

# Conjoint analysis as a tool for support urban decision making: two case studies in Catalonia

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## 1. Research Objective

**This Report is the results of two investigations that have been aimed at assessing how conjoint analysis, a technique affiliated to the design of goods and services through the involvement of future users, can be used as a support tool in urban decision making .**

## 2. Implementation

**This method has been used to evaluate the relevance of the attributes of two possible projects of urban intervention in Catalonia.**

**The first, related to the recovery of the Pirelli factory in Manresa city and the second, is related to the creation of a "traditional" commercial street in Barcelona.**

*To what extent the conjoint analysis could serve as a support tool in urban decision making.*

### 3. Conjoint Analysis Philosophy

The conjoint analysis was born four decades ago as a tool to take into consideration the preferences of people in the design process for goods and services.

This technique seeks to find the attributes that give greater satisfaction or utility to future users and, therefore, that determine success in terms of acceptance of the goods produced.

Therefore, it is a way to involve future users in design process.



## 4. Conjoint Analysis

Now, Conjoint analysis (CA) is a methodology applied on a few urban decision making.

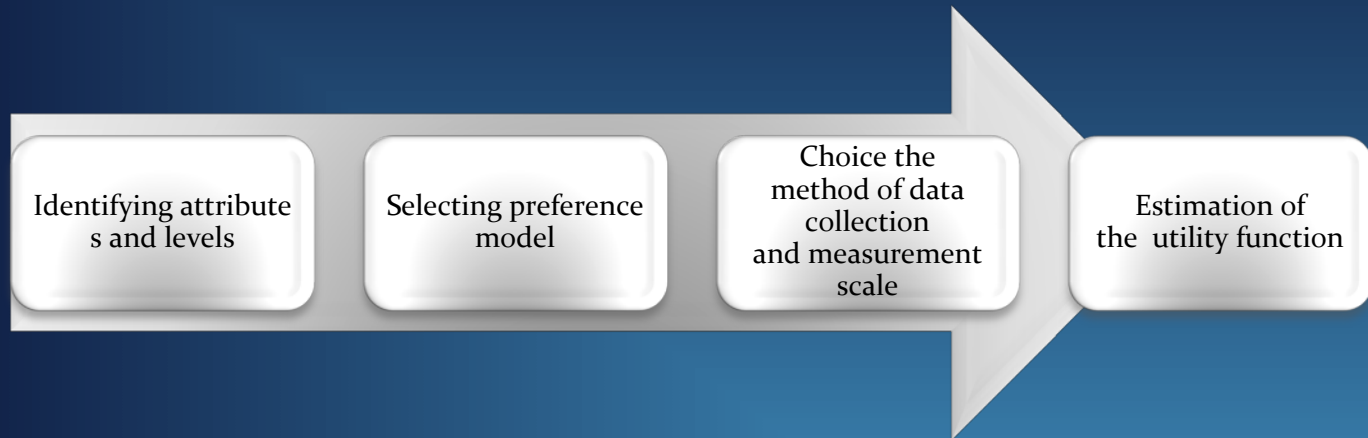
Users value products according to their attributes, from which we obtain the user preferences.

It's about finding a set of values or utilities related to the levels of different attributes with the user preferences.



## How is the Conjoint Analysis structure?

The Conjoint Analysis and their variants ACV, CBC and ACA have a modular structure, which possess the following common elements:



- a) The AC based on a set of attributes that describe the products, services, projects or policies, and each attribute takes mutually exclusive levels.*
- b) The levels of these attributes are combined to produce compound goods.*
- c) The compound goods are evaluated by a representative sample of future users.*
- d) The relative importance of each level for each attribute is the result of the global preferences by using statistical models.*

