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RELIABILITY OF INTERNATIONAL BENEFIT TRANSFER IN CULTURAL ECONOMICS: NON-MARKET VALUATION OF THEATER IN DENMARK AND POLAND

ALEKSANDRA WIŚNIEWSKA

EWA ZAWOJSKA

ANDREA BALDIN

TRINE BILLE

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Reliability of international benefit transfer in cultural economics: Non-market valuation of theater in Denmark and Poland

Aleksandra Wiśniewska^{a,}, Ewa Zawajska^a, Andrea Baldin^{b,c}, Trine Bille^c*

^a *University of Warsaw, Faculty of Economic Sciences*

^b *Ca' Foscari University of Venice*

^c *Copenhagen Business School*

Corresponding author: awisniewska@wne.uw.edu.pl

Abstract: Cultural goods provide numerous non-market benefits to society. Estimates of the benefits are needed for benefit-cost analyses, helping to inform cultural policy decisions and aiming at the efficient allocation of public funds. The non-market benefits cannot be assessed through market transactions. While original non-market valuation studies require substantial budgets and time, a benefit transfer approach offers an alternative. It enables the application of empirical estimates from existing original studies conducted at one site to approximate the value at another site. This study provides the first international benefit transfer for performing arts and examines the reliability of various benefit transfer approaches. We use empirical data from two separate stated preference valuation surveys conducted in Denmark and in Poland. Our results suggest that the benefit function transfer accounting for differences in purchasing power parity between the countries can generate transfer errors as low as 3-6%, indicating high reliability of the transferred values.

Keywords: international benefit transfer, performing arts, contingent valuation, discrete choice experiment, transfer errors

JEL codes: Z11, Z18, D61, H40

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1. Introduction

Many cultural goods, such as heritage sites and services offered by cultural institutions, have public-good characteristics and generate substantial positive externalities to society (Frey and Pommerehne, 1989; Throsby, 2001; Snowball, 2008). These potentially justify public subsidy of the cultural sector operating in various countries. To help efficient allocation of public funds, and to plan public policies for the improvement of social welfare, benefit-cost analyses may be applied (OECD, 2006; Treasury, 2018). While costs of policies aimed at provision of cultural goods are relatively easy to calculate, measuring the value of the benefits these goods provide to society is more problematic. Many of the benefits are of a non-market character, as no market transactions are undertaken that could put a value on, for example, the existence of heritage sites or the social educational impact of theater performances. The use of market prices to approximate the value of cultural goods is therefore limited.

Performing arts, including theater productions, are one of the cultural sectors most often supported by governments in many countries (Towse, 2010). It is claimed that the provision of theater performances can, for example, raise levels of education, enhance creativity, and promote critical discourse and cultural identity (Throsby, 1990). Hence, performing arts are perceived as a quasi-public good with a high degree of direct, private benefits to users, resulting from these users' experience (the use value), and a substantial degree of indirect societal benefit (the non-use value) in the form of, for instance, education, bequest, and prestige (Bille Hansen, 1997).

Stated preference methods are non-market valuation methods that allow for the estimation both of use and of non-use values (Bishop et al., 2017; Johnston et al., 2017). These methods rely on large survey studies, in which respondents make statements expressing their preferences towards a considered good or policy (see Noonan, 2003, for an overview of the use of this technique in cultural economics). Original stated preference studies require extensive effort in the preparation and implementation of surveys, and considerable research funds, which places time and financial constraints on valuation inquiries. In the light of these challenges, a benefit transfer method seems an attractive alternative (Rolfe et al., 2015). Benefit transfer enables the application of empirical value estimates from existing studies conducted at a study site(s) in order to approximate the value at another, usually unstudied, site (a policy site) (Johnston and Rosenberger, 2010).

