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Summary

This study explores the potential of conjoint choice analysis for planning decisions in urban sites. We elicit people's preferences for regeneration projects that change the aesthetic and use character of specified urban sites. We focus on two sets of regeneration projects. The first set entails hypothetical transformations of an actual square with an important cultural and historical dimension. The other set of projects consists of hypothetical transformations of an abstract square. Each regeneration project is defined by aesthetic and use attributes. Our results suggest that people behaved in a way that is consistent with the Random Utility Model for the abstract square, and that there are both similarities and differences between preferences for the actual and the abstract square.

Keywords: Conjoint analysis, conditional logit, consumer behavior, aesthetic and use values, urban regeneration

JEL: Q26, R14, Z10

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1. Introduction

When planning decisions have to be made about urban areas, and about projects for the regeneration and reuse of existing sites and public spaces in urban areas, economists would suggest that at least some consideration be given to the costs and the benefits associated with these projects. It is, however, sometimes difficult to compute the monetary benefits of urban regeneration and restoration projects, because many of the services that they provide to the public—including aesthetic quality, comfort, sense of neighborhood identity, town character, preservation of cultural and historical heritage, access to outdoor space—are non-market goods. Lacking markets where these services are traded, economists have devised a number of methods to place a monetary value on them.

Contingent valuation is one such method. The contingent valuation approach (see Mitchell and Carson, 1989) surveys individuals, asking them directly to report their willingness to pay (WTP) for a specified (change in the provision of a) public or private good. Conjoint analysis is a variant of contingent valuation where respondents are asked to rate, rank, or choose between hypothetical public programs or commodities described by a set of attributes (see Hanley et al. 2001). Respondents trade off the attributes of the programs or goods, one of which is usually its cost to the respondent. Recent high-quality valuation efforts based on this approach have asked respondents to choose between two or more alternatives that differ in the levels of the attributes, and have inferred WTP for public goods or programs and the implicit value of each attribute (see Hanley et al. 1998).

This paper reports on a survey employing conjoint choice questions to elicit people's preferences for urban regeneration projects that change the aesthetic and use character of specified urban sites. One set of these regeneration projects entails transformations of a "synthetic," digitally-generated square, while the other set of projects consists of hypothetical transformations of an actual square with an important cultural and historical dimension (and of similar typological and

morphological characteristics). The survey was administered in person to a sample of 254 residents of Belfast, Northern Ireland, randomly intercepted at various locations of the main shopping area of downtown Belfast in December 2001.

The purpose of this study is three-fold. First, we wish to see if respondents are capable of assessing different urban landscape alternatives created as combinations of simple aesthetic and use attributes, and whether the differences in the alternative scenarios are meaningful to them. We focus on three attributes capturing use and aesthetic features of a public space in an urban environment: (i) the proportion of buildings dedicated to residential use and retail, respectively, (ii) the height of buildings, and (iii) open space versus building mass.

Second, we investigate whether people's preferences are consistent with the economic paradigm by including among the attributes the cost to the respondent of each urban landscape alternative. All else the same, we expect respondents to shy away from more expensive alternatives. Third, we wish to see whether people's responsiveness to various use and aesthetic attributes depend on a site's historical and cultural context. To investigate this matter, we randomly assign respondents to one of two groups. We ask respondents in one group to engage in conjoint choice experiments about hypothetical restoration alternatives concerning St. Anne's Cathedral Square, an actual square in Belfast that local residents are well acquainted with, while all others are given conjoint choice tasks about transformations of an abstract square. This experimental design allows us to assess the performance of conjoint choice methods for abstract and actual goods, our actual good having a cultural and historical dimension.

Our results suggest that the choice exercise worked well for the abstract square. Our subjects favor variants of the abstract squares with greater proportions of the building dedicated to retail uses, and have a slight preference for more open space (as opposed to building mass), and buildings of lower heights. Importantly, the cost of the project is—all else the same—negatively associated with the probability of selecting a regeneration alternative for the hypothetical square, a result that

is consistent with our expectation. Their choices are, therefore, consistent with the random utility model.

Likewise, our respondents find variants of the actual square, St. Anne's, more attractive if they contain more open space than buildings and less attractive if the height of buildings is increased, but would like to see a greater proportion of the buildings in the actual square dedicated to residential use. Moreover, the coefficient on the cost of the alternative is positive for transformations of St. Anne's. We examine alternative explanations for the latter result. It is possible that people may have interpreted price as an indicator of the quality of the intervention, or that the attributes we used to describe the square did not adequately capture all of its dimensions.

The remainder of this paper is organized as follows. In section 2, we present the goods to be valued and discuss stated preference non-market valuation methods. Section 3 describes our survey instrument and experimental design. In section 4, we present the statistical model of the responses to the choice questions. Section 5 reports estimation results and section 6 presents our concluding remarks.

2. Preferences for Urban Squares

A. Squares and Urban Regeneration

Squares play a crucial role in the definition of a city and its public space. As Rykwert (1976) points out, the ancient ideogram for the city takes the form of a Y, showing how the city itself, at its beginnings, is born by the confluences of roads, and is built around the square, the place where all the trades and discussions took place. The ancient Greek agora, and the Roman forum are still regarded as the public place for excellence, and the design of squares has always had a crucial impact on the quality of life of the residents.

This study assesses people's preferences for regeneration projects of squares in an urban environment, focusing on the aesthetic and use services they provide. We examine two squares: St.

Anne's Cathedral Square in Belfast, Northern Ireland, and an unnamed, abstract square morphologically similar to St. Anne's, but without its historical and cultural significance.

Several reasons motivated the choice of St. Anne's Square, which is the public square facing St. Anne's Cathedral. We were looking for an area that stood out for its historic value, that had the potential to play a strategic role in the cultural development of the city, and for which regeneration projects were envisaged, and St. Anne's meets all of these criteria.

