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Can International Benefit Transfer in Cultural Economics Produce Reliable Estimates? Non-Market Valuation of Theater in Denmark and Poland

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ABSTRACT

Cultural goods generate numerous non-market benefits to society that cannot be assessed through market transactions and therefore require non-market valuation techniques. While original non-market valuation studies are costly and time-consuming, the benefit transfer approach offers a practical alternative. This study provides the first international benefit transfer for performing arts and examines the reliability of different transfer approaches using stated preference data from Denmark and Poland. The results show that a benefit function transfer accounting for purchasing power parity yields low transfer errors (3–21%), suggesting relatively high reliability. However, caution is warranted, as challenges remain in valuing activity-based cultural goods, particularly when cultural human-capital externalities are present and the relevant externalities are not well understood by respondents. Further research is needed before benefit transfer can be considered a reliable tool for policy-making in this context.

KEYWORDS

International benefit transfer; performing arts; stated preferences; transfer errors; cultural human-capital externalities

JEL CODES

Z11; Z18; D61; H40

Introduction

Many cultural goods and services exhibit public-good characteristics and generate positive externalities (Frey and Pommerehne 1989; Snowball 2008; Throsby 2001), which may justify public subsidies. A key challenge is that many of these benefits are non-market in nature, lacking observable transactions—for example, the existence value of heritage sites or the educational role of theater. Performing arts are among the most heavily subsidized cultural sectors, as they are believed to enhance education, creativity, critical discourse, and cultural identity (Throsby 1990). They can be understood as quasi-public goods with (i) direct benefits to users (i.e., use value) and (ii) indirect nonuse values, such as educational, bequest, and prestige values (Bille Hansen 1997).

Stated preference methods allow for the measurement of both types of value (Bishop et al. 2017; Johnston et al. 2017) by eliciting preferences through surveys (see Noonan 2003, for an overview of applications in cultural economics). However, these studies

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are costly and time-consuming. Benefit transfer offers a practical alternative (Johnston et al. 2021; Rolfe, Johnston, et al. 2015), allowing value estimates from one or more study sites to another, typically unstudied, policy site (Johnston and Rosenberger 2010). Given common time and budget constraints in public policy evaluation, benefit transfer is often the only feasible approach in areas such as transport and environmental policy (e.g., Hanley et al. 2006; Loomis 2015; Rolfe, Bennett, and Kerr 2015). Yet, it has been only marginally applied in the cultural domain.

Despite its successful use in other sectors, such as environmental economics (e.g., Johnston, Rolfe, and Zawojkska 2018), benefit transfer studies for cultural goods remain scarce and primarily focus on cultural heritage. To date, only seven benefit transfer studies have been published in this field: five on heritage (eftec 2005; Lawton et al. 2018; Mourato et al. 2014; Tuan, Seenprachawong, and Navrud 2009; Ulibarri and Ulibarri 2010), one on museums (Fujiwara et al. 2018), one on galleries and theaters (Lawton et al. n.d.), and one on theater performances (Zawojkska, Jusypenko, and Wiśniewska 2025).

Our study examines whether international benefit transfer can be reliably applied to performing arts. Using two comparable stated preference datasets from Denmark and Poland, we assess the validity of transferring value estimates across countries. Applying benefit transfer to performing arts raises both methodological and conceptual challenges. While it provides a pragmatic response to limited valuation studies and resource constraints facing policymakers, the nature of performing arts benefits—especially those linked to participation and cultural human-capital formation—complicates what is actually being measured and transferred. This article addresses these issues by combining a best-practice benefit transfer application with a critical reflection on its conceptual foundations, assessing whether its empirical performance can be meaningfully interpreted in the context of cultural goods, such as the performing arts.

This article makes three contributions. First, it conducts an international benefit transfer analysis for performing arts using two comparable large-scale stated preference datasets. To the best of our knowledge, this is the first such application. We test standard transfer approaches, including unit-value and function transfers, with and without adjustments for income and purchasing power parity, and evaluate their performance using percentage transfer errors, providing new evidence on feasibility in this underexplored domain.

Second, we assess these results in light of key methodological challenges, including differences in elicitation formats (contingent valuation versus discrete choice experiments), discrepancies between willingness-to-pay and willingness-to-accept measures, assumptions about income elasticity, and site comparability. This allows us to examine whether low transfer errors indicate reliability or reflect modeling artifacts.

Third, we interpret the results through a conceptual lens that foregrounds the specific nature of non-market benefits in performing arts. Drawing on recent work on cultural human-capital externalities (Bille 2024; Bille and Noonan 2026) and value-based approaches to cultural economics (Bille (2026; Klamer 2016) we argue that stated preference responses may capture not only (or not primarily) marginal welfare effects, but also broader attitudes, symbolic valuations, and a willingness to support cultural commons. In this perspective, benefit transfer may be transferring shared cultural norms or institutionalized expectations rather than well-defined economic values. This

raises fundamental questions about the interpretation and policy relevance of transferred estimates, particularly for activity-based cultural goods where externalities are generated through participation and may not be fully understood by respondents.

By integrating these empirical, methodological, and conceptual perspectives, this article moves beyond a narrow focus on transfer accuracy to contribute to a broader debate on the scope and limits of economic valuation in cultural policy. While benefit transfer may yield low transfer errors, this apparent success should be interpreted with caution. A deeper understanding of cultural value and externalities is needed before it can be considered a robust tool for policy evaluation in the performing arts.

