The Regeneration of a Shopping Center Starts from Consumers' Preferences: A Best-Worst Scaling Application

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Abstract. Malling in the United States was characterized by the construction of large shopping centers in the suburbs of the city, in close connection with urban sprawl. These retail spaces have undergone a severe crisis resulting in their closure since the 1990s. In response to this phenomenon, the so-called "demalling" practice has spread intending to redevelop them with new functions. Although more incipient, in Europe this process is only evolving in the last few. This study illustrates a Best-Worst Scaling (BWS) experiment to rank consumer preferences to identify new functions to be installed in the existing shopping centers. Different items were considered in this study, including both commercial characteristics, such as type and size, and architectural-design aspects, such as internal organization, external areas feature, and services. An online survey was conducted and a total of 600 respondents was collected and analyzed through the Analytical Best-Worst Score (ABWS) algorithm. Starting from a real case related to a shopping mall in Turin (Northern Italy), the experiment results were used for definition of specific guidelines for regeneration projects.

Keywords: Demalling · Max Difference Analysis (MaxDiff) · Analytical Best-Worst Scoring (ABWS) · Survey experiment · Consumer preferences

1 Introduction

Originally born in the United States, shopping centers occupied the suburbs in the 1960s and 1970s, facilitated by the urban sprawl phenomenon. For some decades this growth has defined new aggregation centers in the immense American steppes. But in the 1990s, an unexpected crisis phenomenon favored numerous dead mall cases [1]. Although the social, economic and urban conditions of the context were radically different, this

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phenomenon followed a similar trend in Europe; the trial took place with a certain delay but with a frequency that has never reached that of the American cases. The reasons are different; in Europe the diffusion of urban sprawl, which is one of the favorable conditions for the success of the mall model, never touched the American levels and the new department stores, despite their widespread success, always had to compete with the attractiveness of the traditional shopping areas located in the city centers. On the other side - notwithstanding the frequent oppositions, especially by some categories of stakeholders, like merchants' associations, environmentalism activists etc. - the authorization of new malls has been for long time in the Old Continent an effective way to activate urban renovation projects, and to guarantee essential revenues for the local administrations. Anyway, the crisis of this commercial model that first appeared in the US. has not been circumscribed to the American cities, but it reached Europe in a generalized way in the last decades, also because of the widespread of the e-commerce. Italy is not exempt from this phenomenon [2] and in the outskirts of the Italian cities, many cases of abandoned or underused commercial structures can be counted nowadays, constituting a huge amount of real estate assets, stuck in a standoff of their lifecycles.

The urban, economic, and social effects of the decommissioning of shopping centers push policy makers to take preventive actions, aimed at reducing the impact of the new structures on the context. Furthermore, post-recovery interventions are envisaged with the development of so-called demalling projects. The term demalling refers to the process that aims to transform the disused shopping center into something new. Interventions of this type have already spread in the US since the 1990s; some disused structures have been reused with more or less invasive interventions (such as offices, libraries, or sports centers), others have maintained their commercial function, but have been integrated with complementary activities (such as residences, offices and public services), others are been converted into new retail formats closer to consumer preferences. From this point of view, the regeneration and enhancement processes of abandoned areas can represent a great opportunity for the local system, both from the point of view of a new use as an engine of economic development and as a driver to accelerate the transformations of cities and towns [3–8].

The demalling interventions tested at the international level represent a solid basis for the definition of project proposals for the transformation of commercial buildings also in other territorial contexts. Based on the dead mall phenomenon and good demalling practices, this study proposed a regeneration scenario for the Venaria Shopping Center located in Turin (Northern Italy), starting from consumers' preferences. Since in the context of an architectural and urban design it is useful to understand the users' preferences based on the variant utility attributed to the different project proposals [9–12], the Best-Worst Scaling (BWS) method was applied to support the design phase for the regeneration project [13]. The BWS method made it possible to identify a ranking of design elements in line with the needs and preferences of consumers and allowed to create a future vision as much realistic as possible.

After the Introduction, Sect. 2 presents the BWS methodology, the survey structure, and the Analytical Best-Worst Score (ABWS) algorithm used to analyze the responses. Section 3 describes the case study and lists the items selected to develop the BWS experiment. Section 4 presents a descriptive analysis of the sample (Sect. 4.1), the priority of

the items according to the respondents' opinion (Sect. 4.2), and the regeneration project of the shopping center under study (Sect. 4.3). The conclusions and future perspectives follow.

