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An Image-Based SP Experiment to Measure Willingness to Pay of Residents and Tourists for Improving Quality of Urban Areas

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Abstract

Urban modification projects such as cultural projects or new infrastructures are intended to satisfy both citizens and tourists demand for recreation. From an economic perspective, modification projects can be successfully implemented especially if they generate interest in terms of use and willingness to pay (WTP). The problem with large projects in small cities often is that the future use is purely hypothetical and once realized, it might have low impact on urban transformation with respect to the current urban reality. These projects are often planned and implemented in view of visitors and tourists, rather than residents and driven by destination attractiveness and city marketing and hence fail to consider local concerns in a satisfactory way.

The aim is to evaluate preferences and WTP for small project proposals, which intent to improve the quality of the urban area and the usability of a forthcoming cultural center. The projects are a result of an architecture team. We conducted a Choice Experiment based on visual illustration in order to evaluate preferences and WTP for new small projects.

The empirical context of this work is a small city, i.e. Lugano, Switzerland. With the new cultural center, Lugano Arte e Cultura (LAC), the city embraces an urban strategy frequently called “Guggenheim effect”, hoping to achieve a catalytic effect with large investments. The sample covers tourists who stay overnight, daily visitors and residents.

We implemented a choice model in order to measure WTPs and preferences for (a) 3 modification projects with 2 variants each, (b) the allocation of the premises on the square of the cultural center. The price of each alternative was differentiated to obtain different WTPs for residents, tourists staying overnight and daily visitors. Respondents evaluate positively these modification projects, although as expected, residents and tourists assess different WTP, with residents having higher WTP. In addition, we estimated a Hybrid Choice Model with Latent Variable. The likelihood of choosing an alternative, which involves a modification project, increases with a more positive perception of the new cultural center.

Keywords

Hybrid Choice Models, Urban Tourism, SP Experiment, Willingness to Pay

Outline

1. Introduction.....	4
2. Methodology.....	6
3. Results.....	7
4. Conclusions.....	9
5. References.....	10

1. Introduction

The aim of this paper is to investigate and measure preferences and willingness to pay (WTP) for small modification projects proposals, which intent to improve the quality of the urban area and the usability of a forthcoming cultural center. A city can be intended as a series of urban projects, both small or big, private or public, but user behavior represents a fundamental aspect for their successful implementation. Urban modification projects such as cultural projects or new infrastructures are intended to satisfy both citizens and tourists' demand for recreation.

In order to achieve our goals, we implemented a Stated Preference Experiment (SPE) based on visual representation. Moran (2005) discussed the methods for assessing the landscape valuation and other several authors highlighted the importance of direct methods such as SPE in order to assess the non-use value to economic goods. As explained by Adamowicz et al. (1994), direct methods provide a reliable alternative for assessing the environmental quality change involving a large number of attribute changes. SPEs involve hypothetical scenarios, in which respondents are asked to state their choices according to their preferences among some options involving different attributes' changes.

The perceived impacts of tourism on communities hosting touristic attractions have become an important issue, see for instance Lindberga et al. (1999) or Carmichael (2000). Sharma & Dyer (2009) provide insights into the differences of residents' attitudes to tourism planners in developing a policy for sustaining the development of tourist attractions. Many authors put the focus in estimating the WTP for "green" related elements, e.g. Majumdar et al., (2011) used contingent valuation to estimate the willingness to pay of tourists for urban forests. Mmopelwa et al., (2007) assessed the WTP of tourists for park fees in the Moremi Game Reserve and found significant differences in WTP between overseas and South African tourists and also between residents and non residents. Martín-López et al. (2007) studied individuals' attitudes behind the WTP for biodiversity conservation. Lee & Han (2002) estimated the use and preservation values of national parks' tourism resources. Verbič & Slabe-Erker (2009) measured the WTP for environmental goods with embodied natural and cultural heritage, which cannot be otherwise assessed through market price mechanisms, or Boxall et al. (1996) compared Contingent valuation models and Choice experiments in the valuation of environmental amenities. Tagliafierro et al. (2013), through an imaged-based Choice experiment method for the region of Salento, investigated the role of individual landscape perception to assess the monetary valuation of landscape attributes attached by individuals.