The article is organized as follows. Section 2 reviews non-market valuation and benefit transfer methods and briefly introduces cultural human-capital externalities. Section 3 presents the Danish and Polish valuation studies and data. Section 4 outlines the benefit transfer approach and econometric methods, while Section 5 reports the results. Section 6 discusses limitations and provides a critical assessment of benefit transfer in the context of cultural goods with cultural human-capital externalities.

Non-market valuation and benefit transfer: concepts, assumptions, and limitations

Non-market valuation of cultural goods

Many cultural goods, including performing arts, generate benefits not reflected in market transactions, encompassing both use values for attendees and nonuse values such as existence, bequest, educational, and social benefits (Snowball 2008; Throsby 2001). In the absence of observable prices, these benefits can be estimated using non-market valuation methods

These methods are typically divided into revealed preference (RP) and stated preference (SP) approaches. RP methods infer values from observed behavior in related markets. Common examples include the travel cost method, which estimates value based on visitation costs, and hedonic pricing, which derives values from price differentials, for example, in housing. While grounded in actual behavior, RP methods are limited to use values and require a strong link between the cultural good and observable market behavior.

SP methods, by contrast, rely on survey-based techniques in which individuals state preferences for hypothetical scenarios. The two most common approaches are contingent valuation (CV), which elicits willingness to pay (WTP) or accept (WTA) for a specified change, and discrete choice experiments (DCEs), where respondents choose between alternatives with varying attributes and costs. Their main advantage is the ability to capture both use and nonuse values, making them particularly suitable for public goods where nonuse values may be substantial (Snowball 2008).

However, SP methods face well-known challenges, including hypothetical bias (differences between stated and actual behavior), strategic responses, sensitivity to survey design and framing, and difficulties respondents may have in understanding complex or unfamiliar scenarios. These issues are particularly relevant in the cultural domain, where benefits are often abstract and difficult to communicate (Bille 2024; Bille and Noonan 2026).

Benefit transfer method

Benefit transfer refers to the use of existing valuation estimates from one or more “study sites” to infer values for a “policy site,” where conducting an original valuation study is infeasible due to time, budget, or other constraints (Johnston and Rosenberger 2010). The method is widely applied in policy appraisal, particularly in environmental and health economics, to support benefit-cost analyses when primary data are unavailable.

Two main approaches can be distinguished. Unit-value (or value) transfer applies estimates, such as mean WTP, directly to the policy site, sometimes adjusting for income or price differences. Function transfer instead uses an estimated valuation function from the study site to predict values based on policy site characteristics. In international contexts, purchasing power parity (PPP) adjustments are commonly used to account for cross-country price differences (Ready and Navrud 2006).

A central requirement for valid benefit transfer is the similarity between study and policy sites. This includes similarity in the good being valued, the population affected, and the institutional and socio-economic context. In the cultural domain, this requirement is often interpreted as focusing on “average” or representative cultural goods (e.g., an average museum or theater system) rather than unique or iconic sites, in order to reduce site-specific heterogeneity and improve transferability.

In the cultural sector, where primary valuation studies are relatively scarce, benefit transfer has the potential to expand the empirical basis for policy evaluation and to facilitate comparisons across contexts.

Despite its advantages, benefit transfer is subject to several limitations and potential biases. Although, in our case, we have data for two sites that serve as both study and policy sites for the purpose of testing benefit transfer, there remain several sources of potential discrepancies in values across sites, which complicate the evaluation. First, differences between study and policy sites may be greater than observed and only partially controllable. Variations in cultural context, institutions, or participation patterns may influence preferences in ways not captured by observable variables. In performing arts, differences in cultural traditions, attendance rates, and public funding may all affect valuation outcomes. Second, methodological heterogeneity across primary studies can reduce comparability. Differences in elicitation formats (CV versus DCE), valuation measures (WTP versus WTA), survey design, and econometric modeling may lead to inconsistent estimates. Third, assumptions about functional form and parameters, such as income elasticity, may be inappropriate. In the cultural domain, income effects vary widely, limiting the validity of standard adjustments. Finally, there are conceptual limitations regarding what is being measured. In cultural goods, SP responses may capture not only individual welfare gains but also broader attitudes, social norms, or symbolic values, raising the possibility that benefit transfer reflects these underlying attitudes rather than well-defined economic values.

Cultural human-capital externalities and limitations of SP valuation

An important limitation in valuing performing arts concerns the nature of the benefits they generate. Recent work introduces the concept of cultural human-capital

externalities (Bille 2024; Bille and Noonan 2026), referring to broader societal effects arising from individuals' participation in cultural activities through processes of learning, identity formation, and social interaction. Unlike traditional nonuse values, these externalities are activity-based and depend on engagement.

This distinction has important implications. For cultural heritage, where benefits are largely linked to the existence or preservation of an asset, SP valuation scenarios can be relatively clearly defined. By contrast, performing arts generate value through participation, with externalities that are diffuse, indirect, and difficult to communicate in survey settings, making it harder for respondents to relate their preferences to changes in provision. This limits the use of SP valuation methods, as it is challenging to construct scenarios that adequately capture how participation translates into wider societal benefits. Responses may therefore reflect a willingness to support cultural goods as shared or civic resources rather than a calculation of individual welfare gains.

Bille (2024) and Bille and Noonan (2026) argue that valuing cultural goods with participation-based externalities is particularly challenging. Unlike asset-based cultural capital (Throsby 2001), these externalities arise from engagement and are often unfamiliar to respondents, making them difficult to communicate in SP valuation scenarios. As Bille (2024) notes, it is “almost impossible” to explain such externalities in a way that enables consistent valuation. Since theater has (almost) no value without an audience, much of its value depends on participation and the resulting cultural human-capital externalities. While use values are substantial, nonusers may struggle to assess changes in provision or participation.

