# Cultural and Heritage Capital: Value of Maintaining Theatre Buildings - Discrete Choice

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Ipsos UK: Dr Ricky Lawton, Jack Philips, Stephen McSwiney

University of Glasgow: Professor Patrizia Riganti

# Contents

# Executive Summary

This research contributes to the Department for Culture, Media and Sport's (DCMS) Culture and Heritage Capital (CHC) Programme. The CHC Programme aims to develop a formal approach, using economic methodologies, to create a robust evidence base for decision making on the value and benefits of culture and heritage assets to society. The CHC Programme aims to include supplementary guidance to the HM Treasury Green Book, a database of values for a range of culture and heritage assets, and a set of culture and heritage capital accounts.[1] The Programme seeks to ensure that economic, social and cultural value is assessed equally using economic methodology alongside both quantitative and qualitative evidence to create a robust evidence base for decision making. This Study's findings add to that growing evidence base.

The Culture and Heritage Capital Programme generally provides a range of estimates that refer to a cultural or heritage asset in its entirety. Organisations can use these estimates to better understand the benefits of their assets to society and value these benefits in ways which are consistent with HM Green Book guidance. However, DCMS recognises that on their own it is difficult to determine the marginal value of interventions i.e., the additional value of a policy or investment to support a particular attribute or to improve or maintain the quality of the asset. To date, there is only one study within the CHC that explores marginal willingness to pay values.[2]

The maintenance of cultural assets (such as theatres, opera houses and other performance venues) is integral to the continuation of high-quality cultural experiences in a setting that enables and enhances performances. As such, this research aims to quantify the marginal value of maintenance for cultural assets, focussing on theatres as a specific case study. **This research is experimental in nature, and we urge caution to readers when using similar approaches and recommend that the findings within this report are not used within Business Cases.**

The CHC Programmes aims for the research were:

- **Valuation question 1:** To what extent do people value the maintenance of theatres with historical attributes versus more modern theatre venues?
- **Valuation question 2:** To what extent do people value the maintenance of individual aspects of the theatre interior and exterior?
- **Valuation question 3:** How does the value attributed to the maintenance of Theatre attributes and heritage differ depending on whether a person has visited the theatre recently, their demographics and other characteristics?

The overarching aim of this Study was to understand the welfare impact of maintenance on historic and non-historic theatres. To do this, Ipsos applied a relatively novel approach, using a Discrete Choice Experiment (DCE) to estimate WTP - which can be interpreted as the public welfare for different parts of a theatre to be maintained in a good condition. This research also acts as an investigation of the

[1] H. Sagger, J. Philips, and M. Haque, 'Valuing Culture and Heritage Capital: A Framework towards Informing Decision Making' (London, UK: Department for Digital Culture Media and Sport, January 2021), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/955203/GOV.UK_-_Framework_Accessible_v2.pdf

[2] Lawton *et al.* (2023) Choice modelling and methodology development: Marginal willingness to pay for museum improvements. https://www.gov.uk/government/publications/choice-modelling-research-and-methodology-for-the-chc-programme/choice-modelling-and-methodology-development-marginal-willingness-to-pay-for-museum-improvements

possibilities for this type of experiment. In addition, we explore the practical implications for applying the evidence within policy appraisal.

The Old Vic Theatre and Young Vic Theatre were selected as case sites. The diversity of the infrastructure of the more modern Young Vic, against the historically significant Old Vic, allows for comparison of preferences and values of the public towards maintenance of more historically significant attributes versus more modern attributes. Being closely geographically located reduces the potential noise caused by surveying populations from different geographical areas, or how the situ and available services around the theatre influence willingness to pay (WTP).

We report on the results of a Discrete Choice Experiment (DCE) designed to elicit preferences for the heritage value of different parts of theatre interiors and exteriors. These are used as a proxy for the value of maintaining the condition of the theatre buildings, isolating the cultural value of the theatre and its performances.[3]

An experimental split sample design is applied, with half of the DCE sample run on a historic theatre building (the Old Vic located on the Cut in Southwark, South London) and the other half on a modern theatre building (the Young Vic, also located on the Cut in Southwark). This experimental design is employed to explore whether it is possible to estimate the heritage value of maintaining historic theatre buildings over and above the value of maintaining non-heritage theatre buildings. This is relevant to policymakers in DCMS and Historic England, as it would provide an estimate of the welfare value of preserving theatre services within theatre buildings to both theatre goers and non-visitors.

The novel approach included the use of Artificial Intelligence to create images of theatre attributes in poor and severe conditions to provide a visual representation of what the theatre would look like under different maintenance options. Initial indications of the success of this innovative AI-assisted approach are mixed, and should be explored further in future research.

## Methodology

An online survey of 1,110 adults aged 16+ in London were recruited via the Ipsos Interactive Services panel. The sample consisted of users (visited the Old and Young Vic in the past 5 years), and non-users (had not visited either theatre), with the sample of visitors in the panel sample frame broadly proportional to the proportion of theatre visitors in the Greater London population. Non-users were randomly allocated to the Old Vic or Young Vic, since non-use questions are not dependent on people having visited either theatre. Although non-users have not visited the theatre recently, previous evidence has shown that they still display WTP via option value as well as existence, bequest and altruistic values.[4] Users were asked for their WTP for an increase in the ticket price while non-users were asked for their WTP for an increase in monthly council tax.

A conjoint model was constructed using 5 attributes across 3 levels of condition (good, poor and severe) across 9 choice cards. This technique allows us to understand the WTP for maintenance options to ensure the theatre is in good or poor condition over severe condition. The design of the DCE can be seen in Section 3.4, Figure 3.1.

[3] Discrete choice experiments, a form of choice modelling, is a valuation method prescribed by HMT Green Book (2022) to measure individuals' preferences which can be used to estimate the welfare impact of different interventions.

[4] R. N. Lawton et al., 'Regional Galleries and Theatres Benefit Transfer Report' (Arts Council England, 2021), https://www.artscouncil.org.uk/sites/default/files/download-file/Arts%20Council%20England%20-%20Regional%20Galleries%20and%20Theatres%20Benefit%20Transfer%20Report.pdf.

## Results

### Valuation question 1: To what extent do people value the maintenance of theatres with historical attributes versus more modern theatre venues?

Testing the interaction between preference for maintaining different parts of theatres and the historic or non-historic character of the theatre found no consistent differences for maintenance of the historic theatre and non-historic theatre. However, the lack of significance should not be taken to extrapolate conclusions on the value of historic theatres compared to non-historic theatres across the country. There are several reasons why there may have been statistically insignificant results, including:

- **Small Samples Sizes** limiting the statistical power of the modelling.
- **The Specific Character** of the two theatres selected for this study, which may not be representative of historic and non-historic theatres in the UK as a whole.
- **The Use of Experimental AI Images** within the DCE.
- **The Inconsistent Preferences** exhibited by the respondent. Further research would be required to establish a firm understanding of the different WTP for maintenance of more and less historic theatres to increase the sample size of evidence.

### Valuation question 2: To what extent do people value the maintenance of individual aspects of the theatre interior and exterior?

The research explored the value individuals placed on the maintenance of theatre attributes. The research showed that individuals have varying preferences for maintenance across different types of theatre attributes. Theatre attributes relate to the interior and exterior parts of the theatre building, including the interior auditorium (including seats, carpet and flooring), the interior auditorium (including plasterwork, decoration and box fronts), foyer (including the ticket office, bar and reception), the roof, and the exterior (front of theatre).

Preferences varied considerably depending on the theatre attribute in question and between users and non-users. Users and non-users also showed different preference ordering, with non-users having the greatest preference for the roof and exteriors while users broadly preferred to pay for maintenance to the interiors. However, there remain inconsistencies in the preferences. This may indicate that respondents struggled to distinguish between the severe and poor condition levels for some attributes, which may be due to the language or innovative AI-assisted visuals used in the DCE.

However, it is important to note that inconsistencies in the preferences are not identified among the non-user sample, despite being shown identical information and visuals. This would suggest that the inconsistency is driven by something specific to the user sample, either due to their genuine preferences (informed potentially by their direct experience of the theatre), or underlying sample size of modelling issues. It would be necessary to undertake further follow-up interviews and post-survey cognitive interviews to understand whether these inconsistent results are due to DCE design or underlying modelling issues.

### Valuation question 3: How does the value attributed to the maintenance of Theatre attributes and heritage differ depending on whether a person has visited the theatre recently, their demographics and other characteristics?

Through interacting sociodemographic characteristics and theatre attributes, we explored the relationship between preferences for maintenance of theatres and respondent characteristic including

gender, income, age, ethnicity and whether they walk past the theatre regularly. Of the characteristics, there was no clear evidence that there existed differential impacts by sociodemographic characteristics in terms of maintenance of different theatre attributes.

## Methodological Limitations

This study attempted to address three key research questions, but during the course of the research the following limitations were identified:

- **Inconsistencies in the price attribute:** The study faced challenges with inconsistent responses to price changes, which didn't match theoretical expectations. This led to exploring different models to better understand respondent preferences. The inconsistencies might be due to unclear scenarios or inappropriate price ranges, suggesting that some participants were not sensitive to the prices shown. More research, including qualitative methods, could be needed to understand these preferences, and multiple rounds of cognitive testing are crucial in the design phase to set appropriate price ranges.

- **Sampling issues:** Previous studies focused on popular institutions, making it easier to find enough respondents. However, newer studies target less-visited institutions, complicating sample collection, especially with more complex methodologies like discrete choice modelling. Future research should prioritise practical sample sizes and consider mixed data collection methods (online and face-to-face), though this may introduce biases.

- **Site selection process:** The process of choosing theatres for the experiment aimed to conceptually match sites but may have overlooked practical sample size considerations. Future research should focus on feasible sample sizes and acknowledge optimism bias in projections. Additional funding for mixed data collection methods is recommended, despite potential biases.

- **The use of AI-generated images:** This study was the first to use AI-generated images to show different conditions of theatre attributes. It was hypothesised that this may help respondents better understand the attribute and level descriptions. However, upon reflection, it could be suggested that some images did not clearly distinguish between condition levels, possibly leading to inaccurate results. More rounds of cognitive testing were needed but were not feasible within the project's scope. Adequate time and budget for multiple testing rounds are essential in future projects.

## Feasibility of WTP Business Case Tool

The weak statistical significance of preferences for maintaining different parts of the theatre in the user sample DCE models and small magnitude of the price attribute raise concerns around the reliability of the price attribute coefficient.

**These inconsistencies and uncertainties in the statistical significance of DCE results lead us not to recommend that user WTP be estimated from the results, which means that the results in their current form should not be used in a Business Case tool to inform SCBA calculation.** Willingness to Pay (WTP) values are presented in Appendix 7.2 for illustrative purposes only. However, the preferences elicited for maintaining different parts of the theatre could still be used for informing maintenance activities by helping decision-makers to understand which parts of the theatre building are most important for theatre goers and the general public.

Alternative approaches to including the social value of asset maintenance within a SCBA framework could draw inspiration from Sagger and Bezzano (2023) who set out how heritage science and risks based approaches can be used where it might be harder for the general public to cognitively express their view and value on different states of states of an asset.[5]

[5] H. Sagger, and M. Bezzano, 'Culture and Heritage Capital: using economic valuation methodologies and heritage science to measure the welfare impact of ongoing conservation, protection, repair and maintenance of culture and heritage assets, (London, UK: Department for Digital Culture Media and Sport, June 2023)

# Introduction

The Department for Media, Culture and Sport (DCMS), through the Culture and Heritage Capital (CHC) Programme, commissioned Ipsos to design a Discrete Choice Experiment (DCE) using Stated Preference (SP) survey questionnaires to test and obtain respondents understanding and estimation of the relative value of the heritage value of theatre buildings, as distinct to the functional value of its cultural (theatre) attributes.

## 1.1 Context

The DCMS aims to promote and protect culture and heritage and help businesses and communities to grow by investing in innovation and highlighting Britain as a fantastic place to visit. Theatres play an important role in the cultural infrastructure of towns and cities in the UK. Part of this value is expressed in people's behaviour, and their willingness to return to theatres in large numbers after the social distancing lockdowns of the COVID-19 period with theatre attendance increasing from 14% to 28% between 2021 and 2022[6]. The DCMS Participation Survey showed that 30% of those surveyed had engaged physically with theatre performances in 2022-23; the fifth most popular way to engage with the arts physically.[7]

Theatres also play a place-making role in the enjoyment that people gain from the townscape, whether they visit the theatre or simply pass it in their everyday life. Historic theatres, in particular, may play an important role in the character of an area, as well as contributing to the sense of pride and local identity for residents.[8]

Theatre buildings require continuous maintenance to keep in good condition for the public. These costs can be especially high for historic theatres, which may require specialist techniques and materials to restore, and which may be less adaptable to the extremes of modern climate conditions. Decisions must be made with limited pots of public funding on whether to maintain the heritage value of the original features of historic theatres or focus on the functional value of theatres.

Research to date has focused on the value of theatres in terms of the cultural services they provide and the contribution they make to local places, but no research has been undertaken to understand public preferences for maintenance of the interior and exteriors of theatre buildings.

This Study seeks to address this research gap, by attempting to understand the public preferences for maintenance of different parts of the theatre, and where possible estimating willingness to pay values that can be used within a social cost-benefit analysis (SCBA).[9]

### 1.1.1 Contribution to the CHC

This study contributes to the DCMS' major research-led initiative - the Culture and Heritage Capital (CHC) Programme - which aims to place public investment in culture and heritage on a more sustainable footing.[10] Through the CHC Programme, DCMS is developing a formal approach to value culture and

[6] https://www.campaignforthearts.org/wp-content/uploads/2023/01/Arts-attendance-in-England-Oct-2020-to-Sep-2022.pdf

[7] https://www.gov.uk/government/statistics/participation-survey-2022-23-annual-publication/main-report-for-the-participation-survey-april-2022-to-march-2023

[8] As demonstrated in previous Stated Preference studies of the value of theatres to local residents: R. N. Lawton *et al.*, 'Regional Galleries and Theatres Benefit Transfer Report' (Arts Council England, 2021), https://www.artscouncil.org.uk/sites/default/files/download-file/Arts%20Council%20England%20-%20Regional%20Galleries%20and%20Theatres%20Benefit%20Transfer%20Report.pdf.

[9] As discussed in later sections of the paper, the WTP values estimated **are not recommended for use within a SCBA**.

[10] H. Sagger, J. Philips, and M. Haque, 'Valuing Culture and Heritage Capital: A Framework towards Informing Decision Making' (London, UK: Department for Digital Culture Media and Sport, January 2021),

heritage assets including evidence and guidance to help practitioners estimate the value of these assets to society.

Culture and heritage provide many (non-market) benefits including, but not limited to, increased wellbeing, educational improvement and pride, as well as economic value in terms of the contribution culture makes to economic growth and job creation.[11] Valuation of costs and benefits plays an important role in deciding how the Government should spend taxpayer's money, where appraisal guidance is set out in the HM Treasury Green Book (HM Treasury, 2022).[12]

The Culture and Heritage Capital (CHC) program recognises that there is no agreed approach to measure the benefits of culture and heritage in ways that are consistent with the principles of the HM Treasury's Green Book.[13] As a result of this, the contributions of cultural and heritage assets like theatres can be underrepresented in funding bids and decisions. The CHC programme aims to overcome this by providing research, data, guidance and tools to support organisations in making a case for investment in culture and heritage assets, and policymakers in their decision making.

The publication of 'Valuing Culture and Heritage Capital: a Framework Towards Informing Decision Makers'[14] is an important milestone in the valuation of cultural and heritage assets. The document outlines that the development of a robust evidence base for decision making requires a cross-disciplinary approach connecting heritage science and economic valuation methodologies. DCMS' 'Embedding a Culture and Heritage Capital Approach'[15] report takes this further, seeking to understand the benefits of cultural and heritage assets like theatres as a stock, from which flow a set of services can be produced which can include Aesthetic services, Authenticity services, Communal services, Inspirational and creative services, Identity services, Knowledge (educational) services, and Health services.

DCMS have been responsible for commissioning an unrivalled body of research demonstrating the economic value of different classes of cultural and heritage (CHC) assets (museums, galleries, theatres, high streets, civic buildings, historic city cores) elicited as the Willingness to Pay (WTP) of users (visitors or local people) and non-users (the general public). These studies have included benefit transfer testing, to provide confidence that the values obtained for different classes of cultural or heritage assets are representative of other comparable sites in England.[16]

As part of this bank of benefit transfer CHC values, DCMS and Arts Council England previously commissioned a contingent valuation study of four regional theatres.[17] This previous study was designed to capture public preferences for keeping the theatre in the city, which can be seen as their WTP to keep the theatre 'stock' in the city, so that they and others can continue to benefit from the cultural services the theatre provides. The previous study was designed explicitly to isolate the functional use of the

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/955203/GOV.UK_-_Framework_Accessible_v2.pdf.

[11] P. Kaszynska *et al*., 'Scoping Culture and Heritage Capital Report' (London, UK: Department for Digital Culture Media and Sport, 2022), https://www.gov.uk/government/publications/scoping-culture-and-heritage-capital-report.

[12] H. M. Treasury, 'Green Book: Appraisal and Evaluation in Central Government' (London, UK: H. M. Treasury, 2022), https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent/the-green-book-2020.

[13] H. M. Treasury.

[14] Sagger, Philips, and Haque, 'Valuing Culture and Heritage Capital: A Framework towards Informing Decision Making'.

[15] Sagger & Bezzano, 'Embedding a Culture and Heritage Capital', DCMS 2024.

[16] D. Fujiwara et al., 'The Economic Value of Culture: A Benefit Transfer Study' (London, UK: Department for Digital Culture Media and Sport, 2018); R. Lawton et al., 'The Economic Value of Heritage: A Benefit Transfer Study' (Arts and Humanities Research Council, 2018); Ricky Lawton et al., 'The Economic Value of Heritage in England: A Benefit Transfer Study', *City, Culture and Society*, 27 September 2021, 100417, https://doi.org/10.1016/j.ccs.2021.100417; Lawton et al., 'Regional Galleries and Theatres Benefit Transfer Report'; R. N. Lawton et al., 'Local Museums Benefit Transfer Report' (Arts Council England, 2022), https://www.artscouncil.org.uk/sites/default/files/download-file/Local%20Museums%20Report.pdf.

[17] Lawton *et al*., 'Regional Galleries and Theatres Benefit Transfer Report'.

theatre services, by stressing to respondents that the building itself would continue to be preserved, but for another use. This leaves a research gap for understanding the welfare that visitors and non-visitors would gain from a policy focused on maintaining the theatre building itself, as separate from the value of the theatre services it produces.