Since constraints related to funding, time, and data availability are common within public management and policy evaluations, benefit transfer is often the only feasible approach for non-market valuation. Benefit transfer has been in frequent use for large-scale benefit-cost analyses in the US, EU, and elsewhere (e.g. Hanley et al., 2006; Brouwer and Navrud, 2015; Loomis, 2015; Rolfe, Bennett and Kerr, 2015)—although, to the best of our knowledge, it has barely been applied in the cultural domain. The literature provides few examples of studies employing benefit transfer for cultural goods, and these applications are predominantly in the context of cultural heritage. As far as we are aware, there are no published reports on the implementation of benefit transfer to performing arts,¹ and no international benefit transfer for performing arts has ever been undertaken.

Our primary research objective is to examine whether an international benefit transfer can be applied in the field of cultural economics, particularly for performing arts, to obtain reliable value estimates. In order to assess the performance of the benefit transfer, we examine the transfer's reliability, using the standard measure of a percentage transfer error (TE) (Rosenberger and Stanley, 2006). TEs capture relative differences between the transferred value estimates and the actual values as estimated at a policy site. Given the various approaches to conducting benefit transfer, as developed in other areas of the literature (Czajkowski et al., 2017), we examine several typical approaches, which include value and function transfers, and transfers that are unadjusted and adjusted for differences in income or purchasing power parity (PPP). This allows us to identify the most reliable approaches for our application to performing arts.

Our empirical investigation relies on two large databases containing stated preference data on the value of theater services—one for Denmark and the other for Poland. The two stated preference studies share many similar characteristics, which provides us with a unique opportunity for assessing the reliability of international benefit transfers. Both stated preference surveys were conducted within a similar timeframe (between 2018 and 2020) and allow for the estimation of the value of the respective country-wide theater services. The theater services and theater funding systems in the two countries studied display a range of similarities.

We believe that our study contributes to the existing literature by addressing substantial research gaps. These include: (1) a paucity of non-market valuation studies for cultural goods, such as

¹ To our knowledge, the only example of benefit transfer applied to performing arts is a conference paper by Zawajska et al. (2022).

performing arts, despite a clear need for the value estimates (e.g., for optimally allocating public funds to cultural goods); (2) hardly any applications of benefit transfer in this field despite its significant usefulness and common application in other areas (e.g., Johnston, Rolfe and Zawojka, 2018); and (3) an unexplored question of the social value of performing arts.

The paper is structured as follows: the next section contains a literature review of non-market valuation studies of cultural goods, and we present the few existing studies applying the benefit transfer approach to cultural goods; section 3 describes our empirical study context as well as the data, including surveys and samples; section 4 presents our methodological approach, discussing benefit transfer and econometric models; section 5 reports the results; and section 6 concludes the paper.

2. Literature review: Non-market valuation of cultural goods

2.1. Original valuation studies of cultural goods

The methodology of non-market valuation, particularly well established in other areas of literature such as environmental economics and transportation, has already been applied many times since the 1980s in the context of valuation of culture, evidencing its usefulness and suitability. Nevertheless, this area of application of non-market valuation methods is still meager in comparison with other fields in which the methods are employed (Carson, 2011).

The majority of valuation studies within cultural economics use stated preference methods, particularly contingent valuation, with a few recent applications of discrete choice experiments (e.g., Choi et al., 2010). At the beginning of the 20th century, Noonan (2002, 2003) identified nearly 140 reports that employed stated preference methods to elicit values of cultural assets, typically in the context of cultural heritage. The other group of non-market valuation methods comprises revealed preferences, although these have been applied to a lesser extent (e.g., Martin, 1994; Forrest et al. 2000; Boxall et al., 2003; Bedate et al., 2004; Poor and Smith, 2004; Armbrrecht, 2014; Melstrom, 2015). While cultural heritage has long been at the center of non-market valuation in the cultural field, current literature covers a far more diverse set of cultural assets. For example, Bakhshi et al. (2015) offer a detailed review of more than twenty valuation studies of museums and art galleries. In cultural economics, a long-standing approach to non-market valuation assumes valuation of the maintenance of a current state (and associated government expenses) in a general cultural area such as all the historic sites in a country or all

the performing arts services in a region (“whatever those funds produce” as Noonan, 2003, notes).