## 5. Case studies

### A new use for the Pirelli factory (Manresa city)



Aquí le presentamos el estado actual de planta Pirelli en Manresa

### The design of Vía Augusta retail street (Barcelona)



Vía Augusta, tramo avenida Diagonal-Travessera de Gràcia

Vía Augusta, tramo avenida Diagonal-avenida Príncipe de Asturias

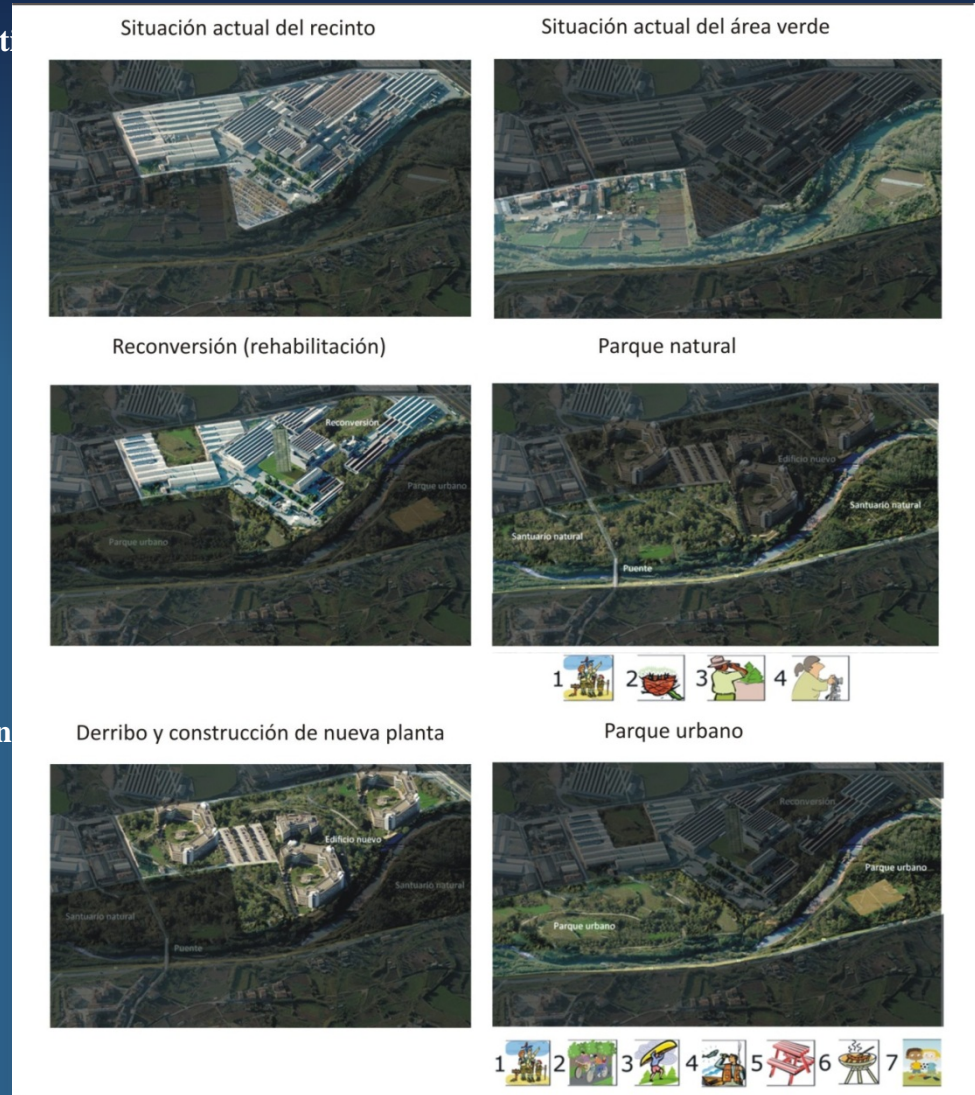
Vía Augusta, tramo avenida Príncipe de Asturias-Plaça de Molina

Fuente: Elaboración propia

## 6. Attributes and levels

### A new use for the Pirelli factory

1. The level of intervention in buildings: the conversion of existing buildings and / or construction of other new ones.
2. The use of the buildings: Using as a museum, museum and housing, museum and science park, or museum and social facilities.
3. The use of green areas: urban sanctuary or park
4. The system of transport: by car, by car-bus and car-bus-bicycle.
5. Connection on the Cardener river : to maintain or create a new bridge.
6. Operation Management: private, public, or public-private partnership.
7. Price: Annual subscription: 10, 25 and 50 euros per person.