Recent empirical evidence supports this concern. Nonusers' valuations are often insensitive to variations in cultural supply, suggesting that responses may reflect general attitudes rather than marginal welfare changes. For example, Bille and Storm (2025) find that users' valuations vary with local theater supply, while nonusers' valuations do not. Similar results are reported in Bille and Honoré (2025), who identify significant effects of theater activity for users but not for nonusers. These findings indicate a limited understanding of how participation generates externalities, complicating the construction of credible valuation scenarios.

These issues extend to benefit transfer. If SPs capture attitudes or symbolic values rather than well-defined economic benefits, transferring them across contexts may reproduce similarities in cultural norms rather than measure welfare effects. Low transfer errors may therefore reflect homogeneity in cultural attitudes rather than true validity. From this perspective, benefit transfer results for performing arts should be interpreted with caution: they may indicate consistency across contexts but are less informative about underlying economic value.

Empirical case study and data

Empirical study context: Theater sectors in Denmark and Poland

The theater sectors in Denmark and Poland share several key features, which is important given that reliable benefit transfer requires similarity between study and policy sites (Johnston and Rosenberger 2010).

Both theater landscapes are highly subsidized and dominated by publicly supported venues, ranging from large national theaters through major regional stages to small-scale theaters. Excluding the Royal Danish Theater due to its exceptional funding share (35% of total public expenditure on performing arts), Denmark has 189 publicly supported theaters attracting approximately 1.9 million visitors annually. Poland has over 120 publicly supported theaters, accounting for more than 90% of total attendance (Theater in Poland, 2020).

Both countries allocate a slightly above average share of government expenditure to culture compared to the EU-27: 1.15% in Denmark and 1.65% in Poland (Eurostat 2022). In both cases, 8–9% of the cultural budget is devoted to performing arts, primarily funding public theaters (Statistics Denmark 2022; Statistics Poland 2022). Public subsidies are essential, typically covering around 80% of theater budgets.

Despite these similarities, differences in socio-economic context remain. Gross Domestic Product (GDP) (PPP-adjusted) is approximately 1.5 times higher in Denmark (The Organisation for Economic Co-operation and Development (OECD) 2022a), contributing to higher public spending on theaters per resident (18.75 EUR in Denmark, excluding the Royal Danish Theater, versus 7.19 EUR in Poland in 2020).¹ Attendance rates also differ, with 327 visits per 1,000 residents in Denmark and 150 per 1,000 residents in Poland. Such differences may affect transfer reliability. However, given the lack of clear formal criteria for assessing site similarity (e.g., Johnston and Rosenberger 2010), the substantial structural similarities between the two theater systems suggest that a reasonably reliable transfer is feasible (see Table 1 for a formal comparison of study sites and Table A1 for a comparison of socio-economic survey environment).

Design and implementation of country-specific surveys

This study uses data from two comparable SP surveys conducted in Denmark and Poland. We briefly outline their design, key similarities and differences, and sample characteristics.

Survey in Denmark

The Danish survey uses a CV approach to elicit preferences of the Danish population for public support of theaters in the country. It first collects information on respondents' engagement with different types of performing arts and attitudes toward theaters as a public good. It then presents a description of the theater landscape in Denmark, including the level of public subsidies per taxpayer,² and asks respondents whether they support taxation for theater funding, along with their motivations.

The WTP question is posed only to respondents who support such taxation; those who do not are assigned a WTP of 0 Danish Krone (DKK) in the analysis. The specific wording of the question is: "If the decision was yours to make: What is the maximum annual amount you are willing to pay to theaters in Denmark *via* taxes?"³ The WTP question does not involve a program change; instead, it is intended to capture the value of the status quo, i.e., the current theater landscape in Denmark, excluding the Royal Danish Theater.⁴ The elicitation format is randomized between an open-ended question and a payment card with eleven options ranging from "0" to "More than 3,000" DKK. A budget reminder is included in line with best-practice guidance (Johnston et al. 2017).

The scenario design follows common practice in cultural economics by valuing the status quo (e.g., Fujiwara, Lawton, and Mourato 2019). While single binary choice formats are preferred for incentive compatibility (Carson and Groves 2007), they require large samples. Payment card and open-ended formats were therefore used to obtain more information per respondent.

The questionnaire was tested in five focus groups representing the general population of Denmark (including users and nonusers of theater services, and individuals varying in age and education levels). Survey responses are linked to administrative register data from Statistics Denmark, providing detailed socio-demographic information and weights to ensure population representativeness.

Survey in Poland

The Polish survey first collects information on respondents' cultural preferences, theater attendance (frequency and location), perceptions of theaters' individual and societal benefits, and attitudes toward public subsidies. Following previous studies in Warsaw (Wiśniewska 2019; Wiśniewska and Czajkowski 2019), theater performances are described through four types in the survey: entertainment, drama, children's, and experimental.

The core of the survey is a DCE eliciting preferences between maintaining current theater performance levels and accepting reductions in exchange for lower taxes, enabling esti

ensation) and a policy alternative (reduced services with tax compensation). Reductions may apply to all or selected performance types, and compensation levels are set at 5, 10, 20, or 50 Polish Zloty (PLN).⁵ Figure 1 presents an example choice task. Each respondent completed four choice tasks, each featuring different scenarios.⁶

The experiment design is optimized for D-efficiency in a multinomial logit model (Ferrini and Scarpa 2007; Scarpa and Rose 2008), using priors derived from an initial sample of 300 respondents. The order of tasks and of performance types displayed within a task are randomized to minimize ordering effects. The survey concludes with socio-demographic questions and was thoroughly pre-tested with the general public and reviewed by sociologists and theater experts.