Performing arts, including theater services, have only been the subject of non-market valuation inquiries to some small extent. Morrison and West (1986) examine whether the current level of public support for performing arts in Ontario, Canada, is consistent with the preferences of local residents. They find that many of the residents are in favor of paying taxes to finance theaters that they do not use, suggesting a substantial non-use value. According to Bille Hansen (1997), the overwhelming share of benefits from continuing the activities of the Royal Danish Theater in Copenhagen at their current level comprises the non-use value derived from the preferences of non-visitors. These studies point to the importance of the non-use value in the total value of performing arts, as recently confirmed by Wiśniewska and Zawojka (2019) in a study of theaters in Poland. This may explain the general social agreement on financing performing arts from public funds despite the strongly elite character of audiences attending the performances.

2.2. Valuation of cultural goods with benefit transfer

The literature review points to a very limited use of the benefit transfer method for valuation of cultural assets. To the best of our knowledge, there are only six published benefit transfer studies in the field of cultural economics.

The more estimates available from study sites, the more precise the transfers to policy sites. Limited original valuation studies translate into unsatisfactory first attempts at conducting benefit transfer in cultural economics, and lead to doubts about applicability. eftec (2005) estimates the value of maintenance or improvement of the policy sites (unmovable cultural heritage in the UK), choosing a study site from a collection of thirty-three existing non-market valuation studies. In three out of the six value transfer attempts, “the current coverage of valuation literature does not make it possible” (eftec, 2005, p. 77). Tuan et al. (2009) exemplify the intercountry transfer of economic values of cultural heritage involving preservation and restoration of historic temples in central Thailand and Vietnam that are at risk of deterioration. The smallest TEs (46% to 129%) are obtained for the unadjusted value transfer, while the PPP-adjusted value transfer and function transfer perform far more weakly, leaving authors dissatisfied with the reliability of their results.

Ulibarri and Ulibarri (2010) infer the economic value of Petroglyph National Monument in the US by transferring estimates from three different study sites. However, their paper focuses on

cost-benefit analysis. Having no original valuation study at the policy site carried out with benefit transfer, the opportunity to draw conclusions about the applicability of the method is here limited.

Recent reports include the authors' own original valuation in order to provide evidence for reliability of the benefit transfer method within a cultural context. This endeavour was supported by public authorities (European Commission, and UK public bodies in particular), presumably in recognition of the advantage in employing a less resource-consuming valuation technique, advising research-based cultural policies. Mourato et al. (2014) provide an extensive exercise in transferring values of preserving built heritage interiors against climate change damages in five European countries. The authors undertake the original valuation of visitors' benefits derived from increased conservation of ten chosen non-iconic sites, as well as the general population's willingness to pay for increased conservation across *all* the country's built heritage interiors. Many of the single site value transfers are reliable, with TEs even as low as 2% to 5%. However, the diversity of results for single site value transfers renders any generalization challenging. The results of transferring values of *all* the country's built heritage interiors offer more consistent conclusions. For the majority of such transfers, TEs vary within a 13% to 53% range. Simple unit-value transfer approach performs better than the income-adjusted value transfer and the function transfer.

Two recent reports, one on benefit transfer for British museums (Fujiwara et al., 2018) and one on historic cities and their cathedrals (Lawton et al., 2018), examine the value of maintaining the current state of cultural services. Willingness-to-pay estimates are largely similar when calculated for cathedrals individually and for cathedrals in the cities as a whole, suggesting limited responsiveness of the value to the scope. The authors use the average value estimates from multiple study sites to estimate the value at a policy site. All benefit transfers reported result in TEs below the 40% threshold suggested for reliability in the literature (Morrison and Bergland, 2006). Since all benefit transfer techniques perform equally well, the authors recommend the use of the simplest approach: the unit-value transfer. For this approach, TEs range from 6.6% for transferring use values (derived from preferences of users) across four historic cities to 32.8% for transferring non-use values (based on preferences of non-users) across four museums.

