $NEG\_SATISFACTION_{i,j,t} = \begin{cases} SATISFACTION_{i,j,t} \ if \ SATISFACTION_{i,j,t} \leq median(\ SATISF_{i,t}) \\ median(\ SATISFACTION_{i,t}) \ otherwise \end{cases}$

(14) $POS\_SATISFACTION_{i,j,t} = \begin{cases} 0 \ if \ SATISFACTION_{i,j,t} \leq median(\ SATISFACTION_{i,t}) \\ SATISFACTION_{i,j,t} - \ median\big(\ SATISFACTION_{i,t}\big) \ otherwise \end{cases}$

In the ICLV specification of the model (Walker, 2001), an unobservable construct is added to choice attributes and socio-demographic characteristics as determinant of individual utility and it is hypothesized to bear a significant role in the decisions-making process. In our specific case, the latent construct refers to the attitude shown by parents when children complain (indulgent parental attitude). Typically, in ICLV models the latent construct is expressed as a function of socio-demographic covariates and, in this sense, one hypothesizes that socio-demographic traits have an indirect role in determining choice behavior via the attitudinal construct. In our case, the latent trait structural equation is specified by the following significant variables:

(15) $INDULGENT\_PARENTAL\_ATTITUDE_i = \gamma_{AGE\_CHILDREN} * AGE\_CHILDREN_i + \gamma_{N\_CHILDREN} * N\_CHILDREN_i + \gamma_{NATIONALITY} * NATIONALITY_i + \omega_i$

where:

- AGE_CHILDREN is the average age of children;
- N_CHILDREN is the number of children;
- NATIONALITY stands for the nationality of respondents;
- ω_i is a standard normally distributed error term.

In order to assure model identification, the latent construct has to be related to observed variables which take the form of individual psychographic indicators collected with the survey. As usual in this framework, for each indicator we specify the respective measurement equation:

(16) $I_{r,i} = \lambda_r * INDULGENT\_PARENTAL\_ATTITUDE_i + \sigma_r * \theta_i$

where $I_{r,i}$ is *r*-th indicator (*r*=1,2,3) for individual *i*, λ_r is the coefficient associated to the latent variable, θ_i is a standard normally distributed error term and σ_r a standard deviation[20]. The statements used as indicators for the latent variable are expressed as 5-point Likert scales with 1 being "totally disagree" and 5 being "totally agree"[21] (descriptive statistics are reported in table 10):

$I_{1,i}$= *"In order to make my children stop complaining I'm willing to do the activity they want"*

$I_{2,i}$= *"In order to make my children stop complaining I'm willing to eat where they want (also if there's no really healthy food)"*

$I_{3,i}$= *"In order to make my children stop complaining I'm willing to buy them games or gift"*

Item	mean	st. dev
In order to make my children stop complaining I'm willing to do the activity they want	2,83	1,22
In order to make my children stop complaining I'm willing to eat where they want (also if there's no really healthy food)	2,07	1,08
In order to make my children stop complaining I'm willing to buy them games or gift	1,61	0,88

Table 10 Items' statistics

In order to test the hypothesis that parental attitudes influence parents' importance attached to children's satisfaction when taking leisure-related decisions (2nd research hypothesis), we consider an interaction between the latent variable and the attribute SATISFACTION. Two different parameters are specified in the interaction term, one related to the negative levels of satisfaction and one related to the positive levels: this is to evaluate whether the non-linearity in marginal utility expressed in the choice model is enhanced or moderate by parental attitude. In this sense, in the utility function of the ICLV model the interaction term is expressed as follows:

(17) $$\beta_{SATISFACTION} * SATISFACTION_{i,j,t} * IPA_i =$$

$$[(\tau_{PERMISSIVE\_NEG} * IPA_i + \beta_{NEG\_SATISFACTION}) * NEG\_SATISFACTION_{i,j,t}\ ]$$

$$+ [(\tau_{PERMISSIVE\_POS} * IPA_i + \beta_{POS\_SATISFACTION}) * POS\_SATISFACTION_{i,j,t}]$$

[20] In the estimation process, the sample average for each indicator was subtracted from the individual value of the indicator. In this way one does not have to specify the constant terms in the measurement equations.

[21] A note must be put forward in order to justify the choice of a normal distribution as a representation of 5 point-distributed variables: the correct approach implies the definition of an ordered regression to treat these items (Daly et al, 2012) and our initial model specification was in this sense. After several attempts, we decided to turn to a linear solution given the impossibility to reach convergence in the estimation phase. This said, adopting a normal distribution as an approximation is commonly reported in literature (Glerum et al, 2012; Hess and Beharry-Borg, 2012) and we are confident that the direction and the sense of results obtained with our specification remain valid.

where IPA is the parental attitude and τ captures the interactions between the latent variable and the piecewise-modified attribute. To summarize, the estimated ICLV model is the following:

$$(18)\quad U_{i,j,t} = ASC_j + \beta_{COST} * COST_{j,t} + \beta_{DISTANCE} * \mathrm{DISTANCE}_{j,t} + \beta_{LOCATION} * LOCATION_{j,t}$$
$$+ (\tau_{PERMISSIVE\_NEG} * IPA_i + \beta_{NEG\_SATISFACTION}) * NEG\_SATISFACTION_{i,j,t}$$
$$+ (\tau_{PERMISSIVE\_POS} * IPA_i + \beta_{POS\_SATISFACTION}) * POS\_SATISFACTION_{i,j,t}$$
$$+ \beta_{TOURIST} * TOURIST_i + \beta_{MEMBERS} * MEMBERS_i + \beta_{EXPERIENCE} * EXP_{i,j} + \epsilon_{i,j,t}$$

A scheme of the proposed model is presented in Figure 4.

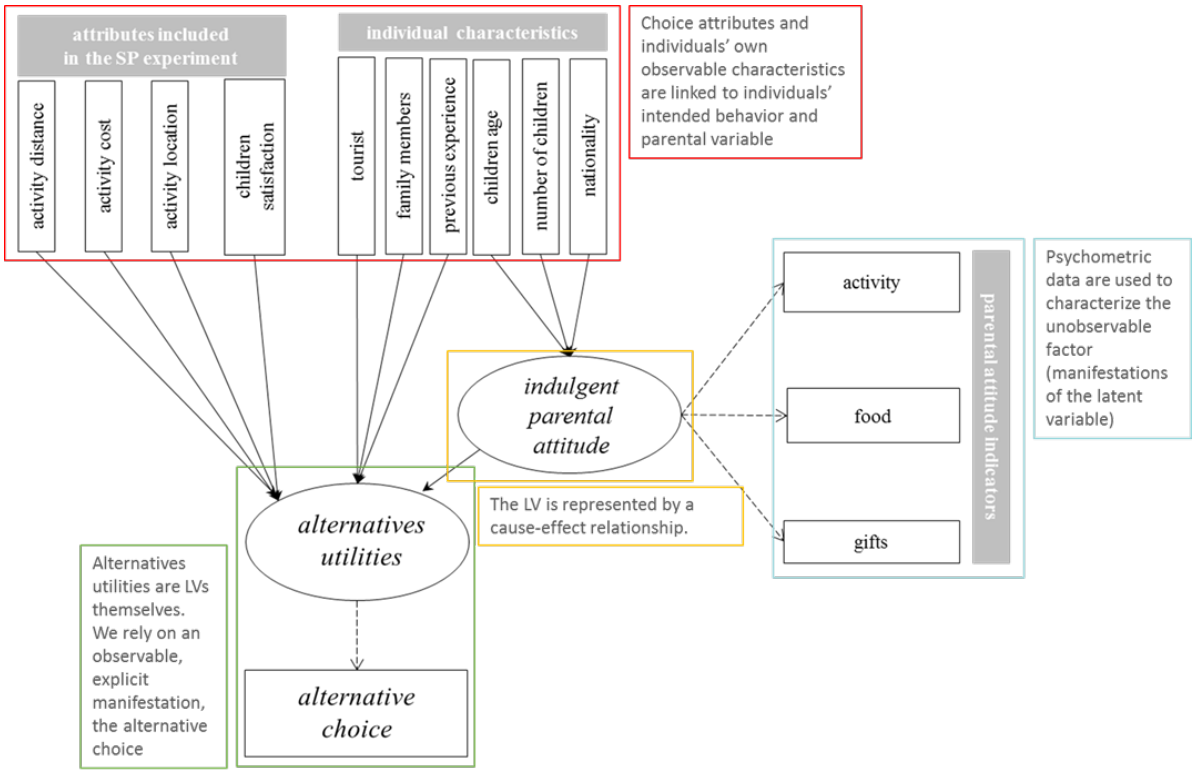

Figure 4 Model's scheme

2.4 Results

In this section we present the results of two models, a base one in which no latent variable is specified and the hybrid version including the attitudinal construct. Both models were estimated in R, the ICLV model estimation was performed with Maximum Simulated Likelihood (Train, 2003) adopting 3000 MLHS draws for the latent variable specification. It is important to notice that the final model formulation presented in the previous chapter derives from a backward induction procedure after which all the non-statistically significant variables were excluded.

Model estimates	model 1 MNL			model 2 ICLV		
	est	rob.se	t-ratio	est	rob.se	t-ratio
Choice model						
ASC_boat trip	2,739	0,789	3,47	2,858	0,777	3,68
ASC_lido	2,891	0,682	4,24	2,797	0,706	6,96
ASC_funicolar (reference)	-	-	-	-	-	-
β_cost	-0,015	0,003	-4,93	-0,016	0,003	-4,93
β_distance	-0,011	0,004	-3,03	-0,011	0,004	-3,04
β_location_Sopraceneri	0,457	0,186	2,46	0,476	0,188	2,53
β_location_Sottoceneri_boat trip	0,371	0,220	1,69	0,359	0,220	1,63
β_neg_satisfaction	0,258	0,049	5,21	0,412	0,134	3,07
β_pos_satisfaction	0,178	0,043	4,17	0,296	0,104	2,84
β_tourist_boat trip	0,507	0,265	1,92	0,540	0,267	2,02
β_members_boat trip	-0,741	0,195	-3,80	-0,778	0,191	-4,07
β_members_lido	-0,631	0,171	-3,69	-0,610	0,176	-3,46
β_experience	0,469	0,219	2,14	0,399	0,232	1,72
τ_permissive				0,094	0,054	1,75
Measurement equations						
λ_1				0,114	0,060	1,90
σ_1				1,178	0,048	24,66
λ_2				0,152	0,059	2,57
σ_2				0,995	0,057	17,61
λ_3				0,266	0,110	2,46
σ_3				0,533	0,016	34,36
Structural equation						
γ_agechildren				-0,052	0,017	-3,15
γ_nationality (swiss)				-0,562	0,189	-2,97
γ_nchildren				-0,267	0,194	-1,38
Model statistics						
Number of decision-makers		172			172	
Number of choices		1032			1032	
Number of parameters		12			22	
Number of parameters (choice)		12			13	
LL (final)		-947,73			-6862,31	
LL (choice)		-947,73			-931,50	
AIC (final)		1919,45			13768,61	
BIC (final)		1977,03			13874,17	
AIC (choice)		1919,45			1889,00	
BIC (choice)		1977,03			1951,38	

Table 11 Estimation results

Classical discrete choice model

The first results concern a simple multinomial logit model with no attitudinal variables. Alternative specific constants were estimated for the boat trip (2.739) and the lido (2.891) activities, both being positive and significant hence indicating an individual preference for these activities instead of the reference alternative, the funicular ride. Concerning the attributes related to cost and distance, parameter estimates show intuitive values concerning their sign: cost (-0.015) and travel time (-0.011) coefficients are both negative implying decreasing utility as the levels increase.