Surveys' comparison

Table 1 summarizes the comparison of the two surveys, which share several key features. Most importantly, both assess policy scenarios for all publicly supported theaters at the national level. This helps address a common challenge in international benefit transfer (Ready and Navrud 2006), namely variation in measurable features (e.g., number of performances or budget), which tends to be greater across individual theaters than across national public theater systems. Although each venue is unique, the public theater sectors in both countries offer relatively homogeneous services. A national-level approach also avoids issues related to venue specificity and localized populations, ensuring a consistent market scope that includes both users and nonusers. In both surveys, annual taxation is used as the payment/compensation vehicle, with public subsidies as the funding mechanism.

However, the surveys differ in elicitation formats and value measures. The Danish survey uses open-ended and payment card CV to elicit WTP for maintaining current

	Alternative A Status quo	Alternative B
Theater services in the whole of Poland 		
 Entertainment performances	No change	No change
 Drama performances	No change	Reduced by 25%
 Children's performances	No change	Reduced by 50%
 Experimental performances	No change	No change
Change in your expenditure per annum	0 PLN	Reduced by 5 PLN

Figure 1. An example choice task (translated from Polish)

Table 1. Comparison of study sites, and evaluated goods and preference elicitations across the country-specific surveys.

Comparison of study sites*		
Characteristic	Denmark	Poland
No. of publicly supported theaters	189	123
Theater visitors per year	1.9 million	5.8 million
Expenditure on culture as a share of total government expenditures	1.15%	1.65%
Public expenditures on theaters as a share of public expenditure on culture	8–9%	8–9%
Public spending on theaters per 1,000 residents**	18.75 EUR (excluding the Royal Danish Theater)	7.19 EUR
Theater visits per 1,000 residents	327	150
Comparison of evaluated goods and preference elicitations		
Characteristic	Danish survey	Polish survey
Evaluated good	Services of publicly supported theater groups and theaters in Denmark	Services of publicly supported theaters in Poland
Scope of theaters included in the evaluated good	All theaters in Denmark subsidized from the public budget, except for the Royal Danish Theater	All theaters in Poland subsidized from the public budget
Countrywide funding mechanism for maintaining theater services	Subsidies from the public budget	Subsidies from the public budget
Preference elicitation format	Open-ended question and payment card	Discrete choice experiment
Preference elicitation question	"If the decision was yours to make: What is the maximum annual amount you are willing to pay to theaters in Denmark <i>via</i> taxes?"	A binary choice between (i) the current state of the theater services in Poland with no change in taxes, and (ii) a possible reduction in the theater services by 25% or 50% in all or selected types of performances associated with a reduction in annual taxes per person
Payment/Compensation vehicle	Annual taxes	Annual taxes
Cost/Compensation amounts	In the payment card: 11 cost amounts, ranging from "0" to "More than 3,000" DKK	5, 10, 20, and 50 PLN

*Sources: Statistics Denmark 2021; Theater in Poland 2021 (data for the theater season 2018/2029); Eurostat 2022; Statistics Poland 2022.

**GDP (PPP-adjusted) is approximately 1.5 times higher in Denmark than in Poland (OECD 2022a).

theater services, while the Polish survey applies a DCE to estimate WTA for service reductions.

To ensure comparability, we define the evaluated good as the maintenance of current theater services in each country. In Denmark, this is directly captured by WTP. In Poland, the DCE includes a status quo option (no reduction), where WTA reflects the value of avoiding reductions in theater services, making it conceptually consistent with the Danish measure.

While WTP and WTA often yield different estimates (e.g., Horowitz and McConnell 2002), we account for this in the empirical analysis by scaling WTA results using a WTA/WTP ratio of 3.28 for “all goods,” as reported in the meta-analysis by Tunçel and Hammitt (2014). In [Online Appendix Table B1](#), we conduct a sensitivity analysis using an alternative WTA/WTP ratio of 3.93, based on the estimate for “all public goods that are not environmental or related to health and safety” reported in the same meta-analysis.

The surveys also differ in their treatment of national theaters. In Denmark, respondents are instructed to exclude the Royal Danish Theater, which receives a disproportionate share of public funding, in order to avoid bias. The Polish survey does not explicitly reference national theaters; however, additional analyses suggest minimal influence. Only 6% of Polish respondents reported visiting national theaters in the preceding year, and fewer than 1% mentioned them when identifying performance types they had attended. Furthermore, we estimate an additional model in which all preference parameters are interacted with a binary variable controlling for respondents who visited one of the national theaters in the preceding year. This variable has no statistically significant effect on the estimates. Thus, we argue that national theaters do not materially influence value estimates in either survey.

Survey administration and study samples

The surveys were administered online using quota sampling to nationwide samples in Denmark and Poland. The Danish survey was conducted in May–June 2020 on a random adult sample and distributed by Statistics Denmark *via* e-Boks (a Danish digital mailbox service delivering official messages from public authorities and private companies to citizens), with 1,270 completed responses out of 4,450 invitations. The Polish survey, conducted between May and December 2018 by a professional sampling agency (SurveyEngine GmbH), yielded 2,863 completed questionnaires.

Although conducted only two years apart, the surveys span a period of significant change. The Danish survey took place shortly after the outbreak of the Covid-19 pandemic. Respondents were instructed to consider typical rather than pandemic conditions, although some residual influence cannot be ruled out.