St. Anne's Square is at the core of one of the oldest areas of the city of Belfast, the Cathedral Quarter, characterized by interesting street patterns with a mixture of historical building styles. Lack of investment and long-term neglect has caused a progressive deterioration of this historic area, threatening its role within the development of the city. The residents of Belfast are aware of the state of deprivation of the quarter, which is situated in North Belfast, traditionally one of the areas where the social and political troubles have been acute in recent years, spurring regeneration initiatives endorsed by the government.[2]

Elicitation of the public's preferences for, and economic valuation of, regeneration projects for St. Anne's, however, is complicated by two factors. First, the aesthetic and some of the use values of a square to the residents of a city—such as aesthetic quality, comfort, sense of neighborhood identity, town character, historical and cultural heritage, access to outdoor space within the urban environment—are not bought and sold in regular markets. This implies that we need to apply non-market valuation techniques. Second, as the regeneration projects have only recently begun and have not been completed, we resort to *stated preference* non-market valuation

[2] Arts and culture have always been at the center of the activities traditionally taking place in St. Anne's Cathedral Square. In more recent years many artists and writers have settled in the area, mostly because of cheap rents. Therefore, many cultural activities found their natural place in the Cathedral Quarter, but a more comprehensive project was needed. In 1987 a new urban vision for the development of the city of Belfast was proposed in the Laganside Concept Plan, with the regeneration of both banks of the river Lagan as one of the forefront objectives. In 1989 the British Government created the Laganside Corporation with the purpose of tackling the social and economic regeneration of identified areas of the inner city, using public investments as a catalyst for private capital. The Cathedral Quarter is one of the areas of Belfast slated for regeneration, and Laganside Corporation has begun to implement a number of projects, including the refurbishment of the open space in front of St. Anne's Cathedral, now dubbed "Belfast's writers square" because of the literary events that have recently taken place there.

techniques, relying on what people *say* they *would* do under hypothetical circumstances, rather than actual behaviors.

Since we wish to elicit people's attitude towards simple aesthetic and use features, whose combination may define design alternatives for an urban square, we identified a basic number of spatial and land use attributes that could easily be found in other comparable urban situations. We created three-dimensional visualizations of possible regeneration projects for St. Anne's aimed to aid respondents in focusing on these attributes.

An additional concern with St. Anne's is that aesthetic and use services may be difficult to separate from the cultural and historic significance of this square. Because we wanted to check how the aesthetic and use attributes of a square are perceived and valued independently of historical and cultural aspects, we created an abstract square with morphological characteristics similar to St. Anne's, but none of St. Anne's historical and cultural heritage. Since this square and its variants do not exist, stated preference techniques are appropriate to elicit people's preferences for the aesthetic and use attributes that define them.

B. Stated Preference Methods

When one wishes to place a monetary value on the aesthetic and use services of a public urban space using stated preference techniques, two approaches are possible: Contingent valuation and conjoint choice studies.

In a contingent valuation survey, people are asked directly to report their willingness to pay (WTP) to obtain a specified urban space (or change in the urban space).[3, 4] The change in the urban space is hypothetical, and no actual transaction takes place. Contingent valuation has been used to

[3] Formally, WTP is defined as the amount that must be taken away from the person's income while keeping his utility constant: $V(y-WTP, p, q_1; \mathbf{Z}) = V(y, p, q_0; \mathbf{Z})$, where V denotes the indirect utility function, y is income, p is a vector of prices faced by the individual, and q_0 and q_1 are the alternative levels of the good or quality indexes (with $q_1 > q_0$, indicating that q_1 refers to improved environmental quality). $\mathbf{Z}$ is a vector of individual characteristics.

place a monetary value on programs for the preservation and restoration of specific urban *buildings* with historical and cultural significance, such as churches, museums, theaters, and marble monuments (Navrud et al, 1992; Grosclaude and Soguel, 1994; Willis, 1994; Hansen, 1997; Scarpa *et al*. 1998; Riganti and Scarpa, 1998; Whitehead *et al*. 1998; Santagata and Signorello, 2000; Pollicino and Maddison, 2001; Morey *et al*. 2001). These studies specify a (hypothetical) level of conservation or restoration for the building or monument under consideration and elicit the respondent's WTP for it, recruiting respondents among residents of the area (Pollicino and Maddison, 2001) and/or visitors to the site (Riganti and Scarpa, 1998).

Two major advantages of the contingent valuation method is that it can be used to value commodities that are not exchanged in regular markets, and/or when it is difficult to observe market transactions under the desired conditions. The method, therefore, allows one to estimate the benefits of proposed projects ex ante.

When numerous alternative regeneration projects are under consideration—as is the case with St. Anne's—the sample of survey respondents could be divided into several groups, with each group reporting their WTP for a different regeneration alternative, or one could turn to the second stated preference approach, namely conjoint choice analysis.

In a typical conjoint choice experiment study, respondents are asked to choose between two or more commodities (or "policy packages") each of which is defined by a set of attributes, one of which is usually the cost to the respondent. Attributes are varied across "packages," and the packages are usually matched in such a way that the choice between them is not straightforward, and the respondents must trade off attributes. Conjoint choice analysis, therefore, lends itself to situations where the investigator wishes to see how support for a policy or program changes as aspects of the program itself are altered. Indeed, two recent studies about preferences for public spaces employ conjoint analysis. Katoshevski and Timmermans (2001) use conjoint choice

[4] See Mitchell and Carson (1988) for a comprehensive survey of the contingent valuation method, and Carson et al. (1995) for a bibliography of studies using contingent valuation.

experiments to elicit the preferences of recent immigrants to Israel for housing and settlement types,[5] while Oppewal and Timmermans (1999) ask respondents to rate various shopping center designs and management attributes.[6]

For the purpose of statistically modeling the respondent's choices in a conjoint choice experiment, it is assumed that the respondent chooses the alternative that gives the highest utility. Utility is a function of the alternative's attributes and of residual income (income net of the cost of the alternative under consideration), plus a random error term.

Depending on the assumptions about the distribution of the error term, the resulting statistical model is either a conditional logit, a multinomial probit, or a related choice model.[7] The marginal values of each attribute and the welfare changes associated with changes in the level of the attributes are easily derived (Freeman, 1993).

The statistical model of the responses to the choice questions and the interpretation of the estimation results depend crucially on the assumption that the individual behaves in a compensatory fashion—in other words, that he trades off the attributes of alternatives he is asked to consider. However, when choicemaking is complex—in the sense that there are numerous attributes to trade off, many alternatives to consider, and some of them are very similar to one another—and when the respondent has become bored or fatigued during the course of the survey, it is feared that he or she might rely on other criteria for picking his or her preferred alternative (Swait and

[5] In Katoshevski and Timmermans (2001), respondents (selected among the residents of towns in Israel that had experienced fast recent growth) were asked to indicate which alternative was deemed more attractive among two housing alternatives described by type of dwelling (apartment in high-rise building, apartment in low-rise building, terraced and detached house), number of rooms, age of the dwelling, possibility to build an expansion, price, and sociodemographic and physical characteristics of the neighborhood, including distance to public transportation, work, shops, schools and playgrounds, for a total of 20 attributes.