2 Methods

2.1 Best-Worst Scaling

The preferences evaluation by means of market analysis and sample surveys has a long tradition in the field of marketing, as well as econometrics. In particular, the latter assumes that, within the framework governed by the principle of the rationality of consumer choice, the preferences of each individual are represented by a Random Utility Maximization (RUM) model. The choice modeling within the RUM theory has undergone a slow evolution that led them towards a gradual improvement, in an attempt to overcome some rigidities inherent in McFadden's original formulation [14]. In recent years, the experimentation of the BWS approach in the field of preference assessment perfected the conventional Choice Experiments and Conjoint Analysis.

BWS technique [15], also known as Max Difference Analysis (MaxDiff), is a method of detecting preferences requiring the respondent to select the best and worst alternative from the list of proposed items. BWS exploits the idea that when individuals evaluate a series of objects, the extreme choices (best and worst) should be more reliable than intermediate ones. This latter aspect is consistent with Helson's theory of adaptation level, according to which a certain judgment, in a given situation, is also the result of previous experiences and their relevance in terms of more intense positive/negative sensations [16].

2.2 Questionnaire

The BWS experiment was included in a questionnaire administered online. The software used to create the questionnaire was Sawtooth Software Discover®. After a brief presentation of the research goal, the questionnaire was organized into three main parts.

In the first part, the interviewee was asked about the activities that he/she usually attended in a shopping center, how he/she reached them or why he/she went there. The second part included the BWS method, evaluating the various features and services offered by a generic shopping center. Each respondent had to answered eight choice sets consisting of five items each. The elements of each choice set were randomly extracted by the software.

The final part of the survey investigated the respondent's personal data. The questions concerned gender, age, educational qualification, profession and family income. These responses were useful in validating the consistency and heterogeneity of the sample.

2.3 Analytical Best-Worst Scoring

For calculating the BWS score, the Analytical Best-Worst Scoring (ABW) proposed by Lipovetsky & Conklin [17] was chosen. ABW is part of simple methods for calculating MaxDiff scores. ABW is calculated as following Eq. (1):

$$ABW = ln\left(\frac{1 + NBW}{1 - NBW}\right) \tag{1}$$

where NBW is the best-worst score normalized by the unit calculated according to Eq. (2):

$$NBW = \frac{\#Bests - \#Worsts}{Total\ times\ shown} \tag{2}$$

where the difference between $\#Bests$ and $\#Worsts$ (the number of times an item is selected as best and worst respectively) is divided by the number of times the item is shown. ABW has a lower error than the Best Minus Worst Scoring for the estimation of elements latent values proposed by Finn and Louviere [15, 18], and can be compared to multinomial logit (MNL) models while being less computationally efficient [19].

3 Application

3.1 Case Study

The Venaria Shopping Center is in the north-western part of the city of Turin (Northern Italy) which borders the municipalities of Venaria and Collegno (Fig. 1). The area is well connected and accessible through numerous connecting roads, as well as the railway infrastructure. The area has a purely productive-industrial vocation. The extensive vegetation that characterized the area in the past is no longer present today, replaced over time with a building density consisting mainly of production structures. Over the years, numerous mass-selling commercial structures have sprung up.

The Venaria shopping center understudy was one of the first with typical characteristics of the American mall in the Turin area. It was built in the early 1980s under the name of "Città Mercato". The structure of the Venaria shopping center emulates the American and French malls, common to those that have spread throughout Italy. The distribution is based on an internal gallery that houses small shops and two anchor stores. The outdoor areas are mainly used for parking, resulting in underutilization of many hours of the day. The sales activities present are mainly personal services (pharmacy, laundry, tailoring, hairdresser), cosmetic, tobacco, telephone and internet shops, and catering (bar and restaurant). The hypermarket is the shop that most induces the regular customer to visit the site, even several times a week. However, the small shops guarantee a certain frequency of visitors during the week.

Although the Venaria Shopping Center is still an important hub for residents of the area and beyond, it has faced competition in recent years. The Allianz Stadium, also known as Juventus Stadium, was built in the immediate vicinity. Thanks to the different functions present inside, including the Area12 shopping area, it has become a reference

place for the residents of the area. The differences between the Venaria shopping center and the Area12 are evident both from an architectural and functional point of view. Area12 shopping center is in a strategic position given the adjacency to the new Allianz Stadium, becoming a reference point for fans and regulars in the area. The Area12 center integrates various traditional functions (such as hypermarket, personal services, and services in general) with new destinations in line with new retail trends (such as exhibition spaces, medical centers, etc.).