The benefit transfer aims to estimate the value of maintaining current theater services for both populations. To ensure representativeness, observations are weighted in the preference modeling. The weights for Denmark are provided by Statistics Denmark. The weights for Poland are generated based on three socio-demographic characteristics for which statistically significant differences are observed between the sample and the population: age, university education attainment, and household income. In [Online Appendix A](#), we provide detailed socio-demographic characteristics of the Danish and

Polish samples and populations, along with the results of the representativeness tests. We also describe the construction of the weights used in the econometric models.

Methods

Benefit transfer approaches and transfer error

The main types of benefit transfer are value transfer and function transfer (Johnston and Rosenberger 2010; Navrud and Ready 2007). Value transfer applies estimated values from one or more study sites to a policy site, either directly or with adjustments (e.g., for differences in income or PPP). Function transfer instead uses an estimated valuation function, derived from a single study or a meta-analysis, to predict values at the policy site.

This study implements the following five approaches: (1) unadjusted value transfer, (2) income-adjusted value transfer, (3) PPP-adjusted value transfer, (4) function transfer using nominal exchange rates, and (5) function transfer using PPP-adjusted exchange rates (both based on country-specific valuation functions). The adjusted approaches and function transfers account for differences between study and policy sites.

Income-adjusted value transfer typically assumes a constant income elasticity of demand, expressed as follows:

$$value_{policy} = value_{study} \left(\frac{income_{policy}}{income_{study}} \right)^{elasticity} . \quad (1)$$

This approach requires an assumption about income elasticity. Evidence for performing arts suggests substantial variation across countries, modeling approaches, and income concepts, with estimates ranging from insignificant or even negative values to levels substantially above one (e.g., Castiglione and Infante 2016, 2025; Seaman 2006; Wu, Keshen, and Yuan 2019; Zieba 2009). In this context, we adopt a unitary income elasticity assumption as a neutral and conservative benchmark that avoids arbitrarily treating theater as either a necessity or a luxury good. Moreover, the relevant parameter for benefit transfer is the income elasticity of WTP rather than demand elasticity. As Flores and Carson (1997) note, income-elastic demand does not necessarily imply willingness-to-pay elasticity above one. Given the absence of robust WTP-based elasticity estimates, adopting unit elasticity is consistent with common applied practice under evidential uncertainty.

PPP-adjusted value transfer accounts for differences in price levels between study and policy sites. PPP exchange rates reflect the amount of currency required to purchase the same bundle of goods across countries and are generally preferred to nominal exchange rates in international transfers (Czajkowski et al. 2017; Ready and Navrud 2006). We use OECD (2022c) PPP data.

For function transfer, we estimate country-specific valuation functions and use the resulting coefficients to predict values at the policy site by inserting population means of explanatory variables (age, gender, education, and income) obtained from national statistics. A key limitation of this approach is the assumption that the estimated functional relationships are transferable across sites.⁷

Transfer reliability is assessed using transfer error (TE) (Ready and Navrud 2006), which measures the deviation between transferred and observed values. We use the absolute percentage TE (Rosenberger and Stanley 2006) defined as follows:

$$|TE| = \frac{|value_{transferred} - value_{actual}|}{value_{actual}} \cdot 100\%. \quad (2)$$

Econometric approaches for estimating values

The Danish and Polish surveys use different elicitation formats, requiring distinct approaches for estimating country-specific values of maintaining theater services. Danish data are modeled using interval regression, while Polish data are analyzed using a random-parameter (mixed) logit model.

Econometric model for the Danish data

In the Danish survey, WTP for maintaining current theater services is elicited through either an open-ended question (yielding continuous WTP data) or a payment card (yielding right- and interval-censored WTP data). WTP is observed directly for open-ended responses and for the “0” DKK response option in the payment card. Otherwise, WTP lies within an interval $c_l < WTP < c_u$, where c_l and c_u denote the lower and upper bounds of the selected payment-card interval. For the highest category (“More than 3,000” DKK), $c_l = 3,000$ and $c_u = +\infty$.

We estimate an interval regression model, which can be viewed as a generalization of a censored regression, assuming the linear functional form

$$WTP = \alpha + \beta'x + \varepsilon, \quad (3)$$

where x is a vector of explanatory variables, α and β are parameters to be estimated, and ε is a normally distributed error term with mean zero and variance σ^2 . The interval regression model allows parameter interpretation analogous to ordinary least squares, while the log-likelihood function accommodates both point values and interval data (Vossler and Zawojka 2020).

We estimate two specifications of the model. The first includes only a constant, yielding average WTP for use in value transfer. The second additionally includes socio-demographic variables and is used for function transfer.

Econometric model for the Polish data

Preferences in the DCE are modeled within a random utility framework (McFadden 1974). The utility of individual i from policy scenario p , $U_{ip}(\cdot)$, is specified as a function of (1) observed policy attributes, including non-monetary attributes used in the choice tasks, X_{ip} , and the monetary attribute, C_{ip} , and (2) unobserved idiosyncratic factors captured by an error term, ε_{ip} . Formally, utility is specified as

$$U_{ip}(\cdot) = \beta_i'X_{ip} + \alpha_i C_{ip} + \varepsilon_{ip}, \quad (4)$$

where β_i and α_i are parameters representing individual-specific marginal utilities of the non-monetary and monetary attribute, respectively. These parameters are allowed to vary across individuals according to a predefined multivariate distribution (Train 2009), thereby capturing preference heterogeneity and yielding a random-parameter (also called mixed) logit model.