[6] The questionnaire was administered to residents of the city of Maastricht in the Netherlands. Hypothetical shopping malls are described by 10 attributes, including the percentage of stores located out of doors, the percentage of shopping streets restricted to pedestrians only, decorations and furnishings, greenery, coffee shops and restaurants, and accessibility from the respondent's home. Respondents were instructed to *rate* the appearance, layout and furnishings of the shopping center based on the description provided in the questionnaire. Notably, the cost of the alternative is not included among the attributes, so that implicit prices of the attributes and WTP for each public space alternative cannot be computed.

[7] For instance, if the error terms are independent and identically distributed and follow the type I extreme value distribution, the resulting statistical model is a conditional logit (see Greene, 2000). If the error terms of the alternatives in the choice set are jointly normally distributed, the resulting model is a multinomial probit.

Adamowicz, 2001). For instance, the respondent may restrict attention to one or two key attributes, ignoring the others. Because of these considerations, when we designed our conjoint choice experiment, we deemed it best to present respondents with a small number of choice tasks, and to limit the number of attributes describing each alternative.

In earlier applications of conjoint analysis, respondents were sometimes asked to rate the alternatives (e.g., assign ratings ranging from 1 to 10, where 1 denotes low preference and 10 denotes the highest degree of desirability), or to rank the alternatives from the most preferred to the least preferred (Roe et al., 1996). However, these approaches have been criticized for various reasons (Hanley et al., 2001). For example, ratings are generally not comparable across individuals (i.e., one's rating of 7 is not the same as another person's 7), and when ranking alternatives people often find it relatively easy to identify the most preferred and the least preferred alternative, but difficult to distinguish between the others. For this reason, we opted in favor of a conjoint *choice* experiment, where respondents simply pick their most preferred alternative out of K alternatives, without rating them or ranking them by their desirability.

3. Public Preferences for Urban Regeneration: A Survey of Belfast Residents

A. Objectives of the Study

In this study we wish to understand people's perceptions of some basic attributes of public spaces and squares that can shape the urban environment. The purpose of the study is three-fold. First, we wish to see if people are capable of assessing different urban landscape alternatives created as combinations of simple aesthetic and use attributes, and whether the differences in the alternative scenarios are meaningful to them. We focus on three attributes capturing use and aesthetic features of a public space in an urban environment: (i) the proportion of buildings dedicated to residential use and retail, (ii) the height of buildings, and (iii) open space versus buildings.

Second, we investigate whether people's preferences are consistent with the economic paradigm by including among the attributes the cost to the respondent of implementing each urban landscape alternative. All else the same, we expect respondents to shy away from more expensive alternatives. Third, we wish to see whether people's responsiveness to various use and aesthetic attributes depend on a site's historical and cultural context. To investigate this matter, we randomly assign respondents to one of two groups. We ask respondents in one group to engage in conjoint choice experiments about hypothetical restoration alternatives concerning St. Anne's Cathedral Square, while all others are given conjoint choice tasks about transformations of an abstract square.

B. Selection of the Attributes

We focus on four basic attributes of squares: (i) the height of buildings, (ii) their bulk as the proportion between open space and built space, (iii) their use, interpreted as the proportion between residential and retail buildings, and (iv) the cost to the respondent of the regeneration project.

In choosing these attributes, we were guided by environmental psychology studies that imply that they are the most important attributes describing a square. Specifically, Stamps and Nasar (1997) analyze people's preferences for architectural style and find that "bulk," or building massing, affects people's perception of aesthetic quality in urban environment. Green (1999) finds that land use typology, such as residential and retail, are elements that affect what people perceive as "town character." These considerations were confirmed in the initial phases of the questionnaire development, which helped us determine that the height and bulk of buildings, and the proportion between buildings slated for residential use and retail were the minimum number of attributes for describing alternative urban scenarios for a public square.

We added the cost as the fourth attribute of the regeneration projects as this is required to estimate the implicit value of each attribute for economic valuation purposes. Focusing on a total of four attributes is consistent with our goal of keeping the number of attributes of the regeneration

profiles to a minimum, and is justified by the need for a gradual approach to the assessment of aesthetic features, as well as by statistical design considerations.

Adopting a small number of attributes, and "discrete" increments in the levels of the attributes (e.g., the proportion of buildings for residential use is 25%, 50% and 75%), also proved invaluable to facilitate the computer visualization of the alternatives in the choice exercise. Specifically, we restrict attention on two levels for the attribute "height of building:" (a) current and (b) taller than current. We reason that, given the cost of land in urban environments, it would seem unlikely that urban regeneration projects for squares and public spaces would replace existing building with lower buildings. For the proportion between built and un-built space, we use just two levels: either an increase or a decrease by 50%. The proportion between residences and retail was set to one of three possible levels: (a) 50%-50%, (b) 25%-75%, and (c) 75%-25%. Finally, we used four levels for the cost attribute, namely £5, 10, 20 and 30, to be incurred in the form of a one-time addition to the respondent's income taxes. A summary of the attributes and attribute levels is presented in table 1.

C. Conjoint Choice Questions

In our conjoint choice questions, respondents are asked to indicate which their prefer between alternatives A and B of regeneration projects that differ in the level of at least one of the attributes. To create the pairs of alternative regeneration projects, we first created the full factorial design, i.e., all of the possible combinations of attribute levels. This gave a total of 72 regeneration alternatives. We then randomly selected two of these alternatives, but discarded pairs containing dominated or identical alternatives.[8]

In many conjoint analysis studies the choice set includes the "status quo" option (i.e., the current state of the square at no additional cost to the respondent). Including this option as one of

[8] A dominated alternative is one that should obviously be less preferred to the other. For instance, if two projects are created that are identical in every respect except for the price, the project with the higher cost is dominated by the other.

the alternatives is necessary if one is to estimate willingness to pay for a project (Hanley et al., 2001; Johnson and Desvousges, 1997). In our study we did not include a status quo option for two reasons. First, one of our two urban regeneration projects involves a completely abstract site, for which the status quo would be ill-defined. To make the experimental treatments completely comparable, we decided to ignore the status quo option for St. Anne's Square as well. Second, our analysis was not aimed at estimating willingness to pay per se, but at assessing how people react to architectural and land use attributes of public spaces and their associated regeneration projects.[9]

D. Structure of the Questionnaire and Survey Administration

The questionnaire comprises five main sections. The first section elicits the respondent's interest in architecture, design and planning, and asks questions regarding his/her attitudes towards cultural goods. For example, we ask the respondent how frequently he or she visits museums and historic sites, and attempt to gauge the respondent's direct involvement in urban planning issues and debates.