Children satisfaction was specified in a non-linear manner with a piecewise-linear specification. Children faced three different activities and they had to state the best and the worst one, allowing us

to have a full rank of their preferences. Then, through the use of emoticons, children rated the three alternatives. What parents could see in the experiment, as depicted in Table 8, is the corresponding preference of their children toward the alternatives, expressed in a numerical scale. What has been estimated is the impact of the increase in children's preferences, expressed in the numerical way, on parent's utility. Assuming a non-linear impact of children's preferences on parent's utility, a piecewise-linear specification of the attribute has been estimated, with two parameters identifying two different marginal impacts depending on the level of children's satisfaction. The estimated parameters are both positive and significant meaning that the greater the satisfaction kids retrieve from an activity, the higher the probability parents will choose that alternative. Translated in terms of utility, parameter estimates are indicator of a greater marginal utility when children "change" from very unhappy to the median level of satisfaction of the three purposed activity if compared to the situation in which children "change" from the median level of satisfaction to very happy. In order to find the level of satisfaction that identifies two different slopes of the utility increase, we tested two different intermediate point: the median level (corresponding to the level shown in the activity ranked as second best by the children) and the level "0" in the numerical scale shown to parents. While the level "0" does not seem to have an impact in changing parents' utility, the median level seems to be a reference point for parents. In fact, the sensitivity of parents to children's satisfaction, corresponding the marginal utility gain, is different for the levels below or above the median level. The different values of the parameter of the piecewise specification seem to indicate that, taking as a reference the median level of preference, the marginal utility gain in choosing the most favorite instead of the intermediate one (0.178) is lower than the utility loss in choosing the least favorite one instead of the intermediate (0.258), although with a p-value of 0.129 of being the same. The difference between the two parameters needs to be better analyzed and the inclusion of a latent variable is useful with this regard. Thus, the alternative representing the second best choice for children can be considered, ceteris paribus, as a quite satisfactory choice, and a hypothetic change from this alternative could give more disadvantages than advantage. Parents show a higher sensitivity for losses rather than for gains, in this sense, this can be associated to Kahneman and Tversky's prospect theory-like behaviour (Kahneman & Tversky, 1979). It seems that parents' priorities while facing choice situation is the avoidance of situations in which children manifest strong unhappiness, but as long as children are not unhappy, satisfaction-associated increase in parents' utility is far less accentuated. From a behavioral perspective, results are very interesting considering the choice context. When three option are available, and parents choose the alternative making trade-offs between different attributes, they consider advantages and disadvantages relative to the level of the attributes shown in the choice task. By considering a linear effect of children's preferences on choices we could miss an important point, that the increase in utility is much higher until the median level is reached. That means that once the

median level of satisfaction is reached, parents have almost reached their maximum level of satisfaction and perceive that a worse experience rather than the intermediate one could damage them more than the utility they could gain in choosing a better one. It seems that when parents exactly know their children's ranking of a limited set of activities, their first priority is to avoid the worst situation for children. Considering other socio-demographics variable, one attempt has been made in order to get possible different impact of children's preferences for family having one or more children, but not significant differences have been found. Remaining parameters refers to a change in the alternative specific constants referring to a change in the location of the activity and the place of interview, the origin of the families, meaning if they are resident or tourists, previous experiences and the size of the family. Concerning the location of the activity (we distinguished between Sopraceneri and Sottoceneri, a geographical distinction typically adopted to separate the northern and southern regions in Ticino) which are interacted with the location where the data was collected (again, Sopraceneri and Sottoceneri). Both parameters are positive and significant meaning that respondents prefer to undertake the activity in the region in which they are located rather than moving from one region to the other. Tourists tend to prefer a boat trip (0.507) rather than lido or cable car excursion and the positive parameter of the experience variable (0.469), capturing whether an individual already undertook an activity (among the alternative ones); implies that past experience enhances the probability of performing the leisure activity. Finally, two parameters related to the number of family members are estimated, one for the boat trip (-0.741) activity and one for access to lido (-0.631). Both are negative and significant meaning that the higher the number of individual in a family (generally given by the number of children) the lower the probability of undertaking such activities if compared to the funicular trip. To conclude the analysis of the choice model, we report that an attempt was made to include family income as explanatory variable, both in a linear and non-linear fashion, but parameter estimates all turned out being non-significant.

ICLV model

The interaction between the satisfaction attribute and the latent variable identifying permissive parents is positive and significant (est. = 0.094, p.value = 0.078)[22]. This implies that parents who are prone to satisfy children's complaints for the sake of quiet living tend to give even more weight to the satisfaction of their kids in the choice of leisure activities. Furthermore, the ICLV model allows to disentangle the effect of a baseline children's preferences on parents' choices and the effect of the latent variable. The two different parameters of the piecewise specification seen in the classic discrete choice model, referring to the lower or higher children's preferences relative to the intermediate level,

[22] Different sensitivities have been tested for levels of children's satisfaction below or above the median, resulting with no statistical differences, thus for parameters' parsimony only one parameter is reported in the final model.

have a statistically stronger difference when the psychological latent variable is considered (β_neg_satisfaction = 0. 412 , β_pos_satisfaction 0.296, H0: β_neg_satisfaction - β_pos_satisfaction = 0, p.value = 0.090). These results confirm our second hypotheses concerning the role of parental attitudes on the choice of leisure activities, parents identified as permissive, tend to give a statistically higher importance to children's preferences for their choices (Figure 7).

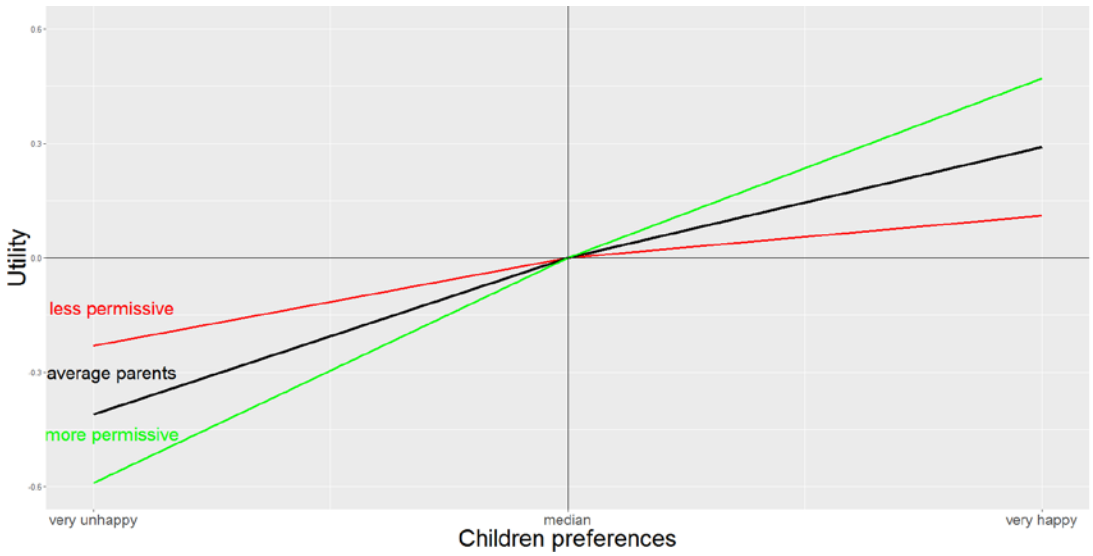

Figure 5 Children's preferences and utility

For what concerns the latent variable structural equation, only statistical significant parameters are retained after a process of variable elimination. The latent construct capturing parental attitude toward children complaints is negatively influenced by the average age of children (-0.052) meaning that the older the children the less parents are willing to surrender their requests. The results is consistent with that of previous studies that found a decline of children's influence on behavior with the increase of their age (Kelly, 1983, Thornton et al, 1997). The same goes for the number of kids (-0.267). Results of the classical discrete choice model showed that higher number of children does not affect the impact that children preferences have on the final choice, whilst it does through the latent variable. That means that parents with a higher number of children seem to be less permissive and this affect the role that children's preferences have on the final choice. Finally, the negative sign of the nationality parameter (referring to Swiss individuals) implies that Swiss parents are less permissive compared to non-Swiss respondents (-0.562). After looking at the significant parameter, few words are spent on variables with no statistical meaning. Like in the choice model, the inclusion of variables regarding income and education were investigated but no relevant estimation was obtained in the structural and choice model. Recalling instead the discussion about different degrees of permissiveness that parents might have during holidays or everyday life, we tried to verify if there is a different effect on the degree of permissiveness between resident and tourist, but no difference has

been found, in line with results of Ram et al. (2014). To conclude, we report the results for the measurement equations. All the psychographic indicators adopted are substantive in specifying the latent variable as it can be observed from the estimated loadings, all of which bear a positive sign implying that the latent variable is positively reflected by adopted indicators. Moreover, all the standard deviation parameters are significant indicating heterogeneous responses on the sample.

Willingness to pay

In discrete choice modelling it is possible to obtain willingness to pay (WTP) measures for non-monetary attributes calculating the ratio between the parameter of interest and the cost parameter. Considering the attribute for children's preferences and cost parameter, it is possible to have a rough estimates of parents' willingness to pay in order to satisfy children's preferences. As it is shown in the ICLV model, the utility that parents gain by choosing their children's preferred alternatives varies depending on the latent variable, and so does their WTP. In figure 8 it is possible to see the distribution of parents' WTP for an alternative that will make their children very happy, differentiated in WTP when the initial status for the children is being very unhappy (dotted black line) or having a neutral state (blue line). The blue line shows that on average parents are willing to pay 20 CHF to make a child happy when children are in a neutral state while if children are very unhappy, parents would be willing to pay up to 50 CHF on average to make them happy. The distributions of the two WTP depend on parents' degree of permissiveness, so that parents with a permissive level higher than the mean (which is inversely correlated with number of children and children's age), are willing to pay prices higher than the average (and vice versa).