A classical problem with large projects is that the future success is purely hypothetical and once they are realized, the impact on urban transformation can be marginal. These projects are often

planned and implemented in view of visitors and tourists, rather than residents, and driven by destination attractiveness and city marketing and hence fail to consider local concerns in a satisfactory way. From an economic perspective, modification interventions can be valuable projects only if they generate interest in terms of use and preferences can be translated into WTPs.

The empirical context of this work is a relatively small city of around 60,000 inhabitants, i.e. Lugano in Switzerland. Both domestic and international tourists, which account for around 420,000 yearly overnight stays, visit the city. In addition to that number, being a city close to the border, Lugano is also a regular destination for daily tourists. During the last couple of years, the city embraces an urban strategy frequently called “Guggenheim effect”, hoping to achieve a catalytic effect with large investments. The city is experiencing a remarkable urban transformation process, i.e. the new cultural center project (Lugano Arte e Cultura) has been approved and its opening event is planned for the summer of 2015.

The surrounding area considered as a context in the choice experiment includes three sites very close to the LAC, i.e. 1) Piazza Luini¹, 2) Belvedere² and 3) Scalinata degli Angioli³. The area is a point of interest for both residents and tourists. In Piazza Luini it is located the Church Santa Maria degli Angioli, a late Romanesque religious building. Belvedere is a green corner on the lakeshore, as well as an attractive point of observation during the promenade that runs alongside the lake. The Scalinata degli Angioli is behind the Church and adjacent to the old funicular that was operating from 1913 to 1987. A reactivation of the funicular may be possible given the forthcoming opening of the new cultural center as it may find usefulness in the dynamics of the city.

The decision about premises and activities to organize on the square in front of the LAC is another important issue, because once it will be operational, the new cultural center is going to become a city’s hub and will integrate additional services other than cultural offer, e.g. restoration and shopping.

It is important to mention that the proposed modification projects that we define in the choice experiment are a result of an architecture work team⁴.

¹ Urban Square

² Lakeview

³ Stairway

⁴ In fact, this work is part of a multidisciplinary project on Relationality of Urban Projects. More details on http://www.urbanrelation.org/?page_id=25

2. Methodology

The sample of 487 respondents covers tourists who stay overnight (39.8%), daily visitors (28.7%) and residents (31.6%). We organized a collection data point in front of the LAC, so that respondents were able to observe the current situation.

Table 1 Choice Experiment Design

Attributes	N° Levels	Levels
Project 1: Piazza Luini (Urban Square)	3	[Current]; [Architects' version]; [Urban furniture version]
Project 2: Belvedere (Lakeview)	3	[Current]; [Architects' version]; [Urban furniture version]
Project 3: Scalinata degli Angioli (Stairway)	3	[Current]; [Architects' version]; [Urban furniture version]
Allocation of the premises on the square	3	[Cultural Activities]; [Bars Restaurants]; [Shops Boutiques]
Variation of the tax:		Respectively:
- Residents (semi-annual fee)	3	[2CHF] ; [4CHF]; [6CHF]
- Daily visitors (fees on public services)		[Current]; [+1CHF]; [+2CHF]
- Tourists staying overnight (tourist fee)		[Current]; [+1CHF]; [+2CHF]

An interesting and innovative aspect of this research is that the choice tasks were based on visual illustration, i.e. we proposed to respondents some drafts of the variants of the three projects.

On the other side, the attribute concerning the premises on the square as well as the monetary attribute were settled in a traditional text format.

Given the importance of individuals' perception, we decided to estimate a Hybrid Choice Model, i.e. we implemented an Integrated Mixed Logit and Latent Variable Model in order to take into consideration the perception of the new cultural center. The choice model part of our analysis has been set up in order to measure preferences and WTPs for (a) three modification projects with two variants each, (b) the allocation of the premises on the square of the cultural center (cultural activities, bars and restaurants, shops and boutiques). The price of each alternative was differentiated to obtain different WTPs for residents (semi-annual fee), daily visitors (car park rates and the city's public transport) and tourists staying overnight (tourist fee).

3. Results

In this section, we present some results, which are still preliminary but the majority of these parameters seem to be stable. Especially for the LV part of model we intent to investigate some more accurate specification.