The second section is descriptive. It first gives the respondent information on the architecture of the city of Belfast and then briefly presents the conjoint choice experiment that follows. The third section consists of the conjoint choice exercise, where the respondent is shown five cards divided in two groups, one referring to St. Anne's Square in Belfast and the other to an abstract square. Each card presents verbal descriptions and three-dimensional visual representations for two regeneration alternatives. The alternatives are represented at the same visual angle and differences in shading convey the different proportions between residences and retail.

The pairs of square regeneration alternatives for St. Anne's and the abstract square are shown to the respondent in different order, depending on whether the respondent has been randomly assigned to the first or the second subsample. The first subsample received first three

[9] Likewise, Swallow and Adamowicz (2001) design pairs of alternatives without the status quo option because they deem the status quo option unfeasible in their particular situation.

choice questions about transformations of St. Anne's Cathedral Square in Belfast. These were followed by two pairs referring to the unnamed, abstract square, whose transformations were obtained as combinations of the same attributes. In the questionnaire for the second subsample, the first three choice questions referred to the abstract square, and the remaining two referred to St. Anne's. For each pair, the respondent is asked to tell us which regeneration alternative he deems more attractive.

Follow-up questions record the reason(s) for the choices made by the respondent (i.e., which attribute(s), if any, was (were) the most important reason(s) for the choices they made in the conjoint portion of the questionnaire), and the respondent's intention to use the transformed urban space.

Section 4 gathers sociodemographic information such as the respondent's age, income, city of residence, level of education and household size. Finally, we included questions to debrief the interviewee, and questions asking the interviewer to report about his or her perceptions of the respondent's attitude towards the survey.

The survey was administered in person to 254 respondents randomly intercepted in the shopping area of downtown Belfast, Northern Ireland, in December 2001 by seven interviewers. We decided to elicit Belfast residents' preferences because we presume that any change in St. Anne's Cathedral Square will primarily influence the welfare of the residents of the city. Others may hold both use and non-use values for St. Anne's Square, but we ignore them at this stage of the research.[10]

4. The Econometric Model

[10] People that do not use a resource or a good may still hold a value for this good, whether or not they are residents of the city. If so, the entire economic value they place on this good would be a non-use value. Non-use values are classified into (a) existence values, due to very existence of the good, (b) option values and (c) bequest values. Option values arise when an individual is uncertain whether he will demand a resource in the future or if he is faced with uncertainty about the future supply or availability of the good. This individual may be prepared to pay to preserve the commodity in case in the future he wishes to use it. A bequest value is the value placed on the resource if an individual who is not a user wishes to preserve for the use and enjoyment of future generations.

To motivate the statistical analysis of the responses to the choice questions, we assume that respondents select the alternative with the highest indirect utility. We assume that the indirect utility function is:

(1) $$V_{ij} = a_0 + H_j a_1 + S_j a_2 + R_j a_3 + (I - C_j) a_4 + e_{ij}$$

where H is height, S is level of the open space attribute, R gives the split between residential and retail, I is the respondent's income, C is the cost of the project to the respondent, i denotes the respondent and j denotes the alternative. The αs are a set of unknown parameters.

If the error terms ε are independent and identically distributed and follow the type I extreme value distribution, the probability that alternative k is selected out of K alternatives is:

(2) $$\Pr(\text{resp. } i \text{ chooses } k) = \exp(\mathbf{w}_{ik} a) \Big/ \sum_{j=1}^{K} \exp(\mathbf{w}_{ij} a)$$

where $\mathbf{w}$ is a vector containing the alternative-specific attributes and α is the vector of their respective coefficients.[11] Equation (2) is the contribution to the likelihood in a conditional logit model. Equation (2) can be amended to include in $\mathbf{w}$ interactions between the levels of the attributes and individual characteristics of the respondents.[12] In our questionnaire, K=2, and the conditional logit model is reduced to a binary logit model.

Once model (2) is estimated, the marginal rate of substitution between any two attributes is the ratio of their associated α coefficients. The marginal value of each attribute is computed as the negative of the α coefficient on that attribute, divided by the coefficient of the "price" variable.

5. Results

A. Characteristics of the Sample

[11] The intercept is not identified, and is set equal to zero. It is possible, however, to identify alternative-specific intercepts, and indeed in what follows we fit conditional logit models with alternative-A specific intercepts.

[12] The influence of individual characteristics on the choice can be captured only if individual characteristics are interacted with alternative-specific attributes and are included in $\mathbf{w}$.

Since we randomly intercepted visitors in the shopping area of downtown Belfast, we cannot claim that our sample is representative of the population of residents of Belfast or Northern Ireland. Our first order of business is, therefore, to examine the individual characteristics of our respondents and to compare them with those of the residents of the area.

Table 2 reports descriptive statistics for our sample and for the population of Northern Ireland, showing that the sociodemographics of our sample are for the most part very similar to those of the population of Northern Ireland. The average respondent is 36 years old, has a household income of roughly £16,000 a year, and has completed high school. The sample is well balanced in terms of gender, with only a slight prevalence of men. Fifty-eight percent of the respondents own their home, 86% own at least one car, and the average household size is 3.6, 35% of the sample having at least one person in the household who is younger than 16. These figures are very similar to those of the population of Northern Ireland, with the only exceptions of the percentage of households who own a car (notably higher than that of Ulster) and household size (slightly higher than that of Ulster).

Regarding interest in architecture and cultural activities, eighty percent of the respondents report having read magazines or watched television programs about interior design and architecture in the last two years, implying that they have some interest in architectural issues. Sixteen percent of the sample visited a historic garden in the last year (a popular activity in the UK), and 41% had visited a cultural site in the last year. Finally, about 6% is a member of a cultural society.

B. Comprehension of the survey materials and the choice task

Our next order of business is to assess respondent comprehension of the survey materials and of the choice tasks they were asked to engage in. We use three criteria to assess comprehension of the survey materials and of the choice tasks.