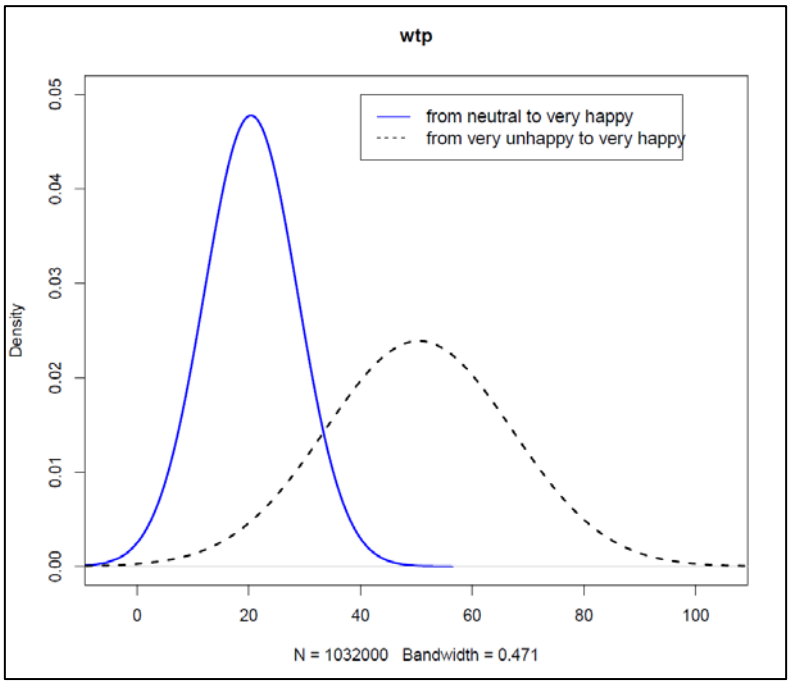

Figure 6 Parents' willingness to pay to satisfy children's preferences depending on their initial status

2.5 Discussion and conclusions

This article aimed at analyzing the influence of parental attitude on leisure-related decision making and at investigating the influence of children's feelings on family leisure choices. In particular, we tested the hypothesis that parents react in a non-linear way when their decision-making is determined by negative or positive emotions shown by their children. This means that, when parents are facing a limited set of options in which children show different levels of satisfaction, the choice of the alternative representing the median level of satisfaction for children seems to be a good compromise for parents, who are still trading off children's preferences with their own but also with time or cost constraints. Moreover, it was hypothesized that parents who are more prone to be permissive and satisfy their requests tend to give greater importance to kids' satisfaction when deciding on family leisure activities. We proposed an empirical examination based on data collected among families with young kids and presented an Integrated Latent Variable and Choice model in which the classical discrete choice framework is enriched by the inclusion of a psychological component. In the specific setting of this article, the latent construct resembled parents' willingness to satisfy children in order to stop their complaints. The psychological variable was included alongside a set of attributes characterizing the choice alternatives and some individual-specific variables. This study represents a contribution to the ongoing research on the role of children in parental decisions concerning family leisure activities. Most relevant results have shown that children's level of satisfaction bear a significant role in determining parents' decisions and this is particularly true when the decision-maker has to deal with negative emotions rather than positive ones, in which case the influence of children

is highly mitigated. At the same time, parents' preferences towards specific leisure activities are mediated by their parenting style in the sense that permissive parents take in greater consideration children's negative emotions if compared to parents showing an attitude less inclined to be accommodating towards kids' complaints. The inclusion of parental attitudes in the framework of a choice model returned interesting results that allow to draw some conclusions in terms of tourist destinations' marketing and promotion strategies. In particular, communication campaigns targeted at families should appeal to both parenting styles and children satisfaction. Marketing strategies should be aimed at promoting the role of activities in enhancing children satisfaction and, in this way, convincing the parents. This can be particularly effective when the effort is aimed at those individuals who are particularly prone to satisfy children's complaints or whims. In this sense, promotional messages should stress the importance of avoiding children dissatisfaction in order to grant tranquility and lack of stress to parents and maintain a good atmosphere in the whole family. Moreover, practitioners have to be aware that parents tend to be less permissive as children grow up and this implies that these promotional strategies are particularly focused to families with small kids. Based on the theoretical and methodological framework presented in this article, some limitations and hints for future research can be put forward. First, although our conclusions are sound, for a greater generalization and detail of results it is crucial to test the model on a different and more numerous sample of respondents. Second, in our study we limited to a parental attitude characterized by indulgence towards children complaints and future research can propose a more comprehensive model in which other parenting styles are taken into account, in order to get a more general picture regarding the way parents interact with their children and manage their emotions and reactions. Third, although it is unlikely to find parents preferring to choose activities unsatisfactory for their children, it is very likely that a phase of bargain takes place before the parents make their choices in order to balance the adult's preferences and children's desires. Our approach is based on an overall prior evaluation of the children regarding certain activities, and parents' stated choices are influenced by children's prior preferences, hence future research should be aimed at investigating a possible persuasive approach adopted by parents and children during the bargain-phase, given that the unilateral strategy we proposed might fail to capture a bilateral strategy used by older children. In addition, "satisfaction" or "happiness" are rather vague terms we used to describe children feelings and emotions; in this sense, several other aspects like curiosity, interest or aspiration of the children should be examined when considering how kids express approval or disapproval for leisure activities. Finally, a more structured experiment could be developed, allowing a combined use of unilateral and bilateral strategy, but also considering a more flexible composition of group of preferences. This means that instead of imposing a priori that parents evaluate children's preferences for their choices, a different composition of the group and a different causal relation might be considered.

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Chapter 3

Camping guests' willingness to pay for an ecocamping label. Evidence from a SP experiment in the Swiss context.

Curtale R.

Abstract

Tourists preferences for ecological procedure received lower attention in the camping sector by scholars with respect to the hotel one, despite its importance in terms of economic impact in the accommodation industry and the interest in nature and sustainability related issues of its guests. This study investigates camping guests' preferences for green practices in accommodation choice and their willingness to pay for an ecocamping label. Data have been collected through a SP experiment in the biggest Camping of Canton Ticino, the touristic region which registers 23,3% of the total overnights in the camping sector in Switzerland. The final sample is composed of 256 respondents and data have been estimated using discrete choice modelling with an innovative approach, based on latent class, controlling for lexicographic preferences. Results show a very small percentage of extremely "green" guests (who consider the ecological procedure as the most important attribute for their choices), almost a third of the sample interested only in the minimization of the accommodation cost (without interest for ecological procedures), while the remaining part of the sample composed of "traders", thus respondents choosing their accommodation by trading-off attribute's levels in a classical utility maximization framework. The majority of camping guests strongly appreciate the presence of an ecocamping label and is willing to pay a premium around 1% of the total accommodation cost to sustain green practices. Regarding a hypothetical upgrade of ecological procedures by adopting 100% renewable resources, respondents are not willing to sustain it. The strong preference for the ecocamping label and the unwillingness to sustain economically an ecological improvement when the label is already present, suggest that a shift towards a greener behaviour might depend more on stricter criteria selected by regulators for the assignment of ecocamping label rather than on owners' initiatives.

Keywords:

Discrete choice modelling, SP experiments, camping, Eco camping label, willingness to pay, ecological procedures.

3.1 Introduction

In the last decades, an increasing consumption and production of goods and services caused a rise of pollution, a deterioration of the natural environment and an increase of global warming which started to warry citizens and governments. Climate change is one of the main issues of our society, and several nations are involved into a common effort to fight it by adopting sustainable procedures. Consumers, on their side, show a growing awareness about sustainability issues through a higher preference for eco-friendly products (Nimse, Vijayan, Kumar & Varadarajan, 2007) and eco-conscious organizations such as hotels (Han & Kim, 2010). The tourism sector might provide a further boost towards an ecological conscientiousness and become an important actor for a social change (Ryan, 2002). In fact, hotels and accommodation sites, by installing visible eco-friendly technology (solar panel or recycling bins), can lower their footprint on the environment, their image can become more valuable and they might be seen as an example for a large number of consumers. In the tourism industry, one interesting and under researched sector is that of campsites, which has a relevant economic impact in the tourism industry and whose guests are particularly attracted by nature and sustainability issues.

According to Eurostat (2018), the participation of tourists in the camping sector is growing in the last decades with almost 405 million of overnights generated in the camping sector in Europe in 2017, a value that represents around 17,1% of the total accommodation demand in the tourism industry. The share of overnights in the camping sector is lower in Switzerland (5,9%), but not in Ticino (17%), the Italian speaking canton where the case study is conducted, which represents the most important touristic region for camping in Switzerland (Federal Statistical Office, 2018a). Despite the relevance of campings' overnights in the tourism industry, there is still a much lower attention from scholars and researchers to this specific sector with respect to the hotel one (Mikulić, Prebežac, Šerić & Krešić, 2017) and there is a lack of studies investigating camping guests' attitudes and willingness to pay for ecological procedures. A recent research by Mikulić et al. (2017) shows that ecological standards of campsites is an attribute of primary relevance and determinance for camping guests. Although the term ecological standards is quite vague as it does not exist an international definition of it, a possible way to signal the application of ecological procedures adopted by companies or accommodation sites is through the use of the so called eco-labels. Eco-labels are largely used in the food sector and, after the introduction of the blue flag, have had a huge increase of adoption in the tourism field. It is not clear yet if consumers are willing to economically support green initiatives for an ecological shift and which is the willingness to pay for eco-labels in the camping sector. However, this information could be very useful for campsites' owners, who, being aware of guests' willingness to pay for ecological procedures and eco-labels, might consider the introduction of such innovations and price them accordingly.

This case study, through a SP experiment conducted to guests of the biggest camping in the Ticino touristic region, which represents the 23,3% of the overall Swiss overnights in camping sector (Federal Statistical Office, 2018b), presents conceptual and methodological innovations. Conceptually, it is the first study to the best of author's knowledge to investigate camping guests' willingness to pay for an eco-label and for the introduction of an upgrade in ecological procedure. Methodologically, it provides an estimate of WTP controlling for respondents with lexicographic preferences and considering a possible source of heterogeneity coming from their green attitude.

The remainder of the article is organized as follows: in chapter 2 a literature review contextualizes camping guests preferences and shows consumers' willingness to pay for ecological procedures and eco-label in general; chapter 3 introduces the context of the study, the methodology of the experiment and the data collection; chapter 4 reports the main results and chapter 5 concludes with a discussion of the results and proposes some policy implications. Finally, chapter 6 identifies possible directions for future studies.