The dead mall phenomenon inevitably impacted the Venaria Shopping Center due to the trend of change in commercial demand and considering the multiplicity of the commercial offer of the new Area12 settlement. In this perspective, a new redevelopment project of the Venaria Shopping Center should focus on a different business logic, which follows the changing tastes of consumers, and which points to new types of activities, such as lifestyle centers. New and complementary functions must be added to the traditional ones by defining a restyling that starts from the small intervention up to the total transformation of the site.

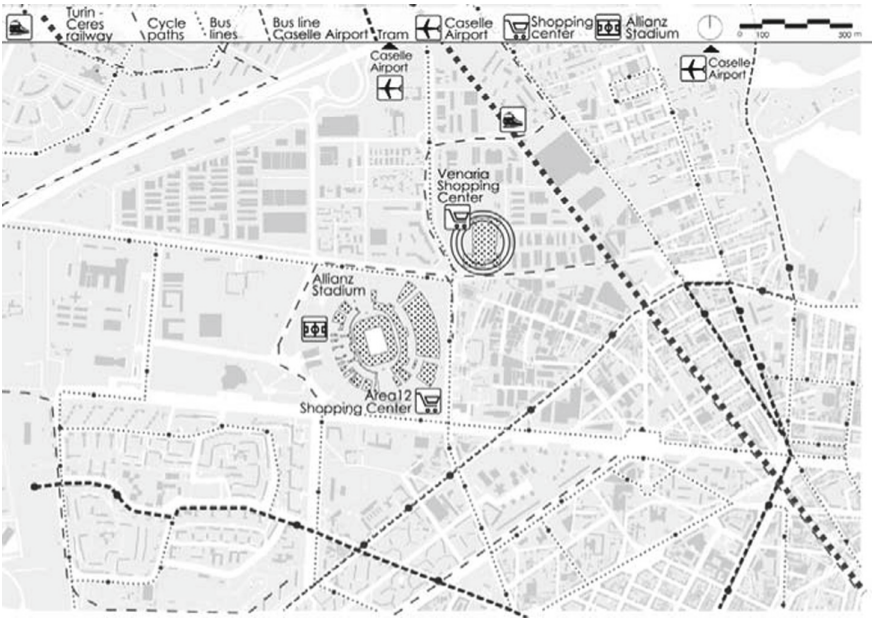


Fig. 1. Study area.

3.2 Items Selection

The regeneration of the shopping center was guided by a study based on the comparison of the architectural and functional characteristics present in today's and most innovative shopping centers in Italy and around the world. The study aimed primarily at defining a list of items that users could indicate as the most needed within a generic shopping mall.

Subsequently, the survey aimed to identify among the multitude of services those strategic for the regeneration of the shopping center starting from the preferences declared by consumers.

The items involved different spaces and dimensions of the shopping center, investigating the usefulness of the consumer for the different parts that make up the structure. The items can be classified into five dimensions.

The first group referred to the type, size, and sales offer (SO); small and single-brand stores, based on specialize retail, and the presence of the hypermarket, a larger selling space focused on quantity over quality.

The second group referred to the architectural design of the interior spaces (IS). The items investigated the internal distribution by covered or open-air galleries and defined two commercial typologies: classic shopping malls or lifestyle centers respectively. Other items referred to a multi-story center or open-air market structure.

The architectural design aspects for the external spaces (ES) constituted the third group of attributes. These items represented functions dedicated to socializing, such as the presence of open spaces dedicated to events, outdoor cinemas, open green spaces, greenhouses and winter gardens, urban gardens, and pedestrian squares.

The fourth group included the most innovative functions present in shopping centers and referred to complementary services and activities (CS). The items included the availability of play areas, spaces for exhibitions, the presence of a cultural center, coworking areas, restaurants, self-service areas, the possibility of charging electric cars, the presence of accommodation facilities, sports facilities, and multiplex cinemas.

The last issue referred to the type of parking space (PS), whether outdoor or covered.

The twenty-four items identified built an exhaustive list of characters, within which the interviewed the consumer had the opportunity to choose which of these attributes he/she considered the most important to get the shopping center closest to his/her needs and requests.