First, in debriefing questions at the end of the survey, we directly asked respondents to let us know whether they found the questions easy or difficult to understand, and their judgment of the quality of the visual presentation. The majority of the respondents did not have a problem with the survey questions: only about 11 percent of the respondents stated that they found some of the questions hard to understand, and only 8 percent said that they did not find the visual materials clear enough.[13]

Second, it is sometimes argued that excessive perceived complexity of the choice tasks may result in respondents failing to answer the choice questions. In our case, however, this did not seem to be a serious problem: only ten respondents skipped the choice questions out of the original 254 completed interviews, resulting in 244 usable surveys.

Third, as in Viscusi et al. (1991), we check for possible abnormal response patterns by examining the percentage of respondents who always choose the alternative displayed on the left-hand side of the card (alternative A hereafter), or the alternative displayed on the right-hand side of the card (alternative B hereafter).

In our survey, we found a slight preference for alternative A, which was selected in 53% of the choice questions by respondents assigned to version 1 of the questionnaire (where the first three choice questions are about St. Anne's Cathedral Square) and in 56% of the choice questions by respondents assigned to version 2 (where the first three choice questions are about the hypothetical square). Only 4 respondents selected alternative A for all of the five choice questions included in the questionnaire, and only 6 selected alternative B for all of the five choice questions. When attention is restricted to the first three choice questions, we found that 12 respondents assigned to version 1 of the questionnaire and 9 respondents assigned to the version 2 of the questionnaire selected the alternative on the left-hand side of the card. The corresponding figures for the

[13] The interviewers were instructed to note down their impressions about each interview they completed. About eleven percent of the respondents were found to have misunderstood the project to be valued, nine percent answered the questions strategically, and roughly twenty percent did not take the scenarios seriously.

alternative on the right-hand side of the card are 5 and 1.[14] While these announced preferences are not necessarily inconsistent with compensatory behavior and the random utility model (equation (1)), in the analyses of the responses reported below we check the robustness of our results by re-estimating our conditional logit models after these respondents are excluded from the usable sample. As we show below, the results do not change appreciably when the sample is purged of these observations.

C. Choice Models: Results for the Abstract Square

In this paper, we report the results of conditional logit models estimated separately for the two groups of respondents using only the responses to the first three choice questions, which refer to St. Anne's for one subsample, and the hypothetical square for the other subsample of respondents.[15]

Table 3 displays the estimation results for the subsample examining the abstract square, while table 4 refers to the subsample examining St. Anne's Square. In both tables, the first column (column (A)) displays the basic specification of the conditional logit model, where the only predictors of choice included in the equation are the attributes of the alternatives. In the other columns we report the results of specifications that also include interactions between the attributes and individual characteristics of the respondent. All specifications include an alternative A-specific constant. The attribute HEIGHT is coded as a dummy variable that takes on a value of one if the height of buildings in the transformation of the square is greater than the baseline height. OPENSPACE is coded as a -1 if the proportion of open space is decreased by 50% relative to its

[14] The proportion of respondents who select always alternative A or B is, therefore, comparable to that in the Viscusi et al,. study, where it was equal to 5.6 percent. We found no correlation between choosing always A or B and self-reported problems with comprehension and quality of the visuals. Moreover, we found no correlation between being identified by the interviewer as having problems with attention, strategic behavior and understanding of the survey materials, and always choosing A or B.

[15] We decided to limit the analysis of the data to the first three choice questions because we believe that the switch in scenario may have increased the difficulty of the choice task, resulting in greater error variance and less predictable choices for the later pairs of alternatives.

current level, 0 if there is no change, and +1 if it is increased by 50%.[16] PRICE is the cost of the project to the respondent and is expressed in British pounds. PCTRESID takes on the values 25, 50, and 75, representing the percentages of building slated for residential use.

We do not have specific priors about the sign of the coefficient of the land use and architectural features attributes, and indeed one of the purposes of this study is to find out if the choice responses *are* systematically related to these attributes, and, if so, how. Economic theory, however, predicts that *ceteris paribus* individuals should shy away from more expensive alternatives, which implies that the coefficient on the cost variable should be negative.

We begin with the discussion of the results for the sample that was answering choice questions about the abstract square, shown in table 3. Column (A) of table 3 shows that these respondents exhibit, all else unchanged, a slight preference for variants of this square that entail more open space. The coefficient of OPENSPACE, however, is not statistically significant.

Alternatives with higher proportions of the buildings slated for residential use are deemed *less* attractive, an effect that is statistically significant at the 1% level. The coefficient on the cost variable is negative and significant, as predicted by economic theory. Finally, the alternative A-specific constant is negative and significant, implying that, all else the same, respondents tend to choose the regeneration project that is presented on the right-hand side part of each card.

It is, of course, possible that the attributes of the regeneration projects under investigation appeal in different degrees to respondents of different wealth, different interest in and taste for architecture and design, and with different commitment to the community they live in. To address this possibility, we created interactions between the attributes and various respondent characteristics and included them in the model in columns (B)-(E).

In column (B), we check for heterogeneity of preferences by including interactions between the attributes of the alternatives and income. In column (C), we include interactions between the

[16] This assumes symmetry in the impact of the change on the probability of selecting a regeneration project. In our preliminary analyses, we created and included in our conditional logit models separate dummy variables for increase by

attributes and watching shows about architecture and design (TVWATCH), which presumably captures interest in and taste for architecture and design. In column (D), we add interactions between visiting historic gardens and being a homeowner, and, finally, in column (E) we control for people who hold a membership in a cultural society (MEMBER) and for those who visit cultural sites at least three times a year (CULTUR).

Specification (B) shows that the attractiveness of the attributes of the regeneration options does not, after all, vary with income, while (C) shows that the negative impact of the percentage of buildings dedicated to residential use is somewhat attenuated for individuals with an interest for architecture and design, as shown by the positive and significant coefficient on this interaction.

Column (D) suggests that, to assess the effect of the OPENSPACE attribute, it is important to allow for heterogeneity among individuals: the coefficient of this attribute retains its positive sign and becomes significant at the 10% level once we include, among other things, interactions between OPENSPACE and a dummy denoting whether the individual visits historic gardens. The coefficient of the interaction implies that the attractiveness of the OPENSPACE attribute is even greater among those individuals who visit historic gardens. In this specification we also include an interaction term between a dummy denoting whether the respondent own his or her own home, and OPENSPACE variable. We control for home ownership because home ownership is often interpreted to imply a more permanent intention to live in the community, and hence a stronger and possibly more vocal interest in the community, which may influence preferences for the use of public spaces. The coefficient of the interaction term is positive, suggesting that people who own their home favor open space (as opposed to building mass) even more, but this effect is very small and statistically insignificant.