## 1.2 Purpose

The research approach of previous CHC studies, as outlined above, was to estimate the value of public engagement to infer the use value of attendance and non-use values of attendance or existence. DCMS is seeking to expand the CHC evidence base, to understand what exactly individuals are valuing in their response to a stated preference survey in terms of the flow of services to society from CHC stocks like theatres. This provides a framework for categorising the benefits of theatre buildings in terms of the aesthetic and authenticity services (for instance, whether the physical character of the theatre's heritage attributes), or the inspirational and creative services which flow from the functional use of the asset being valued.[18]

- First, this study specifically aims to understand to what extent these stated preference values capture the heritage value of the asset, irrespective of attendance value. The objective of this study is to isolate heritage value from functional value for the theatre as a whole. This is the first time that any study has attempted to distinguish between cultural and heritage value in this way. This will help DCMS - as well as other art, cultural, and heritage organisations - understand the separation between the functional value of seeing a performance and the value of the building and its features that make it a theatre. This will help organisations understand the potential welfare loss from under-investment in the maintenance of buildings, in addition to the loss of value by the impact on performance (as more easily captured in loss of earnings).

An alternative approach to estimating the marginal value of maintenance is set out in DCMS' Working Paper 'Using economic valuation techniques and heritage science to measure the welfare impact of conservation, repair and maintenance of culture and heritage assets.[19] This approach sets out how heritage science and risk based approaches can be used where it might be harder for the general public to cognitively express their view and value on different states of an asset.

This study therefore aims to understand public preferences towards welfare loss, contributing to the understanding of how the condition of a heritage asset is associated with social welfare benefits. This study further aims to monetise the loss of welfare from deterioration of the theatre building itself, beyond just the loss of revenue generated by ticket sales, to allow policy makers to better understand the full range of costs and benefits to society.

- Second, we seek to provide policy-relevant evidence which can support prioritisation decisions around funding for maintenance of different parts of the stock of cultural assets like theatres. This is addressed through the design of the hypothetical scenario for the Stated Preference study, which elicits WTP for repair and maintenance of different parts of a theatre building. This is elicited through a Discrete Choice Experiment which presents different combinations of maintenance or deterioration levels for five parts of the theatre. This is represented through text and visually through Artificial Intelligence (AI) generated edits to images of the theatre features. AI-generated images were used with the aim to increase the realism of the scenario, in a way which is

[18] Sagger & Bezzano, 'Embedding a Culture and Heritage Capital Approach', DCMS 2024.

[19] H. Sagger, and M. Bezzano, 'Culture and Heritage Capital: using economic valuation methodologies and heritage science to measure the welfare impact of ongoing conservation, protection, repair and maintenance of culture and heritage assets, (London, UK: Department for Digital Culture Media and Sport, June 2023)

anticipated to accentuate the welfare decreasing consequences of degradation of the theatre building to survey respondents. See Section 5.2 and Section 5.4 for a reflection of the use of AI-generated images within this DCE.

- Finally, a novel experimental design is applied to isolate the value of maintaining heritage features compared to non-heritage features, with half the sample seeing a modern theatre (The Young Vic), and half the sample seeing a historic theatre (The Old Vic). This addresses the question of whether the public and theatre-goers have a higher WTP to preserve theatre buildings which are older and recognised for their historical significance, compared to the same features in newer buildings. This has important policy implications since historic buildings may be more costly to maintain and require additional funds to continue operating. It is assumed that people gain greater utility from the cultural services (theatre performances) which flow from stocks of heritage theatres, compared to non-heritage theatres. This is the first time that this hypothesis has been tested by using the same SP survey instrument on two separate cultural sites (one historic, one non-historic).[20]

[20] We note, as a caveat, that there may be other features of the theatre or theatre going sample which differ in ways which drive any observed differences in the WTP values stated, which means that this is not a 'true' experiment. This would require randomised research, for example, randomising free tickets to comparable shows at historic and non-historic theatres and testing outcomes like willingness to pay, satisfaction and wellbeing ex-post, which is outside of the scope of this study.

# Literature Review

In 2020, the DCMS commissioned a Rapid Evidence Assessment (REA) of economic value of culture and heritage studies conducted from 2000-2019. This was designed to provide a systematic assessment of what valuations have been conducted in the international academic and grey literature over the past 20 years, and what gaps remain.[21] The REA was also designed to help direct ongoing research on monetary valuation of cultural and heritage assets to inform the DCMS's Cultural and Heritage Capital programme. The REA results are presented within an Evidence Bank of economic values that includes valuation details, such as the estimated monetary values for assets, a grading of the quality of each study, the article details, and an overview of the valuation method used.

The DCMS REA identifies one Discrete Choice and one Contingent Valuation study of theatres[22]. First, Wiśniewska et al. ran a DCE survey on municipal theatres in Warsaw, Poland to investigate preferred ways of dividing public resources. This was to understand the value to the broader accessibility of municipal theatres and their willingness to pay for different type of plays in repertories. The study found different preferences toward public support for heterogeneous parts of theatre services: entertainment theatres had the highest WTP (9 EUR), then drama theatres (5 EUR), children's theatres (3 EUR) and experimental theatres (2.50 EUR).[23]

Second, the contingent valuation study measured the use and non-use benefits of theatre venues which already have a clear set of traditional 'market values' (i.e., people implicitly show their valuation of theatre productions through the ticket prices they pay). However, while this gives an indication of the values that the public hold for individual productions, it is only a partial picture of the value of the services that theatres provide. The regional theatres benefit transfer study was designed explicitly to exclude the heritage value of the theatre building, by stressing to respondents that the building itself would continue to be preserved, but for another use. This leaves a research gap for understanding the welfare that visitors and non-visitors would gain from a policy focused on maintaining the theatre building itself, as separate from the value of the theatre services it produces (which is already captured through the previous benefit transfer study).

A survey was designed for four theatres[24] to collect WTP values for how much visitors (users) and non-visitors (non-users) value the presence of theatres in their respective cities. The survey proposed a hypothetical scenario where the theatre would move to another city and asked respondents for the maximum increase to their taxes (local or national depending on the respondent's location) they would be prepared to pay to keep the theatre in the city. Across the four regional theatres, WTP for an increase to taxes to maintain the theatre in its city was £13.10 per household per year on average over a three or five-year period, with a lower bound of £11.08 (based on the 95% confidence interval). Almost half of respondents (47%) were not prepared to pay anything.

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[21]. R.N. Lawton *et al*., 'DCMS Rapid Evidence Assessment: Culture and Heritage Valuation Studies - Technical Report' (London, UK: Department for Digital Culture, Media and Sport, 2020), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/955142/REA_culture_heritage_value_Simetrica.pdf.

[22] Lawton *et al*., 'Regional Galleries and Theatres Benefit Transfer Report'.

[23] A. Wiśniewska, 'Utilizing the Discrete Choice Experiment Approach for Designing a Socially Efficient Cultural Policy: The Case of Municipal Theaters in Warsaw', *University of Warsaw Faculty of Economic Sciences* 36/2015 (184) (2017): 22.

[24] Birmingham Repertory Theatre, Leeds Playhouse, Manchester Royal Exchange Theatre, and Theatre Royal Plymouth

The survey also elicited non-visitors' willingness to support one of the four theatres a respondent indicated they had not visited in the past three years (£5.01 on average as an annual increase in household tax over either a three- or five-year time horizon, with a lower bound of £4.32).

In terms of lessons for the current study, the previous theatre's benefit transfer study used the payment vehicle of a top-up donation for those who had already paid a ticket. However, we note that there is no need to apply the same payment vehicle in this study as we are eliciting WTP for maintaining the theatre building (and distinguishing between historic and modern theatres to understand the heritage value of historic theatres). Furthermore, the previous study focused on preserving the theatre company in the city for the theatre services it provides. We are not looking to perform direct comparison or read across between this study and the previous BT study, as the research questions are focused on heritage value and funding for maintenance and preservation of the theatre building as built capital, as distinct from the theatre services hosted there.

Elsewhere, Throsby *et al.* (2023) elicit the value of live theatre, rather than theatre buildings, through conditional demand modelling using data from an online survey of 924 theatre-goers.[25] The data is analysed in a two-stage regression model which shows that determinants of preferences for live theatre and their influence on future demand are significantly associated with emotional, intellectual and transcendental experiences in generating preferences, and of the role of preferences being shaped by both emotional engagement and past transcendental experience in promoting demand for euphoric and ecstatic experience in future. The "having fun" outcome, the emotional experience preference variable, shows a positive impact while intellectual preferences have a negative impact.

There have been previous efforts to link new DCE research to an existing contingent valuation study, to estimate marginal changes in value of greater relevance to policymakers. The National Railway Museum (NRM) was selected to undertake this analysis as it had already been valued as part of the 2018 study '*The economic value of culture: a benefit transfer study*'.[26] This was the first time that DCE has been applied to an existing body of WTP values to estimate the marginal value of an intervention that would lead to changes to the provision of a non-market good or service, in this case a significant expansion of the museum building and visitor offering.

An online survey of 941 adults in England divided into 357 users and prospective users and 584 non-users. A conjoint model was constructed using 8 attributes over 2-3 levels across 7 tasks. This provided a marginal WTP range for the improvement scenario (per person) of +£1.17 to +£1.32 per visitor, equivalent to 19.3% of baseline WTP without the improvement. Marginal values for non-user WTP are also explored, but the elicitation of non-user marginal WTP introduces some additional challenges which require further consideration in future research.

In a previous methodologically relevant study unrelated to theatres, Lawton *et al.* applied a DCE to estimate a change in WTP under different hypothetical closure scenarios, where different combinations

[25] The Throsby et al. (2023) their study is notable for the way it seeks to move beyond established methods for assessment of preferences for non-market phenomena (i.e. SP surveys), to dig into 'the back-story of where preferences come from and how they are determined [which] is a road somewhat less travelled': David Throsby, John R. Severn, and Katya Petetskaya, 'Preference Formation in Demand for Live Theatre', *Journal of Cultural Economics, 23 August 2023, https://doi.org/10.1007/s10824-023-09487-6.*

[26] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/963226/The_Economic_Value_of_Culture_-_A_Benefit_Transfer_Study_-_Final_report_V2.pdf

of the house or gardens are to be closed for a year.[27] This was designed to capture the relative importance of different parts of the site as a source of cultural and heritage value.

Visitor preferences did not follow welfare theory[28], with participants on average selecting choice sets which had the higher donation price. In other words, respondents appeared to gain more utility from paying a higher donation, regardless of which parts of the house and gardens were open/closed in the DCE.

In principle, there are a number of possible explanations for this counterintuitive finding. It may be that respondents simply do not understand the DCE including donation/ticket prices (as standard DCEs typically do not include donations/ticket prices). Another hypothesis consistent with our findings is that individuals who have an attachment to Blenheim palace are willing to pay a higher amount - donation or ticket price - in order to keep the site open regardless of whether specific parts of the site are closed or remain open.

[27] R. N. Lawton, D. Coyle, and H. Bakhshi, 'Cultural Capital Services Valuation Study', ESCoE Technical Report TR-24 (London, UK: Economic Statistics Centre of Excellence, 2023), https://escoe-website.s3.amazonaws.com/wp-content/uploads/2023/11/20142156/ESCoE-TR-2023-24-V2.pdf.

[28] Daniel McFadden, 'The Measurement of Urban Travel Demand', *Journal of Public Economics* 3, no. 4 (1 November 1974): 303–28, https://doi.org/10.1016/0047-2727(74)90003-6.

# 3. Methodology

Discrete Choice Experiment (DCE) methods present a series of alternatives (with varying attributes and levels) from which respondents select their preferred option. The result is a complex decision-making scenario that is reflective of market conditions.

A key challenge of this Study was that visitors already (partially) revealed their preferences through the market, in the ticket/membership prices they paid.[29] This data was collected as part of the survey.

The Stated Preference (SP) survey concerning the value of theatre buildings was designed to assess the following research questions:

- **Valuation question 1: To what extent do people value the maintenance of theatres with historical attributes versus more modern theatre venues?** By utilising a DCE for attributes of both the Old Vic and the Young Vic it is possible to compare how preferences for heritage versions of interior and exterior attributes differ from modern versions of the same theatre attributes. The Old Vic includes many of its original theatres from its construction in the 17th century while the Young Vic was first opened in the 1970s and rebuilt in 2005.

- **Valuation question 2: To what extent do people value the maintenance of individual aspects of the theatre interior and exterior?** Discrete Choice modelling was applied to elicit estimates of value for individual elements of the theatre by asking respondents to trade-off the deterioration of different parts of the site against a payment (an increase in ticket prices for users or increase in taxes for non-users).

- **Valuation question 3: How does the value attributed to the maintenance of Theatre attributes and heritage differ depending on whether a person has visited the theatre recently, their demographics and other characteristics?** Theatres have a range of users across various demographic groups, and previous studies show that characteristics such as income are significant in their choice of values.[30] It is therefore important to explore how preferences for maintaining different parts of theatres differ by characteristics which act as indicators of cultural engagement (e.g., past visits to the theatre, amount paid in previous ticket price) and indicators of ability to pay (income).

There is also the crucial difference between how users and non-users respond to these DCE exercises on their preferences for maintaining different parts of the theatre. This is why the sample is split between those who have visited one of the theatres and those who have not. Although non-users tend to value the existence of cultural assets less than users, these people consistently show value from the existence and maintenance of cultural assets for others (altruistic value), future generations (bequest value) and the opportunity to visit in the future (option value).

Following on from this, **we explore the practical implications for applying the evidence within policy appraisal as a business case tool for understanding the preferences of theatre users to keep different parts of the theatre building maintained .**

[29] Following the principles set out in the HMT Green Book, it is important to consider all market and non-market values within a social cost benefit analysis.

[30] Lawton et al., 'Regional Galleries and Theatres Benefit Transfer Report'.

## 3.1 Site Selection

Given that we are applying an experimental design which seeks to isolate the differential WTP value for maintaining a historic theatre by surveying a historic and a modern building, it is important that the other features of the theatre and local area are kept constant (e.g. local incomes levels or other socio-economic demographics which may drive willingness to pay).[31]

One of the key challenges faced during site selection was that the spread of suitable historic and modern theatres is highly variable across regions – presenting challenges in holding the above factors constant.

Due to the high density of theatres in London compared to the rest of the country, London presented a promising location for sampling both the historic and modern case study theatres, whilst ensuring that the key variables are held constant.

Considering the above, the theatres selected for the purposes of this study were:

- **The Old Vic**: a 1,000-seat, not-for-profit producing theatre in Waterloo, London, England, Grade II listed, dating from 1871.
- **The Young Vic**: Constructed in 1970 as a breeze-block building, and rebuilt in 2006. Producing theatre with capacity for 420 Main house+150 Maria (studio)+70 Clare (studio).

South London sites were chosen on the basis that South London has a wider distribution of income levels compared to the West End.

## 3.2 Stated Preference Methodology

Stated Preference - through Contingent Valuation (CV) or Discrete Choice Experiments (DCE) - allows estimation of the welfare impact of non-market and public or quasi-public goods, defined as those which can either be enjoyed at no direct price to the consumer in the market, or at a price which is subsidised at the point of use or in some other way does not capture the full costs of maintaining or providing the good/service (the additional welfare value over and above prices paid termed ‘surplus value’). In the literature it is commonly argued that this method is suited to capturing the flow of benefits associated with a cultural/heritage asset, in terms of both use and non-use values[32] (See text box).

[31] To ensure comparability between WTP values, key site selection factors were considered: Geographical proximity: To avoid significant differences in income and other demographic characteristics between the two sites, which could otherwise drive WTP. For the differential WTP between theatre sites to be relevant, the income of the users and non-users should be as similar as possible to be meaningful - given that survey WTP is consistently associated with household income levels (as well as other demographics). By choosing two theatres within close proximity of one another (approximately 100m apart) – this increases the likelihood that the socio-economic demographics of the users and non-users are similar. It should be noted that this does not explicitly control for any differences in the socio-economic demographics between users of each theatre – where differences in demographics of users and non-users between each theatre can be tested ex-post; Producing vs receiving theatres: As set out in the previous regional theatres benefit transfer study , producing theatres are essential for the continued presence of original theatre works, distinct from receiving theatres which do not promote their own original works. As such it was assumed that people have higher WTP for cultural value of producing over receiving theatres, and for this reason, both theatres should be consistent in this regard; Comparable visitor numbers: The two theatres should have similar levels of demand and reach, with a sufficient number of historic visitors to enable data collection via an online panel.

[32] Kaszynska et al., ‘Scoping Culture and Heritage Capital Report’.

**Use value** - referring to the benefits that individuals gain through their use of cultural or heritage assets (such as theatres), which are split into direct use, indirect use and option value:

Direct use values stem from direct engagement with theatres. For instance, visiting the theatre for entertainment, transcendence, socialisation, education, and a range of other cultural services.

Indirect use values relate to the presence of culture and heritage sites in the local area, as well as its function as a site of social interaction. For example, theatres may also provide educational opportunities through outreach programmes, or encourage social interaction with people commonly visiting as part of a trip with family or friends.

Option value can be attached to potential future use of the theatre or of the services provided by different parts of the theatre, even if an individual has never visited previously.

**Non-use value** – referring to the benefits that individuals derive from culture and heritage sites, without them personally engaging directly or indirectly. There are three forms of non-use value:

Altruistic values - welfare increases in association with knowing that others can enjoy the asset in the present.

Bequest values – welfare increases in association with knowing that future generations will benefit from the asset. Just as an individual may value the existence of a theatre for others to enjoy in the present, so that they may value its continued existence for the benefit of future generations in the same way, in that current generations have a duty to leave heritage assets to future generations.

Existence values – welfare enhancements from knowing that the asset, including its performances and cultural services offered, exist even if an individual does not experience a use benefit now or in the future.

## 3.3 Experimental Design

The DCE used in this study offers an innovative advance by presenting detailed visual representations of different levels of maintenance and upkeep of the interior and exterior parts of the theatres (defined as DCE attributes at different levels of deterioration).

Five parts of each theatre (the attributes) were identified: the seats, carpet and flooring, the interior decorations, the foyer, the roof and the exterior of the building, each with three levels:

- Maintained in current condition
- Visible wear and tear
- Serious damage left unrepaired.

In addition, a ‘price’ attribute was included, with 5 levels, based on the user or non-user group and their respective payment vehicles. Figure 3.1 below shows an extract from the DCE used within this Study.

Levels of deterioration are described both in text and visually using Artificial Intelligence (AI)[33] to edit images to represent the deterioration that would be present under different scenarios. This is considered

[33] Adobe Photoshop AI generative fill: https://www.adobe.com/uk/products/photoshop/generative-fill.html

a considerable advance on previous DCE studies in the cultural and heritage sector which have relied only on text or at best crude illustrations of different scenarios. The advantage of AI generated images is that it increases the realism of the hypothetical attribute conditions presented in the survey, assuming that the pictures align with the maintenance level as described in the text, and are interpreted by respondents as such.[34]

Previous studies have found that respondent preferences in the text-only survey are based on the respondent creating mental images of building types, whereas in the visual survey, preferences are based on the displayed images (see survey images in Figure 3.1).[35] It may be that visual images ensure respondents are all valuing the same object, rather than their different mental images of what the object looks like.