**The design of Vía Augusta retail street  
 (Barcelona)**

**7. Attributes and levels**

**1. Complementary uses to retail:** Restaurants & cafes, bars and lounges day or showroom + libraries.

**2. The configuration of the street:**

The first level proposes to extend the existing sidewalks, reducing the lanes and keeping the central promenade.  
 The second level proposes to further expand the sidewalks, reduce vehicle lanes and expanding the central promenade.  
 The third level proposes to extend the sidewalk, reducing the lanes to a road and creating a new side promenade.

**3. The use of public space:** space walk, space + walk + playground + kiosk  
 space walk + playground + kiosk + terraces  
 space walk + playground + kiosk + space for art exhibitions.

**4. Type of parking:** car parking area, parking area for motorcycles and parking underground.

**5. Price:** One year monthly rate of 3, 5 and 7 euros

**Alternativa 1 de configuración de la vía**

Acera Se amplía, 2 carriles Se reduce, Rambla Se mantiene, 2 carriles Se reduce, Acera Se amplía

**Alternativa 2 de configuración de la vía**

Acera Se amplía, 1 carril Se reduce, Rambla Se amplía, 2 carriles Se reduce, Acera Se amplía

**Alternativa 3 de configuración de la vía**

Acera Se amplía, 3 carriles Se mantiene, Rambla Se amplía

**Otro aspecto a regular sería el uso de los espacios peatonales:**

- Espacio de paseo + Juegan infantes + Quioscos
- Espacio de paseo + Juegan infantes + Quioscos + Terrazas
- Espacio de paseo + Juegan infantes + Quioscos + Espacio de arte

Otra cuestión se refiere a las alternativas de aparcamiento. Las alternativas son:

- Parking en superficie → Fundamentalmente para coches
- Parking en superficie → Fundamentalmente para motos
- Parking soterrado → P

Finalmente, para poder financiar las obras se cobraría una tasa mensual, durante un año a las personas residentes y a las actividades económicas en los distritos de Sant Gervasi, Gracia y el Ensanche:

<b>3 € mensuales, por persona</b>	Esto equivale a que el 33% del coste de las obras sea pagado por los residentes y las actividades económicas y el resto por la administración
<b>5 € mensuales, por persona</b>	Esto equivale a que el 53% del coste de las obras sea pagado por los residentes y las actividades económicas y el resto por la administración
<b>7 € mensuales, por persona</b>	Esto equivale a que el 73% del coste de las obras sea pagado por los residentes y las actividades económicas y el resto por la administración

## 8. Application design



*Display formats for election levels, the implementation of choice experiment based on conjoint analysis based on choice. (CBC)*

## 9. Preferences revealed in the case of the Pirelli

"The majority of users prefer to keep the buildings to demolish and re-build them"

"The most preferred level is which combine the museum with social equipment"

"The preferred level option is the included car, bus and bicycle," enabling multimodal access to the site.

In the price attribute, as expected, the most preferred level is the cheapest, because the higher the cost, the greater the negative impact on the utility function of respondents.