Finally, in column (F) we return to a specification identical to that in (A), but we exclude from the sample those respondents who did not find the survey questions or the quality of the graphics in the questionnaire sufficiently clear. The estimated coefficients are virtually unchanged

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50% and decrease by 50%, but found that it was acceptable to treat their impact as symmetric.

relative to their values in (A), suggesting that results are not unduly influenced by these respondents.

In sum, comparison of the various specifications of the conditional logit model shows consistently that the higher the cost of an alternative, the less attractive it is for the respondent—a result that agrees with our expectations—and that the estimates of the coefficients on the attributes are robust. Since the coefficient on the cost of the project is negative and significant, it is possible to compute implicit prices for each of the attributes of the hypothetical square examined by the respondents in group 2. Specifically, the price of a 50% percent increase in open, unbuilt space is 0.1709/0.0195=8.76 (roughly £9), and individuals are willing to pay 0.0195/0.0265=£ 0.73 for each percentage point increase in retail space at the expense of residential use.

D. Choice models: Results for St. Anne's

The results for the actual square are shown in table 4. Column (A) of table 4 shows clearly that respondents who were shown alternative regeneration projects for St. Anne's Cathedral are slightly less likely to prefer projects that raise the height of the buildings in the square. This effect, however, is not significant at the conventional levels. All else the same, our subjects have a preference for regeneration scenarios that entail more open space, as opposed to built space: the coefficient of the OPENSPACE variable is positive and strongly significant. The magnitude of the coefficient implies that if two alternatives were compared that are identical in all respects, but one has the current proportion of the space and the other has 50% more open space, the likelihood of selecting the latter is almost twice as large as the probability of choosing the former.[17]

Respondents also favor a higher proportion of buildings used for residential purposes versus retail. The alternative A-specific constant is negative and significant, implying that, all else the

[17] To illustrate, consider the pairs of alternatives defined by (a) HEIGHT=current level, OPENSPACE=current level, PRICE=£20, and PCTRESID=50%, and (b) HEIGHT=current level, OPENSPACE=increase by 50% over the current level, PRICE=£20, and PC TRESID=50%. The probability of choosing (a) is 0.35, while that of choosing (b) is 0.65.

same, respondents tend to choose the regeneration project that is presented on the right-hand side part of each card.

The most surprising result, however, is that the coefficient of the cost of the project is *positive* and significant, which is against expectations. There could be several possible explanations for this result. The first (explanation (i)) is that the simple specification of the conditional logit model we have adopted in column (A) does not adequately account for heterogeneity across individuals, so that the positive coefficient of price is due to misspecification bias. Another explanation, (ii), is that the results are due to the abnormal, non-compensatory behavior of a small number of respondents to whom the random utility model of equation (1) does not apply. A third possible explanation, (iii), is that respondents might be exhibiting strategic behaviors in hopes of influencing the actual implementation of the regeneration plan. A fourth explanation (explanation (iv)) is that the "price tag" of the regeneration project is, in the absence of more detailed information, interpreted by the respondents as a signal for the quality of the project itself. Respondents would then pick more expensive projects because they believe them to be of higher quality than less expensive projects. Finally, it is possible (explanation (v)) that the attributes we use in our questionnaire do not adequately capture the aspects of the square, its aesthetic and use services that influence people's utility, leading respondents to making assumptions about these factors, and/or that *most* people do not engage in compensatory behavior.

E. Exploring Reasons for the Results

We explore explanation (i) by creating interactions between the attributes and various respondent characteristics and including them in the model in columns (B)-(D). As before, we examine heterogeneity for income, taste for architecture, and commitment to the community they live in. (Interactions between the attributes of the alternative transformations of St. Anne's Square

and (i) gender and (ii) years of schooling were also attempted but found insignificant, and have therefore been omitted from the specifications shown in table 4.)[18]

We begin with interactions with household income in column (B). None of the coefficient of the interaction terms is significant, as shown by a likelihood ratio test of the null that they are all equal to zero,[19] but including these terms makes the coefficient of cost insignificant. The sign of this coefficient remains, however, positive.

In an effort to control for heterogeneous interests in architecture in our sample, in column (C) we include interactions between the attributes of the project and the dummy variable TVWATCH. A likelihood ratio test implies that, taken together, these interaction terms *do* help explain respondent choices. Including the interaction terms has little effect on the coefficients of the attributes measuring open space and the proportion of buildings slated for residential use v. retail, and results in a negative and insignificant coefficient on the cost variable. By contrast, the coefficient on (TVWATCH×PRICE) is positive and significant, suggesting that people who claim interest in architecture and design tend to select, all else the same, projects with higher price tags. This provides some support for our conjecture (explanation (iv)) that the cost of the project may have been interpreted as a signal about the quality of the project itself, at least among people who care for architecture and design.

Column (D) displays another specification that further controls for the attributes' different appeal to different individuals. This specification further adds interactions between having visited a historic garden in the last 12 months and the proportion of built/unbuilt space in the square, and

[18] Effectively, interaction terms imply a departure from the linear specification of the random utility model. We explicitly considered alternative forms for the indirect utility function, such as an indirect utility function that is quadratic in residual income, and one that uses a logarithmic transformation of residual income, but the performance of these models was disappointing.

[19] The log-likelihood function of the restricted model (A), after deleting the missing observations of those respondents that did not report their income, is -179.1948. The unrestricted log-likelihood function for model (B) is -178.4948. The likelihood ratio statistics is: -2*(-179.1948 - (-178.4948))=1.4. Thus, we cannot reject at the conventional levels the null hypothesis that the coefficients of the interaction terms in model (B) are jointly equal to zero.

between being a homeowner and the proportion of built/unbuilt space.[20] The results shown in the column suggest that more residential-intensive use of the buildings in the square is less attractive to individuals who have an interest in architecture and design, and that airier, less heavily built transformations of the square have greater appeal to individuals with an interest in historic garden than to others, but are deemed less attractive by homeowners. Perhaps people with a vested interest in the community object to regeneration projects that might demolish part of existing buildings, or object to the loss of the uses associated with existing buildings. It is interesting that the coefficient on the cost variable turns positive and significant. Based on this, one cannot conclude unambiguously that heterogeneity of taste among individual is the reason why in specification (A) the cost of project was positively associated with the probability of selecting an alternative.