DCE design was produced in collaboration with a stakeholder group of DCMS and Historic England representatives. This introduced useful perspectives on the policy needs for the heritage sector into the design. The original objective of the study as set out by DCMS was to isolate heritage from functional value for the theatre as a whole. This is based on the starting point that we know the WTP for keeping theatre services in the city (from the previous benefit transfer study).However, we need alternative approaches to understand how important the heritage of the theatre is, distinct from the function of theatres' services.

Historic England added an additional perspective on the need to understand public preferences for repair and maintenance of different parts of the theatre in a way that could potentially feed into future repair and maintenance funding decisions. This would be best answered through DCE for different parts of the theatre (heritage features).[36]

A more innovative experimental design emerged which involved a split sample design, with half the sample answering the DCE on maintenance of parts of a non-historic theatre, and half seeing a historic theatre. This would entail a survey presenting two theatres, where one is a standard theatre with no historical features, while the other has heritage-related features. The idea was to isolate the heritage features by running two samples, putting them into the same DCE then using an interaction term to understand the additionality.

This moved away from a standalone CV study comparing WTP for maintenance and conservation of a historic and non-historic theatre building with follow-up DCE design for capturing the value of each heritage feature to a redesign of the DCE involving a split sample. The aim was to generate a heritage interaction to demonstrate the additional value of maintaining, e.g. the roof of a historic theatre vs the roof of a non-historic theatre. It was hoped that this would provide an estimate of both the value of maintaining these features, as well as the 'heritage premium' if people valued maintenance and conservation of the historic vs non-historic features. This decision led to a more experimental study,

[34] This aligns with some of the virtual reality DCE work which has been found to reduce choice error. See: Yvonne Matthews, Riccardo Scarpa, and Dan Marsh, 'Using Virtual Environments to Improve the Realism of Choice Experiments: A Case Study about Coastal Erosion Management', Journal of Environmental Economics and Management 81 (1 January 2017): 193–208, https://doi.org/10.1016/j.jeem.2016.08.001.

[35] Zachary Patterson et al., 'Comparing Text-Only and Virtual Reality Discrete Choice Experiments of Neighbourhood Choice', Landscape and Urban Planning 157 (1 January 2017): 63–74, https://doi.org/10.1016/j.landurbplan.2016.05.024.

[36] It is important to note that WTP for individual attributes cannot be summed together to estimate WTP for the theatre as a whole because simply summing WTP values fails to account for diminishing marginal returns for cumulative improvements (accommodated by the sigmoidal shape of the logit function). Summing WTP values also fails to consider increasing resistance due to consumers' budgetary constraints where increasing the price by cumulative amounts may very well push the utility function for price into a new region of the utility function that reflects greater price sensitivity.

whereas the standalone CV would have potentially provided more policy-relevant values for development of a business case tool.

## 3.4 Survey Design

The SP survey was designed in alignment with best practice in previous research on the economic value of culture and heritage as published on the Cultural and Heritage Capital Portal.[37] The survey was divided into four main sections:

- Section One asked about respondents' engagement with the theatre (visit frequency, onsite expenditure, likelihood to visit again, etc.);
- Section Two explored how much respondents would be willing to pay to support either the Old Vic of the Young Vic;
- Section Three presented respondents with the DCE;
- Section Four asked a set of standard socio-demographic questions, including education level, marital status, employment status, self-reported health status, annual income, and number of dependent children.[38] [39]

Prior to the valuation scenario and DCE, all respondents were asked questions about their preferences for public spending and their attitudes towards culture and heritage, as a means of preparing them cognitively for the payment scenario. These questions also provide attitudinal data which can be used in ex-post sensitivity analysis to test whether WTP for cultural/heritage assets is statistically associated with theoretically consistent drivers of cultural and heritage value (in line with Arts Council England good practice survey design guidance).[40]

### 3.4.1 Payment Vehicle

A crucial design issue for a SP survey is the choice of payment vehicle. Compulsory payment vehicles are preferable as in principle they increase the incentive compatibility of the survey design and avoid hypothetical bias caused by potential free-riding (everyone has to pay a for ticket or pay their tax, but it is possible to not pay a donation and still enjoy the continued flow of benefits from the good/service if others are willing to pay). [41]

The final decision of which payment vehicles to adopt was made through extensive consultation with academics, DCMS and Historic England:

[37] https://www.gov.uk/guidance/culture-and-heritage-capital-portal

[38] I. Bateman et al., *Economic Valuation with Stated Preference Techniques: A Manual* (Cheltenham, UK: Edward Elgar, 2002). Edward Elgar, UK 2002.

[39] Following good practice, respondents were provided with cheap talk scripts in the WTP in principle question, asking them to be realistic, reminding them of their household budgetary constraints, and the existence of other things they may wish to spend their money on: Lawton et al. 'Comparing the Effect of Oath Commitments and Cheap Talk Entreaties in Contingent Valuation Surveys: A Randomised Field Experiment', *Journal of Environmental Economics and Policy*, 11 November 2019, 1–17, https://doi.org/10.1080/21606544.2019.1689174; Gregory Howard et al., 'Hypothetical Bias Mitigation Techniques in Choice Experiments: Do Cheap Talk and Honesty Priming Effects Fade with Repeated Choices?', *Journal of the Association of Environmental and Resource Economists* 4, no. 2 (20 February 2017): 543–73, https://doi.org/10.1086/691593; Fredrik Carlsson, Peter Frykblom, and Carl Johan Lagerkvist, 'Using Cheap Talk as a Test of Validity in Choice Experiments', *Economics Letters* 89, no. 2 (November 2005): 147–52, https://doi.org/10.1016/j.econlet.2005.03.010.

[40] https://www.artscouncil.org.uk/sites/default/files/download-file/Guidance%20Note%20-%20How%20to%20estimate%20the%20public%20benefit%20of%20your%20Museum%20using%20the%20Economic%20Values%20Database.pdf

[41] The choice of payment vehicle typically includes: entry fees or ticket prices, tax (local or national) and donations

- **For theatre users**, an increase in ticket prices was selected as it most closely aligns with how they currently pay to engage with the theatre and was considered the most realistic scenario. The payment range was set on the basis of the current ticket price range and following feedback during cognitive interviews (see section below), to ensure that the upper end of the range was not so high as to put off the majority of theatre visitors, while not being so low as to have no identifiable influence on their WTP: £2.50 to £10 increase in ticket price.

- **For theatre non-users**, a ticket price increase would not be relevant because they have never visited or paid for that theatre before. Instead, an increase in monthly council tax was presented to theatre non-users. Council tax has the advantage of being a compulsory payment vehicle which could realistically be raised from the general public to pay for maintenance of theatre buildings. Given that non-users are consistently found to state lower WTP in SP surveys of cultural and heritage assets (see previous DCMS benefit transfer studies[42]), and that a monthly payment is for most people a more regular payment than a ticket for the theatre, the non-user payment range was lower at: £1 to £10 increase in monthly council tax.

### 3.4.2 Valuation Scenario

The valuation section presented respondents with information about the Old Vic or Young Vic (see text box for an extract of the information presented, with full information on key interior and exterior parts of the theatre building also provided, as set out in Appendix 7.1). In particular, the survey outlined the services that the theatre building provided the public, information on its current funding arrangements and the ongoing financial challenges for management of the theatre building.

**Text Box 1. Extract of Information presented on the Old Vic Theatre**

*"The Old Vic, originally named the Royal Coburg Theatre, was designed in 1818 by Rudolph Cabanel. Its name was later changed to the Royal Victoria Theatre, then the Royal Victoria Hall, before it took on its nickname of 'The Old Vic' as its official name in 1925.*

*The Old Vic has housed acclaimed performances with such celebrated actors as John Gielgud's Hamlet, Laurence Olivier's Macbeth and Othello in 1937, and Judi Dench's Juliet in Romeo and Juliet, which was privately performed for The Queen in 1957.*

*Architecturally, as well as historically, the Old Vic is one of London's most significant theatres. The grade II listed theatre has one auditorium with a capacity of 1,067 across three tiers. Major parts of the roof and the external brick shell are largely of the first period of the building, as is the massive internal timber construction of the roof. Visitors have access to a daytime Café as well as bars on each floor as well as a larger bar in the basement."*

[42] Lawton et al., 'The Economic Value of Heritage: A Benefit Transfer Study'; Lawton et al., 'Regional Galleries and Theatres Benefit Transfer Report'.

**Text Box 2. Information presented on the Young Vic Theatre**

*"The theatre venue was created in 1970 as an offshoot of the Old Vic from a former butcher's shop and an adjacent bomb-site. The structure was intended to last for five years, but has become permanent. The theatre was renovated between 2004 and 2006. Substantial work was carried out on the main auditorium adding a new layer of entrances, providing a moveable wall and demountable gallery into a large new workshop space. The renovation also included two new adaptable performance and studio spaces, work on public facilities such at the bars and lobby, and backstage spaces.*

*The Young Vic performs both new writing and classic plays, the latter often in innovative productions. The main auditorium has an approximate capacity of 420, although the configuration and capacity can vary depending on the design of each production."*

The Survey then presented respondents with information on the required maintenance, and the barriers to undertaking the required maintenance:

> *"Theatre buildings are large and costly to heat and maintain. The auditorium contains seating and upholstery, light fittings and complex stage machinery[43] which need ongoing care and maintenance. The roof of the building requires regular maintenance to keep it in good condition. The exterior facade of the building is a visible part of both the theatre and the wider townscape, which requires continuous maintenance to keep in a good state of repair.*
>
> *The maintenance of the theatre building has become increasingly challenging as it has become more vulnerable to extreme and fluctuating weather, such as summer heatwaves and extreme wind and rainfall. These put the theatre's exterior and interior at higher risk. Additionally, the interior upkeep and maintenance requires a high use of energy to maintain the right levels of humidity and temperature. High energy use combined with increased costs of energy will make it more difficult to maintain the interior at optimal environmental conditions."*

Respondents were asked if they would be willing to pay in principle, before those answering 'Yes' or 'Maybe' proceeding to the payment card of values:

- **For users**, an increase in ticket prices was used: "*In this scenario, the [Old Vic/ Young Vic] is faced with the option of increasing its ticket prices to cover the cost of operating in the current theatre building, or keeping ticket prices the same but reducing its maintenance and repair activities, leading to a deterioration in the condition of the interior and exterior of the building. Would you be prepared to pay an increase in ticket prices, even if only a small amount, to support the ongoing maintenance and repair required to keep the [Old Vic/ Young Vic] in good condition?*"
- **For non-users,** an increase in council tax was used: "*In this scenario the [Old Vic/ Young Vic] is faced with the option of subsidising its maintenance through additional funds raised through council tax, or reducing its maintenance and repair activities, leading to a deterioration in the condition of*

[43] Note that technical aspects of the theatre were not included in the DCE attribute list, in part because they do not typically vary in character between historic and non-historic theatres, and because cognitive testing found that respondents struggled to understand their role in keeping the function of the theatre maintained.

*the interior and exterior of the building. Would you and your household be prepared to pay an increase in your monthly council tax, even if only a small amount, to support the ongoing maintenance and repair required to keep the [Old Vic/ Young Vic] in good condition?"*

The valuation scenario aimed to quantify this welfare loss in monetary terms by asking **how much they would personally be willing to pay to support maintenance which would avoid that outcome**. This was designed to align closely to the infrastructure repair funds which DCMS have recently funded for museums (Museum Estate and Development Fund AND Public Bodies Infrastructure Fund) [44], to make them more realistic and more relevant to any future policies around theatre infrastructure repairs and maintenance.

### 3.4.3 Discrete Choice Experiment

DCEs are an established methodology for understanding the trade-offs involved when selecting between different products or service offerings.[45]

A number of choice tasks were generated through an experimental design each with different combinations of the interior and exterior of the theatre building in good, poor, or severe condition (Figure 3.1), each containing multiple options, which represented different combinations of the attribute levels being tested.

For this study, the DCE elicits respondents' preference for paying to support the theatre under different hypothetical maintenance scenarios, where different combinations of the interior and exterior of the theatre are maintained or left to degrade to a moderate or severe level. Respondents were asked to think about how much they would be willing to pay based on which parts of the theatre would be left to degrade to a poor condition or severe (at-risk) level, and which would be maintained in good (current) condition, with each scenario represented through either current images or AI-generated images for each attribute.

**Figure 3.1: Discrete Choice Experiment: Attribute text and visual information used**

| Attribute (part of theatre) | L1 (good condition) | L2 (poor condition) | L3 (severe condition) |
|---|---|---|---|
| **Interior auditorium: Seats, carpets and flooring.** |  Interior upholstery in good condition with minimal to no marks or damage |  Visible wear and tear: Seats have rips and marks with some repairing |  Serious damage left unrepaired: Some seats are broken and therefore unusable |

[44] The Museum Estate and Development Fund AND Public Bodies Infrastructure Fund are two capital investment programmes administered by DCMS. The programmes are designed to enable national and non-national museums to undertake vital maintenance works. In August 2022, DCMS appointed a consortium made up of Ipsos, Ecorys, BOP Consulting, UCL Institute for Sustainable Heritage and independent advisor George Barrett to undertake a mixed-method evaluation of these dual funds.

[45] Daniel McFadden, 'The Measurement of Urban Travel Demand', *Journal of Public Economics* 3, no. 4 (1 November 1974): 303–28, https://doi.org/10.1016/0047-2727(74)90003-6; David Throsby, Anita Zednik, and Jorge E. Araña, 'Public Preferences for Heritage Conservation Strategies: A Choice Modelling Approach', *Journal of Cultural Economics* 45, no. 3 (2021): 333–58.

**Interior auditorium: Decoration, plasterwork, box fronts etc.**

Interior surfaces (e.g box fronts) of auditorium in good condition with minimal to no marks or damage

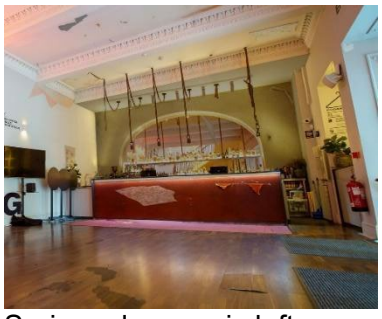
Visible wear and tear: Interior surfaces (e.g box fronts) chipped and peeling in place

Serious damage left unrepaired: Significant damage to surfaces and some structural elements means some areas are unusable

**Foyer: Ticket office, reception, bar and catering space(s)**

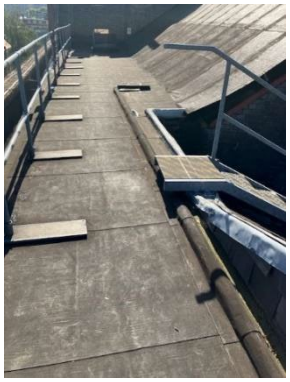
Public spaces (e.g., bar area) maintained to good condition

Visible wear and tear: Public spaces (e.g., bar area) have surface marks to floors and ceiling



Serious damage is left unrepaired to floors, walls and ceilings

**Roof**



Roof regularly inspected and kept in good condition

Roof irregularly inspected leading to surface cracks

Ongoing cracks and leaks risking structural integrity of roof

**Exterior: Front of theatre**


Frontage regularly painted and maintained


Irregular maintenance leading to paint falling away

| | | | |
|---|---|---|---|
| | | and plaster damage to frontage | Frontage in disrepair with long-term scaffolding and wooden boarding |
| **Attribute (part of theatre)** | **L1 (Good)** | **L2 (Poor)** | **L3 (at Risk)** |
| **Interior auditorium: Seats, carpets and flooring.** |  Interior upholstery in good condition with minimal to no marks or damage |  Visible wear and tear: Seats have rips and marks with some repairing |  Serious damage left unrepaired: Some seats are broken and therefore unusable |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** |  Interior surfaces (e.g box fronts) of auditorium in good condition with minimal to no marks or damage |  Visible wear and tear: Interior surfaces (e.g box fronts) chipped and peeling in place |  Serious damage left unrepaired: Significant damage to surfaces and some structural elements means some areas are unusable |
| **Foyer: Ticket office, reception, bar and catering space(s)** |  Public spaces (e.g., bar area) maintained to good condition |  Visible wear and tear: Public spaces (e.g., bar area) have surface marks to floors and ceiling |  Serious damage is left unrepaired to floors, walls and ceilings |

**Roof**

Roof regularly inspected and kept in good condition

Roof irregularly inspected leading to surface cracks

Ongoing cracks and leaks risking structural integrity of roof

**Exterior: Front of theatre**

Frontage regularly painted and maintained

Irregular maintenance leading to paint falling away and plaster damage to frontage

Frontage in disrepair with long-term scaffolding and wooden boarding

The participants had an 'opt-out' option, to select neither of the choice sets presented to them. Estimating WTP should incorporate a realistic set of relevant and appropriate competition. It has been shown that including the 'none' option leads to more realistic and lower estimates of WTP, but also has implications for choice of regression modelling (see Section 3.8).[46]

For each choice task, participants were asked to compare two choice sets and to select the one they preferred the most when thinking about what they would be willing to pay to maintain that combination of theatre attributes in their presented condition. The combination of levels was varied across the choice tasks so that the trade-offs that participants were using in their choices could be identified.[47]

## 3.5 Cognitive Interviews

Cognitive testing played a pivotal role in ensuring the effectiveness and accuracy of the survey. Cognitive testing also assisted in assessing the respondents' capacity to recall relevant information and make informed judgments. By conducting cognitive testing, we sought to ensure that the survey was user-friendly, easy to understand, and capable of capturing accurate and representative data, thereby enhancing the validity and reliability of our survey findings.

[46] This responds to critiques in the literature of DCE estimation which does not consider competition or the ability to opt out and often can lead to inflated estimates of WTP, leading to a more robust estimation of consumer surplus WTP. See, e.g., Danny Campbell and Seda Erdem, 'Position Bias in Best-Worst Scaling Surveys: A Case Study on Trust in Institutions', *American Journal of Agricultural Economics* 97, no. 2 (1 March 2015): 526–45, https://doi.org/10.1093/ajae/aau112.

[47] To undertake a DCE, a set of choice tasks based on several criteria must be created: 1) that each level was shown approximately the same number of times across the design; 2) the 2-way combinations (e.g. how often Attribute 1 level 1 appears together with attribute 2 level 1) were approximately equal for all combinations across the whole design, and; 3) the attributes were largely orthogonal (no correlation). When those conditions were satisfied, a balanced design was said to have been achieved.

This preliminary testing was implemented to assess the comprehension and interpretive processes that individuals would use when responding to the survey. Cognitive testing was used to identify potential problems in the survey design, such as complex or confusing questions, misleading instructions, or biases that might lead to misinterpretations. It allowed us to test the appropriateness of the range of values presented in the DCE as price attribute levels (i.e., the range of ticket price increases).

Cognitive testing is standard for survey samples of this size and provides a proportionate sample of survey respondents for testing key elements of the survey design. Of the 10 participants recruited, three had visited the Old Vic theatre within the last five years, three had visited the Young Vic theatre within the last five years and four had not attended either theatre within the past five years (but could have attended other theatres).[48] Within these ten interviews we made sure to speak to participants from a range of different demographics including a mix of gender, age and ethnicity. to ensure different audiences could understand the content of the survey.