The parameter “No choice” refers to a dummy variable for the no option alternative. All the explanatory parameters related to attributes of alternatives, are treated as generic parameters, meaning that they have the same coefficients for “Alternative 1” and “Alternative 2”. The *No-choice alternative-specific constant* is negative ($ASC_N = -1.92$) and statistically significant at a 99% confidence interval (CI), i.e. people are more likely to choose one of the two alternatives consisting in a change in one attributes, ceteris paribus. As expected the *alternative-specific constant* is not statistically different from zero in any unlabeled experiments, i.e. there is not a preference between the two unlabeled alternatives net of the influence of the attributes.

The modification projects proposed by the architecture team are preferred with respect to the current situation and the second variants. Nevertheless, we were only able to estimate the conjoint effect of modification projects for Piazza Luini and Belvedere with respect to each version, i.e. the versions proposed by the architecture team form one unique coefficient $\beta_{LB_V11} = 1.24$, while the other two versions related to the urban furniture form another coefficient $\beta_{LB_V22} = 0.855$. The same does not apply for the Scalinata degli Angioli, in which we are able to distinguish the specific effect of each version, i.e. $\beta_{SCAL_V1} = 0.655$ and $\beta_{SCAL_V1} = 0.547$. All coefficients are significant at a 99% CI and have to be interpreted as marginal utilities.

The current situation of the allocation of the premises on the square of the LAC involves cultural activities, we proposed to respondents to evaluate scenarios containing also Shops and Boutiques or Bars and Restaurants. We are able to distinguish some statistically significant interactions between respondent type (resident, tourist or daily visitors) and the premises attribute. With respect to the current situation (reference, cultural activities on the square), the interactions between respondent type with restaurants attribute are not statistically different from zero. Shops are less preferred to cultural activities and restaurants both for residents ($\beta_{SHOP_RES} = -0.928$) and daily visitors ($\beta_{SHOP_DV} = -0.632$), while the interaction with tourists who stay overnight is not significant. Moreover, there is a significant positive relation between level of income and restaurants ($\beta_{REST_INC} = 0.115$), while a negative relation with the age of the respondent ($\beta_{REST_AGE} = -0.0156$).

As expected the coefficients related to the monetary costs are negative, and statistically significant at a 99% CI. For residents it is $\beta_{FEE_RES} = -0.371$. For tourists we have $\beta_{FEE_TOU} = -0.439$,

while for daily visitors $\beta_{FEE_DV} = -0.679$. In addition, the interaction between the fee and the age is significant, $\beta_{FEE_AGE} = 0.00527$.

By implementing a Hybrid Choice Model we simultaneously estimate a Latent Variable Model and a Mixed Logit (with error component); the findings suggest that the likelihood of choosing an alternative which involves a modification project is positively related with a more positive perception of the new cultural center, i.e. $\beta_{PERC} = 0.541$ at a 99% CI.

4. Conclusions

We conducted a choice experiment evaluating preferences and WTP for new small projects based on visual illustration. It can be interpreted as a measure of the WTP for improving the quality and the usability of the urban area of the new cultural center.

In addition, by implementing a Hybrid Choice Model, the findings suggest that people who have a more positive perception of the new cultural center, are more likely to choose an alternative consisting in a modification project.

From these results, it is possible to estimate the WTP for the different modification projects for each respondent. As mentioned before, currently we are still in the estimation phase; therefore, we give the following results for WTPs⁵, which are the results of preliminary model specifications:

Table 2 Willingness to pay results (preliminary average results on the sample)

Projects:	Willingness to pay (in CHF)		
	Residents	Tourists	Daily Visitors
Piazza Luini V1 and Belvedere V1	9.21	6.26	2.58
Piazza Luini V2 and Belvedere V2	6.35	4.32	1.78
Scalinata degli Angioli V1	4.86	3.31	1.36
Scalinata degli Angioli V2	4.06	2.76	1.14

Notice that respondents evaluate positively these modification projects, although as expected, residents, tourists and daily visitors assess different WTP, with residents having the highest WTP and daily visitors the lowest one.

The likelihood of choosing an alternative, which involves a modification project, increases with a more positive perception of the new cultural center.

⁵ The WTP, in the choice model framework, is the ratio between the marginal utility of an attribute over the monetary cost coefficient.

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