In column (E) we display estimation results when the basic model is fit (i.e., the same specification as in column (A)), but we exclude from the sample those respondents who did not find the survey questions or the quality of the graphics in the questionnaire sufficiently clear. The coefficients from this run are generally within 10 percent of those from the earlier runs, and the coefficient on price remains positive and significant. This holds true when we drop from the sample those respondents who always select option A or always selected option B, and when we exclude those subjects who—in the opinion of the interviewer—paid relatively little attention to the questionnaire and may have failed to understand the purpose of the exercise (both sets of results available from the authors). Based on these runs, we conclude that the positive coefficient on the cost variable is probably not due to the abnormal behavior of a small number of respondents, as we had suggested in explanation (ii).

We do not have enough evidence to support or refute explanation (iii), although it should be noted that practitioners of conjoint choice experiments sometimes argue that people probably do *not*

[20] Likelihood ratio tests indicate that inclusion of these two regressors improves the fit of the model over specification (C) and over the basic specification, (A).

engage in strategic behavior since they are focused on trading off between attributes (Adamowicz et al., 1994). We return to explanation (v) in the next section.

F. Comparison between the two treatments

Comparison between the conditional logit results for St. Anne's Cathedral Square and for the abstract square suggests that there are both differences and similarities in the preferences shown by individuals for the various attributes of the regeneration projects. Respondents generally prefer options with more open space, instead of building mass, but this effect is statistically significant only for the actual square. Subjects generally shy away from alternatives where the height of the buildings is raised, but this effect is not statistically significant.

Our subjects would gladly see a greater proportion of the buildings in the actual square dedicated to residential use, but feel otherwise when dealing with the abstract square. The cost of a regeneration alternative for the abstract square is negatively associated with the probability of selecting that alternative, as predicted by economic theory. We conclude that the choice exercise worked well with the abstract square, and that individuals shown the abstract squares exhibited behaviors consistent with the random utility model.

By contrast, the cost of the project is positively associated with the probability of selecting a regeneration project for the actual square. Subsequent investigation shows that subjects with an interest in architecture and design are less sensitive than the others to the cost of the project for the actual square. In addition, when asked which attribute(s) was (were) most important in answering the choice questions, only 4.6 percent of the subjects dealing with St. Anne's Cathedral Square listed the cost of the project. As shown in table 5, building height and use were mentioned only by negligible fractions of the sample, whereas 78 percent of the respondents mentioned "other factors" (without specifying what these factors might be). By contrast, 20 percent of the respondents assigned to the abstract square listed cost as the most important factor. Other frequently mentioned

attributes were open space (41 percent of the sample), and height of the buildings (14 percent of the subjects), whereas "other factors" captured 19 percent of the respondents.

Perhaps these findings point to the possibility that the four attributes that worked well as descriptors of the abstract square may not have been adequate descriptors of St. Anne's. For the latter public space, historical and cultural factors, and other visual and use attributes, may have been important, and should perhaps have been added to the four attributes we used in this study.

These findings suggest that future applications of conjoint choice experiments to urban planning intervention and to the valuation of cultural and historical goods require careful development work, and probing of people's motivations in answering conjoint choice questions in focus groups and/or one-on-one interviews.

6. Conclusions

We have conducted a conjoint choice survey of residents of Belfast to elicit their preferences for urban regeneration projects. We asked respondents to choose between two transformations of a city square, where each transformation is described by a combination of four attributes: the height of the buildings, the proportion of open space to building mass, the split between buildings slated for residential and for retail use, and the cost of the project to the respondents.

We used two squares: one was an actual square in Belfast, and the other a completely abstract, digitally-generated square of similar morphological characteristics. The order in which these squares were presented to the respondents was varied in two independent subsamples, allowing us to see if attributes are valued differently when they refer to abstract and actual urban sites. We fit conditional logit models relating the choice of an alternative to the attributes of that alternative and to individual characteristics, interacted with the attributes.

The conditional logit results indicate that there are both similarities and differences in the preferences for regeneration plans for the two squares. Specifically, with both St. Anne's and the

abstract square, respondents deem the square more attractive if it contains more open space than buildings, and less attractive if the height of the buildings is raised.

When dealing with the proportion of the building dedicated to residential use, however, our subjects indicate a preference for increasing this proportion at the expense of retail space for the St. Anne's, but feel otherwise for the abstract square. Finally, the cost of the project is—all else the same—negatively associated with the probability of selecting a regeneration alternative for the abstract square, a result that is consistent with our expectation. By contrast, the coefficient on the cost of the alternative is positive for transformations of St. Anne's.

We examine alternative explanations for the latter result, finding that subjects with an interest in architecture and design are less sensitive than the others to the cost of the project. In addition, when asked which attribute(s) was (were) most important in answering the choice questions, only 4.6 percent of the subjects dealing with St. Anne's Cathedral Square listed the cost of the project, while 20 percent of the respondents assigned to the abstract square listed cost as the most important factor. The frequencies with which the other attributes were mentioned by our respondents suggest that indeed they may have been more accepting of the choice exercise and with trading off attributes for the abstract square than for St. Anne's.

This may be due to the symbolic, historical and cultural heritage associated with St. Anne's, to possible biases against changes from the current situation, or to the possibility that the attributes we use work well for the abstract square, but are not sufficient to describe St. Anne's and its variants. More attributes might have been needed to capture the relevance this square has for the local residents, and hence to elicit their preferences for its regeneration.

Clearly, further research is needed to determine how conjoint choice experiments can be successfully applied to valuation of the aesthetic and use services of an urban public space. Future studies, in particular, should devote special attention to the initial development work, and to the selection of the attributes that describe the urban space. Attitudes of respondents towards the

specific features representing urban spaces and the perception of their symbolic, historical and cultural relevance may need to be discussed in depth during focus groups and preliminary work.

To our knowledge, our study is the first that attempts to elicit people's preferences for a public space using digital alterations of an existing square and digital renditions and transformations of an abstract square. We believe that there is a great potential for the use of conjoint choice experiments in urban decision-making processes, particularly when accompanied by visualizations of proposed transformations of urban areas. The role of non-market valuation methods in urban planning is still to be fully explored, especially if evidence from choice experiments is to become part of consultation processes that accompany urban developments with a public impact.

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Table 1. Attribute and attribute levels in the conjoint choice experiment survey.