**Results of cognitive interviews:** The results of the ten cognitive interviews showed that people were able to recall information about previous visits to the Old Vic Theatre and Young Vic Theatre including the time they spent at the venue, the facilities they used and the amount they spent on tickets and at the venue.

Given the novel nature and complexity of the discrete choice question, the cognitive interviews were focused on how individuals interpreted the images and payment card. Although many felt able to interpret the presented information, some individuals found it difficult to identify the difference between the condition of theatre attributes in the images. Where cognitive interviews identified confusion steps were taken to add more severe damage to images representing “Poor condition”.

Similarly, a number of those surveyed during the cognitive testing phase found the payment card options to be higher than they would consider paying. We therefore took the decision to lower the payment card range. Some respondents (non-users of the theatre) also found it difficult to interpret changes in yearly council tax and felt a monthly value would be easier to interpret given that this is more typically how people pay their council tax bills. This edit was made to the final non-user survey.

The information we had from the limited number of cognitive interviews suggested that individuals would be unlikely to choose the higher payment options in our original survey design. Given the evidence, it was felt using a too high a payment range may bias results or not give us the diversity in selected payment values needed if relatively few people selected the larger values.

## 3.6 Sampling and Data Collection

The survey took place from 2nd November 2023 to 7th December 2023, collecting a total sample size of 1,110 split between:

- Old Vic users, n= 345
- Old Vic non-users, n=267
- Young Vic users, n= 230
- Young Vic non-users, n=268

[48] Ten interviews were considered appropriate as the survey was not overly complex so we could test the routing and flow of the survey.

The sample sizes collected were chosen to align with the DCMS Rapid Evidence Assessment[49], which recommends 200 observations as a minimum sample size for the total sample of an SP survey. However, given the additional statistical power requirements of a DCE, we targeted a higher number of respondents.

An online survey of adult residents in Greater London aged 16+ was recruited via Ipsos Interactive Services. The decision to survey only Greater London was partly designed to maximise sample in a cost-effective way by surveying those who were most likely to have visited, and partly designed to avoid yea-saying or recollection bias (especially among non-users) by surveying a national sample about a less nationally reaching theatre like the Young Vic based in South London.

To avoid response acquiescence (where people inaccurately say they have visited a site because they think it is the focus of the survey), a number of questions were asked before identifying respondents as users or non-users of each theatre. Respondents were first asked if they had ever visited a range of cultural and heritage sites, including theatres. They were also asked when they last visited one the theatres, with a dropdown menu of years from 2017 to 2023. They were then presented a list of eight theatres, where respondents chose any they had visited in the past 5 years.

For those who chose both the Young Vic and Old Vic among their visited theatres, the survey asked when they last visited and how often they had visited in the past year. Only those who chose the Young Vic and Old Vic out of the open list of eight sites, and who confirmed they had visited in the past five years were classed as 'Old Vic users' or 'Young Vic users.[50] This allowed those who had visited either the Old or Young Vic in the past five years to be split out. Respondents only answered questions about one of the theatres: those who had visited both were asked when they visited each, and answered for the most recently visited. If respondents had visited both in the same year, the theatre was randomly selected). Regional (Greater London) representative quotas for age, gender and region were set for non-users. Theatre visitors were obtained through natural fall-out in the panel.

A comparison of the proportion of those living in Greater London who have visited the Old Vic and the total proportion of our sample (including all activity/ clicks on the survey) that have visited the Old Vic can be made. This presents reasonable evidence that the engagement of users with the Old Vic in our Panel broadly matches the engagement with the Old Vic in the Greater London area:

- **Approximately 1.6% of the Greater London Population visit the Old Vic each year.**[51] Amongst a population of 8.8 million[52], the Old Vic has approximately 350,000 visitors each year.[53]

[49] R.N. Lawton et al., 'DCMS Rapid Evidence Assessment: Culture and Heritage Valuation Studies - Technical Report' (London, UK: Department for Digital Culture, Media and Sport, 2020), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/955142/REA_culture_heritage_value_Simetrica.pdf.

[50] All survey participants in this research were England residents aged 16+ and will have answered a detailed consent form. Ipsos UK is compliant with the highest regulatory standards for the legal and safe processing of personal and/or sensitive data, including the Market Research Society Code of Conduct, IS0 27001, 20252, 9001 and GDPR. We are also a Fair Data company and an MRS Company Partner and compliant with GDPR, the Data Protection Act, HMG Cyber Essentials, UK Statistics Code of Practice, the GSR Code and the MRS Code of Conduct. In terms of retention and destruction of personal data, our processes ensure that we meet client contractual requirements as well as GDPR legislation regarding how information should be labelled, handled, stored, transferred and destroyed. Any personal data is collected (usually two months after projects are completed). Identifiable data is anonymised when reporting. This will be outlined in a privacy notice available to participants, which would also provide details on why we are collecting the data, what is being used for and any further information for participants to make a subject access request, which we would promptly respond to. Alongside these measures, we would reassure DCMS that all work is conducted in-house by Ipsos staff and researchers who have undergone data protection and GDPR training.

[51] This assumes that each Old Vic visitor visits the theatre twice per year (as per Table 4.2) and that 25% of Old Vic visitors live outside of London.

[52] https://data.london.gov.uk/dataset/londons-population

[53] https://www.oldvictheatre.com/about/more-about-us/

- **Approximately 2.2% of our Panel have visited the Old Vic**.[54] The total number of activity/ clicks on the survey was 8620. Of this, 345 people were eventually classified as Old Vic users.

A similar exercise can be undertaken for the Young Vic. Whilst the proportion of those who have used the Young Vic in our panel was estimated to be marginally higher than what is observed in the Greater London area, this does not suggest that that we have significant overrepresentation from Young Vic users:

- **Approximately 0.4% of the Greater London Population visit the Old Vic each year.**[55] Amongst a population of 8.8 million[56], the Young Vic has approximately 100,000 visitors each year.[57]

- **Approximately 1.3% of our Panel have visited the Old Vic**.[58] The total number of activity/ clicks on the survey was 8620. Of this, 230 people were eventually classified as Young Vic users.

Whilst this is a subjective assessment of sample quality, and importantly does not account for multiple/ repeat visits and that a proportion of visitors are likely to live outside of Greater London, it does suggest that broadly speaking, our sample is realistic compared to observations in Greater London, which suggests that it is unlikely that there is a problem of 'yea-saying' or misspecification of the user sample, which could lead to unrealistic or inconsistent preferences.

## 3.7 Exclusions

We removed survey '**speedsters'** (those who complete the survey in an unreasonably short period of time). Given the complexity of the DCE survey and the number of choice tasks each respondent is presented with (9 choice sets each), a threshold time of 5 minutes was set for user and 4.5 minutes non-user samples. Internal time testing suggested that this was the minimum period in which all the information provided in the survey could realistically be read and used to make informed preference decisions based on internal testing and exploration of the data.[59]

Following best practice in minimising hypothetical bias, we removed respondents who gave inconsistent follow up answers when asked why they gave their stated WTP value. This included those who selected an unrealistic option in follow-up responses: "I do not believe I would have to pay".[60]

## 3.8 DCE: Conjoint Modelling

The aggregate logit model employs a mathematical methodology that amalgamates individual-level data into an aggregate measure to estimate choice probabilities.[61] This aligns with the modelling originally

[54] This assumes that each Old Vic visitor visits the theatre twice per year (as per Table 4.2)

[55] This assumes that each Young Vic visitor visits the theatre twice per year (as per Table 4.2) and that 25% of Young Vic visitors live outside of London.

[56] https://data.london.gov.uk/dataset/londons-population

[57] https://www.youngvic.org/sites/default/files/attachments/Young%20Vic%20Theatre%20Announces%20Spring-Autumn%202023%20Programme%20FINAL.docx.pdf

[58] This assumes that each Young Vic visitor visits the theatre twice per year (as per Table 4.2)

[59] 18 respondents were dropped from the user sample and 14 respondents from the non-users sample as speedsters.

[60] 66 respondents were dropped from the total sample based on the follow up response: "I don't believe I would really have to pay".

[61] The process of logit analysis is an iterative procedure to find the maximum likelihood solution for fitting the logit model to the data. The computation begins with estimates of zero for all items' scores, and a gradient vector is determined indicating how those estimates should be adjusted for optimal improvement. Iterations persist until the maximum number of iterations is reached, or the log-likelihood increases by too little, or the gradient is too small.

proposed in the McFadden model[62], and aligns with more recent DCE modelling exercises in the cultural economics field.[63]

To estimate the utilities associated with each attribute of the theatre in this study, an extension of the logit model is used: **Alternative Specification Conditional Logit Model:** The ASC Logit Model is a class of Multinomial Logit Model[64] in which each choice situation (i.e., repetition of the experiment) has their own attributes (and associated level of attribute). Therefore, the ASC Logit Model allows us to understand how the characteristics of the choice (i.e. the attributes of the theatre) affect a respondent's choice.[65] The ASC logit model is the appropriate model choice where there is an 'opt out' option included in the DCE.[66] [67]The ASC Logit Model produces aggregate level coefficients, and therefore assumes that the impact of the attribute on the respondent's choice (i.e. a respondent's utility for each attribute) is homogenous across all respondents.

## 3.9 Estimating Consumer Surplus in Willingness to Pay from DCE Models

As set out in McFadden (1974)[68], Willingness to Pay for any heritage attribute comes from dividing the marginal utility of the attribute evaluated at the inverse utility function and the marginal utility of money in the same utility function:

$$WTP = (U' - U)/-P \quad (1)$$

In this case, U' is the attribute level in the worst condition (e.g. Severe or Poor condition) and U is the attribute level in the baseline best condition (Good condition). **The baseline of Good condition is chosen for maximum policy relevance, since maintenance funding will typically be allocated based on severity of the current condition, and any maintenance activity would aim to bring the condition up to Good.** This reference would allow for a business case tool that would provide information on the relative welfare gains from investments on parts of the theatre which are in severe condition, compared to those in poor condition. As standard in McFadden's WTP model, -P is the negative of the price coefficient.

As set out in Train[69], the total consumer surplus in the population is calculated as the weighted sum of consumer surplus – notation $E(CS_n)$ - over a sample of respondents. Following McFadden[70], the change in consumer surplus that results from a change in the alternatives and/or the choice set is calculated from equation (2). In particular, the weighted sum of consumer surplus $E(CS_n)$ is calculated twice: first under the conditions before the change, and again under the conditions after the change. The difference between the two results is the change in consumer surplus:

[62] McFadden, 'The Measurement of Urban Travel Demand', 1 November 1974.

[63] Throsby, Zednik, and Araña, 'Public Preferences for Heritage Conservation Strategies: A Choice Modelling Approach'; Campbell and Erdem, 'Position Bias in Best-Worst Scaling Surveys'.

[64] Where Multinomial Logit Models can be characterised as having categorical (rather than binary) dependent variables

[65] Compared to a traditional Multinomial Logit Model which models the choice as a function of respondent characteristics.

[66] Campbell and Erdem, 'Position Bias in Best-Worst Scaling Surveys'.

[67] An important assumption that underpins the ASC Logit Model (and more generally Multinomial Logit Models) is the Independence of Irrelevant Alternatives (IAA). The IIA is an important axiom of microeconomic theory stating the in the choice set of {A,B} where A is preferred to B, the introduction of option C into the choice set ({A,B,C}) should not affect the original preference that A is preferred to B. See, Arrow, Kenneth J. Social Choice and Individual Values. Yale University Press, 2012.

[68] McFadden, D.L. (1974) Conditional logit analysis of qualitative choice behaviour, *Frontiers in Econometrics*, ed. P. Zarembka, 105-142. New York: Academic Press.

[69] Kenneth E. Train, *Discrete Choice Methods with Simulation* (Cambridge, UK: Cambridge University Press, 2009).: The weights reflect the numbers of people in the population who face the same representative utilities as the sampled person.

[70] McFadden, 'The Measurement of Urban Travel Demand', 1 November 1974.

$$\Delta E(CS_n) = \frac{1}{\alpha_n}\left[ln\left(\sum_{j=1}^{J^1} e^{V_{nj}^1}\right) - ln\left(\sum_{j=1}^{J^1} e^{V_{nj}^0}\right)\right] \quad (2)$$

where the superscripts 0 and 1 refer to before and after the change. The number of alternatives can change (e.g., a new alternative can be added) as well as the attributes of the alternatives.[71]

To calculate the change in consumer surplus, the researcher must know or have estimated the marginal utility of income, $a_n$ – i.e. the negative of the cost coefficient estimated from the Logit Model is the amount that utility rises due to a one-pound decrease in costs.[72] A one-pound reduction in costs is equivalent to a one-pound increase in income, since the person gets to spend the pound they save in ticket price/ council tax as if they received the extra pound in income. This is interpreted as the marginal utility of income.

### 3.9.1 DCE: Data Quality Checks

For both user and non-user samples, prior to the estimation, participants who selected the same concept position (e.g. consistently selected only one option (e.g. either only Option A or only Option B), or consistently selected the 'Neither of these' option, despite the variation in services and price offered) in all 9 tasks were removed. Due to randomness in the experimental design, it was statistically improbable that a participant making reasoned choices could choose the same concept position this frequently.

When estimating WTP from DCE utilities, it is important to test that the price coefficient is behaving logically. This is in accordance with welfare theory that, holding all things constant, paying a lower price provides greater utility than paying a higher price for the same good or service, since that gives the respondent more money to spend on other things which can bring them additional utility.

We explore in detail the distribution of utilities for the price attribute levels. Following guidance[73], "if the price coefficient for a respondent is extremely small in absolute value, approaching zero… the [pound] equivalents for incremental features become very large, approaching infinity." A typical way to handle this is to characterise the centres of the distributions using medians rather than means. It is also possible to exclude respondents whose price coefficient approaches zero and estimate WTP on a restricted sample of those who behave in a 'logical' welfare consistent way to price.

We note that in the case of non-market goods and services, it may be that true preferences around price increases or donations to support non-market aspects of a cultural asset are unknown.

Given that the DCE task is asking for money to support the maintenance of the theatre building - independent of the theatre performances themselves - it may be that respondents have a certain 'budget envelope'[74] which they are willing to pay to support the maintenance of the theatre building. Respondents are presented with a combination of attributes at various levels (including the price attribute). It may therefore be the case that, within each individual choice task presented to the

[71] Since the unknown constant C enters expected consumer surplus both before and after the change, it drops out of the difference and can therefore be ignored when calculating changes in consumer surplus.

[72] Usually a price or cost variable enters the representative utility, in which case the negative of its coefficient is αn by definition (a price or cost coefficient is negative; the negative of a negative coefficient gives a positive αn). See Train, Discrete Choice Methods with Simulation.

[73] B. Orme, 'Assessing the Monetary Value of Attribute Levels with Conjoint Analysis: Warnings and Suggestions' (Provo, UT: Sawtooth Software, 2001), https://sawtoothsoftware.com/resources/technical-papers/assessing-the-monetary-value-of-attribute-levels-with-conjoint-analysis-warnings-and-suggestions.

[74] Ranjith Bandara and Clem Tisdell, 'Changing Abundance of Elephants and Willingness to Pay for Their Conservation', *Journal of Environmental Management* 76, no. 1 (1 July 2005): 47–59, https://doi.org/10.1016/j.jenvman.2005.01.007.

respondents, there may be an aversion to the lower price options since they may be considered below their prior ‘budget envelope’ which they would be willing to pay to support the theatre under any scenario.

In this case, the ’warm glow’ or ‘non-use’ motivation may override the specifics of the maintenance scenario presented in the DCE. In other words, the respondents could have been interpreting the act of donating more to the theatre in principle as more important (the main driver of their welfare) than any combination of the attributes being maintained at any given level. This may therefore result in the triangular preferences to the ticket price increase observed in a large proportion of the theatre user samples (such as we see in Section 4.6 among users, to pre-empt our results).

This is only one possible hypothesis and remains an area of ongoing research. It is therefore not possible to expand any more on whether people have different preferences towards some price levels depending on the non-market value of the good/service being valued.

# Results

## 4.1 Demographic Characteristics

A total sample of 1,110 respondents completed the survey after exclusions were applied. Of those, 345 respondents had visited the Old Vic Theatre in the past 5 years and 230 had visited the Young Vic in the past 5 years. 535 respondents were non-visitors from the general public (London residents aged 16+) which were allocated evenly between the Old Vic and Young Vic in the survey.

Notably, theatre users on average have higher levels of household income (mean household income of £79,605 compared to £55,868), with the differences statistically significant at the 99% confidence level. Theatre users are also more likely to have a degree or higher (86% of users had a degree compared to 63% of nonusers), and are more likely to be employed (87% of users were employed compared to 64% of nonusers), in both instances differences are significant at the 99% confidence level. Theatre users also demonstrate higher engagement with culture and heritage, where users are more likely to be a member of cultural organisations (31% of users were a member of a cultural organisation compared to 16% of nonusers) and consider spending on culture and the arts a government spending priority (13% of users consider this a priority compared to 4% of nonusers), in both instances differences are significant at the 99% confidence level.

Differences between Old Vic and Young Vic users are less stark, however there are still some statistically significant differences identified between the two user groups. Old Vic users are more likely to be older (average age of Old Vic users was 44 compared to 41 for Young Vic users, differences significant at the 95% confidence level); Old Vic users were more likely to have dependent children than Young Vic users (63% and 52% respectively, differences are significant at the 99% confidence level); Young Vic users are more likely to have a degree or above than Old Vic users (90% and 83% respectively, differences significant at the 99% confidence level); and Young Vic users are more likely to be employed than Old Vic users (92% and 84% respectively, differences significant at the 99% confidence level).

When looking across the non-users, no significant differences in the demographics were detected between non-users assigned to the Old Vic and those assigned to the Young Vic, which would be expected given random assignment of non-users to either of the unvisited theatres.

## Table 4.1 Demographic characteristics of theatre users and non-users

| | Old Vic Users | Young Vic Users | All Users | Old Vic Non-users | Young Vic Non-users | All Non-Users |
|---|---|---|---|---|---|---|
| **Mean Age** | 44 | 41 | **43** | 50 | 50 | **50** |
| **Is Male** | 52% | 49% | **50%** | 50% | 51% | **51%** |
| **Has Dependent Children** | 52% | 63% | **57%** | 30% | 25% | **28%** |
| **Has a Degree of Above** | 83% | 90% | **86%** | 61% | 65% | **63%** |
| **Is Employed (Full- or Part-Time)** | 84% | 92% | **87%** | 62% | 66% | **64%** |
| **Mean Household Income** | £76,992 | £83,482 | **£79,605** | £58,522 | £53,238 | **£55,868** |
| **Median Household Income** | £77,500 | £77,500 | **£77,500** | £50,000 | £40,000 | **£40,000** |
| **Middle or Upper Class** | 70% | 67% | **69%** | 59% | 62% | **61%** |
| **BAME** | 25% | 23% | **24%** | 33% | 34% | **34%** |
| **Member of cultural organisation** | 31% | 32% | **31%** | 14% | 18% | **16%** |
| **Culture and the Arts are in Top 5 Spending Priorities** | 14% | 11% | **13%** | 5% | 4% | **4%** |
| **Sample Size** | 345 | 230 | **575** | 267 | 268 | **535** |

On average, theatre users visited the theatre 3 times per year, with most users visiting between 1 and 3 times per year. 24% of Old Vic users and 20% of Young Vic users haven't visited the theatre in the past year, indicating that the frequency in which the theatre is used can vary quite drastically. Note that the definition of theatre user was based on having visited in the past five years, to capture those who have engaged with theatres at some point in the recent past, but may have reduced down their visits due to Covid-19 or other factors.