3.2 Literature review

In the last decades consumers' concern about the environment increased much faster than their adoption of green behavior or purchase of sustainable products (Joshi & Rahman, 2015), generating a so called attitude-behaviour gap (Bray, Johns, & Kilburn, 2011; Joshi & Rahman, 2015). In order to understand possible ways to enhance a green consumerism, researchers started to study the impact of ecological labels, a system of certification that guarantees the low impact of products' production cycle on the environment (Gustin & Weaver, 1996; Creyer, 1997). Scholars have investigated the role of eco-labels on consumers' preferences in several fields of consumption such as food (Loureiro & McCluskey, 2000; Tanner & Wölfing, 2003; Ginsberg & Bloom, 2004; Zhou, Liu, Mao & Yu, 2017), energy (Bang, Ellinger, Hadjimarcou, & Traichal, 2000; Sundt & Rehdanz, 2015) and tourism (Kang, Stein, Heo, & Lee, 2012; Stefanica, 2013; Gregory-Smith, Manika & Demirel, 2017; Merli, Preziosi, Acampora, Lucchetti & Ali, 2019). In the tourism industry, the camping sector is a compelling field of research given the interest of camping guests for nature and sustainability related issues (Garst, Williams, & Roggenbuck, 2009; Brooker & Joppe, 2013; Mikulić et al, 2017). Through this chapter, the reader can familiarize with camping guests preferences for ecological procedure, understand why this sector is of particular interest for the topic, and have an overview of studies investigating consumers' willingness to pay for ecological procedure and eco-labels in several fields of consumption.

Campsite guests' preferences for ecological procedures

The camping sector is a particular type of tourism that goes beyond a simple accommodation site but consists in a whole touristic experience for its guests. In fact, camping represents the occasion to enjoy nature, get fresh air and socialize with other tourists (Brooker & Joppe, 2013). Camping guests are

particularly interested in social interactions and nature (Garst et al., 2009), with the camping experience that generates a sentiment of protection and preservation of the nature, which often leads parents to educate children about the respect of nature, as an example by teaching them to leave no trace and recycle trash. The camping sector was object of research in the 1960s and 1970s, when there was a special attention dedicated to social interactions and camping activities (Brooker & Joppe, 2013) but despite its importance in terms of overnights, it received less attention from scholars compared to the hotel sector in recent years (Mikulić et al., 2017). With respect of factors influencing tourists' accommodation choice, the importance of the natural environment remained constant over time for campsite guests (Brooker & Joppe, 2014) but new needs and requests emerged in recent years. Indeed, nowadays camping guests have a higher interest for factors as comfort, especially with the concept of "glamping", which combine glamour and camping (Brochado & Pereira, 2017), or the ecological procedures adopted by camping owners (Mikulić et al., 2017). The sustainability aspect and the ecological procedures adopted by campsites assume a crucial roles for camping guests, who consider those features as attributes of high relevance (meaning that they are core attributes) and determinance (meaning that they effectively drive people's choices). Ecological procedures, which can be certified by eco-labels, can be considered as high-impact core attributes (Mikulić et al., 2017) and represent a key element for building a strong durable competitive position for campsites. In fact, the presence of eco-labels can increase guests' satisfaction, which has a significant role in determining guests' loyalty (Hardy, Ogunmokun & Winter, 2005; Mikulić et al., 2017; Merli et al., 2019).

Eco-labels and consumers' willingness to pay

Being aware of camping guests' preferences for ecological procedures, it is important to understand how entrepreneurs can signal the presence of ecological procedures. To distinguish "green" products from those not respecting determined ecological standard, an important role is played by eco-labels, which can certify as an example the low impact of the production cycle on the environment (Gustin & Weaver, 1996; Creyer, 1997). A review of several studies done by Gallastegui (2002) shows that a large number of consumers is willing to pay a premium for products certified by eco-labels or a sustainability timber, especially in developed countries, but this is not always the case. In fact, other factors rather than eco-label might have a stronger effect in driving people's choices, as an example, with respect of food labelling, there might be a cultural effect on the perception of quality, and a different factor such as the country of origin might be considered a more valuable attribute with respect of the eco-label (Loureiro & McCluskey, 2000). In addition, with respect of people's attitudes towards green initiatives, results from the literature show heterogeneous and controversial results regarding their willingness to participate actively to sustain them. In general, people show a quite high environmental friendly attitude, which is not always accompanied by a green behavior, reporting a distance between attitude

and behavior, a phenomenon that research define as attitude-behavior gap (Bray, Johns, & Kilburn, 2011). In fact, while some qualitative studies show that people manifest a positive attitude towards buying green products (Gustin & Weaver, 1996; Creyer, 1997), they are not always willing to pay an additional premium to purchase them. Indeed, when facing trade-offs situations, consumers rarely sacrifice attributes such as convenience, availability, price, quality or performance to buy green products (Ginsberg & Bloom, 2004). Often consumers' actual purchase of eco-friendly product depends on the level of self-interest they perceive, as an example in the case of organic food, people are willing to pay for them because they believe them to be healthier and tastier (Ginsberg & Bloom, 2004). With respect of WTP for ecological procedures and eco-labels, results are heterogeneous depending on the choice context and individuals' characteristics. As an example, with respect of energy consumption, people with a high level of environmental concern seems to be willing to pay a premium for renewable energy sources (Bang, Ellinger, Hadjimarcou, & Traichal, 2000; Sundt & Rehdanz, 2015) even though the tangible short term benefits are not evident. Concerning green initiatives in the tourism sector, there are studies showing contrasting results. In fact, some research find that guests are willing to pay to sustain green initiatives in the hotel industry (Choi & Parsa, 2007; Kang, Stein, Heo, & Lee, 2012; Shen, 2012) and in restaurants (Dutta, Umashankar, Choi, & Parsa, 2008), while others not, especially in less developed countries with a high price sensitivity (Manaktola & Jauhari, 2007; Chia-Jung, & Pei-Chun, 2014; Yadav & Pathak, 2017). In the Swiss context, there is evidence of people's interest towards environmentally sustainable products independently from their cost, with results showing that personal attitudes and beliefs are important predictors of green purchases in supermarkets, while cost does not play a role (Tanner & Wölfing, 2003).

Eco-labels in the tourism sector

With respect of eco-labels in the tourism sector, the first eco-labels emerged around 1987 with the introduction of the Blue Flag for European coastal zones. Since then, there has been a huge rise of eco-labels, mostly based on volunteering adoption which led to around 180 eco-labels in tourism in 2016 (Kraus, 2016), of which, only one specific for campsites[23]. There is evidence of the positive impact that eco-labels has on tourist decisions, satisfaction and loyalty (Capacci, Scorcu, & Vici, 2015; Merli, Preziosi, Acampora, Lucchetti & Ali, 2019), however, there is no evidence to the best of the author knowledge of guests' WTP for an eco-label in campsites.

[23] It is not possible to find a website referring to an exhaustive list of eco-labels, some non-exhaustive lists can be found in the following websites: http://www.greentourism.eu/en/GreenLabel/IndexPublic, http://www.ecolabelindex.com/ecolabels/?st=category,tourism. To the best of author knowledge, although campsites can be certified by different generic eco-label for accommodation sites, the only eco-label specific for campsites is the ECOCAMPING label, which has a total of 225 campsites partners in Germany, Austria, Switzerland, Italy, Croatia and Slovenia (https://ecocamping.de/this-is-ecocamping).

Willingness to pay (WTP) measures

There are several ways of measuring consumers' willingness to pay for products, services or some related features. While some methodology can only give qualitative insights whether or not consumer are willing to pay, as an example those based on structural equation modeling (SEM – Lomax & Schumacker, 2004; Kline, 2015), others can provide a quantitative estimation of the WTP, with the most popular technique referring to analysis of market data, experiments or surveys (Breidert, Hahsler & Reutterer, 2006). Across surveys, one of the most flexible ways to collect data about consumers' WTP is through discrete choice modeling, which through the simulation of a purchase situation, analyze respondents' choices between alternative profiles of product. With discrete choice modeling based on the classical random utility theory (see paragraph 3.3.2) it is possible to measure as an example tourists' preferences for hotel's attributes, their price sensitivity and finally calculate their WTP (Masiero, Heo, & Pan, 2015; Martín, Román & Mendoza, 2018). One of the limitations of classical discrete choice models is that of estimating an average WTP for the sample of respondents, thus failing to capture if there are respondents who are not willing to pay for a specific attribute. It is possible to find classes of respondents with different willingness to pay as an example with latent class models, which can separate respondents choosing always the cheapest option (using a so-called lexicographic approach to make choices– see paragraph 3.3.5) and who are not willing to pay for innovations (Hess, Stathopoulos & Daly, 2012).

3.3 Research method

3.3.1 Hypothesis formulation

Despite the importance of ecological procedures for camping tourists, there is lack of studies investigating their preferences towards eco-initiatives and the willingness to pay to support them. Thus, this research aims at shedding lights on this topic by formulating 3 hypotheses.

H1: Camping guests are willing to pay for an ecocamping label

The eco-label is a way to certify ecological procedures for accommodation sites, it is important for entrepreneurs to understand the marginal utility guests associate to the presence of an eco-label and their willingness to pay for them in order to price accommodation sites accordingly or consider adopting ecological procedures and charge a premium.

H2: Guests with higher green attitude are willing to pay higher prices

A green attitude is an unobservable characteristic of individuals, and even if studies show that on average it is quite high in consumers nowadays, it has a heterogeneous intensity across them, being stronger for some consumers and weaker for others. This research wants to understand whether heterogeneity in green attitude reflects differences in guests' willingness to pay for an eco-label.

H3: Guests are willing to pay for green features in addition to the eco-label

Eco-labels are assigned in response to the respect of some criteria. However, campsites might introduce other ecological procedures in addition to the minimum requirement. This study investigates whether camping guests are willing to support economically the introduction of further ecological procedures in addition to the criteria for the eco-label.

3.3.2 Methodology

A Stated Preference (SP) experiment is conducted in order to understand camping guests' willingness to pay for an ecocamping label and for improvement of ecological procedures. The use of SP experiments is not new for the study of consumers' willingness to pay for accommodations' charcateristics, some examples can be found in the hotel industry, in which Masiero, Heo, & Pan (2015) or Martín, Román & Mendoza (2018) conducted similar experiments to understand guests' willingness to pay for hotel room attributes. SP data are used instead of revealed preference (RP) data for the investigation of those choices referring to hypothetical, but realistic, choice situations in which no existing data is available to the researcher. Results of the SP experiment are analyzed through discrete choice models (DCM), firstly developed by the Nobel laureate Daniel McFadden (1973). In this paragraph only the essential elements of discrete choice models are discussed, readers interested in a deeper understanding of discrete choice models might refer, between others, to McFadden (1973), Ben-Akiva & Lerman (1985), Walker (2001) or Train (2009). Discrete choice models are a useful toolbox to explain all the situations in which the dependent variable is qualitative, and refers to choices involving exhaustive and mutually exclusive alternatives. They rely on the random utility theory, based on the assumption that individuals involved in a choice situation are rational agents who choose the alternative that maximizes their utility function across the choice set. The utility function U is a mathematical tool that assigns a numerical value to all the alternatives in a choice set for every respondent. The higher the value, the higher the preference of the specific respondent for the corresponding alternative. For every individual *i* and alternative *j*, the utility function $U_{i,j}$ is composed by two components: a deterministic part $V_{i,j}$ and a stochastic part $\varepsilon_{i,j}$:

$$U_{i,j} = V_{i,j} + \varepsilon_{i,j} \quad (19)$$

The remainder of this section discusses the context of the research, the SP experiment design and the econometrical setting.