Although recent research results are promising, only cultural heritage-related case studies are included. The reliability of transferring values across sites within a country and internationally

is corroborated by low TEs. Methodologically, the simple unit-value transfer approach is often recommended, as it is easy to apply and provides estimates of comparable or better reliability than other approaches. Authors conclude that, in order to achieve a valid and reliable benefit transfer, it is important to carefully ensure that chosen sites exhibit comparable features, focusing on what can be called an average museum, an average manor, and so forth, to avoid uniqueness of individual cultural phenomena and to ensure the necessary similarities across study and policy sites.

3. Empirical case study and data

3.1. Empirical study context: Theater sectors in Denmark and Poland

Theater systems in Denmark and Poland share a number of key features. This is fundamental for our study, as the literature generally agrees that reliable benefit transfers require similarity across study and policy sites (Johnston and Rosenberger, 2010).

Both theater landscapes are highly subsidized from public funds and are dominated by publicly supported venues. The publicly subsidized venues in both countries are very diverse, ranging from large national theaters through major regional stages to small-scale theaters. Leaving the Royal Danish Theater aside, given its special status in receiving 35% of the total government expenditure on performing arts, there are 189 publicly supported theater groups and theaters in Denmark, attracting approximately 1.9 million visitors a year. In Poland, there are more than 120 publicly supported theaters, constituting the core of the Polish theater sector and accommodating more than 90% of all theatergoers (*Theater in Poland 2021. Documentation of the season 2019/2020*, 2021).

Both countries are slightly above the EU-27 average percentage of total government budget expenditure on the cultural sector: in 2018-2020, an average of 1.15% in Denmark and 1.65% in Poland (EUROSTAT, 2022). In Denmark and Poland, 8-9% of the respective total government expenditures on culture goes to performing arts, with most of this funding granted to public theaters (*Statistics Denmark*, 2022; *Statistics Poland*, 2022a). Publicly supported theaters, both in Denmark and Poland, are partially financed by their own revenues (mainly from ticket sales and private sponsors). However, public subsidies from the state and local governments are essential for operation of the theaters, comprising over 80% of their budgets.

The social and economic contexts for the theater sector are obviously different across the two countries. GDP corrected for the PPP differences is 1.5 times higher in Denmark than in Poland (OECD, 2022a). This may contribute to a difference in government expenditure on theaters per resident; in 2020, this was 18.75 EUR in Denmark (excluding the Royal Danish Theater) and 7.19 EUR in Poland (*Statistics Poland, 2022a; Statistics Poland, 2022b*).² Another important difference lies in theater attendance rates, which, in 2020, were equal to 327 per 1,000 residents in Denmark and 124 per 1,000 residents in Poland. These and other differences may affect the reliability of the considered international benefit transfer between the two countries. Nevertheless, as there is no defined set of criteria for assessing similarities across sites for the purpose of benefit transfer (e.g., Johnston and Rosenberger, 2010), we believe that the substantial similarities observed across theater systems in the two countries may suffice for undertaking a transfer of high reliability.

3.2. Design and implementation of country-specific surveys

Our research is based on data collected within two separate but similar stated preference surveys: one conducted in 2020 in Denmark and the other in 2018 in Poland. In the following, we present the surveys undertaken in Denmark and Poland, discuss their similarities and differences, and summarize the samples.

Survey in Denmark

The survey in Denmark employs a contingent valuation approach to elicit preferences of the Danish population towards public support for theaters in the country. The first part of the survey asks about the respondents' engagement with different types of performing arts: theater, dance/ballet, opera, musicals, stand-up/cabaret shows. Respondents are then questioned about their frequency of theater attendance, their expenditure on performing art shows, and their level of agreement with statements about the role of theaters as a public good.