### Table 4.2 Number of visits to the theatre in the past year

| Number of visits in the last year | Old Vic Users | Young Vic Users | Total Users |
|---|---|---|---|
| **0** | 24% | 20% | **23%** |
| **1** | 33% | 29% | **31%** |
| **2** | 14% | 18% | **16%** |
| **3** | 12% | 14% | **13%** |
| **4** | 6% | 7% | **6%** |
| **5** | 3% | 3% | **3%** |
| **6** | 6% | 6% | **6%** |
| **7** | 0% | 1% | **1%** |
| **8** | 1% | 1% | **1%** |
| **9** | 0% | 0% | **0%** |
| **10 or more** | 1% | 1% | **1%** |

Table 4.3 presents the price paid by users during their last visit to the theatre. We present three categories of ticket price; low, medium and high and define these as:

- Low ticket price – respondents paid less than £19 for their ticket(s).
- Medium ticket price – respondents paid between £20 and £49 for their ticket(s).
- High ticket price – respondents paid £50 or above for their ticket(s).

### Table 4.3 Ticket price paid during last visit for last visit to the theatre

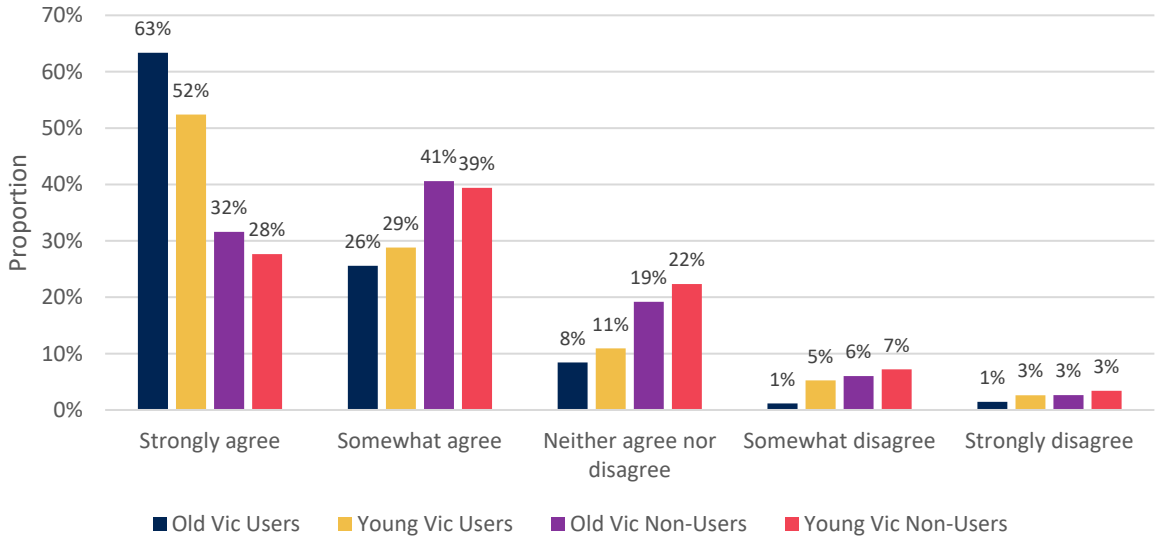
| | Old Vic Users | Young Vic Users | Total Users |
|---|---|---|---|
| **Low ticket price** (< £19) | 14% | 22% | **17%** |
| **Medium ticket price** (£20 - £49) | 53% | 52% | **52%** |
| **High ticket price** (> £50) | 33% | 26% | **31%** |

Note that whilst we asked the respondent "*How much did you pay for your ticket last time you visited [Old Vic/ Young Vic]?*", we cannot say with certainty that the respondents answered referring to the cost of 1 ticket, and instead may have answered by citing the total cost (i.e. if they bought multiple tickets). We therefore recommend caution in drawing detailed conclusions using the results in Table 4.3.

Table 4.3 indicates that the majority of theatre users paid between £20 and £49 for their tickets. On average, Old Vic users pay a higher ticket price (median ticket price of £40) compared to Young Vic users (median ticket price £35).[75]

The majority of theatre users felt that preserving theatres is important to current and future generations (with 86% of respondents saying they strongly agreed or somewhat agreed with the statement, see Figure 4.1). This sentiment was shared with non-users, where 70% felt the preservation was important. This may suggest that the bequest value of theatres is a key concept when considering the non-use value of theatres.

**Figure 4.1 Preserving theatres for current and future generations is important to me**




The majority of theatre users also felt that the theatre increased one's wellbeing (86% of users either strongly agreed or somewhat agreed with the statement, see Figure 4.2). Similarly, 73% of non-users felt that the theatre increases one's wellbeing.

[75] We note that differences in the mean ticket price are statistically significant at the 90% confidence level. We report the median in the main body as the median is not skewed by large ticket prices at the upper end of the distribution.

## Figure 4.2 Visiting theatres increases one's wellbeing

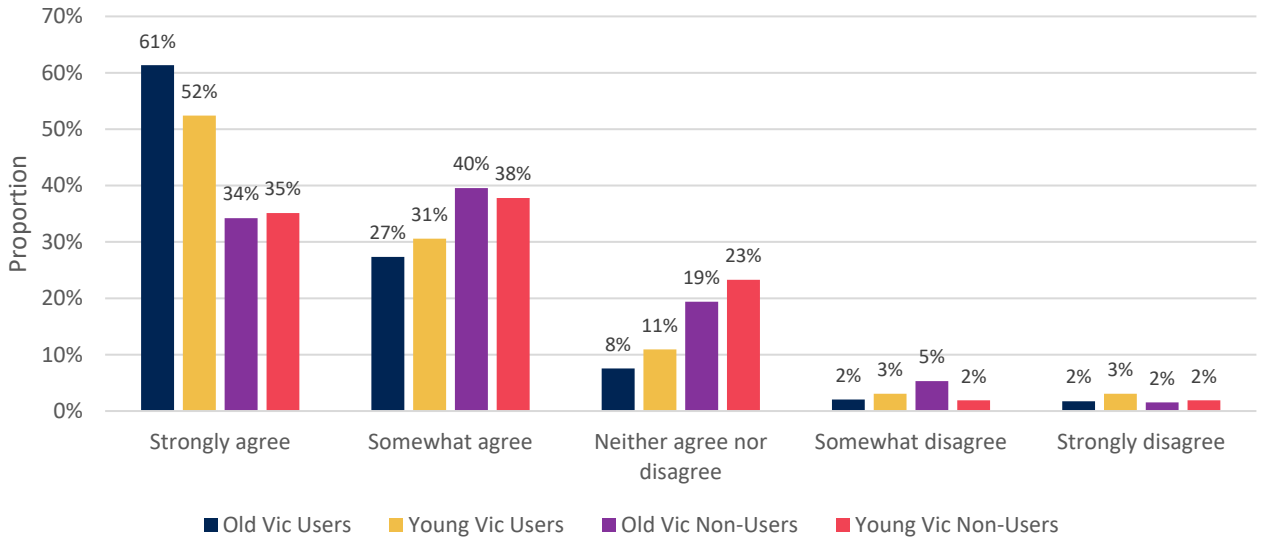
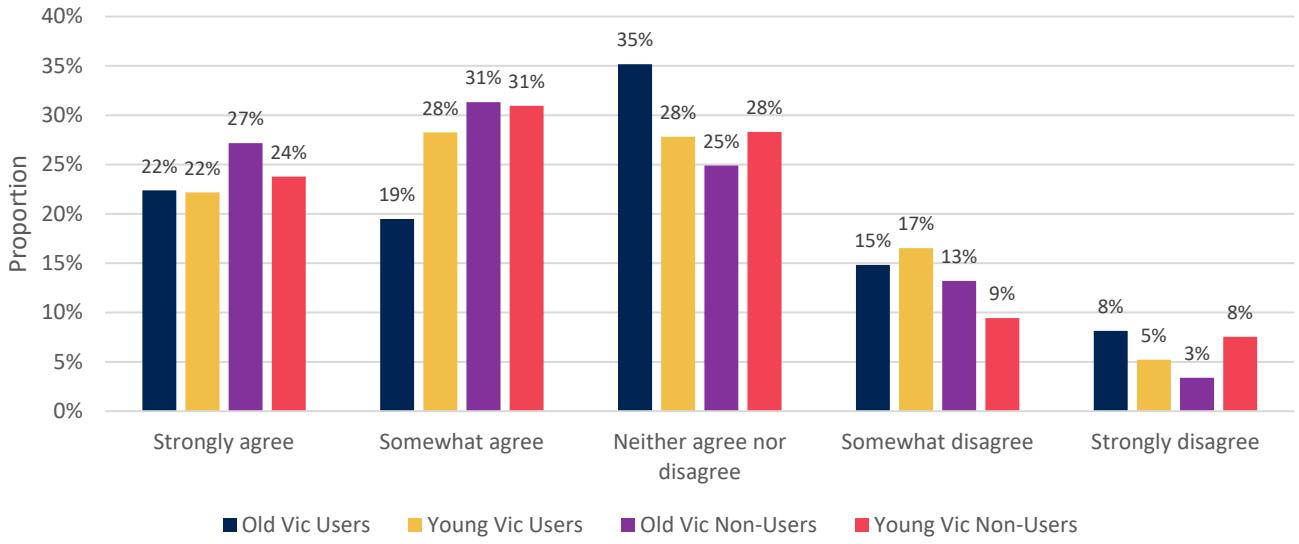



Figure 4.3 below suggests that 45% and 57% of users and non-users respectively felt that there were more important things to spend their money on than theatres (those selecting strongly agree and somewhat agree). Roughly a third of users (32%) and roughly a quarter of non-users (27%) neither agreed nor disagreed with the statement. This suggests that whilst theatres generate benefits in terms of bequest value and wellbeing, people feel that there are other more important things that they should spend their money on.

The correlation between the importance of preserving the theatre and there being more important things to spend money on was estimated to be 0.28 indicating a weak correlation. Given there does not appear to be a correlational relationship, this suggests that respondents have the means to pay extra costs to ensure the preservation of the theatre (i.e. it does not appear to be the case that an inability to afford additional costs to ensure the preservation is masking their sense that preservation is important).

## Figure 4.3 There are more important things to spend my money on than theatres



## 4.2 Old/ Young Vic Experiment

As discussed in Section 3.8, the ASC Logit model is used to estimate the utilities of each attribute for different parts of the theatre to be maintained in a poor or severe condition, from a baseline of a good condition.

Within the following sections, we estimate five ASC Logit models[76] to address the specific valuation questions and understand the preferences of the respondents:

1. ASC Logit Model including interaction term between attributed and Old/ Young Vic dummy, to test Valuation Question 1 on the difference in preferences between historic and non-historic theatres.

2. ASC Logit Model excluding the interaction terms, to test Valuation Question 2 on the value of maintaining different parts of the theatre.

3. ASC Logit Model including interaction terms for sociodemographic characteristics, to test Valuation Question 3 on heterogeneous effects between demographics and user characteristics.

4. ASC Logit Model using a restricted user sample of those that exhibited 'rational' preferences, to test the feasibility of calculating WTP for business case purposes.

5. ASC Logit Model including a squared price attribute term, to further test the feasibility of calculating WTP for business case purposes.

Logit model (1) presented below includes both the theatre attributes as well as an interaction variable between the theatre attribute and a binary identifier of whether the respondent was part of the Old Vic or Young Vic sample. The interaction terms provide a means of assessing whether there is a higher welfare gain from interventions which maintain and preserve a historic compared to a non-historic theatre.

The reference scenario used in the ASC Logit Model is maintaining and preserving the part of the theatre in good condition. As such, it would be expected that the coefficients are negative in value, representing a welfare loss as the theatre transitions from a good to either a poor or severe condition. It would also be expected that the absolute value of the severe condition coefficient is larger than the absolute value of the poor condition coefficient, representing a greater welfare loss under severe condition compared to poor condition. **Note that coefficients between different regressions cannot be directly compared (i.e. coefficients for the user sample cannot be compared to the non-user sample), rather comparisons must be made using ratios of coefficients.**[77]

The results suggest that:

- **There is a limited difference in the utility for maintaining the Old Vic compared to the Young Vic** as the majority of the interaction terms are statistically insignificant. For users, differential impacts were identified for preventing the roof from falling into a severe condition (statistically significant at the 99% confidence level), preventing the exterior from falling into poor condition (statistically significant at the 90% confidence level), and the price attribute was statistically significant at the 95% confidence level. Note that the lack of significance should not be taken to

[76] A logit model is a type of statistical model that predicts the probability of an event occurring or certain action being taken.

[77] This is because the utility scale for each sample is relative (i.e. not the same from one sample to the next). Therefore, only ratios of the coefficients can be compared as this normalises the scale.

extrapolate that historic theatres are no more valuable than non-historic theatres across the country.

- **All interaction terms are statistically insignificant for non-users**, again suggesting that there does not exist a differential in preferences for the maintenance and preservation between the Young and Old Vic.

- **In sum, the sign and magnitude of the attributes broadly follows theoretical expectations**, with mainly negative coefficients, and the majority of coefficients that are larger in absolute value in the severe condition than the poor condition, although there are some exceptions. However, a large proportion of the attributes among both users and non-users are not statistically significant – most notably the price coefficient is statistically insignificant in the user group, suggesting that the users were not responsive to changes in the price shown in the experiment.

The price coefficient can be interpreted as the marginal utility of income.[78] McFadden (1974) suggests that the coefficient of price should be negative (i.e. holding all other factors constant, as higher prices lead to lower levels of utility.[79] The price coefficient is also positive for Young Vic users.[80]

On average, theatre users did not align with the expectations of rational consumer behaviour, meaning lower prices did not lead to lower utility levels, holding all else equal. **Guidance from the literature states that WTP should not be calculated if price preferences are inconsistent, given that a key input to the WTP calculation (the price denominator), and would lead to spurious results.**[81]

On the other hand, the price utility for non-users follows theoretical expectations, suggesting the ASC Logit Model specification is suitable for modelling non-user preferences.

Testing of the interaction between preferences for maintaining different parts of theatres and the historic or non-historic character of the theatre found no consistent differences for maintenance of the historic theatre and non-historic theatre. **In subsequent modelling in this report, Old and Young Vic theatre users are combined into a pooled 'user sample' to explore attribute preferences for theatre maintenance overall, regardless of the historic character of the theatre**.

Note that the lack of significance should not be taken to extrapolate that historic theatres are no more valuable than non-historic theatres across the country. It is likely that this lack of significance is a result of lower sample size (limiting the statistical power of the interaction modelling) or due to the specific character of the two theatres selected for this study, which may not be representative of historic and non-historic theatres in the UK as a whole. Future research should seek to utilise mixed-method approaches, across a number of theatre venues to provide a more holistic, and in theory more representative, view of public preferences towards theatre maintenance across the country.

It should also be noted that whilst the model outputs provide inconclusive evidence on the preferences of the public toward maintenance and preservation of the theatres, it cannot be ruled out that this is a

[78] The marginal utility of income is the increase in utility gained from receiving an incremental increase in income.

[79] Daniel McFadden, 'The Measurement of Urban Travel Demand', *Journal of Public Economics* 3, no. 4 (November 1974): 303–28, https://doi.org/10.1016/0047-2727(74)90003-6.

[80] The marginal utility of income for Old Vic users can be found by adding the price coefficient with the price coefficient interaction term.

[81] Orme, 'Assessing the Monetary Value of Attribute Levels with Conjoint Analysis: Warnings and Suggestions'; B. Orme, 'Estimating Willingness to Pay (WTP) Given Competition in Conjoint Analysis' (Provo, UT: Sawtooth Software, 2021), https://sawtoothsoftware.com/resources/technical-papers/estimating-willingness-to-pay-in-conjoint-analysis.

function of the experimental design opposed to a true reflection of preferences for heritage. This is discussed further in Section 5.2.

### Table 4.4 ASC Logit Model (1) including binary 'Old Vic' interaction term

| | Theatre Users Coefficient | Theatre Non-Users Coefficient |
|---|---|---|
| **Number of Respondents** | **N=549** | **N=531** |
| **Theatre Attribute–- Baseline good condition** | | |
| **Interior auditorium: Seats, carpets and flooring** | | |
| Poor Condition | -0.152* | -0.061 |
| Severe Condition | -0.391*** | -0.277*** |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | | |
| Poor Condition | 0.022 | -0.087 |
| Severe Condition | -0.116 | -0.043 |
| **Foyer: Ticket office, reception, bar and catering space(s)** | | |
| Poor Condition | -0.137* | -0.136* |
| Severe Condition | -0.058 | -0.052 |
| **Roof** | | |
| Poor Condition | -0.018 | -0.127* |
| Severe Condition | -0.058 | -0.320*** |
| **Exterior: Front of theatre** | | |
| Poor Condition | -0.212*** | -0.155** |
| Severe Condition | -0.015 | -0.113 |
| **Price** | | |
| Increased Ticket Price/ Monthly Increase in Council Tax | 0.005 | -0.131*** |
| **Theatre Attribute Interacted with Old Vic–- Baseline good condition** | | |
| **Interior auditorium: Seats, carpets and flooring** | | |
| Poor Condition | 0.049 | 0.008 |
| Severe Condition | 0.233** | 0.103 |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | | |
| Poor Condition | -0.067 | 0.025 |
| Severe Condition | 0.056 | -0.104 |
| **Foyer: Ticket office, reception, bar and catering space(s)** | | |
| Poor Condition | -0.013 | 0.137 |
| Severe Condition | 0.102 | -0.041 |
| **Roof** | | |
| Poor Condition | -0.060 | -0.146 |
| Severe Condition | -0.022 | -0.005 |
| **Exterior: Front of theatre** | | |
| Poor Condition | 0.174* | 0.095 |
| Severe Condition | -0.121 | -0.057 |
| **Price** | | |
| Increased Ticket Price/ Monthly Increase in Council Tax | -0.030** | 0.029 |
| **Constant** | | |
| ASC Constant 1 | 1.835*** | 0.676*** |
| ASC Constant 2 | 1.758*** | 0.652*** |
| **Measure of Model Fit** | | |
| AIC | 8507.592 | 8752.041 |

Note: *** indicates statistical significance at the 99% confidence level; ** indicates statistical significance at the 95% confidence level; and * indicates statistical significance at the 90% confidence level.
Model interpretation: The top panel presents the marginal utilities for the Young Vic Sample. The bottom panel shows whether there are differential impacts within the Old Vic Sample for each attribute. Statistical insignificance indicates that there are no differential impacts for the specific attribute, and that the marginal utilities of the Young Vic attribute is statistically indifferent to the marginal utilities of the Old Vic attribute.