3.3.3 Research context

The study is conducted in camping "Campofelice Camping Village", in the Ticino Canton (the southernmost in Switzerland), a region that represented 23,3% of the overall Swiss overnights in the

camping sector in the year of data collection (Federal Statistical Office, 2018b). The camping considered for the case study is a five star camping on the lake, it is the biggest in the region in terms of overnights and is one of the two having the ecocamping label[24]. Across the 38 camping of the region[25], it is the 9th in terms of price for a basic pitch and, accordingly to a hedonic regression run on the 38 available campings (see appendix), very competitive in terms of price considering the available features. Thus, being the considered camping the biggest in the region with the highest national contribution to camping overnights, this specific case study can provide interesting insight about camping guest's preferences.

3.3.4 SP experiment design

The SP experiments consists of unlabeled alternatives representing a future holiday (similar to the last one that respondents did) and asks respondents to choose their favorite package from a limited choice set. The choice set is composed of a status quo alternative, meaning the same package they chose for their last holiday, two innovative packages (package 1 and package 2) containing new randomly assigned features (attributes) and a no choice option, meaning that the respondent does not intend to come back in the future. Questionnaires have been submitted online between June and October 2018 to camping guests just after their staying. Two preliminary filter questions regarding typology of accommodation (bungalow or campsite) and the real price that tourists paid for their holiday had been asked before the experiment, in order to adapt the choice tasks to a real status quo option. A D-efficient design has been employed through the Ngene software (Rose and Bliemer, 2012), considering 12 choice tasks divided into 2 blocks, resulting in 6 choice tasks per respondent. Every block has been presented in 2 versions, with choice tasks organized in either normal or reverse order. This has been done for a twofold reason: first of all in order to distribute across questions possible biases due to a response fatigue (Choi and Pak, 2005) and secondly because a set of likert-scale items regarding ecological attitudes has been inserted between the first 3 and the last 3 choice tasks with the idea of testing whether their presence could have an effect on respondents' choices. In sum, 8 different versions[26] of the questionnaire have been developed, with every single questionnaire having an

[24] The ecocamping label is based on a series of principles aiming at 1) inform guests, employees, partners and the general public about ecocamping commitment and involve them, 2) use energy more efficiently, 3) promote sustainable and ecologically sound energy production, 4) keep the air clean, 5) avoid soil and water pollution, 6) use water sparingly, 7) avoid waste and optimise material cycles, 8) design the campsite in an ecologically sound manner and promote biodiversity, 9) take the environment and nature into consideration when offering recreational activities, 10) promote soft mobility, 11) favour locally sourced products and services, 12) clean in an environmentally friendly way and avoid hazardous substances (https://ecocamping.de/this-is-ecocamping/ecocampingprinciples).

[25] The complete list of the 38 campings is reported in the website of the touristic region of Canton Ticino: https://www.ticino.ch/en/plan/accommodation/campings.html

[26] The number is obtained by multiplying two different accommodation type per two blocks, each of them presented either in normal or reverse order.

adapted reference price which provides the maximum level of realism. For the status quo alternative, the only available attributes are the price and the ecological procedure, while for the innovative packages, 4 different attributes are proposed either for bungalow and for campsite (Table 12).

Attribute	Levels
package price	100% of RP 115% of RP 140% of RP
ecological procedure	no (downgrade) eco-label (status quo) eco-label 100% RES (upgrade)
pool and wellness area	no yes
mini club	no yes
reservation in advance (for campsite only)	no yes
private bathroom (for campsite only)	no yes
breakfast included (for bungalow guests only)	no yes
linen service (for bungalow guests only)	no yes

Table 12 Attributes and their levels in the SP experiment for bungalow and campsite guest

Across the additional attributes, two attributes are in common for bungalow and pitch renters (access to poll and wellness area, mini club for children), two are specific for bungalow (possibility to have breakfast included, linen service) and two specific for campsites (possibility to book in advance, access to a private bathroom). In the innovative packages price has been randomly changed by an increase of 15%, 40% or it remained the same. The attribute relative to the ecological procedure has three different levels: the eco-label (already present in the status quo), the absence of it (no – representing a downgrade) and the eco-label with a certificate that guarantees the use of 100% renewable energies (eco-label 100% RES – representing an upgrade)[27]. An example of choice task is depicted in Figure 9.

[27] Although the absence of an eco-label in the future is quite unrealistic, the introduction of the "no" level aimed at the estimation of respondents' preferences for the eco-label. In addition, it allows to test if the disutility of losing the eco-label, following the Kahneman and Tversky's prospect theory (Kahneman, 1979; Tversky and Kahneman, 1992; Kahneman and Tversky, 2013), is higher than the utility gained by the addition of the "100% RES" feature.

	current package	package 1	package 2
reservation in advance	.	.	yes
pool and wellness area	.	yes	.
private bathroom	.	.	yes
mini club	.	yes	.
ecological procedures	eco label	no	eco label 100% RES
package price (CHF)	1000	1150	1400

Figure 7 Choice task for the campsite questionnaire

3.3.5 Econometrical setting

Three different type of model has been used for the estimation: a classical multinomial logit (MNL), used as a baseline reference; an integrated choice and latent variable model (ICLV), used to control possible heterogeneity of preferences in response to a change in guests' green attitudes; a latent class model (LC), controlling for possible lexicographic preferences of the respondents.

Multinomial logit model

The deterministic part of the utility shown in equation 19 is expressed as follows:

$$(20) \quad V_{i,j} = \beta_{cost} PRICE \left(\frac{expense}{avg(expense)}\right)^{\beta_{cost\_elast}} + \beta_{downgrade} ECO_{downgrade} + \beta_{upgrade} ECO_{upgrade} + \beta' X_{i,j}$$

Where β_{cost} represents price sensitivity, $\left(\frac{expense}{avg(expense)}\right)^{\beta_{cost\_elast}}$ is a multiplicative factor controlling for a change in price sensitivity in response to different levels of expenditure for the real accommodation[28], $\beta_{downgrade}$ and $\beta_{upgrade}$ are preferences for a change in the ecological procedures and $\beta' X_{i,j}$ represents the remaining observable part of the utility, in which $X_{i,j}$ is a vector containing both alternatives' attributes and individuals' characteristics, while β' is a vector of parameters representing individuals' preferences. $\varepsilon_{i,j}$ is the stochastic component of the utility, that follows a statistical distribution assumed by the researcher: when $\varepsilon_{i,j}$ is extreme-value distributed, the models are called logit model (used in this research), when it is normally distributed, they are called probit models. The deterministic part of the utility function is essential for the estimation of the alternatives' choice probabilities, expressed as follows:

[28] β_{cost_elast}<0 indicates a price sensitivity decrease in response to an increase of real expenditure, β_{cost_elast}=0 indicates that changes in real expenditure does not affect price sensitivity, while β_{cost_elast}>0 indicates an increasing price sensitivity with respect to an increase of real expenditure.

$$(21) \qquad P_{i,j,t} = \frac{e^{V_{i,j,t}}}{\sum_{j=1}^{J} e^{V_{i,j,t}}}$$

Where the probability of a generic alternative *j* to be chosen at the choice occasion *t* by respondent *i* is equal to the ratio between the exponential value of its utility function and the sum of the exponential values of the utility of all the possible alternatives. Finally, the vectors of individuals' preferences is obtained through the maximization of the loglikelihood function, expressed as follows:

$$(22) \qquad LogL(\beta) = \sum_{i=1}^{N} \sum_{t=1}^{T} logP_{i,t}(y)$$

Where N represents the total number of individuals, T represents the number of choice tasks submitted to each individual and $P_{i,t}(y)$ is the probability for individual *i* in the choice task *t* to choose the observed choice *y*, expressed as in equation 21.

Integrated choice and latent variable model

In order to include the green attitude in the choice model, an integrated choice and latent variable model (ICLV - Walker, 2001) has been estimated. In the ICLV model, the deterministic part of the utility function $V_{i,j}$ is not only expression of observable variables, but it also includes psycho-attitudinal latent variables. In order to answer H2, the latent variable is included to test if there is a source of heterogeneity for the preference for the eco-label. Thus, the preference associated to $ECO_{downgrade}$ and $ECO_{upgrade}$ is expressed as follows:

$$(23) \qquad (\beta_{downgrade} + \tau_{downgrade} LV_i) ECO_{downgrade} + (\beta_{upgrade} + \tau_{upgrade} LV_i) ECO_{upgrade}$$

Where LV is latent variable identifying the level of green attitude of individual *i*, while τ represents the impact of the latent variable on their preference for upgrade or downgrade of the ecological procedures. In order to identify the latent variable, two additional components are needed: a measurement equation and a structural equation.

Measurement equation. The latent variable is measured through R indicators, that are related with the latent variable in the following way:

$$(24) \qquad I_{r,i} = z_r * LV_i + \sigma_r * v_i$$

Where r = (1,..,R) refers to the r^{th} indicator for the latent variable, i = (1,…,N) refers to the individual, z_r is the impact of the latent variable on the rth indicator, and σ_r is the measure of the standard deviation of the error term v_i, that is normally distributed. The indicators used for the measurement of the latent variable are expressed in Table 15.

Structural equation. The latent variable is expressed as function of socio-demographic characteristics of the respondents, as follows:

$$(25) \qquad LV_i = \gamma' X_i + \omega_i$$

Where γ is a vector of parameters identifying the relationship between socio-demographics characteristics of the respondents and their latent variable, while ω_i is a normally distributed error term.

These additional components of the model add complexity to the final estimation, which simultaneously consider the probability of observing choices (y) and indicators' values (I), expressed as follows:

$$(26) \qquad P_{i,t}(y, I) = \int P_{i,t}(y|.) * f_i(I|.) * g(LV|.)\, dLV$$

Where $P_i(y|.)$ is the probability expressed in equation 21, $f_i(I|.)$ Is the density of the indicators defined in eq. 24 and $g(LV|.)$ is the latent variable distribution. The final estimates of the parameters are obtained by maximizing the loglikelihood function as expressed in eq. 22 by substituting $P_{i,t}(y, I)$ to $P_{i,t}(y)$. The complex integral in eq. 26 has no closed form. For this reason, the model is estimated with a simulated maximum likelihood using draws of the ω_i distribution extracted with a Montecarlo simulation technique. More details on the simulated maximum likelihood can be found in the work of Train (2009).