MOD 1P		
<b>Ajuste del modelo</b>		
rh		0,383
Log-verosimilitud modelo	-	465,02
Log-verosimilitud modelo nulo	-	532,83
Dif	-	67,80
Porcentaje de acierto		41%
Consistent Akaike Info Criterio		1.023,44
Chi cuadrado		135,61
Chi cuadrado relativa		10,43
<b>Utilidades parciales</b>		
<b>Niveles por atributo</b>	<b>Efecto</b>	<b>T student</b>
Rehabilitar el edificio	0,15	2,91
Derribar y construir todo de nuevo	0,15	2,91
Museo	0,12	1,11
Museo-Vivienda	0,01	0,13
Museo-Parque Tecnológico	0,04	0,36
Museo-Equipamiento social	0,17	1,62
Parque natural	0,01	0,24
Parque urbano	0,01	0,24
Coche	0,24	2,86
Coche y autobus	0,04	0,53
Coche, autobús y bicicleta	0,28	3,49
Mantener la actual	0,02	0,32
Crear un nuevo puente	0,02	0,32
Gestión privada	0,06	0,70
Gestión pública	0,01	0,17
Gestión público-privado	0,04	0,52
Precio entrada	0,17	4,67
Opción nula	1,04	8,03

### Importancia relativa de los atributos con niveles significativos al 95% de confianza

Intervención edilicia	0,30
Usos de los edificios	0,29
Transporte	0,52
Precio	0,17

Nota: en negro están señalados los efectos significativos al 95% de confianza  
 \* efectos significativos al 90% de confianza

Note: Attributes "use the green area", "connection on the Cardener" and "operation management" no statistically significant differences, although in the case of public management is preferred rather than private.

## 10. Preferences revealed in the case of the Vía Augusta

The use of public space is the most crucial attribute for casual users. "Ride +playground + kiosk + terrace"

“In relation to parking the reports more useful option is related to the solution underground, surface parking for cars is the least preferred option”.

“As for the regulation of uses of private space, in addition to trade, is the preferred choice of exhibition halls and libraries, while the daytime bars is the least desired”.

“Finally the model indicates that the fee is less important and also has the expected negative sign”.

Ajuste del modelo	
rh	0,364
Log-verosimilitud modelo	- 497,54
Log-verosimilitud modelo nulo	- 540,52
Dif	- 42,98
Porcentaje de acierto	51,21%
Consistent Akaike Info Criterio	1.067,07
Chi cuadrado	85,95
Chi cuadrado relativa	8,60

Utilidades parciales		
Niveles por atributo	Efecto	T student
Restaurantes+cafeterías	0,052	0,737
Bares diurnos	- 0,175	- 2,364
Sala de exposiciones+librerías	0,124	1,759
Rambla central	- 0,035	- 0,187
Rambla central ampliada	0,065	0,584
Rambla lateral ampliada	- 0,029	- 0,262
Espacio de paseo	- 0,448	- 2,282
Espacio de paseo + Juegos infantiles + kiosco	0,022	0,206
Espacio de paseo + Juegos infantiles + Kiosco + Terraza	0,370	3,461
Espacio de paseo + Juegos infantiles + Kiosco + Exposiciones de arte	0,056	0,503
Parking en superficie fundamentalmente para coches	- 0,149	- 2,042
Parking en superficie fundamentalmente para motos	- 0,064	- 0,888
Parking soterrado	0,213	3,063
Tasa (precio)	- 0,181	- 5,748

Importancia relativa de los atributos	
Usos complementarios al comercio	18%
Usos del espacio público	49%
Tipo de aparcamiento	22%
Tasa (precio)	11%

## 11. Final remarks

“Conjoint analysis is a technique whose efficiency rises above the surveys based on the valuation of isolated attributes. This method find the relative importance of each attributes and their interactions as well as the trade off in terms of the utility between them”

“Although the advantages of this methodology, the Conjoint Analysis does not provide elements to discern what attributes should be subject to evaluate”

## 12. Final remarks

It is important to highlight the fact that the stated preferences are based primarily on everyday citizenship perception, which neither guarantees the future needs nor the preferences of younger generations

The Conjoint Analysis may provide elements of reflection, which now are insufficient, and it needs complementary qualitative techniques to know the main reasons, that are behind of preference citizenship structure.

# Muito obrigados

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