The model is estimated in WTA space to facilitate interpretation, such that parameters can be read directly as monetary (WTA) amounts. To derive the WTA specification, we first define $\alpha_i = \gamma_i / \theta_i$ as the monetary parameter in preference space, where γ_i represents the underlying marginal utility of income and θ_i is a scale parameter, and we define $\beta_i = \lambda_i / \theta_i$ as a vector of preference-space parameters on the non-monetary attributes, where λ_i denotes a vector of underlying marginal utilities associated with these attributes. We further assume error term ε_{ip} to follow an independent and identically distributed (i.i.d.) type I extreme value distribution with constant variance equal to $\pi^2 / 6$ (Scarpa, Thiene, and Train 2008; Train and Weeks 2005). Marginal WTA for a change in a non-monetary attribute is calculated as the ratio of the attribute coefficient to the monetary coefficient: $\omega_i = \beta_i / \alpha_i = \lambda_i / \gamma_i$. Specification (4), defined in preference space, can be reformulated into an equivalent WTA-space specification:

$$U_{ip}(\cdot) = \alpha_i \left(\frac{\beta_i}{\alpha_i} X_{ip} + C_{ip} \right) + \varepsilon_{ip} = \alpha_i (\omega_i' X_{ip} + C_{ip}) + \varepsilon_{ip}. \quad (5)$$

The WTA parameters in ω_i are allowed to vary across individuals, typically following a normal distribution. The monetary coefficient is assumed to follow a lognormal distribution to ensure a positive marginal utility of income, consistent with standard practice in discrete choice modeling.

In our application, vector X_{ip} of non-monetary attributes additionally includes a constant for the status quo, equal to one for the status quo option and zero otherwise, allowing us to estimate the marginal utility and associated WTA for maintaining current theater services. For function transfer, this constant is interacted with socio-demographic variables to capture heterogeneity in WTA. We only consider the interactions with the status quo, as they are the most relevant for the study's objective. Both specifications of the random-parameter model are estimated using simulated maximum likelihood with 4,000 Sobol draws.⁸

Results

To examine the performance of international benefit transfer in the performing arts, we conduct transfers between Denmark and Poland. Specifically, values associated with maintaining the current level of theater services (the status quo) are estimated for each country and then transferred to the other. Transfer reliability is assessed using TEs.

We first report country-specific value estimates based on each dataset. For both countries, two model specifications are presented, namely a basic specification without socio-demographic variables and an extended specification including them. The basic

specifications are subsequently used for value transfers, while the extended specifications are used for function transfers.

Country-specific models of theater service values

Results of the interval regression model specifications based on the Danish data are presented in Table 2. The income variable is specified in logarithmic form, as this provides a better fit to the data.

The basic specification indicates an average annual WTP of 29 EUR (218 DKK) for maintaining current theater services in Denmark. The extended specification shows that WTP increases with income and university education, while age and gender are not statistically significant. This is consistent with evidence that theater audiences tend to have higher income and education levels (McKenzie and Shin 2020; Seaman 2006).

Results for the Polish data are presented in Table 3. Non-monetary attributes (performance types) are specified as binary variables taking a value of one for a reduction in a given theater performance type and zero otherwise.⁹ As the model is estimated in WTA space, the coefficients on the means of these attributes can be directly interpreted as annual WTA amounts in PLN.

The basic specification yields a negative WTA estimate for maintaining the status quo (i.e., not reducing theater services), implying a positive WTP of approximately 35 EUR¹⁰ (155 PLN) for maintaining current theater services. Interpreting the negative WTA as positive WTP and scaling by the WTA/WTP ratio of 3.28 reported by Tunçel and Hammitt (2014), the estimated WTP equals approximately 11 EUR (47 PLN) per year. Respondents exhibit positive WTA values for reductions in three of the four performance types considered, indicating that compensation is required if these services are reduced. Statistically significant standard deviations for almost all attributes suggest substantial preference heterogeneity.

The extended specification (last column in Table 3) includes interactions between the status quo constant and socio-demographic variables. The results indicate higher WTA among men and a decline in WTA with age. Across specifications, the estimated mean coefficients are consistent and not statistically different, except for the status quo constant. In the extended specification, this coefficient lacks practical interpretation when considered independently of the interaction terms, as it corresponds to an individual with zero age.

Table 2. Results of the interval regression model specifications for Denmark.

	Basic specification	Extended specification
	Mean coefficients (standard errors)	Mean coefficients (standard errors)
Man		12.97 (30.50)
Age		1.18 (0.81)
University degree		129.95*** (56.16)
Log of annual household adjusted income		72.20* (37.00)
Constant	217.98*** (17.28)	-761.53* (444.34)
Pseudo-log-likelihood	-18,794,861	-18,767,339
Number of observations (respondents)	1,270	1,270
including:	722	722
Number of uncensored observations	7	7
Number of right-censored observations	541	541
Number of interval-censored observations		

Notes: ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. For income definition, see footnote 7.

Table 3. Results of the random parameter logit model specifications in WTA space for Poland.

	Basic specification	Extended specification
Means		
Status quo	−154.86*** (22.99)	37.76 (23.99)
Entertainment	38.68*** (7.95)	39.14*** (8.35)
Drama	35.31*** (7.49)	36.19*** (8.14)
Children's	31.68*** (7.04)	34.07*** (7.80)
Experimental	0.35 (5.38)	2.94 (5.86)
Compensation (in 100 PLN)	0.96*** (0.32)	0.68*** (0.22)
Standard deviations		
Status quo	246.09*** (39.40)	247.71*** (39.64)
Entertainment	59.09*** (12.89)	63.16*** (16.90)
Drama	57.44*** (13.04)	60.40*** (16.47)
Children's	28.45*** (9.69)	40.02** (18.48)
Experimental	15.50 (10.35)	37.01** (16.19)
Compensation (in 100 PLN)	1.17*** (0.38)	69.39** (27.27)
Interactions of the mean for the status quo with socio-demographics		
Status quo × Man		29.28** (13.45)
Status quo × Age		−4.01*** (0.73)
Status quo × University degree		−21.98 (14.88)
Status quo × Annual household unadjusted income (PLN)		−0.00* (0.00)
Log-likelihood	−4,561.53	−4,502.61
Number of observations (n)	11,452	11,452
Number of respondents	2,863	2,863
AIC/n	0.80	0.79
BIC/n	0.81	0.80

Notes: Standard errors are given in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. For income definition, see footnote 7.