The second part of the survey starts with a short description of the theater landscape in Denmark and information about the level of public support, particularly annual public subsidies for

² Unless otherwise stated (specifically, in the empirical analysis), the currency conversion is based on the 2020 nominal exchange rates as provided by the OECD: 0.1339 EUR/DKK and 0.2246 EUR/PLN (OECD, 2022b).

theaters per average taxpayer.³ Thereafter, respondents are asked if they approve of paying taxes to support theaters, and motivations for this answer are elicited.

The willingness-to-pay (WTP) question is only asked of those who agree with the payment of taxes to support theater activities. 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?”⁴ The WTP question does not involve any program change, but is intended to infer the value of the status quo to respondents (the value of the current theater landscape in Denmark as described earlier and with the exclusion of the Royal Danish Theater).⁵ The response format of the WTP question is randomized: half of the sample answers an open-ended question and the other half receives a payment card with eleven response options, ranging from “0” to “More than 3000” DKK. The WTP question is preceded by a reminder of the budget constraint, following best-practice guidance (Johnston et al., 2017).

The survey data is linked to official register data from Statistics Denmark (micro-level data), which provides a range of socio-demographic information for each respondent. For those sample characteristics that diverge from their general population counterparts, Statistics Denmark provides weights allowing the study sample to be representative of the general population.

Survey in Poland

The Polish survey is organized in a way very similar to the Danish survey. The first part asks respondents about the relative importance for them of different cultural institutions and about the frequency and location of their theater visits. Next, the survey questions respondents about their perception of various benefits that theaters provide to individuals and society as a whole, and their support or disapproval of public subsidies paid to theaters. Like earlier studies on theater in the capital city of Poland (Wiśniewska, 2019; Wiśniewska and Czajkowski, 2019), the survey uses the division of theater performances into four repertoire types: entertainment, drama, children’s, and experimental performances.

³ See Bille Hansen (1997) for a discussion of 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 the early stage of testing the questionnaire.

⁴ All passages from the questionnaires throughout the paper are translated into English from the original languages; both surveys are conducted in their local languages.

⁵ The exclusion of the Royal Danish Theater is discussed in detail in the “Survey comparison” section.

The central part of the survey is a discrete choice experiment, in which respondents state their preferences towards programs of reduction of the theater services in Poland. This survey starts with a description of the current state of the Polish theater sector and the subsidies it receives. Hypothetical policy programs to reduce the theater services are then outlined: “A 25% or 50% decrease in the theater services is currently under consideration. If introduced, there would be fewer performances and new productions. For example, if the services were decreased by 50%, every theater would on average stage 3 fewer performances per week and 1 less new production per season than is the case today. The change would not affect ticket prices. [...] A decrease in the theater services would mean a decrease in subsidies for theaters. This would allow for a reduction in taxation, and your annual expenditure would therefore be reduced.” So, the theater services might be reduced by one of two amounts—25% or 50%—or stay unchanged, and this might apply to all four types of theater performance or only to selected types.

In the discrete choice experiment, a respondent chooses between two alternatives: a status quo option, related to no changes in the subsidies and associated taxes; a policy scenario of reduced theater services, resulting in reductions in subsidies and taxes. In the discrete choice experiment tasks, a respondent needs to make trade-offs between a reduced theater services and a tax decrease (compensation for the offer reduction), which help us derive values of the policy to the audience. Possible levels of cost reduction in the choice tasks are 5, 10, 20, and 50 PLN.⁶ Consequently, the value measure obtained from the survey is a willingness to accept (WTA). Figure 1 presents an example discrete choice experiment task. Each respondent reacts to four such tasks, with each task presenting a different policy scenario.⁷

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

	Alternative A	Alternative B
Theater services in the whole of  Poland	Status quo	
 Entertainment performances	No change	No change
 Drama performances	No change	Reduced by 25%

⁶ Additional levels of cost reduction, equal to 2.5 and 25 PLN, used in an early stage of the data collection (268 respondents) were later removed due to design efficiency considerations in the discrete choice experiment.