## 4.3 Preferences for maintaining different parts of a theatre (regardless of historic character)

Following the lack of statistical significance of the interaction terms failing to detect differential utilities in terms of preferences of preservation and maintenance between the Old Vic and Young Vic, the interaction term is dropped from ASC model (2). This tells us user and non-user preferences for maintaining different parts of a theatre, regardless of the historic character of the theatre. In this way we assume that the preferences relate more to their functional and aesthetic utility, rather than their historic character.

The results of the non-interacted model (2) suggest that:

- The sign and magnitude of the coefficients broadly follow theoretical expectations, suggesting that the welfare loss of the respondent increases as the condition of the theatre worsens (shown by larger absolute value of the severe coefficient compared to the poor coefficient). Compared to the previous model, more coefficients are statistically significant, suggesting that the different attributes of the theatre and the condition of these attributes have an impact on the utility of the respondents.

The Akaike Information Criterion (AIC) is a measure of how well the specified model fits the data; where the objective is to minimise the AIC. Among users, the AIC between the two models are relatively similar in magnitude (albeit slightly smaller in Model 1 – the interaction model) suggesting that the extent to which the model fits the data is broadly similar between the two models. As such, the simplest model specification is preferred for the user-groups (i.e. Model 2 – no interaction terms included).

Among non-users, a lower AIC is observed in Model 2 for non-users. Following the above principles, Model 2 – no interactions, is the preferred model specification for non-users.

- However, there remains minimal inconsistencies in the preferences. This may indicate that respondents struggled to distinguish between the severe and poor condition levels for some attributes, which may be due to the language or visuals used in the DCE. However, it is important to note that inconsistencies in the preferences are not identified among the non-user sample, despite being shown identical information and visuals. This would suggest that the inconsistency is driven by something specific to the user sample, either due to their genuine preferences (informed potentially by their direct experience of the theatre), or underlying sample size of modelling issues. It would be necessary to undertake further follow-up interviews and post-survey cognitive interviews to understand whether these inconsistent results are due to DCE design or underlying modelling issues.

- Whilst for both users and non-users price coefficients are negative (suggesting that all else held equal, higher price levels lead to lower level us utility), the magnitude of the price coefficient for users is small, which suggests that preferences for lower versus higher price increases are negligible, which is inconsistent with welfare theory. As set out in the guidance on DCE, calculating

WTP on insignificant or spuriously lower price coefficients can lead to the inflation of WTP values, and should be avoided as it leads to unreliable WTP estimates. [82]

- In terms of trends identified in the results, the DCE models demonstrate that **users and non-users express their preference for parts of the theatre they are likely to interact with the most**. Users of the theatre express greater preferences towards the condition of the interior of the theatre, compared to the exterior. The opposite is true of the non-users, who exhibit greater preferences towards exterior parts of the theatre.[83]

- The results suggest that theatre users would experience the greatest welfare loss if the interior auditorium: Seats, carpets and flooring was to fall in a severe state of disrepair. This perhaps reflects the fact that these are the areas of the theatre where people spend the most time and impacts the comfort of their experience.

- Among non-users, the roof was the attribute for which non-users would experience the greatest welfare loss if it fell into a state of disrepair. This was followed by the exterior: front of theatre, which may suggest non-users are more motivated by maintaining the public facing aspects of the theatre which provide 'spillover' benefits into the public realm.

### Table 4.5 ASC Logit Model (2), no interaction terms included

| | Theatre Users Coefficient | Theatre Non-Users Coefficient |
|---|---|---|
| **Number of Respondents** | **N=549** | **N=531** |
| **Theatre Attribute–- Baseline good condition** | | |
| **Interior auditorium: Seats, carpets and flooring** | | |
| Poor Condition | -0.129** | -0.056 |
| Severe Condition | -0.257*** | -0.220*** |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | | |
| Poor Condition | -0.017 | -0.074 |
| Severe Condition | -0.078 | -0.098* |
| **Foyer: Ticket office, reception, bar and catering space(s)** | | |
| Poor Condition | -0.148*** | -0.065 |
| Severe Condition | -0.178*** | -0.073 |
| **Roof** | | |
| Poor Condition | -0.054 | -0.201*** |
| Severe Condition | -0.072 | -0.320*** |
| **Exterior: Front of theatre** | | |
| Poor Condition | -0.106** | -0.106* |
| Severe Condition | -0.090* | -0.142*** |
| **Price** | | |
| Increased Ticket Price/ Monthly Increase in Council Tax | -0.012* | -0.116*** |
| **Constant** | | |
| ASC Constant 1 | 1.831*** | 0.673*** |
| ASC Constant 2 | 1.756*** | 0.650*** |
| **Measure of Model Fit** | | |

[82] Orme, 'Assessing the Monetary Value of Attribute Levels with Conjoint Analysis: Warnings and Suggestions'; Orme, 'Estimating Willingness to Pay (WTP) Given Competition in Conjoint Analysis'.

[83] Note, coefficients between the user and non-user models cannot be compared because the utility scale for each sample is relative (i.e. not the same from one sample to the next). Therefore, only ratios of the coefficients can be compared as this normalises the scale.

| | | |
|---|---|---|
| AIC | 8516.002 | 8750.518 |

Note: *** indicates statistical significance at the 99% confidence level; ** indicates statistical significance at the 95% confidence level; and * indicates statistical significance at the 90% confidence level.

## 4.4 Do preferences for maintenance of theatre attributes have sociodemographic differences?

ASC Logit model (3), including interaction terms between the attribute and gender, regularly passed by, BAME, high income, and older individuals, is estimated to understand the extent to which preferences for attributes vary by sociodemographic characteristics.[84]

The below tables present the regression outputs including the sociodemographic interaction terms. Separate regressions are run for users and non-users, where all the interaction terms are included in a single regression for the user/non-user group.

[84] Variables that are not inherently binary (e.g. income and age) are defined as 1 if above the median value and 0 if below.

## Table 4.6 ASC Logit model including sociodemographic interactions, user sample

| | User Sample | | | | | | |
|---|---|---|---|---|---|---|---|
| **Number of Respondents** | | | | | | | |
| **Theatre Attribute - Baseline good condition** | **Attribute** | **Interaction with gender** | **Interaction with pass by regularly** | **Interaction with BAME** | **Interaction with high (log) income** | **Interaction with age** | **Have visited the theatre in the past year** |
| **Interior auditorium: Seats, carpets and flooring** | | | | | | | |
| Poor Condition | -0.413*** | 0.143 | 0.334*** | -0.061 | 0.100 | -0.115 | 0.061 |
| Severe Condition | -0.624*** | 0.011 | 0.407*** | -0.213* | 0.033 | 0.065 | 0.249* |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | | | | | | | |
| Poor Condition | 0.014 | 0.054 | 0.123 | 0.056 | -0.239** | 0.045 | 0.298** |
| Severe Condition | -0.146 | -0.053 | 0.168 | -0.050 | -0.300*** | -0.067 | 0.187 |
| **Foyer: Ticket office, reception, bar and catering space(s)** | | | | | | | |
| Poor Condition | -0.414*** | 0.034 | 0.049 | -0.319*** | 0.204* | -0.010 | 0.025 |
| Severe Condition | -0.256** | 0.122 | 0.064 | -0.074 | 0.129 | -0.071 | 0.053 |
| **Roof** | | | | | | | |
| Poor Condition | -0.399*** | 0.089 | 0.121 | 0.127 | 0.112 | -0.202** | 0.198 |
| Severe Condition | -0.298** | 0.154 | 0.002 | -0.144 | -0.010 | -0.249** | 0.343** |
| **Exterior: Front of theatre** | | | | | | | |
| Poor Condition | -0.056 | 0.075 | -0.049 | 0.065 | -0.058 | 0.032 | -0.094 |
| Severe Condition | -0.314*** | 0.381*** | -0.028 | -0.091 | -0.061 | -0.096 | 0.104 |
| **Price** | | | | | | | |
| Increased Ticket Price/ Monthly Increase in Council Tax | -0.202*** | 0.008 | 0.056*** | -0.032* | 0.060*** | -0.003 | 0.019 |
| **Constant** | | | | | | | |
| ASC Constant 1 | | | | 2.168*** | | | |
| ASC Constant 2 | | | | 2.114*** | | | |

Note: *** indicates statistical significance at the 99% confidence level; ** indicates statistical significance at the 95% confidence level; and * indicates statistical significance at the 90% confidence level.

## Table 4.7 ASC Logit model including sociodemographic interactions, user sample

| | | Non-user Sample | | | | |
|---|---|---|---|---|---|---|
| **Number of Respondents** | | | | | | |
| **Theatre Attribute - Baseline good condition** | **Attribute** | **Interaction with gender** | **Interaction with pass by regularly** | **Interaction with BAME** | **Interaction with high (log) income** | **Interaction with age** |
| **Interior auditorium: Seats, carpets and flooring** | | | | | | |
| Poor Condition | 0.031 | -0.008 | 0.160 | -0.098 | -0.066 | -0.100 |
| Severe Condition | -0.224 | -0.009 | 0.111 | 0.056 | 0.027 | -0.196 |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | | | | | | |
| Poor Condition | -0.001 | -0.215* | 0.044 | -0.133 | 0.103 | 0.049 |
| Severe Condition | -0.100 | -0.102 | 0.028 | 0.161 | -0.010 | 0.064 |
| **Foyer: Ticket office, reception, bar and catering space(s)** | | | | | | |
| Poor Condition | -0.015 | -0.019 | 0.084 | 0.092 | -0.148 | -0.047 |
| Severe Condition | 0.041 | -0.003 | -0.015 | -0.003 | -0.136 | -0.065 |
| **Roof** | | | | | | |
| Poor Condition | -0.278* | -0.052 | 0.076 | -0.008 | 0.110 | 0.010 |
| Severe Condition | -0.329* | -0.059 | 0.142 | -0.153 | 0.167 | -0.145 |
| **Exterior: Front of theatre** | | | | | | |
| Poor Condition | -0.199 | 0.106 | 0.195 | 0.131 | -0.102 | -0.012 |
| Severe Condition | -0.078 | -0.040 | -0.023 | -0.053 | 0.034 | -0.099 |
| **Price** | | | | | | |
| Increased Ticket Price/ Monthly Increase in Council Tax | -0.140*** | 0.050** | 0.124*** | -0.040* | 0.022 | -0.051** |
| **Constant** | | | | | | |
| ASC Constant 1 | | | | 0.781*** | | |
| ASC Constant 2 | | | | 0.741*** | | |

Note: *** indicates statistical significance at the 99% confidence level; ** indicates statistical significance at the 95% confidence level; and * indicates statistical significance at the 90% confidence level.

Where the interaction terms are statistically significant, this indicates there are differential utilities across sociodemographic groups.

The above regression tables indicate that there is **no clear difference in preferences for the attributes across sociodemographic groups, for both users and non-users**. Whilst some of the interaction terms are statistically significant, these are sporadic and do not offer clear evidence of any differential impacts.

## 4.5 Feasibility of WTP Business Case Tool

As set out in DCE guidance, the outputs of the Logit Models can be used to inform estimates of the WTP by taking the ratio of the coefficient of the theatre attribute and the negative of the coefficient of the price attribute, provided that there is sufficient confidence in the reliability of the results.

However, the weak statistical significance in the user sample and small magnitude of the price attribute raises concerns around the reliability of the price attribute coefficient. We explore possible reasons for this in the next section.

**We do not therefore recommend that user WTP be estimated from the results. This means that the results in their current form should not be used in a Business Case tool to inform CBA calculation.** Illustrative WTP values are presented in Appendix 7.2, noting these are not recommended for use in a Business Case. However, the attribute preferences set out in the previous section could still be used for informing maintenance activities by helping decision-makers to understand which parts of the theatre building are most important for theatre goers and the general public.

Notwithstanding, given that the price coefficient is operating in the expected way among non-users**, it would in principle be possible for the non-user preferences for attributes, where statistically significant, to be used to calculate WTP** in a way that could inform a non-user business case tool. **However, there is a wider policy question of how reliable non-user WTP would be on its own for business case purposes**, without the accompanying user WTP values. For this reason, non-user WTP is not calculated at this stage.

## 4.6 Exploring illogical price preferences

Given the statistical influence of the price attribute on calculations of WTP, it is important to test the sensitivity of results to respondent price preferences. [85] This can be tested by analysing the part-utilities associated with each price level, for each user and non-user group. The welfare assumptions from choice modelling data assume that the price attribute (holding all other attributes equal) should be negatively and linearly correlated with utility.[86] In other words, utility should be highest for the lowest price level and decrease through the price levels.

A possible explanation for why the price coefficient may not align with theoretical expectations is that the relationship between price and utility may actually contain non-linearities which are not being accounted for in the current model specification. There may be legitimate reasons for non-linearity of price preferences for non-market cultural heritage goods and services. For instance, those who are more culturally engaged may have an aversion to paying the amounts at the lower end of the price scale, because they consider them too low for a culturally significant site of this type. In such instances, a

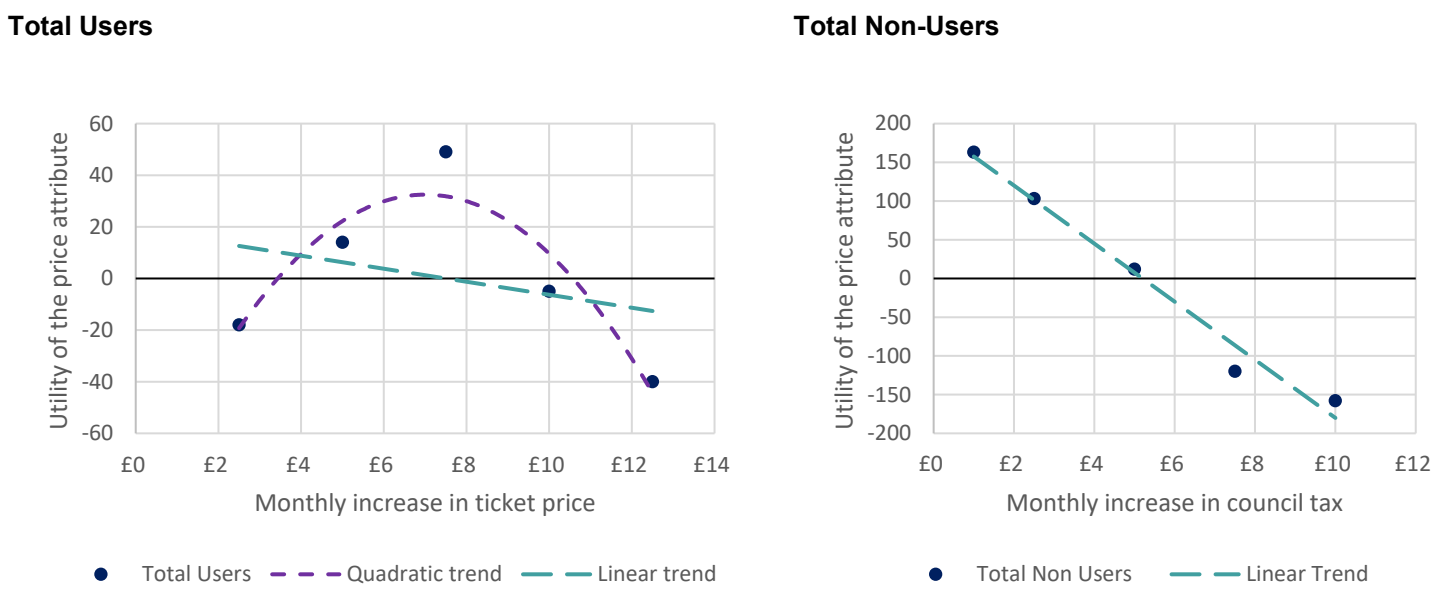
[85] Orme, 'Assessing the Monetary Value of Attribute Levels with Conjoint Analysis: Warnings and Suggestions'; Orme, 'Estimating Willingness to Pay (WTP) Given Competition in Conjoint Analysis'.
[86] McFadden, 'The Measurement of Urban Travel Demand', November 1974.

respondent would refuse the rational choice expected by the market (taking the lowest price on offer for their consumption of the theatre services), and would instead prefer a higher price increase which more closely represents the welfare they gain from non-use services of the theatre, or which is strategically motivated to ensure the continued existence of the site for their future use (option value). Forcing a linear relationship through non-linear data may therefore lead to errors in the estimated utilities.

Hierarchical Bayesian (HB) algorithms can be used to fit Multinomial Logit Models[87] to each individual respondent.[88,89] In other words, HB finds the optimum set of utility parameters given the observed respondent data and given the knowledge about the rest of the sample. It is called 'Hierarchical' as respondent data (Lower model) is supplemented by the data for the total sample, known as the population (Upper model). This additional information from the 'population' strengthens the estimation for individual respondents by looking at how different the respondent data is compared to the population. The resulting output is a set of parameters, known as Utility scores (one for every level tested) and measure the desirability of each level in the choice process.

Using the HB method described above, each respondent's price utility for each price level can be estimated.[90] The resultant plot of this can be seen in Figure 4.4 below.

**Figure 4.4 User and Non-User preferences for price attribute levels**




Note, utility for each price level estimated using Hierarchical Bayesian techniques. The plots are for descriptive purposes only

The right panel of Figure 4.4 plots the utility of the price attribute for non-users against the increase in the ticket price. This plot aligns with the expectations described above – where the utility of the price attribute linearly decreases as the price level increases.

[87] Recall, the ASC Logit model is a class of multinomial logit model

[88] See Allenby, G,M. and Rossi, P.E. (1998) Marketing models of consumer heterogeneity, *Journals of Econometrics*, 89, 1-2, pp57.78.

[89] This is achieved using an iterative approach that finds the optimum set of utility parameters, such that the posterior likelihood function is maximised.

[90] The reported utilities are zero-centred difference utilities. Usually estimated utilities are zero-centered, but the absolute size of parameters can be related to the noise of an individual e.g. inconsistent respondents will have parameters closer to zero. Therefore a direct comparison or an average calculation isn't appropriate and a Diff transformation is used for rescaling individual utilities. The "diffs" transformation rescales utilities on an individual level so that the total sum of the utility differences between the worst and best levels of each attribute is equal to the number of attributes times 100. Diff transformations are used for descriptive purposes.

The left panel of Figure 4.4 plots the utility of the price attribute for users against the monthly increase in the council tax. However, the linear decrease observed for the non-user group is not observed for the user group. We do see that preferences at the upper end of higher price range behave as expected (negative preferences for higher price increases), giving utility lowest at the upper price levels and increasing into the middle of the distribution. However, the linearity assumption breaks down at the lowest price level, where lower price increases have negative preferences.