Latent class with decision rule heterogeneity control

A source of heterogeneity to express respondents' choices might be caused by different decision rules adopted by decision-makers. In fact, some respondents can maximize their utility function without considering all the attributes characterizing the alternative but choosing the alternative in which the most important attribute they consider has the most desirable level, using a so-called lexicographic approach (LEX - Tversky, 1969; Luce, 1978). The failure of controlling for consumers with lexicographic approaches might produce biased estimation of WTP. As an example, those having a lexicographic approach with respect to price choose always the cheapest option and do not trade off price against the presence of eco-label when making choice and have a virtual WTP which is equal to 0. Thus, the presence of respondents using a lexicographic approach, if not controlled, might cause an underestimation of the WTP. The control of this source of heterogeneity is possible as an example by using a latent class model, in which every class is characterized by a decision rule (namely *m*), characterized as follows. Let us consider a sequence of T choices, namely y, for every respondent *i*:

$$(27) \qquad \boldsymbol{y} = (y_1, \dots, y_T)$$

Let us call $P_i(\boldsymbol{y})$ the probability of observing that series of choices for every respondent *i*:

$$(28) \qquad P_i(\boldsymbol{y}) = \sum_{m=1}^{M} \pi_{i,m}\, P_i(\beta_{(m)}, m)$$

where $\sum_{m=1}^{M} \pi_{i,m}$= 1, $0 \leq \pi_{i,m} \leq 1$ and $\pi_{i,m}$ represents the probability for respondent *i* to use the *m*th decision rule. $P_i(\beta_{(m)}, m)$ represents the probability of observing the sequence of choices for respondents *i,* using the *m*th decision rule, characterized by a $\beta_{(m)}$ vector of preferences. In that case, the probability for respondent *i* of applying the RUM or the LEX approach are the following:

$$(29) \qquad \pi_{i,RUM} = \frac{1}{1+e^{\gamma_{LEX}}}; \qquad \pi_{i,LEX} = \frac{e^{\gamma_{LEX}}}{1+e^{\gamma_{LEX}}}$$

The probability of the sequence of choices for those applying a RUM decision rule is expressed as the product for the T choices of the probability expressed in equation 21. While the probability of the sequence of choices given the lexicographic approach is the following:

$$(30) \qquad P_i(LEX) = \prod_{t=1}^{T} I_{att,l,t}$$

Where $I_{att,l,t}$ is an indicator identifying if in the choice occasion t, the alternative l presents the highest desirable level for the specific attribute. For a more technically detailed contribution to the control of heterogeneity in decision rules, readers might refer to Hess, Stathopoulos & Daly (2012).

Willingness to pay and willingness to accept measures

In discrete choice modeling it is possible to estimate the economic value of non-monetary attribute by calculating the ratio between the parameter of interest and the cost parameter. The economic value that respondents are willing to pay for the introduction of a new attribute is called willingness to pay, while the value of existing attribute is calculated as willingness to accept and refers to the minimum economic compensation that respondents would be willing to receive for the elimination of that attribute (Field & Field, 1997). The value of the eco-camping label is calculated as respondents' willingness to accept for the avoidance of the label (see equation 31).

$$(31) \qquad WTA\ (ecocamping\ label) = \frac{\beta_{downgrade}}{\beta_{cost}}$$

The willingness to pay for the upgrade of ecological procedures is calculated as expressed in equation 32:

$$(32) \qquad WTP\ (ecocamping\ label\ 100\%\ RES) = \frac{-\beta_{upgrade}}{\beta_{cost}}$$

3.3.6 Questionnaire and sample

Attitudes and sociodemographic questions

In addition to the choice experiment, the questionnaire included attitudinal and socio-demographic questions. In order to understand respondents' attitudes toward a sustainable behavior, a set of items has been included with a Likert scale asking their level of agreement with some statements, related to their sustainable attitude. Statements are shown in Table 15. The final part of the questionnaire

included classical socio-demographic questions such as gender, age, education level, income, travel companionship and mean of transport used to get to the camping.

Sample

In total, 262 guests completed the survey (141 bungalow guests, 121 camping guest). Families represent the majority of the sample (72%), with a higher presence in bungalow (78%) than in camping (64%), couples represent the 20% of the bungalow sample while 32% in camping's one. The average age of the respondents in the bungalow sample is 46, while in camping 51. With respect of the annual income, bungalow guests earn on average 85'000 CHF per year while camping guests 91'000 CHF (slightly higher than the population median of 77'000 CHF). There is no difference in the education level across the two samples, with a 61% of the respondents having a diploma as the highest qualification (against 45% at the national level), 29% a university degree (34% at the national level) and 10% a lower education level (21% at the national level)[29]. The majority of the population is Swiss (92%) and arrived by car or caravan (96%).

[29] Income figures available at the following link: https://www.bfs.admin.ch/bfs/en/home/statistics/catalogues-databases/publications.assetdetail.4522209.html
Education figures available at the following link: https://www.bfs.admin.ch/bfs/en/home/statistics/education-science.assetdetail.7767499.html

Type of accommodation	bungalow		camping		total	
Total respondents	141		121		262	
Travel companionship						
Solo	0	0%	3	2,5%	3	1,1%
Couple	29	20,6%	39	32,2%	68	26,0%
Family	111	78,7%	78	64,5%	189	72,1%
Group	1	0,7%	1	0,8%	2	0,8%
Income						
less than 40'000 CHF	8	5,7%	6	5,0%	14	5,3%
40'001 - 60'000 CHF	18	12,8%	13	10,7%	31	11,8%
60'001 - 80'000 CHF	26	18,4%	19	15,7%	45	17,2%
80'001 - 100'000 CHF	27	19,1%	28	23,1%	55	21%
100'001 - 120'000 CHF	19	13,5%	16	13,2%	35	13,4%
120'001 - 140'000 CHF	11	7,8%	10	8,3%	21	8%
140'001 - 200'000 CHF	4	2,8%	2	1,7%	6	2,3%
more than 200'000	0	0%	3	2,5%	3	1,1%
prefer not to answer	28	19,9%	24	19,8%	52	19,8%
Education						
Lower education level	17	12,1%	10	8,3%	27	10,3%
Diploma	87	61,7%	73	60,3%	160	61,1%
Bachelor degree	23	16,3%	24	19,8%	47	17,9%
Master's degree	14	9,9%	13	10,7%	27	10,3%
PhD	0	0%	1	0,8%	1	0,4%
Age						
20-29 years old	5	3,5%	1	0,8%	6	2,3%
30-39 years old	35	24,8%	17	14%	52	19,8%
40-49 years old	58	41,1%	40	33,1%	98	37,4%
50-59 years old	25	17,7%	35	28,9%	60	22,9%
60-69 years old	7	5,0%	18	14,9%	25	9,5%
70-79 years old	10	7,1%	9	7,4%	19	7,3%
Mean of transport						
car	136	96,5%	91	75,2%	227	86,6%
caravan	0	0%	28	23,1%	28	10,7%
train	4	2,8%	2	1,7%	6	2,3%
moto	1	0,7%		0%	1	0,4%
Country of residence						
Switzerland	133	94,3%	109	90,1%	242	92,4%
Germany	2	1,4%	7	5,8%	9	3,4%
Netherlands	2	1,4%	2	1,7%	4	1,5%
Other	4	2,8%	3	2,5%	7	2,7%

Table 13 Sample statistics

3.4 Results

In total, 6 models are estimated: two multinomial logit models (Model 1 and 4), two integrated choice and latent variable models (2,3), one latent class model considering a lexicographic approach (5), and an integrated latent class and latent variable model (6). Model 1 provides coefficients for the preference about upgrade and downgrade on ecological procedures, while model 4 disentangles the effect of changes in ecological procedures in the case of same price or higher price. The integrated choice and latent variable models (Model 2,3 - ICLV) investigate the heterogeneity of preferences across the sample with respect of two different latent variables: one capturing respondents' ecological attitude (Model 2), and one capturing their ecological behavior during holiday (Model 3). Model 5 controls for heterogeneity in decision rules, identifying two additional classes with respect to the classical RUM: those 2 classes separate respondents choosing with a lexicographic approach for price (always choosing the cheapest option) or ecological procedure (always choosing the "greenest" option). Model 6 finally includes the latent variable capturing respondents' behavior on holiday (the only one having a significant impact) in the latent class model. Models 2, 3 and 6 are estimated with 500 MHLS draws. Table 14 reports the results for the models and their respective statistics of fit. In terms of model fit, model 5 shows the best fit in terms of loglikelihood (-1575.56) and in terms of AIC and BIC criterion (3183,12 and 3268,51). Model 2, 3 and 6 present lower fits due to a higher complexity for the inclusion of latent variables. Considering the model fit for the choice part only, model 6 has a small (and not statistically significant - LR test = 2.16 < 9,2 = $\chi^2_{0.05,2}$) increase in fit with respect of model 5 but it is obtained at a higher cost in terms of parameters (18 against 16 for the choice model only, plus 30 parameters for latent variable estimation) and of estimation time (29 hours compared to less than a minute for model 6). Values of AIC and BIC suggests that benefits of model 6 with respect of model 5 are not worth the cost in terms of parameter's parsimony (AIC=3184.96 and BIC=3281.02). Comments in the main results paragraph and in the conclusions are based on model 5 results. Results from model 6, which do not add significant behavioral indications, are used only for the insight regarding the latent variable. Results of model 1-4 are presented for comparison reasons in order to show the benefits of using the latent class approach.