Benefit transfer results

This section reports and compares the reliability of the five benefit transfer approaches outlined in Section 4.1. The value of interest is WTP for maintaining current nationwide theater services. As both nominal and PPP-adjusted exchange rates are used, values are reported in original currencies (DKK and PLN), which form the basis for calculating TEs. The results are summarized in Table 4.

We first focus on unit value transfers based on the basic model specifications. The observed mean WTP equals 218 DKK in Denmark and 47 PLN in Poland. When transferring values from Poland to Denmark, the estimated WTP ranges from 79 to 333 DKK, depending on the value transfer approach used. Conversely, transferred values to Poland based on the Danish data range from 31 to 124 PLN. For both countries, the lowest TEs are obtained using PPP-adjusted value transfers, amounting to 20% for Denmark and 19% for Poland. Income-adjusted value transfers yield somewhat higher TEs (53% and 35%, respectively), while unadjusted value transfers perform worst, with TEs of 64% for Denmark and 163% for Poland.

We next analyze function transfers based on the extended model specifications. Two versions of the function transfer are considered: one using nominal exchange rates and the other using PPP-adjusted exchange rates. For Denmark, the observed average WTP equals 224 DKK. The transferred values are 112 DKK using nominal exchange rates and 211 DKK using PPP-adjusted exchange rates, corresponding to TEs of 50% and 6%, respectively. For Poland, the observed average WTP equals 49 PLN, while the transferred values are 71 PLN (nominal exchange rate) and 48 PLN (PPP-adjusted exchange rate), yielding TEs of 45% and 3%, respectively.

Table 4. Actual and transferred WTP values for maintaining the current state of the theater services in Denmark and Poland, and associated TEs.

	2018	2020	
	WTP value	WTP value	TE
Actual mean values			
Denmark – basic specification [DKK]	216.94 ^b	217.98 ^a	
Denmark – extended specification [DKK]	222.62 ^b	223.69 ^a	
Poland – basic specification [PLN]	47.21 ^a	46.82 ^b	
Poland – extended specification [PLN]	49.23 ^a	48.82 ^b	
Values transferred from Poland to Denmark [DKK]			
Simple unadjusted value transfer		78.54	63.97%
PPP-adjusted value transfer		173.50	20.41%
Income-adjusted value transfer		333.16	52.84%
Nominal-exchange-rate function transfer		112.36	49.77%
PPP-based function transfer		210.71	5.80%
Values transferred from Denmark to Poland [PLN]			
Simple unadjusted value transfer	124.09		162.82%
PPP-adjusted value transfer	56.05		18.71%
Income-adjusted value transfer	30.89		34.57%
Nominal-exchange-rate function transfer	71.34		44.91%
PPP-based function transfer	47.87		2.77%

Notes: Values marked with ^a are taken directly from the model specifications reported in Section 5.1. For Poland, these values are adjusted using a WTA/WTP ratio of 3.28, based on the estimate for “all goods” reported in the meta-analysis by Tunçel and Hammitt (2014). Values marked with ^b are the original values (a) adjusted for inflation between 2018 and 2020 using OECD data (1.0048 for Denmark and 0.9917 for Poland). Mean values for the extended specifications are calculated using average population statistics, reported in [Online Appendix A](#).

Overall, the function transfer approach based on PPP-adjusted exchange rates performs best. Our complementary analysis, reported in [Online Appendix Table B1](#), using the alternative WTA/WTP ratio of 3.93 from Tunçel and Hammitt (2014), leads to the same conclusion; however, the corresponding TEs are slightly higher—at 21% and 16%, respectively. This finding is consistent with the literature suggesting that PPP-adjusted exchange rates are preferable in international benefit transfer because they better account for differences in price levels (e.g., Ready and Navrud 2006).

Discussion and conclusion

This article examines whether international benefit transfer can provide reliable value estimates for performing arts while also addressing its conceptual foundations. Empirically, the results are encouraging. PPP-based function transfer yields the lowest TEs, ranging from approximately 3% to 21%. These magnitudes are consistent with previous benefit transfer studies in cultural economics, where TEs below 20% have been reported in selected cases (Fujiwara et al. 2018; Lawton et al. 2018; Mourato et al. 2014). The similarities between Denmark and Poland, as well as many other European countries, suggest that benefit transfer may be feasible at the European level.

TEs in the range of 3–21% indicate relatively good reliability of international benefit transfer, comparable to results in more established fields such as environmental economics. For example, Ready and Navrud (2006) report average international TEs of 20–40%, with some cases reaching 200%. This suggests that international benefit transfer for cultural goods may perform at least as well as transfers conducted in other domains.

Among the approaches considered, PPP-based function transfer performs best, consistent with evidence that more flexible methods often outperform simpler approaches

such as unadjusted unit value transfer (Johnston, Rolfe, and Zawojka 2018). However, the evidence remains mixed. As Johnston, Rolfe, and Zawojka (2018,) note, there is insufficient evidence to identify the conditions under which more sophisticated methods improve reliability. Indeed, previous studies in cultural economics often find, in contrast to our results, no clear advantage of function transfer over value transfer (Fujiwara et al. 2018; Lawton et al. 2018; Mourato et al. 2014; Tuan, Seenprachawong, and Navrud 2009). This points to an important avenue for future research.