Attribute	**Levels**
Height of building	Same as current Taller than current height
Open space (as opposed to buildings)	Current Decrease by 50% Increase by 50%
Split between residences and retail	50%-50% 25%-75% 75%-25%
Price	£5, 10, 20 and 30

Table 2. Descriptive statistics of the sample.

Variable (acronym used in regressions)	**Sample average or percent of the sample (Standard deviation)**	**Northern Ireland average or percent of the population**
Individual characteristics		
Age	35.9 (12.6)	35.44
Income (Pounds) (INCOME)	16,415 (7124.4)	18,616
Gender (percentage of males)	53%	49%
Household size	3.59 (1.97)	2.67
Owns his or her home (OWNER)	58%	67%
Car owner	86%	70%
Households with at least one person under 16	*35.36%*	*35%*
Years of Education	12.7 (3.59)	
Cultural activities and interest in architecture		
Respondent read magazines or watched TV about design and architecture in the last two years (TVWATCH)	80%	
Respondent visited historic gardens at least three times in the last year (GARDEN)	16%	
Respondent visited cultural sites at least once in the last year (CULTUR)	41%	
Respondent is a member of a cultural society (MEMBER)	6.2%	
Respondent debriefs		
Respondents that found some questions hard to understand	11.5%	
Respondents that did not find the visual material clear enough	7.56%	

*Author's calculations based on the Northern Ireland Abstract of Statistics, 2001.

Table 3. Conditional logit model results for subsample 2 (regeneration projects for abstract square only). (T statistics in parentheses)

	Specification A (n= 330)	**Specification B (n=327)**	**Specification C (n=330)**	**Specification D (n=321)**	**Specification E (n=330)**	**Specification F (n=279)**
CONSTANT	-0.5292** (-3.401)	-0.4673** (-2.827)	-0.5216** (-3.280)	-0.5129** (-3.199)	-0.5151** (-3.207)	-0.5748** (-3.419)
HEIGHT	-0.2999 (-1.143)	-0.8545* (-1.640)	-0.7206 (-1.230)	-0.228 (-0.846)	-0.4110 (-1.502)	-0.2879 (-1.026)
OPENSPACE	0.1709 (1.442)	0.3421 (1.052)	0.4259 (1.275)	0.2715* (1.790)	-0.0409 (-0.288)	0.1722 (1.332)
PRICE	-0.0265** (-3.214)	-0.0085 (-0.409)	-0.0430* (-1.846)	-0.0284** (-3.349)	-0.0303** (-3.557)	-0.0313** (-3.547)
PCTRESID	-0.0195** (-2.595)	-0.0167 (-1.145)	-0.0608** (-3.312)	-0.0430** (-2.928)	-0.0447** (-3.021)	-0.0200** (-2.447)
INCOME*HEIGHT		0.0409 (1.175)				
INCOME*OPENSPACE		-0.0132 (-0.705)				
INCOME*PRICE		-4.7639 (-0.846)				
INCOME* PCTRESID		0.0002 (0.247)				
TVWATCH*HEIGHT			0.5909 (0.927)			
TVWATCH*OPENSPACE			-0.2961 (-0.830)			
TVWATCH*PRICE			0.0176 (0.710)			
TVWATCH* PCTRESID			0.0498** (2.628)	0.0293* (1.843)	0.0308** (2.212)	
GARDEN*OPENSPACE				0.1059 (2.134)		
OWNER*OPENSPACE				0.0491 (0.230)		
CULTUR*OPENSPACE					0.9445** (2.511)	
MEMBER*HEIGHT					0.9445* (1.750)	
Log likelihood function	-219.3961	-213.4266	-215.1329	-210.3020	-212.8112	-183.4389

INCOME is expressed in thousand pounds.

Column (F) refers to a sample that excludes respondents who said they found the survey questions or the quality of the graphics unclear.

**: Significant at the 5% level or better; *: Significant at the 10% level.

Table 4. Conditional logit model results for subsample 1 (regeneration projects for St. Anne's Cathedral Square only). (T statistics in parentheses)

	Specification A (n= 402)	**Specification B (n=291)**	**Specification C (n=402)**	**Specification D (n=387)**	**Specification E (n=339)**
CONSTANT	-0.3358** (-2.925)	-0.3279** (-2.411)	-0.2866** (-2.299)	-0.3016** (-2.491)	-0.3463** (-2.706)
HEIGHT	-0.2047 (-1.233)	0.1615 (0.302)	0.2205 (0.498)	-0.2988* (-1.752)	-0.3098* (-1.657)
OPENSPACE	0.6208** (6.135)	0.6770 (1.634)	0.6086 (1.644)	0.8430** (4.776)	0.6856** (6.145)
PRICE	0.0597** (3.750)	0.0376 (0.793)	-0.0226 (-0.761)	0.0403** (2.453)	0.0698** (3.852)
PCTRESID	0.0349** (5.046)	0.0153 (0.706)	0.0285** (2.199)	0.0475** (4.398)	0.0398** (5.025)
INCOME*HEIGHT		-0.0245 (-0.864)			
INCOME*OPENSPACE		-0.0050 (-0.258)			
INCOME*PRICE		7.4099 (0.676)			
INCOME* PCTRESID		0.0010 (0.861)			
TVWATCH*HEIGHT			-0.5651 (-1.142)		
TVWATCH* OPENSPACE			0.0690 (0.180)		
TVWATCH*PRICE			0.1104** (3.145)		
TVWATCH* PCTRESID			0.01422 (0.899)	-0.0229** (-2.112)	
GARDEN*OPENSPACE				0.9113** (2.892)	
OWNER*OPENSPACE				-0.6370** (-3.250)	
Log likelihood function	-238.8781	-178.4948	-231.9651	-221.7053	-195.8831

INCOME is expressed in thousand pounds.

Column (E) refers to a sample that excludes respondents who said they found the survey questions or the quality of the graphics unclear.

**: Significant at the 5% level or better; *: Significant at the 10% level

Table 5. Percent of the respondents an attribute as the most important factor in answering the choice questions.

Factor listed as the most important in answering the choice questions	**Group 1 (St. Anne's Cathedral Square)**	**Group 2 (Abstract Square)**	**All respondents**
Cost	4.58	20.00	11.62
Retail	0.76	3.64	2.07
Height	1.53	13.64	7.05
Open space	15.27	40.91	26.97
Residential	0.00	2.73	1.24
Other	77.86	19.09	51.04

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