Table 14 Estimation results

	Model 1 MNL 1			Model 2 ICLV (eco attitude)			Model 3 ICLV (eco behaviour)			Model 4 MNL 2			Model 5 LC			Model 6 ICLV-LC		
	coeff	std err	signif.	coeff	std err	signif.	coeff	std err	signif.	coeff	std err	signif.	coeff	std err	signif.	coeff	std err	signif.
Parameters																		
price	-0,085	0,020	**	-0,079	0,018	**	-0,079	0,018	**	-0,087	0,020	**	-0,046	0,021	*	-0,017	0,021	
price_elast_camp	-0,459	0,348		-0,434	0,363		-0,477	0,365		-0,469	0,336		0,215	0,726		1,378	1,831	
price_elast_bung	-1,096	0,094	***	-1,094	0,094	***	-1,102	0,089	***	-1,094	0,091	***	-1,144	0,147	***	-1,270	0,242	**
pool	0,389	0,114	**	0,400	0,115	**	0,393	0,117	**	0,391	0,117	**	0,333	0,128	**	0,215	0,132	*
eco-label_downgrade	-0,673	0,126	**	-0,686	0,127	**	-0,668	0,127	**	-0,423	0,162	**	-0,529	0,208	**	-0,346	0,203	*
eco-label_upgrade	-0,157	0,107		-0,159	0,107	*	-0,202	0,109	*	0,348	0,175	*	0,060	0,214		0,115	0,286	
eco-label_downgrade (higher price)										-0,179	0,182		-0,144	0,207		-0,131	0,171	
eco-label_upgrade (higher price)										-0,572	0,152	**	-0,391	0,172	*	-0,669	0,285	**
miniclub_fam	0,059	0,163		0,064	0,163		0,070	0,163		0,085	0,167		0,069	0,179		0,010	0,174	
current	0,489	0,264	*	0,501	0,263	*	0,504	0,264	*	0,533	0,272	*	-0,593	0,324	*	-0,676	0,309	*
bung_nochoice	-1,667	0,550	**	-1,159	0,330	**	-1,159	0,330	**	-1,657	0,555	**	-0,946	0,643		-0,801	0,422	*
bung_breakfast	0,239	0,158	*	0,245	0,158	*	0,249	0,160	*	0,276	0,161	*	0,090	0,179		-0,070	0,177	
bung_linen	0,212	0,109	*	0,216	0,109	*	0,218	0,112	*	0,223	0,111	*	0,039	0,120		-0,110	0,130	
camp_nochoice	-0,560	0,420		-0,515	0,417		-0,511	0,417		-0,552	0,426		0,079	0,481		0,280	0,436	
camp_reservation	0,283	0,143	*	0,288	0,143	*	0,283	0,146	*	0,320	0,146	*	0,382	0,163	**	0,256	0,156	*
camp_privatebath	0,323	0,155	*	0,327	0,156	*	0,332	0,156	*	0,406	0,162	**	0,505	0,180	**	0,483	0,172	**
lv_eco-label_downgrade				-0,257	0,185		-0,165	0,222								-0,323	0,242	
lv_eco-label_upgrade				0,048	0,176		0,464	0,183	**							0,387	0,168	*
gamma_lexicographic_eco-label													-3,863	0,542	***	-3,796	0,506	***
gamma_lexicographic_price													-0,879	0,138	***	-0,878	0,138	***
Prob (MNL)													69,6%			69,5%		
Prob (LEX_eco-label)													1,5%			1,6%		
Prob (LEX_pricel)													28,9%			28,9%		
Model fit																		
Decision makers:	256			256			256			256			256			256		
Observations:	1536			1536			1536			1536			1536			1536		
Draws:				500			500									500		
Estimated parameters:	12			46			42			14			16			46		
Estimated parameters (choice model):	12			14			14			14			16			18		
LL(0):	-2129,35			-2129,35			-2129,35			-2129,35			-1761,79			-1761,79		
LL(final)	-2042,82			-4194,85			-3677,08			-2037,13			-1575,56			-2738,62		
AIC:	4109,64			8481,70			7438,16			4102,25			3183,12			5569,24		
BIC:	4173,68			8727,20			7662,31			4176,97			3268,51			5609,30		
LL(choice model):				-2039,22			-2026,18									-1574,48		
AIC (choice model):				4106,44			4080,36									3184,96		
BIC (choice model):				4181,16			4155,08									3281,02		
Estimation time	<1 min			18 hrs			16 hrs			<1 min			<1 min			29 hrs		

Main results

The LC model (model 6), captures one class of "traders", thus respondents maximizing their utility making trade-off between attributes in a classical RUM framework (69,6%) and two classes of "non-traders" using a lexicographic approach to make their choices: one class of respondents that consider only price (choosing systematically the cheapest option - 28,9%) and one class considering only ecological procedure (which always choose the "greenest" option - 1,5%). In the traders class, a negative price parameter (-0.046) shows that both campers and bungalow guests are price sensitive, meaning that, ceteris paribus, higher costs affect negatively their probability of choosing the accommodation. However, price sensitivity is not the same across bungalow guests and campers, with differences in intensity depending on their real expenditure. Price sensitivity for pitch renters is independent from the price they paid (price_elast_camp is not significant), while for bungalow guests, high spenders are less price sensitive with respect to low spenders (price_elast_bung = -1.144). With respects of other innovations, both bungalow guests and campers strongly appreciate the introduction of a swimming pool (0.333), bungalow guests positively accept the introduction of breakfast (0.90) and the possibility of renting a linen set (0.039) but not significantly at a 10% level, while campers positively accept the introduction of the reservation in advance (0.382) and the possibility of having a private bathroom (0.505). The presence of a miniclub, considered only for families, is positive but not significant (0.069), and people on average prefer to have innovations in the future rather than the status quo (current = -0.593). With respect of ecological procedure, guests are strongly against a downgrade in the ecological procedure (-0.529), with no utility gain for an upgrade (and a disutility in the case of higher price for the upgrade).

Latent variables

The ICLV model integrates latent variables concerning green attitudes and behavior into the choice model. Two different latent variables are estimated: one concerning the ecological attitude (average value = 3.95, Cronbach's alpha = 0.80), and one considering peoples' ecological behavior during holidays (average value 3.18, Cronbach's alpha = 0.77). In table 15 it is possible to see mean and standard deviation of the items composing the two latent variables.

	mean	st. dev
Ecological attitude (Cronbach's Alpha = 0.80)	**3,95**	
I am worried about climate change	3,81	0,89
I am worried about pollution	3,94	0,82
Our society should use less fossil fuels to reduce pollution	3,92	0,82
Generating electricity via renewable energy sources is important	4,25	0,70
Ecological behaviour on holiday (Cronbach's Alpha = 0.77)	**3,18**	
I prefer to spend my holiday in an environmentally friendly site.	3,71	0,78
It is important for accommodation site to have an eco-label.	3,02	0,79
If I spend my holiday in a site with an eco-label, I feel fine with my conscience.	2,82	0,87

Table 15 Item's descriptive statistics

There is a gap between attitudes and behavior, with indicators of the ecological attitude reporting higher results compared to behavior (3.95 vs 3.18). The impact of the latent variables on final choices is estimated in models 2, 3 and 6. Levels of the latent variable capturing respondents' ecological attitude has no impact on their choices (model 2), while latent variable considering their behavior has an impact only for the upgrade (lv_eco_label-upgrade = 0.464 in model 3 and 0.387 in model 6). Structural and measurement equation for the LV referring to ecological behavior in model 6 are reported in Table 16.

Latent variable: eco behaviour on holiday	coeff	std err	signif.
Measurement parameters			
σ1	0,643	0,036	***
zeta1	0,449	0,070	***
σ2	0,395	0,055	***
zeta2	0,704	0,068	***
σ3	0,610	0,040	***
zeta3	0,643	0,059	***
Structural parameters			
Bachelor degree (ref= diploma or lower)	0,227	0,200	
MSc or PhD (ref= diploma or lower)	0,346	0,207	*
Age	0,007	0,006	
Travel companionship: Couple (ref= family)	-0,163	0,178	
Log(income)	-0,266	0,183	
No income declared	-0,564	0,318	*
Type of accommodation: bungalow (ref= campsite)	0,035	0,128	

Table 16 Regression of LV on socio-demographics

Measurement parameters zeta1, zeta2 and zeta3 are statistically significant and have a positive sign, meaning that a higher value in the latent variable concerning ecological behavior on holiday is reflected by a higher rate in the Likert scale of the three items. Sigma parameters capture heterogeneity across respondents. Structural parameters identify socio-economics variable having an effect on people's score in the latent variable. There is no impact of age, travel companionship or their accommodation

choice on the latent variable. Graduate people show higher values for the latent variable with respect to those with a diploma or lower education level (MSc or PhD = 0.346 and statistically significant, Bachelor degree = 0.227 but not statistically different from 0 at a 10% level). Those refusing to communicate their income level have a lower score in the latent variable.

Willingness to pay for the ecocamping label

The value of the eco-camping label was not significant in the hedonic regression (see Appendix), and has been calculated with SP experiment results as respondents' willingness to accept for the avoidance of the label (Table 17).

	WTA (CHF)	WTA (CHF)	% respondents
M1 - MNL	7,94	0,7%	100%
M2 - ICLV (eco-attitude)	8,69	0,8%	100%
M3 - ICLV (eco-holiday)	8,48	0,8%	100%
M4 -MNL	4,86	0,4%	100%
M5 -LC	11,40	1%	69,6%
M6 - ICLV-LC (eco-attitude)	-	-	-

Table 17 Eco-label's value - Willingness to Accept

With a classical MNL model, willingness to accept is 7,94 CHF for camping guests, corresponding to around 0,7% of the average real price they paid for the last holiday. By including latent variables, WTA rises to 0,8% of the average price, while it falls to 0,4% when using a MNL model which disentangles preferences for the ecological label for the same price or higher price. With the latent class model, WTA correspond to 1% of the average price for camping guests and refers to 69,6% of the sample composed by "traders", with a WTA being equal to 0 for those with a lexicographic preference for price. In the Integrated choice and latent variable model controlling for a lexicographic approach it is not possible to measure WTP as the cost parameter is not different from 0.

3.5 Discussion and conclusions

The main purpose of this study is to investigate camping guests' preferences and WTP for ecological procedures in the camping sector, which received much less attention by scholars with respect of the hotel one. Three hypothesis have been formulated and answered with discrete choice models, of those, only H1 has been supported by the results, while H2 and H3 have been rejected. The majority of studies investigating WTP with discrete choice models use RUM models, which might report biased estimation if a lexicographic approach is not taken into account. This study, by the use of a latent class model controlling for lexicographic preferences, finds that, in line with economic theory, price play an important role for people's choice, who, ceteris paribus, prefer cheaper accommodation sites. A 28,9% of the sample chose always the cheapest option in the choice experiment, around 1,5% of them chose

always the greenest one, while the remaining sample chose by trading-off attribute's alternatives, with the price attribute influencing significantly their choices. There is difference in price sensitivity depending on the accommodation type of respondents, with a price sensitivity that for bungalow guests decreases with respect of their real expenditure, while for pitch renters is constant across real expenditure's levels. Considering preferences toward ecological procedures, the presence of the eco-label plays a determinant role for respondents' choices, who show a strong aversion towards options without the eco-label and assign an economic value to the ecocamping label around 1% of the real price they paid. H1 is supported by the data and entrepreneurs interested in ecological procedures might consider that, by obtaining an ecocamping label, could ask a premium around 1% to their guests.