⁷ The series of discrete choice experiment questions consists of eight choice tasks, which are presented in a randomized order: four consider a theater services change at the national level (as presented in Figure 1), and these tasks provide data for this study; the other four tasks consider change at a regional level.

 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

Many tools to enhance incentive compatibility and consequentiality of the survey are included (Carson and Groves, 2007). Following the discrete choice experiment, several questions are aimed at measuring respondents' perceptions about the survey incentive compatibility and consequentiality. The survey concludes with questions about socio-demographics.

The experiment design (the combination of theater services reduction levels across different performance types shown in choice tasks) is selected to optimize D-efficiency of a multinomial logit model (Ferrini and Scarpa, 2007; Scarpa and Rose, 2008), with priors derived from a pilot study. The order of discrete choice experiment tasks and the order of performance types are randomized across respondents, so as to limit any ordering effects.

Survey comparison

A comparison of the two surveys in terms of essential characteristics of the evaluated good and dimensions of the preference elicitation is provided in Table 1. The two surveys have many similarities, including the nationwide sampling that helps to involve users and non-users of theaters in the study. Both surveys use the payment vehicle of annual taxation, and the theater funding mechanism of subsidy.

Most importantly, the policy scenarios in the surveys concern all publicly supported theaters in a given country. By examining performances offered by publicly supported venues throughout each country, a network that allows everyone access to the services in the nearby city and to close substitutes at a relatively modest distance, we aim to reduce a potential impact of differences in measurable attributes of the valued good and its users, this being one of the challenges for international benefit transfer (Ready and Navrud, 2006). Although each theater is specific, theaters as a sector present a relatively homogenous set of services to societies. Conducting the study on a national level (evaluating the services of all theaters in a given country), we avoid a constraint for international benefit transfer, this being the specificity of singular venues, on two dimensions—uniqueness of site and local characteristics of populations—and we rely on the same (national) extent of the market.

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

Criterion	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
Country-wide funding mechanism for maintaining the theater services	Subsidies from the public budget	Subsidies from the public budget
Preference elicitation format	Contingent valuation (one of the formats randomly selected: an open-ended question or a 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 via taxes?”	A binary choice between (i) the current state of the theater services in Poland related to no change in taxes, and (ii) a possible reduction in the theater services by 25% or 50% in all or selected types of performances related to a reduction in annual taxes per person
Payment vehicle in the preference elicitation question	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

Turning now to differences, the surveys employ different preference elicitation formats. In Denmark, respondents are asked about the theater sector as a whole in the contingent valuation question; in Poland, respondents' preferences towards separate theater types are elicited in the discrete choice experiment. The surveys also differ in measures of value: the Danish survey elicits WTP (cost) for the maintenance of the current state of the theater services; the Polish survey elicits WTA (compensation) for a possible reduction of the theater services.

These variations require a clarification of the good evaluated in our benefit transfer study and of the approach to examining transfer reliability when different value measures—WTP and WTA—are used. As regards the former, one of the options in the discrete choice experiment in Poland is the status quo: no change in the current state of the theater services. The estimate of the WTA value for this alternative provides us with information on the value of *not* reducing the theater services—in other words, it is the value of maintaining the current state, which is exactly what the Danish respondents are asked about. Consequently, for the data for Poland, we focus on estimates of the status quo option. We define the good for which we undertake the benefit transfer as the maintenance of the current state of the theater services in a country.

Concerning the latter (different measures of value), the challenge here is that WTP and WTA measures lead to differences in value estimates (e.g., Horowitz and McConnell, 2002). As we expect the difference across the measures to be present in our study, in the empirical analysis we account for this via scaling the WTA results by the WTP/WTA ratio, as identified by Tuncel and Hammitt (2014) in the most recent meta-analysis study on WTP/WTA disparity. Based on 337 observations from 76 empirical studies, they calculate the mean WTP/WTA ratio to be equal to 3.28.