There are several limitations of our benefit transfer study. Most notably, the Danish and Polish surveys rely on different elicitation methods (CV and a DCE), which matters for comparability of the results. However, the existing literature does not provide a consistent or empirically grounded basis for adjusting value estimates across these elicitation formats, as evidence on the direction and magnitude of potential differences remains inconclusive. In addition, the well-known discrepancies between WTP and WTA remain relevant in our analysis.

Despite these important differences between the two country-specific studies, the benefit transfer performs surprisingly well, with TEs at the lower end of those reported in other fields. Why might this be the case? These “surprisingly good” results raise important conceptual concerns. Several explanations are possible.

Beyond technical and methodological factors, the findings can be interpreted in light of the nature of non-market benefits in performing arts. For activity-based cultural goods, value is generated through participation and emerges *via* complex and often intangible processes, such as learning, identity formation, and social interaction. These processes are difficult to articulate in valuation scenarios and may not be fully understood by respondents. This suggests that SP responses may capture something different from the marginal welfare effects assumed in standard economic models. Rather than reflecting well-defined preferences over changes in cultural provision, responses may express broader orientations: support for cultural institutions, symbolic valuations, or a willingness to contribute to a perceived cultural commons. This interpretation aligns with the value-based approach to economics proposed by Klammer (2016), in which the “purpose” of an activity takes precedence over utility. Within this perspective, the notion of “willingness to contribute” replaces “willingness to pay” (Bille 2026). If so, benefit transfer may be less about transferring economic “values” and more about transferring socially shared attitudes or institutionalized expectations.

From this perspective, the apparent success of benefit transfer becomes ambiguous. Low transfer errors may indicate consistency across contexts, but this consistency could reflect similarities in cultural norms or civic attitudes rather than accurate measurement of economic value. Empirical coherence may therefore coexist with conceptual indeterminacy, highlighting the difficulty of separating technical performance from interpretive meaning.

The implications are twofold. On the one hand, benefit transfer remains a useful and pragmatic tool when primary valuation is not feasible. On the other hand, its application to performing arts requires caution: transferred estimates should not be interpreted as precise welfare measures, but rather as indicative signals combining economic, cultural, and social dimensions.

More broadly, this article contributes not only by testing the limits of benefit transfer, but also by raising a more fundamental question: whether tools developed primarily

in environmental economics are adequate for valuing activity-based cultural goods, or whether new conceptual and methodological approaches are needed. Addressing this issue is essential if cultural economics is to provide a meaningful basis for policy in contexts where value is created through participation, interaction, and shared meaning.

We conclude that substantially more research is needed to better understand the non-market values of activity-based cultural goods, such as theaters, as well as cultural goods more generally, before valuation methods can reliably inform policy. While benefit transfer appears to offer a low-cost solution, its effective application requires a deeper understanding of the value of cultural goods and their associated externalities. This need is particularly pressing in rapidly changing societies, where public support for traditional cultural institutions such as theaters cannot be taken for granted.

Notes

1. Unless otherwise stated (specifically in the empirical analysis), currency conversion is based on 2020 nominal exchange rates provided by the OECD: 0.1339 EUR/DKK and 0.2246 EUR/PLN (OECD 2022b).
2. See Bille Hansen (1997) for a discussion of the advantages and drawbacks of informing respondents about the amount of taxation paid for the public good under analysis. The provision of this information in the current survey is guided by insights from focus groups collected at an early stage of questionnaire development.
3. All passages from the questionnaires reported throughout the paper are translated into English from the original (local) languages.
4. The exclusion of the Royal Danish Theatre is discussed in detail in the “Survey comparison” section.
5. In the first phase of the data collection (before updating the design; only for 268 respondents), two additional cost levels were used: 2.5 PLN and 25 PLN.
6. The DCE concerning the performance reduction included eight choice tasks, all displayed in a randomized order. Half of them considered the change in the country as a whole (as presented in Figure 1), and the other half considered the change in a respondent’s province. We only use data from the former in this study.
7. The two datasets use different income definitions. In Denmark, income is equivalized annual household income per person using the OECD-modified scale (1 for first adult, 0.5 for additional adults, 0.3 for children; OECD 2022e). In Poland, income is unadjusted annual household disposable income. Since valuation models are estimated separately by country, each uses its own income measure. Accordingly, in the function transfer, we apply the income variable as defined in each country-specific model.
8. We use a custom code developed in Matlab and available at <https://github.com/czaj/DCE> under CC BY 4.0 license.
9. The model does not distinguish between the 25% and 50% reductions, as analyses of alternative model specifications has revealed no statistically significant differences in respondents’ WTA values between these two reduction levels.
10. For comparability across the two countries, the converted values are calculated in 2020 EUR, by accounting for the value change from 2018 to 2020 based on Producer Price Indices (OECD 2022d) equal to 0.9917 PLN.

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Authors' contributions statement

All authors contributed substantially to the conception, design, execution, and writing of the article. TB developed and implemented the Danish survey, participated in defining the research questions, structuring the article, and writing the introduction, theory section, literature review, and conclusion. AB led the construction of the econometric models, data analysis, and preparation of the Danish data for benefit transfer. AW contributed primarily to the preparation of the original draft by coordinating the research, conducting the literature review, developing the comparative framework from a cultural economics perspective, and co-developing the Polish survey. EZ led the theoretical and methodological development of the benefit transfer framework, guided the econometric approach and analysis of the Polish data, implemented the benefit transfer throughout the study, co-developed the Polish survey, and the interpretation of the results.

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