The left panel of Figure 4.4 contains two trend lines; a linear trend and a quadratic trend. The triangular distribution of the user utilities means that a linear utility function is a (visually) poor approximation of the observed distribution of utilities. Instead, a quadratic trend appears to visually fit the data better. This motivates future avenues of work to explore the use of higher order polynomials within the regression specification to capture these non-linearities.

As such, the 'triangular utility curve' means that theatre user preferences for price increases are counter to the intuition that holding other factors constant, lower price should be most attractive (should have highest utility) and highest price should be less preferred (have lowest utility). This has implications for generating WTP results for theatre users, because it breaks the linearity assumption and means that the price coefficient could be negative and close to zero or even positive.

Willingness to Pay which is calculated as the negative of the ratio of the coefficient for the particular attribute and the coefficient of price. Following McFadden[91], estimation of WTP from logistic regressions of choice data relies on an assumption that the relationship between price and utility is linear and negative (i.e., holding other things constant, paying a lower price for something gives greater utility).

**This means that under the current linearity assumptions, there are challenges in calculating the WTP for theatre users since a high proportion of respondents are provided inconsistent preferences for an increase in ticket prices which introduces spurious preferences into the WTP estimation, and therefore produces a biased estimate of WTP.**

There are possible approaches to overcoming the non-linearities encountered above:

1. ASC Model (4) Restrict the sample to exclude those whose price preferences do not behave in a linear fashion (i.e. excluding those identified in the Bayesian Multinomial Logit modelling as behaving irrationally). The disadvantage of this approach is that it restricts the sample and introduces the risk of small sample errors. It also rejects as irrational non-linear preferences which may be appropriate for non-market goods and services. Noting these caveats, the restricted sample approach is adopted, and reported and discussed below.

2. ASC Model (5) incorporates a quadratic price term into the ASC Logit Model which will allow the utility to vary at each price level. The principal advantage of including the quadratic price term is that it maximises the sample size, minimising the risk of small sample bias. ASC Model (5) is presented in the appendix of this report (Section 7.4).

The inclusion of the quadratic terms better accounts for the price preference of users – where the price utility increases at a decreasing rate, where a point of inflection will be reached, and the utility will begin to decrease. Whilst this still strictly doesn't align with theoretical expectations it does mean that we can more accurately translate the respondent presences into a WTP for the attribute.

[91] McFadden, 'The Measurement of Urban Travel Demand', November 1974.

However, when the WTP values are estimated, we find that these values imply that welfare increases as the theatre is maintained in a worse condition. We therefore do not recommend the quadratic price transformation in this circumstance.

3. The use of Latent Class models could also be explored as a means of understanding the preference structure of the respondents. The benefits of Latent Class models are that they may be able to better handle potential preference heterogeneity of the respondents, allowing each group to have unique preferences for the attributes presented in the DCE.

The output of the ASC Logit Model using the restricted user sample is presented below.

### Table 4.8 ASC Logit Model (4) using restricted user sample

| | **Theatre Users Coefficient** |
|---|---|
| **Number of Respondents** | **N=155** |
| **Theatre Attribute - Baseline good condition** | |
| **Interior auditorium: Seats, carpets and flooring** | |
| Poor Condition | -0.413*** |
| Severe Condition | -0.624*** |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | |
| Poor Condition | 0.014 |
| Severe Condition | -0.146 |
| **Foyer: Ticket office, reception, bar and catering space(s)** | |
| Poor Condition | -0.414*** |
| Severe Condition | -0.256** |
| **Roof** | |
| Poor Condition | -0.399*** |
| Severe Condition | -0.298** |
| **Exterior: Front of theatre** | |
| Poor Condition | -0.056 |
| Severe Condition | -0.314*** |
| **Price** | |
| Increased Ticket Price/ Monthly Increase in Council Tax | -0.202*** |
| **Constant** | |
| ASC Constant | 2.634*** |

Note: *** indicates statistical significance at the 99% confidence level; ** indicates statistical significance at the 95% confidence level; and * indicates statistical significance at the 90% confidence level.

The results of the ASC Logit Model on the restricted user sample indicate:

- For some attributes, the coefficients continue to exhibit logical signs and magnitudes, being mostly positive and severe condition being larger in absolute value than the poor condition. The price coefficient also moves further away from zero, and is statistically significant at the 99% confidence level, suggesting that the 'logical' respondents are sensitive to the price points shown in the experiment.

The ranking of the attributes does not exactly align with what was found from the model that used the full sample. The interior auditorium: seats, carpet and flooring remains the attribute which would yield the largest welfare loss if it went into a severe state of disrepair. In the restricted sample,

users exhibited a greater preference for exterior parts of the building[92], reiterating the idea that the public facing aspects of the theatre may provide 'spillover' benefits into the public realm.

- Whilst the restricted sample produces more plausible estimates of preferences, a key limitation of the restricted sample is the small sample size of 155 respondents, and therefore yields low confidence that the associated WTP values are a true reflection of the avoided social welfare loss. This does however present key insight into future avenues of research for the CHC programme, in that higher sample sizes are required to produce robust WTP estimates.

## 4.7 Conclusions

The Culture and Heritage Capital Programme set out three valuation questions to explore within the current study. The extent to which the research has explored these valuation questions is set out below:

- **Valuation question 1: To what extent do people value the maintenance of theatres with historical attributes versus more modern theatre venues?** Testing the interaction between preference for maintaining different parts of theatres and the historic or non-historic character of the theatre found no consistent differences for maintenance of the historic theatre and non-historic theatre. However, the lack of significance should not be taken to extrapolate that historic theatres are no more valuable than non-historic theatres across the country. It may be a result of lower sample size (limiting the statistical power of the interaction modelling) or due to the specific character of the two theatres selected for this study, which may not be representative of historic and non-historic theatres in the UK as a whole.

Further research would be required to establish a firm understanding of the different WTP for maintenance of more and less historic theatres to increase the sample size of evidence.

- **Valuation question 2: To what extent do people value the maintenance of individual aspects of the theatre interior and exterior:** The research explored the value individuals placed on the maintenance of theatre attributes. The research showed that individuals have varying preferences for maintenance across different types of theatre attributes. Their preferences varied considerably depending on the theatre attribute in question and between users and non-users. Users and non-users also showed different preference ordering, with non-users having the greatest preference for the roof and exteriors while users broadly preferred to pay for maintenance to the interiors.

However, there remain minimal inconsistencies in the preferences. For example, the results suggest that users would exhibit a greater welfare loss if the exterior: front of theatre was to fall into a poor state of disrepair rather than a severe state of disrepair. This may indicate that respondents struggled to distinguish between the severe and poor condition levels for some attributes, which may be due to the language or visuals used in the DCE. It is important to note that inconsistencies in the preferences are not identified among the non-user sample, despite being shown identical information and visuals. This would suggest that the inconsistency is driven by something specific to the user sample, either due to their genuine preferences (informed potentially by their direct experience of the theatre), or underlying sample size of modelling issues.

[92] In terms of the ranking, opposed to the magnitude of the coefficient

It would be necessary to undertake further follow-up interviews and post-survey cognitive interviews to understand whether these inconsistent results are due to DCE design or underlying modelling issues.

- **Valuation question 3: How does the value attributed to the maintenance of Theatre attributes and heritage differ depending on whether a person has visited the theatre recently, their demographics and other characteristics**: Through interacting sociodemographic characteristics and theatre attributes, we explored the relationship between preferences for maintenance of theatres and respondent characteristic including gender, income, age, ethnicity and whether they walk past the theatre regularly. Of the characteristics, there was no clear evidence that there existed differential impacts by sociodemographic characteristics in terms of maintenance of different theatre attributes.

- **Feasibility of WTP Business Case Tool:** The weak statistical significance in the user sample and small magnitude of the price attribute raises concerns around the reliability of the price attribute coefficient. We do not therefore recommend that user WTP be estimated from the results, which means that the results in their current form should not be used in a Business Case tool to inform CBA calculation. However, the attribute preferences set out in this report could still be used for informing maintenance activities by helping decision-makers to understand which parts of the theatre building are most important for theatre goers and the general public.

Alternative approaches to including the social value of asset maintenance within a SCBA framework could draw inspiration from Sagger and Bezzano (2023) who set out how heritage science and risks based approaches can be used where it might be harder for the general public to cognitively express their view and value on different states of states of an asset.[93]

[93] H. Sagger, and M. Bezzano, 'Culture and Heritage Capital: using economic valuation methodologies and heritage science to measure the welfare impact of ongoing conservation, protection, repair and maintenance of culture and heritage assets, (London, UK: Department for Digital Culture Media and Sport, June 2023).

# Recommendations for Future Research

## 5.1 Policy Application

The weak statistical significance in the user sample and small magnitude of the price attribute raises concerns around the reliability of the price attribute coefficient (we explore possible reasons for this in the next section). We do not therefore recommend that user WTP be estimated from the results to inform CBA calculation. Further research is required to develop policy-relevant value estimates around preferences for maintaining cultural assets like theatres. This could be explored by building on the DCE method set out in this report, or through alternative means, such as combining heritage science evidence on damage functions and risk profiles over time with welfare estimates of avoided loss elicited through contingent valuation surveys.

However, the attribute preferences set out in the previous section could still be used for informing maintenance activities by helping decision-makers to understand which parts of the theatre building are most important for theatre goers and the general public.

Currently, we can only assess preferences based on the types of damage shown in the images included in the DCE experiment. To understand the value of maintenance for other types of damage and maintenance, further research is required. The below scorecard is included for indicative purposes to form a starting point for any follow-up research. This would require further research and consultation with surveyors.

| Attributes | Good condition | Poor Condition | Severe Condition |
|---|---|---|---|
| **Interior auditorium: Seats, carpets and flooring.** | •Seats are clean and usable<br>•Carpets are clean and undamaged<br>•Flooring is not marked or scratched | •Seat upholstery marked or discoloured<br>•Carpets are stained<br>•Flooring scratched | •Broken and unusable seats<br>•Flooring damage rendering areas unusable<br>•Carpet ripped or separated from flooring |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | Decoration and plasterwork is:<br>•Unchipped or scratched<br>• Not discoloured | Decoration and plasterwork is:<br>•chipped<br>•scratched<br>•discoloured | Decoration and plasterwork has:<br>•significant parts missing<br>•Crumbling paintwork<br>•Severe discolouring |
| **Foyer: Ticket office, reception, bar and catering space(s)** | •Carpets are clean and undamaged<br>•Flooring is not marked or scratched | •Carpets are stained<br>•Flooring scratched | •Ceiling has holes<br>• Walls damaged |

| | | | |
|---|---|---|---|
| | •Walls not discoloured | •Bar area has surface scratching<br><br>•Walls discoloured | •Bar damaged to point where parts are unusable |
| **Roof** | •Roof has no structural damage or temporary support/covering | •Roof has some surface cracking or temporary support/covering | •Roof has significant cracks/leaks leading to structural issues |
| **Exterior: Front of theatre** | •Front is well painted<br><br>•No damage to windows | •Paint falling away or discolouring<br><br>•Damage to plastering<br><br>•Surface damage to windows | •Permanent is of scaffolding and wooden boarding<br><br>•Exterior walls/features crumbling or parts missing<br><br>•Broken windows |

## 5.2 Methodological Limitations

This study attempted to address three key research questions, but during the course of the research the following limitations were identified:

- **Inconsistencies in the price attribute**. One of the primary challenges within the DCE analysis was inconsistencies within the price attribute – both the detection of non-linearities and responses that did not align with theoretical expectations. This prompted the exploration of alternative modelling specifications to appropriately model the preferences of the respondents (ASC models 4 & 5).

Whilst we were somewhat able to overcome the inconsistencies through the removal of respondents whose preferences did not align with theoretical expectations (ASC model 4), it is not possible to be clear on the source of these inconsistencies. The price preference inconsistencies could be induced through experimental design (e.g. the scenario and different levels were not clearly described), or possibly due to the DCE not being the most appropriate means of isolating heritage value. This remains an open question and should be explored through further research, utilising a mixed method approach (qualitative focus groups) to further understand the preferences of the respondents, where possible.

One likely possibility is that the levels of the price attribute were not close enough to the budget constraint of respondents – which would mean that respondents were not sensitive to the price level shown. This may explain why most respondents appeared to gain higher utility levels for price attributes in the middle of the range, but consistently rejected lower price increases. However, this was despite indications from cognitive testing showing that the original range of price increases was too high.

The challenges of setting an appropriate payment attribute range demonstrates the importance of allocating sufficient time and budget to multiple rounds of cognitive testing in the design phase of

projects like this. The challenge of setting the price range for DCE surveys of this kind, which may be particularly sensitive in the case of non-market goods, is that respondents may have an initial 'budget floor' that they are willing to pay to support a cultural or heritage good/service, regardless of the precise details of the intervention proposed. This concept of a budget floor aligns with some of the literature around the 'budget envelopes'[94] that consumers implicitly hold for charitable and altruistic payment, but requires further research to understand the importance of a budget floor when seeking to elicit price preferences among users of cultural and heritage sites.

- **Sampling issue.** Previous stated preference studies in the CHC value bank have focused on institutions with a wide regional reach, which provided sufficient natural fall-out of historic visitors within online panels of survey respondents. As these 'lower hanging fruit' have been addressed, the focus of subsequent studies has moved to institutions with lower visitor numbers, which makes it more challenging to identify the necessary minimum sample of respondents. This is exacerbated when the methodological complexity of a study increases to include complex discrete choice modelling and testing of experimental designs (see **experimental assumption** bullet below), both of which are more computationally complex and demand higher sample size.

The site selection process required for this experimental assumption was extensive and focused on finding the best conceptual match of theatres for testing the experiment, and this may have been to the detriment of practical considerations of realisable sample sizes in the data collection stage. Within future research, site selection should prioritise sample feasibility and factor in the risk of optimism bias in the projection of expected sample sizes. We also recommend that additional cost be allocated to mixed methods of data collection that includes from the outset the possibility of online and face to face data collection, although it should be acknowledged that this also introduces model effects which can bias the results, and this must be factored into the data design phase.

- **The use of AI generated images**. To our knowledge, this is the first time that AI has been used to augment images to show different condition levels of attributes of a theatre. The motivation for the use of AI was that we would ensure that respondents were able to better understand the descriptions of the condition, and also to ensure that each respondent is valuing the same thing. It could be possible that the AI images generated did not produce a set of visuals which allowed respondents to fully distinguish between the different levels (condition) of each attribute. If respondents were not able to fully distinguish between attribute levels, then this would likely lead to spurious results (though we note that there was no correlation in the inconsistencies between the user and non-user sample). Cognitive testing revealed that some attributes had levels of poor and severe condition which was not clearly distinguishable, and additional editing was undertaken to correct for this. However, there was no scope within the project to go out to a second round of cognitive interviews. This, in addition to the challenges of setting an appropriate payment attribute range, demonstrates the importance of allocating sufficient time and budget to multiple rounds of cognitive testing in the design phase of projects like this.

**Violation of the experimental assumption**. The assumption underpinning the experiment was that the heritage value associated with the older building could drive preferences more in the Old Vic than the Young Vic. However, it may be possible that there are additional factors that may also be

[94] Rahul Deb, Robert S. Gazzale, and Matthew J. Kotchen, 'Testing Motives for Charitable Giving: A Revealed-Preference Methodology with Experimental Evidence', *Journal of Public Economics* 120 (1 December 2014): 181–92, https://doi.org/10.1016/j.jpubeco.2014.09.009; C. Null, 'Warm Glow, Information, and Inefficient Charitable Giving', *Journal of Public Economics*, Charitable Giving and Fundraising Special Issue, 95, no. 5 (1 June 2011): 455–65, https://doi.org/10.1016/j.jpubeco.2010.06.018.

driving the lack of significant differences in preferences between the two sites. For example, differences between the two sites in terms of the types of performances, the reach and status of the theatre as well as differences in the demographics of the visitors (Section 4.1 identifies that there are statistically significant differences in some demographics between Old Vic and Young Vic users). Whilst some of these differences are observable and controlled for, others are more subjective and therefore cannot be controlled for which would have likely affected the extent to which 'heritage theatre' value was isolated from 'modern theatre' value. Future research may need to analyse observational data across a number of theatre venues, in order to classify multiple sites as historic and non-historic, and in this way to overcome more site-specific heterogeneities which may drive differences in results.

## 5.4 Need for further research into inconsistent theatre user price preferences

As outlined in Section 4.2.2, the theatre user samples exhibited inconsistent (non-linear) preferences towards lower price increases. As outlined in the Literature Review section, this has some parallels to the ESCOE DCE of stately homes[95], in which DCE user respondents also behaved in an inconsistent way in relation to the price level. It is important to note that the ESCOE study was more extreme with the expected preference pattern completely inversed. In the current study, we see more of a triangular curve with negative preferences towards the lower prices offered.

The inconsistent results found among theatre users could be caused by a number of factors, which can be grouped into:

1. Issues around theatre users' preferences for heritage conservation.

2. Issues around the survey design.

3. Issues around low sample size and challenges of identifying user groups for theatres with low to medium visitor numbers.

4. Theatre users being willing and able to absorb additional costs into their budget constraints, suggesting that the users were not sensitive to changes in price. Further research could be undertaken to rerun the DCE, but with the price increase attributes starting from a higher starting point, to explore whether this leads to more welfare consistent linearly negative preferences for higher prices, holding other factors constant. This would allow for testing of whether the price attribute was not a deciding factor in the respondents' choice in the DCE, or whether other factors, potentially related to the non-market value of the cultural good/service, were at play. Further experiment design elements could be developed to explore under which conditions welfare inconsistent price preferences can be considered consistent for cultural or heritage sites, with implications for future research in this area.

Fully understanding the reasons that theatre users expressed negative preferences for the lowest ends of the price range would require post-survey cognitive interviews which are outside of the scope of the current study, but would help to further understand the preferences and motivations of willingness to pay of both theatre users and non-users.

[95] https://www.escoe.ac.uk/publications/cultural-capital-services-valuation-study/

## 5.4 Summary of future avenues of research

This section discussed both the policy application of the research, as well as the avenues of future research which this study has prompted. The potential areas for future research are set out below:

- Currently, we can only assess preferences based on the types of damage shown in the images included in the DCE experiment. To understand the value of maintenance for other types of damage and maintenance, further research is required. The below scorecard is included for indicative purposes to form a starting point for any follow-up research. This would require further research and consultation with surveyors.
- Future research should seek to utilise mixed method approaches to further understand the preferences and decision choices of the respondents.
- A greater understanding of the concept of the budget floor, and its importance within stated preference surveys will help to refine the elicitations of price preferences among users of cultural heritage sites.
- Future research may be needed to analyse observational data across a number of theatre venues, in order to classify multiple sites as historic and non-historic, and in this way to overcome more site-specific heterogeneities which may drive differences in results.
- Further research could be undertaken to rerun the DCE, but with the price increase attributes starting from a higher starting point, to explore whether this leads to more welfare consistent linearly negative preferences for higher prices, holding other factors constant.
- Relatedly, it would be beneficial to better understand the use of AI generated images as a means of conveying the attribute levels, potentially through more extensive focus group work and cognitive testing – and whether there are any differences between an image based DCE or a text based DCE.