4 Results

4.1 Descriptive Analysis of the Sample

The link to the questionnaire was disseminated via email and social networks to obtain a heterogeneous sample for different age groups and geographical areas. The survey was carried out between September and December 2020. About 600 questionnaires were collected. After the verification phases, questionnaires that were not fully completed were discarded. The actual number of questionnaires considered reliable was 473. 43% of the interviewees were male, while 57% were female. The respondents were distributed according to age groups: 39.32% of the interviewees were between 18 and 24 years, 19.03% between 25 and 34 years, 13.32% between 35 and 44 years, 8% between 45 and 54 years old, 13.53% are over 55 years old. The limited number of adult respondents was mainly related to the type of compilation medium chosen, far from the daily uses of those age groups. The impossibility of carrying out face-to-face questionnaires in the period of the COVID-19 pandemic did not allow to obtain a large number of questionnaires filled out by individuals in the adult age group. Most of the interviewees belonged to families with at least 3 individuals (80.91%).

Regarding shopping habits, 28.54% of respondents visited a shopping mall at least once a week. The reasons for visiting the usual shopping center were the use of both the hypermarket and the shopping arcade for 52.01%. 26% visit the center only for the hypermarket, while about 22% only for the shops in the gallery. The usual shopping center was located for most of the sample within 10 km (88.37%). 56.45% said shopping habits have changed quite or a lot in the last year (56.45%), with more online shopping. This could be due to lifestyle changes or government restrictions in Italy adopted during the period of the COVID-19 pandemic.

4.2 Individuals' Priorities

Once the descriptive analysis of the sample was developed, a statistical model was constructed to determine the order of the 24 characteristics considered (Table 1).

The data from the survey experiment were analyzed using the ABWS. The ABWS defined an overall picture of individual preferences, stating that the most chosen items referred to the ES dimension; outdoor green spaces (2.46) and pedestrian squares (1.74). The results went towards configurations of open and usable public spaces, according to the "commercial square" common in many cases of redevelopment today. This was followed by the presence of some specialized shops inside the shopping center (1.67). The results confirmed that consumers tend to give importance to the type, size and sales offer, focusing on the quality of the products. This preference was also confirmed by the central position in the ranking of hypermarket presences (–0.16), underlining the indifference towards this type of retail sale.

Other interesting results referred to the open structure of the shopping center galleries (1.07) and the spaces intended for meeting, aggregation, and leisure places; open spaces dedicated to events (0.79), open markets (0.73). Consumers did not only visit shopping centers for shopping only but also to frequent meeting and entertainment spaces, dining places and spaces for events, especially in outdoor spaces (ES).

Among the elements considered less useful were the spaces of services and complementary activities (CS) for co-working (–1.07), multiplex cinema (–1.46) and the presence of hotels and accommodation facilities (–1.92). The multiplex cinema, often designed in the immediate vicinity of shopping centres, now seems to be a solution that is no longer in line with consumer needs. This result could be caused by the change in habits brought about by the restrictions set by the Italian government which included the closure of cinemas, theaters, and live entertainment venues from the earliest days of the global emergency COVID-19 [20]. There was also little interest in the use of shared workspaces for smart working, despite being defined as a practice in pandemic period.

The results were useful in defining the design characteristics of the Venaria shopping center based on the best and worst choices for the twenty-four items identified.

4.3 New Project of Venaria Shopping Center

The results deriving from the questionnaire defined the configuration of a commercial center profile more in line with the preferences and utilities of today's users. The results obtained were also in line with the various cases of current commercial redevelopment

Table 1. Attributes in order of importance.

Items	Dimension	Scoring
Presence of green open spaces	ES	2.46
Presence of pedestrian squares	ES	1.74
Specialized shops (single brand)	SO	1.67
Open air gallery	IS	1.07
Bar/café and self service	CS	0.81
Open space dedicated to events	ES	0.79
Open market	SO	0.73
Presence of a cultural center	CS	0.53
Space dedicated to exhibitions and shows	CS	0.35
Uncovered parking	PS	0.22
Restaurant and/or pizzeria	CS	0.11
Presence of the hypermarket	SO	– 0.16
Outdoor play area	ES	– 0.22
Urban gardens/Green roof	ES	– 0.27
Covered parking	PS	– 0.37
Outdoor cinema	ES	– 0.41
Multi-story shopping mall	IS	– 0.61
Covered gallery	IS	– 0.80
Charging stations for electric cars	CS	– 0.97
Greenhouses/Winter Garden	ES	– 1.00
Sports activities	CS	– 1.05
Presence of an area for coworking or conferences	CS	– 1.07
Cinema multiplex	CS	– 1.46
Presence of an accommodation facility	CS	– 1.92

[21]. Following the results of the evaluation model, the project defines solutions for the redesign of commercial spaces based on green spaces, mixed use (and not just mass sales), experience and leisure with an ever-stronger link between the architectural object and the urban context in which it is inserted. In this way, the new trade will have to open up to the context, even physically, supporting itself with some spaces and events that characterize urban everyday life. The existing centre will have to change by offering a new aggregation site that fills the gaps in the peripheral site of the urban context.