In line with previous results in the literature, camping guests show on average a high green attitude, which is, ceteris paribus, positively correlated with their education level and lower for respondents who do not provide information about their income level. Other socio-demographic variables turned out being not significant in the definition of respondents' green attitude. However, as it often results from studies on ethical consumption, consumers' green attitude does not find a correspondence in their actual behavior. This so called attitude-behaviour gap is confirmed either on the latent variables levels (items referring to their green attitude reported an average level of 3,95 over 5, while those to a green behavior on holiday 3,18) and in the choice experiment results. In fact, heterogeneous levels of the green attitude are not correlated to different willingness to pay for the eco-label: results show that a higher level in the green attitude does not increase their willingness to pay, rejecting H2.

There is a significant difference in preferences for an upgrade or a downgrade of the ecocamping label. Results from the MNL model show that, as in Kahneman and Tversky's prospect theory (1979), the disutility for losses (downgrade of the ecological procedures with respect to the status quo) is higher than the utility for gains (upgrade of the ecological procedures with respect to the status quo), but in this case, people seem to gain utility[30] for the upgrade only if it is free, while their utility decreases with respect of the status quo if they have to pay for it[31]. By controlling for lexicographic preferences, results show that only 1,5% of the respondents is really interested in an upgrade of the ecological procedure, while the rest, being not interested, would be damaged with an upgrade at a higher price. A similar result has been found in another experiment conducted to hotels' guests, who did not show a willingness to pay to support green initiatives but rather they wanted to be compensated for cooperating with environmental behaviors (Chia-Jung, & Pei-Chun, 2014). Thus, H3 is not supported

[30] The higher utility is statistically significant in model 4, while in model 5 and 6, although positive, is not statistically significant at a 10% level.

[31] It is important to mention that a downgrade refers to the downgrade of all the features considered for the release of an eco-label, while the upgrade refers only to an upgrade in the energy provision.

by the data, but it is necessary to investigate which uncontrolled factors might have driven the results. One factor to be considered is that the upgrade of the ecological procedures consists in using 100% of energy coming from renewable sources (RES), but the status quo option (which represents the real eco-label) does not specify the real percentage of energy coming from RES. Thus, respondents' esteem of the status quo percentage might represent a source of uncontrolled heterogeneity in their consideration of the actual gain coming from a hypothetical upgrade. In absence of this information, the most conservative assumption is that of considering people expecting a status quo percentage not far from the national average. In Switzerland (and in Tenero, the camping location) around 68% of electric energy final consumption is produced by RES according to the Swiss Federal Office of Energy[32], which might be considered as a high percentage by respondents and an increase to a 100% might not be so appealing for them[33]. Thus, this study does not provide support for respondents' willingness to pay for a marginal increase of percentage of RES, a result in contrast with that of Bang et al. (2000), who found evidence of consumers willing to pay for a higher share of energy coming from RES. However, this might be influenced by having a status quo of a (perceived) already quite high percentage of energy produced by RES; it is not possible to exclude that with a status quo of 0% RES results might be different. Another aspect to be considered is the labelling of the attribute's upgrade. In fact, the 100% RES option does not specify the energy sources involved. A meta analysis considering 85 willingness to pay for green electricity shows that consumers are generally willing to pay for green electricity, but a higher share of hydropower reduces the WTP (Sundt & Rehdanz, 2015). This might provide an evidence for the result, given that the majority of the sample is composed of Swiss residents, which, considering that 60% of energy produced in Switzerland is generated by hydropower[34], might have taught that a higher percentage of RES could have been generated by this source, which, compared to other sources of green energy, has a negative impact on land use and the landscape. In addition, another explanation could derive from the design of the experiment, whose price level increase might be too high for an upgrade of a relatively inexpensive feature such as the energy consumption[35].

[32] Data are available on the website of the Swiss Federal Office: https://www.bfe.admin.ch/bfe/it/home/novita-e-media/comunicati-stampa/mm-test.msg-id-74577.html and https://www.stromkennzeichnung.ch/it/ricerca/powera/search/powerc/Supplier.html

[33] In this study there is no information regarding respondents' literacy about the composition of energy sources in Switzerland. However, a recent study conducted to almost 2000 Swiss households reports a low level of energy literacy, with a share of 27% of respondents having information as an example about price of electricity in Switzerland (Blasch, Boogen, Filippini & Kumar, 2017). Thus, it is plausible that the information about the status quo level has been considered only by some respondents.

[34] Data are available on the website of the Swiss Federal Office: https://www.bfe.admin.ch/bfe/it/home/novita-e-media/comunicati-stampa/mm-test.msg-id-74577.html

[35] There is no statistics about energy consumption of guests, but a rough estimation of the total consumption of the campsite, divided per the number of overnight, returns an average consumption of 11,37 KWh per overnight.

One last argument of discussion is the impact that the eco-label has on consumers and what regulators or entrepreneurs could do in order to speed up a shift towards a greener society. Camping guests assign an important value to ecocamping labels, so that camping without an eco certificate might consider to get one and charge a premium to their guests. On the contrary, they do not seem so attracted by an upgrade for a 100% provision coming from renewable energy sources. An important aspect to consider in this particular experiment is that the status quo option is characterized by the presence of an eco-label, which could be already enough satisfying for them. There is evidence in the literature showing that consumers think that companies should give more importance to environmental goals such as pollution reduction and sustainability practices rather than increase profitability (D'Souza, Taghian, & Lamb, 2006). Thus, guests from camping already certified by an eco-label might expect the cost for a similar increase in ecological procedure to be paid from others (as an example camping owner's investment or federal incentives) and are not willing to pay themselves for it. Similar results leave room for a reflection on what regulators could do in order to use eco-labels as a tool for a shift towards a greener consumerism. A question regarding respondents' awareness about criteria behind the release of the certificate, reports that only 2,6% of the respondents read the eco-label criteria. This evidence, considering that people's preferences drop dramatically for accommodations' options without an eco-label, shows that people assign economic value to an ecological certificate which is independent from the knowledge of the ecological standards it represents. In order to facilitate a shift towards a more sustainable and eco-friendly economy, regulators could have a stronger impact than entrepreneurs. In fact, the environment is a public good for which entrepreneurs have no interested in paying if not supported by tourists' willingness to pay. Thus, in order to obtain a greener society, governments could have a more important role, as an example by applying a more restrictive policy for the assignments of eco-labels.

3.6 Future studies

To conclude, this study presents some limitations, which can represent an indication for future studies. First, being a case study with a fairly limited sample size, one limitation is represented by the generalizability of its results, so future studies in different geographical areas are needed to provide a more accurate inference. In addition, future studies might consider the effect of other psychological variables on people's choices and some different designs of the experiment. With respect of other psychological variable, future studies should consider that a green behavior depends on several intangible and unobservable aspects, as an example (but not limited to) people's collectivism and altruistic values (Cheah & Phau, 2011), their trust and awareness with respect of the eco-label or the effect of the eco-label on consumers' emotions such as satisfaction, happiness or regret. With respect of different designs of the experiment, it is worth noticing that results found a 30% of non-trader

respondents. However, it is difficult to understand if those classes are composed of real non traders, or if they capture respondents with extreme preferences towards the respective attribute whose trade-offs could not be captured by specific attributes' levels. Thus, different attribute's levels might be considered in order to investigate the consistency of non-traders' share across different attributes' level and extreme preferences that could not be captured by the specific design of this experiment. Finally, in order to estimate the effect of hypothetical policies, different framing of the experiment should be tested, ranging from different systems of labeling or nudges (as an example the inclusion of an explanation of long-term consequences of their choices). Finally, H3 has been rejected but different type of innovations can be tested in order to understand whether there are different strategies to promote a 100% use of green energy, as an example, an upgrade in ecological procedure by using only solar energy generated by photovoltaic panels in the camping itself.

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Future research

The idea for this thesis comes from the necessity to include models with a higher explanation power of the complexity of decision-making in tourism. Using discrete choice models, which are much more popular in other fields such as marketing or transportation, three possible application of discrete choice models in tourism choice contexts are presented, with both an academic interest and relevance at the local level. In order to provide more behavioral insights, the three articles propose Integrated Choice and Latent Variable models that can capture attitude, perceptions or psychological traits and their impact on choices. In addition, the three articles show some tools that can control for behaviors which cannot be explained by a classical RUM model, as an example different choice heuristics affected by a lexicography approach and, in a prospect theory fashion, a non-linearity in preferences with respect to reference points in attributes' levels. Results of this thesis provide some indications for future studies. The author recognizes that ICLV models have some limitations such as a high risk of biases depending on the way attitudes are collected or a lack of clarity whether attitudes affect behaviors of vice versa, in addition, they are obtained at a much higher costs in terms of number of parameters and estimation time, while the benefits in terms of fit seem to be outperformed by other type of models. For future studies his interest is to follow the approach presented in chapter 3 and explore more intensively the role of different choice heuristics to explain human behavior, a topic that discrete choice modelers started to investigate more deeply in the last lustrum.

Appendix

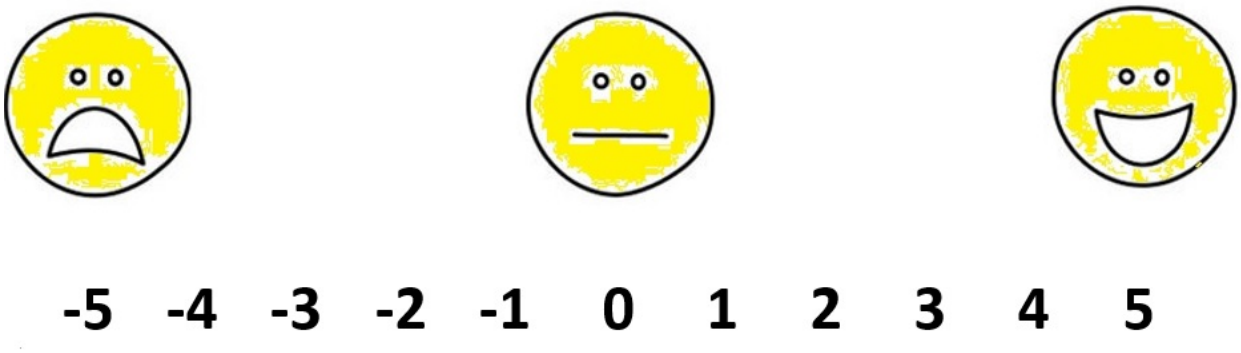

Figure 8 Children's preferences conversion to a numerical scale

Dependent variable: camping price (CHF)			
Parameters	coeff	std err	signif.
Intercept	24,85	2,113	***
Stars	1,72	0,683	**
Lake	8,02	2,627	***
Beach	11,27	3,947	***
Eco-label	-4,70	5,135	
Model fit			
Observations:		38	
F(4,33)		11,18	
R-squared		0,58	

Table 18 Hedonic regression, dependent variable: camping price for a basic pitch for 2 people.