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# Appendix

## 7.1 Valuation Scenario

### 7.1.1 Old Vic survey Text

**The Old Vic Theatre, Waterloo, London**

The Old Vic, originally named the Royal Coburg Theatre, was designed in 1818 by Rudolph Cabanel. Its name was later changed to the Royal Victoria Theatre, then the Royal Victoria Hall, before it took on its nickname of 'The Old Vic' as its official name in 1925.

The Old Vic has housed acclaimed performances with such celebrated actors as John Gielgud's Hamlet, Laurence Olivier's Macbeth and Othello in 1937, and Judi Dench's Juliet in Romeo and Juliet, which was privately performed for The Queen in 1957.

Architecturally, as well as historically, the Old Vic is one of London's most significant theatres. The grade II listed theatre has one auditorium with a capacity of 1,067 across three tiers. Major parts of the roof and the external brick shell are largely of the first period of the building, as is the massive internal timber construction of the roof. Visitors have access to a daytime Café as well as bars on each floor as well as a larger bar in the basement.

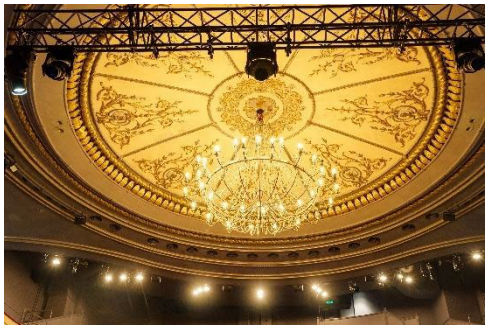
**Exterior**

The facade is of white stucco. The main frontage consists of five bays. At the top of the building, a coat-of-arms surmounts the triangular shaped cornice. The brick side walls of the exterior include eleven bays from the original 1818 design with giant brick pilasters incorporating rendered roundels under contrasting brick arcading, and with blocked first-floor windows.

**Interior**

The interior includes original horseshoe balconies on iron columns, with extensive moulded decoration; although the boxes and the proscenium arch were updated as part of the 1983 refurbishment. The basement Penny Bar is defined with its deep red coloured flooring.

**Ceiling**

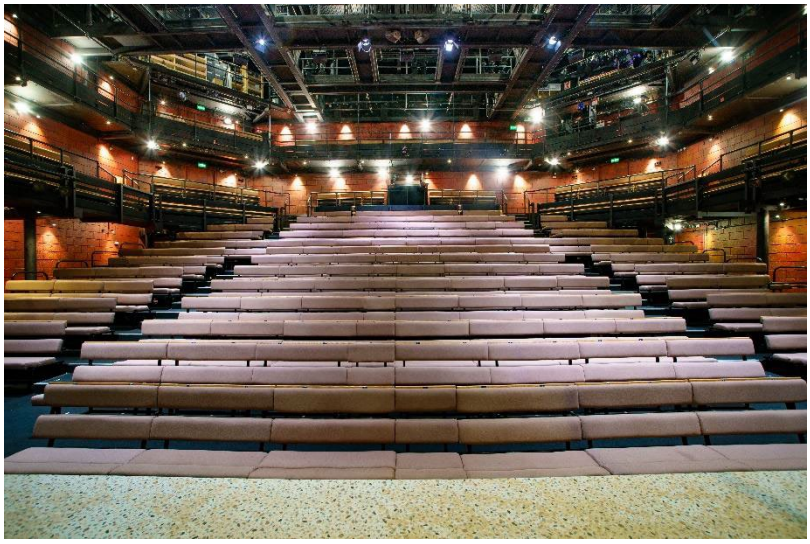


Dome ceiling is decorated white with gold thick leaf. The original complex system of timber roof trusses survives from the original structure.

**Stage**

The proscenium style stage is entirely new, 5 feet lower than the original.

### 7.1.2 Young Vic Survey Text



**The Young Vic Theatre, Waterloo, London**

The theatre venue was created in 1970 as an offshoot of the Old Vic from a former butcher's shop and an adjacent bomb-site. The structure was intended to last for five years, but has become permanent. The theatre was renovated between 2004 and 2006. Substantial work was carried out on the main auditorium adding a new layer of entrances, providing a moveable wall and demountable gallery into a large new workshop space. The renovation also included two new adaptable performance and studio spaces, work on public facilities such at the bars and lobby, and backstage spaces.

The Young Vic performs both new writing and classic plays, the latter often in innovative productions. The main auditorium has an approximate capacity of 420, although the configuration and capacity can vary depending on the design of each production.

**Exterior**


The butcher's shop has been retained as the main entrance to the building and also the box office. The façade of the main theatre includes painted panels, which is overlaid with expanded metal mesh.

**Interior**

The interior has been completely rebuilt. The building includes a multi-functional bar and foyer space, connecting directly with all three auditoria. There is no separate stage door - actors, staff and public enter and leave the theatre together.

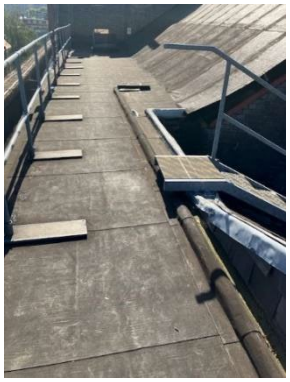
### Stage

The auditorium has a thrust stage with surrounding bold gloss red wooden slat bench seating.

### Ceiling

The roof is constructed using deep structural steel trusses.

### 7.1.3 Discrete choice experiment images and information for the Old Vic

| Attribute (part of theatre) | L1 | L2 | L3 |
|---|---|---|---|
| **Interior auditorium: Seats, carpets and flooring.** |  Interior upholstery in good condition with minimal to no marks or damage |  Visible wear and tear: Seats have rips and marks with some repairing |  Serious damage left unrepaired: Some seats are broken and therefore unusable |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** |  Interior surfaces (e.g. box fronts) of auditorium in good condition with minimal to no marks or damage |  Visible wear and tear: Interior surfaces (e.g box fronts) chipped and peeling in place |  Serious damage left unrepaired: Significant damage to surfaces and some structural elements means some areas are unusable |
| **Foyer: Ticket office, reception, bar and catering space(s)** |  Public spaces (e.g., bar area) maintained to good condition |  Visible wear and tear: Public spaces (e.g., bar area) have surface marks to floors and ceiling |  Serious damage is left unrepaired to floors, walls and ceilings |
| **Roof** |  |  |  |

| | | | |
|---|---|---|---|
| | Roof regularly inspected and kept in good condition | Roof irregularly inspected leading to surface cracks | Ongoing cracks and leaks risking structural integrity of roof |
| **Exterior: Front of theatre** |  Frontage regularly painted and maintained |  Irregular maintenance leading to paint falling away and plaster damage to frontage |  Frontage in disrepair with long-term scaffolding and wooden boarding |

### 7.1.4 Discrete choice experiment images and information for the Young Vic

| **Attribute (part of theatre)** | **L1 (Good)** | **L2 (Poor)** | **L3 (at Risk)** |
|---|---|---|---|
| **Interior auditorium: Seats, carpets and flooring.** |  Interior upholstery in good condition with minimal to no marks or damage |  Visible wear and tear: Seats have rips and marks with some repairing |  Serious damage left unrepaired: Some seats are broken and therefore unusable |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** |  Interior surfaces (e.g. box fronts) of auditorium in good condition with minimal to no marks or damage |  Visible wear and tear: Interior surfaces (e.g. box fronts) chipped and peeling in place |  Serious damage left unrepaired: Significant damage to surfaces and some structural elements means some areas are unusable |
| **Foyer: Ticket office, reception, bar and** | | | |

| | | | |
|---|---|---|---|
| **catering space(s)** |  Public spaces (e.g. bar area) maintained to good condition |  Visible wear and tear: Public spaces (e.g. bar area) have surface marks to floors and ceiling |  Serious damage is left unrepaired to floors, walls and ceilings |
| **Roof** |  Roof regularly inspected and kept in good condition |  Roof irregularly inspected leading to surface cracks |  Ongoing cracks and leaks risking structural integrity of roof |
| **Exterior: Front of theatre** |  Frontage regularly painted and maintained |  Irregular maintenance leading to paint falling away and plaster damage to frontage |  Frontage in disrepair with long-term scaffolding and wooden boarding |

## 7.2 Illustrative Willingness to Pay Values

As discussed in Section 4.5, **it is not recommended to utilise these WTP values for the purposes of a Business Case**.

The table below presents the implied welfare loss that would have occurred should the theatre fall from a good condition to a poor or severe condition. This can therefore be interpreted as the avoided welfare loss. The preferences for the attributes are from the pooled user and the pooled non-user ASC Logit regressions (Table 4.5). Where attributes are statistically insignificant, £0 is imputed.

**Implied welfare loss as the condition of the theatre attributed diminishes**

| | User | Non-User |
|---|---|---|

| | | |
|---|---|---|
| **Interior auditorium: Seats, carpets and flooring.** | | |
| Poor Condition | -£10.86 (-£24.49 - £2.77) | £0 |
| Severe Condition | -£21.61 (-£46.05 - £2.82) | -£1.90 (-£2.94 - -£0.87) |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | | |
| Poor Condition | £0 | £0 |
| Severe Condition | £0 | -£0.85 (-£1.76 - £0.06) |
| **Foyer: Ticket office, reception, bar and catering space(s)** | | |
| Poor Condition | -£12.45 (-£27.52 - £2.61) | £0 |
| Severe Condition | -£14.94 (-£32.92 - £3.05) | £0 |
| **Roof** | | |
| Poor Condition | £0 | -£1.74 (-£2.67 - -£0.81) |
| Severe Condition | £0 | -£2.77 (-£3.90 - -£1.64) |
| **Exterior: Front of Theatre** | | |
| Poor Condition | -£8.92 (-£21.29 - £3.45) | -£0.91 (-£1.87 - £0.03) |
| Severe Condition | -£7.54 (-£-18.79 - £3.72) | -£1.22 (-£2.16 - -£0.30) |

Note: Green values mean than the estimated welfare loss is statistically different from £0 at the 90% confidence level; Red text indicates that a £0 value has been imputed due to statistically insignificant attributes.
WTP values in brackets represent lower and upper bound 95% confidence interval

## 7.3 Respondent level preferences

### Testing for linearity of utilities for price attribute levels: Theatre Users and Non-users: Total sample, Young Vic and Old Vic.

| | Level | Total sample | Young Vic | Old Vic |
|---|---|---|---|---|
| **Theatre Users** | | | | |
| **Sample** | | **549** | **218** | **331** |
| **Increased Cost per ticket** | + £2.50 | -18 | -41 | -3 |
| | + £5 | 14 | -2 | 25 |
| | + £7.50 | 49 | 45 | 52 |
| | + £10 | -5 | 8 | -14 |
| | + £12.50 | -40 | -10 | -60 |
| **Theatre Non-Users** | | | | |
| **Sample** | | **531** | **267** | **264** |
| **Increased Monthly Council Tax** | + £1 | 163 | 170 | 157 |
| | + £2.50 | 103 | 94 | 113 |
| | + £5 | 12 | 1 | 22 |
| | + £7.50 | -120 | -114 | -126 |

| | Level | Total sample | Young Vic | Old Vic |
|---|---|---|---|---|
| | + £10 | -158 | -151 | -166 |

## 7.4 Quadratic Price Preferences

Figure 4.4 indicates that the price utility followed a 'triangular distribution' – where respondents favoured prices in the middle of the range compared to the higher and upper end of the range. This indicates that there may exist non-linearities between the price attribute and the utility from the price attribute – modelling the price utility as a quadratic function may better account for the observed shape of the price utility distribution.[96]

By including a quadratic price term rather than excluding respondents, the sample size is maximised (as it does not require the removal of respondents with non-linear price preferences). The disadvantage is that it forces a non-linear price-utility relationship onto the remaining part of the user sample who did exhibit linear and negative price preferences. This also makes the quadratic transformation largely inappropriate for the theatre non-user sample, since they have predominantly (negative) linear price-utility preferences.

For completeness in Table 7.6 we run the ASC Logit Model including the quadratic price attribute term on the non-user as well as the user sample, but it is not recommended to apply this for WTP purposes, as it does not align with the observed pattern of price-utility preferences.

**ASC Logit Model for all users and non-users including a squared price attribute term and controls for demographic and cultural engagement**

| | Theatre Users | Theatre Non-Users |
|---|---|---|
| | Coefficient | Coefficient |
| **Number of Respondents** | N=333 | N=415 |
| **Theatre Attribute** | | |
| **Interior auditorium: Seats, carpets and flooring.** | | |
| Good vs Severe | -0.140*** | -0.074 |
| Poor vs Severe | -0.265*** | -0.225*** |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | | |
| Good vs Severe | -0.025 | -0.061 |
| Poor vs Severe | -0.082* | -0.083 |
| **Foyer: Ticket office, reception, bar and catering space(s)** | | |
| Good vs Severe | -0.152*** | -0.072 |
| Poor vs Severe | -0.175*** | -0.080 |
| **Roof** | | |
| Good vs Severe | -0.059 | -0.194*** |
| Poor vs Severe | -0.072 | -0.312*** |
| **Exterior: Front of Theatre** | | |
| Good vs Severe | -0.101** | -0.103* |
| Poor vs Severe | -0.100** | -0.145*** |

[96] Examples of the use of quadratic utility functions can be found within health economics (Van Der Pol *et al*. (2014) Specification of the Utility Function in Discrete Choice Experiments, *Value in Health*, 17, 297-301.) and within environmental economics (Dugstad *et al*. (2021) Scope Elasticity of Willingness to pay in Discrete Choice Experiments, *Environmental and Resource Economics*, 80, 21-57.).

| | | |
|---|---|---|
| **Price** | | |
| Ticket Price or Monthly Increase in Council Tax | 0.095*** | -0.327*** |
| Square of either Increased Ticket Price or Monthly Increase in Council Tax | -0.007*** | 0.019*** |
| **Controls** | | |
| Constant: Choice A (baseline 'None' option) | 1.551*** | 0.978*** |
| Constant: Choice B (baseline 'None' option) | 1.475*** | 0.952*** |

ASC Logit provides two estimates for control variable: The significance of the covariate in the likelihood of choosing choice A, and the significance of the likelihood of choosing choice B, against the 'None' reference point.
Significance: *** p<0.01, ** p<0.05, * p<0.1

When incorporating a squared price attribute into the ASC Logit Model we see that:

- The model better accounts for the preferences of users – where the price utility increases at a decreasing rate, where a point of inflection will be reached and the utility will begin to decrease. Whilst this still strictly doesn't align with theoretical expectations it does mean that we can more accurately translate the respondent presences into a WTP for the attribute.
- Non-users exhibit logical preferences, where the price utility decreases at an increasing rate.

The WTP is calculated slightly differently due to the introduction of the quadratic term, allowing the utility to vary for each price level.[97] When using the quadratic term, the WTP for attribute $a$ can be calculated using equation 3:

$$WTP_a = \frac{1}{n}\sum \quad \frac{\beta_{attribute_a}}{\beta_{price} + 2 * \beta_{price^2} * price\ chosen} \tag{3}$$

Where $\beta_{attribute_a}$ is the coefficient of attribute $a$; $\beta_{price}$ is the linear price coefficient; $\beta_{price^2}$ is the coefficient of the quadratic price coefficient; and $price\ shown$ represents the price that corresponds to the respondents chosen option. Because the prove level show differs by respondent and choice task, equation 3 is applied across each respondent and then the mean taken to estimate a mean WTP for each attribute.

### Implied welfare loss from Model 4 estimated utilities

| Theatre Attribute | Users | Non-Users |
|---|---|---|
| **Interior auditorium: Seats, carpets and flooring.** | | |
| Good vs Severe | £3.18 (-£7.54 - £13.90) | £0 |
| Poor vs Severe | £6.02 (-£14.28 - £26.32) | £0.24 (-£4.31 - £4.78) |
| **Interior auditorium: Decoration, plasterwork, box fronts etc.** | | |
| Good vs Severe | £0 | £0 |
| Poor vs Severe | £1.87 (-£4.43 - £8.17) | £0 |
| **Foyer: Ticket office, reception, bar and catering space(s)** | | |
| Good vs Severe | £3.47 (-£8.22 - £15.15) | £0 |
| Poor vs Severe | £3.98 (-£9.45 - £17.41) | £0 |
| **Roof** | | |
| Good vs Severe | £0 | £0.20 (-£3.72 - £4.12) |
| Poor vs Severe | £0 | £0.33 (-£5.98 - £6.64) |
| **Exterior: Front of Theatre** | | |

[97] This is because when the partial derivative of the utility function is taken, the price that the respondent is shown is not 'removed' from the calculus – rather the quadratic price term is transformed into a linear price term.

| | | |
|---|---|---|
| Good vs Severe | £2.29 (-£5.44 - £10.03) | £0.11 (-£1.98 - £2.20) |
| Poor vs Severe | £2.27 (-£5.39 - £9.93) | £0.15 (-£2.78 - £3.09) |

Note: Red text indicates that a £0 value has been imputed due to statistically insignificant attributes.
WTP values in brackets represent lower and upper bound 95% confidence interval

We find there are positive WTP values estimated when using the quadratic price attribute – this therefore suggests that respondents 'benefit' from the theatre being maintained and preserved in a worse condition. **Given this illogical response, which contradicts the expectations and prior findings within this study, we would not recommend using these WTP values.** Whilst the inclusion of a quadratic price term is better able to model the price attribute, difficulties and irregularities arise when combining with other attributes.

# Our standards and accreditations

Ipsos' standards and accreditations provide our clients with the peace of mind that they can always depend on us to deliver reliable, sustainable findings. Our focus on quality and continuous improvement means we have embedded a "right first time" approach throughout our organisation.

## ISO 20252

This is the international specific standard for market, opinion and social research, including insights and data analytics. Ipsos UK was the first company in the world to gain this accreditation.

## Market Research Society (MRS) Company Partnership

By being an MRS Company Partner, Ipsos UK endorse and support the core MRS brand values of professionalism, research excellence and business effectiveness, and commit to comply with the MRS Code of Conduct throughout the organisation & we were the first company to sign our organisation up to the requirements & self-regulation of the MRS Code; more than 350 companies have followed our lead.

## ISO 9001

International general company standard with a focus on continual improvement through quality management systems. In 1994 we became one of the early adopters of the ISO 9001 business standard.

## ISO 27001

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## The UK General Data Protection Regulation (UK GDPR) and the UK Data Protection Act 2018 (DPA)

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Ipsos UK is signed up as a "Fair Data" company by agreeing to adhere to twelve core principles. The principles support and complement other standards such as ISOs, and the requirements of data protection legislation. .