The two surveys also take slightly different approaches to inclusion of national theaters. The Royal Danish Theater receives a lion's share (35%) of public theater subsidies. As it may have a huge impact on stated preferences, respondents are explicitly asked to disregard the Royal Theater when stating their WTP for publicly supported Danish theaters. The intention is to obtain the value of the theater landscape as a whole, rather than this value being distorted by one theater with an exceptional status. In a similar vein, the Polish survey does not direct respondents' attention towards the three national theaters, but asks about the theater services in general. When explaining various theater performance types, no example refers to the national theaters. We conduct an additional analysis to find out if the Polish national theaters drive the value estimates significantly. Firstly, only 6% of the Polish respondents mention the national

theaters among theaters visited within the last year. Secondly, less than 1% of the respondents indicate the national theaters when asked whether, and where, they have ever seen a specific type of performance (entertainment, drama, children's, or experimental). Finally, we estimate an additional model specification, in which all preference parameters are interacted with a zero-one-coded variable controlling for respondents who visited one of the national theaters within the last year. The variable has no significant statistical impact on the estimates, which further confirms that a possible consideration of the national theaters is irrelevant to the value estimates in the case of the data for Poland. We therefore maintain that estimates both for Denmark and for Poland are not substantially affected by considerations of the national theaters, which hold special status in their respective countries.

Survey administration and study samples

The surveys were administered online to nationwide samples from Denmark and Poland. The Danish survey was conducted in May-June 2020 on a random sample of the adult population. It was distributed by Statistics Denmark via e-Boks, which is an established Danish digital post office for providing Danes with digital mails from the private sector and public authorities.⁸ To encourage participation in the survey, respondents were informed that they would be entered in a lottery with the chance of winning 10,000 DKK. In total, 4,450 individuals received the questionnaire and 1,270 of these completed the survey. The Polish survey was distributed among the adult population May-December 2018 by a professional pooling agency. In total, 2,863 completed questionnaires were collected.

Although the two surveys were undertaken just two years apart, the world underwent major changes during the interim period. The survey in Denmark was administered shortly after outbreak of the Covid-19 pandemic. To account for this situation, the Danish survey clearly encouraged respondents to answer the preference elicitation question by considering typical conditions rather than pandemic conditions. Despite this contingency measure, we cannot exclude the possibility of impact from the pandemic on our results.

We aim to obtain value estimates of maintaining the current state of the theater services for the populations of the two countries. Hence, we study whether the survey samples are representative of their respective general adult populations. We control for any divergences by weighting the observations in the preference modeling. In the Appendix, we present in detail

⁸ Except for elderly residents, who can apply for an exemption, every adult Danish resident has to have access to the electronic mailbox.

the characteristics for Danish and Polish samples and populations as well as the results of the representativeness tests. We also discuss how the weights for the models are obtained.

4. Methods

4.1. Benefit transfer approaches and transfer error

The current state-of-the-art practices in benefit transfer have primarily developed in areas beyond cultural economics; particularly in environmental economics, where benefit transfer has the longest history of application. The “Benefit Transfer of Environmental and Resource Values” (Johnston et al., 2015) handbook is among the most recent and comprehensive guides for this non-market valuation technique. Although largely developed for environmental economics, similar techniques may be used for non-market valuation in other areas, including cultural economics.

The most common, broad types of benefit transfer are value transfer and function transfer (Navrud and Ready, 2007; Johnston and Rosenberger, 2010). A value transfer involves direct application of an estimated value or values from a study site(s) to a policy site. The values can be transferred ‘as is’ (an unadjusted transfer) or they can be adjusted in various ways (e.g., by accounting for differences in income or purchasing power parity). In turn, in a function transfer approach, a function estimated based on available empirical data (e.g., data for the study site) is applied to calculate the value at the policy site. The functions can be derived from various data sources, such as an individual study or a meta-analysis synthesizing results from multiple earlier studies.