The design proposal of the building is intrinsically based on its structural aspect (Fig. 2). The structure of the centre consists of steel and reinforced concrete pillars supporting a repeatedly pitched roof, which have been specially designed to reconfigure the building. This peculiarity has made it possible to reconfigure the shopping center by

regenerating it through an open distribution that changes the existing covered gallery. The plan of the center is completely modified favouring an open gallery by eliminating some original parts. In this way, open connections are defined that link a building that is more fragmented than today. The new organization of the structure offers the possibility to define, not only new functions, but to propose a new character to the open space. This space is created by slightly reducing the sales area and transforming part of the parking lot into new open and covered public spaces. The public space is not only an open distribution area, but also a place for temporary activities such as open-air cinema or other leisure activities.

A more detailed and sophisticated commercial offer is proposed, which gives room for possible hybridisation by looking at an alternative trade to the classic shopping centre model. The sale of the centre will not focus on the mass trade typical of a hypermarket, but on a multitude of sales structures of various sizes. The offer will be defined by different types of products and by experiential and specialised selling. Some of the added structures will be set up as cultural, hospitality and service centres.

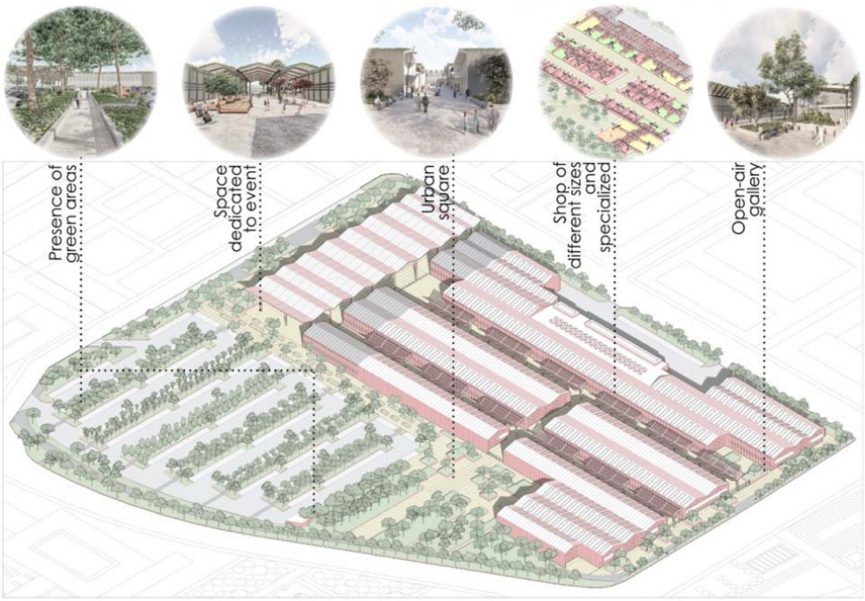


Fig. 2. Axonometry of the restyling project of the shopping center in Venaria.

5 Conclusions and Future Perspectives

The dead mall phenomenon has hit the United States and Europe, favouring numerous cases of closure and abandonment of shopping centers. These cases lead to significant negative consequences considering the impact not only on the shopping center but also on the territory and society of the surrounding areas, especially in peripheral contexts.

In this context, the study aimed to define new functionalities for innovative shopping centers in line with the new needs of consumers.

A survey based on the BWS method was structured with the objective of obtaining a ranking of 24 items defining different characteristics and functions within recent shopping centres. The items focused on the new role offered by public green spaces, the architectural features, the relationship with the context and the different functions and leisure facilities. The results showed a preference for the adoption of outdoor green spaces and pedestrian plazas, and an open structure for the shopping mall. Traditional features often combined with shopping centres did not seem more attractive, such as multiplex cinemas. The results were useful to define the restyling project of a shopping center located in Turin which in recent years has suffered from strong competition.

As future perspectives, the collected data could be segmented to define preferences for subsamples such as age group or geographic area. It would be appropriate to repeat the survey, to verify whether consumer preferences will change after the COVID-19 pandemic. Furthermore, models based on the multinomial model (MNL) could provide more effective estimates and could validate the significance of the estimated coefficients.

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