The transfers conducted in this paper include: (1) a simple, unadjusted value transfer, (2) a value transfer adjusted by income differences, (3) a value transfer adjusted by differences in PPP, (4) a function transfer relying on nominal exchange rates, and (5) a function transfer relying on PPP-adjusted exchange rates (both these function transfer approaches are based on country-specific functions). The considered transfer adjustments and functions help overcome restrictive assumptions of the unadjusted value transfer. Study and policy sites may differ considerably, particularly in an international benefit transfer, and the adjusted approaches and functions allow for accounting for these differences.

A typical value transfer adjusted by mean *income* levels in *study* and *policy* sites assumes a constant level of income *elasticity* of demand for a certain good. This can be represented with the following equation:

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

The use of this transfer approach requires making an assumption on the level of income elasticity. In an overview of econometric studies published since 1966 on demand for performing arts, Seaman (2006) observes a large variation in the results on income elasticity, ranging from insignificant and even negative levels to levels substantially above one. Evidence on income elasticity estimates from more recent studies also displays great variety, with some finding the elasticity to be substantially less than one (e.g., Castiglione and Infante, 2016) and others reporting it to be approximately equal to one (e.g., Zieba, 2009, for disposable income). Literature from other fields, such as environmental economics and health economics, suggests that setting income elasticity equal to one performs well in adjusted value transfers between populations that differ considerably in income levels (e.g., Barton, 2002; Czajkowski and Ščasný, 2010; Lindhjem and Navrud, 2015). We follow the latter approach.

The PPP-adjusted value transfer helps take into account differences in price levels between the original study and policy sites. PPPs are currency conversion (exchange) rates aimed at equalizing the purchasing power across different countries. A PPP-adjusted exchange rate expresses the amount of one-country currency that would allow for acquiring the same amount of market goods as one unit of another-country currency. PPPs are viewed as more suitable for international benefit transfers than market-based (nominal) exchange rates since they facilitate comparisons between countries with different market prices (Ready and Navrud, 2006; Czajkowski et al., 2017). In our empirical analysis, we use OECD (2022c) data on PPP for the PPP-adjusted value transfer.

For a function transfer, we first estimate a country-specific function, explaining how the value changes with changes in explanatory variables, and then the estimates of the function coefficients are used to predict the value at the policy site. The calculation involves inserting policy-site population means for the respective explanatory variables. The inclusion of the explanatory variables helps control for differences between the policy and study sites. In our study, the considered explanatory variables are typical socio-demographic characteristics (age, gender, education, and income). While a common burden for conducting a function transfer is

the need for data on policy-site population means of the characteristics included in the explanatory variables, the data for standard socio-demographics is made publicly available by national statistical offices. One potential challenge of this approach is its assumption that the functional forms (e.g., the relationships between the value and the explanatory variables) are transferable between the sites, which may not necessarily be the case.

To assess the reliability of the benefit transfer conducted with the approaches discussed above, a common measure is transfer error (Ready and Navrud, 2006). It helps evaluate how close the transferred value is to the actually observed value. A standard measure of TE is the absolute value percent transfer error (Rosenberger and Stanley, 2006), which can be expressed as follows:

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

4.2. Econometric approaches for calculating value estimates

The survey studies for Denmark and Poland employ different formats of preference elicitation, and consequently, different approaches for estimating country-specific values of maintaining the theater services are required. We rely on standard modeling approaches. The stated preference data for Denmark is modeled with the use of an interval regression, while the data for Poland is modeled with a random-parameter (mixed) logit approach.

Econometric model for the Danish data

In the Danish survey, the WTP for maintaining the current theater services is elicited by using one of two formats: an open-ended question leading to continuous WTP data, or a payment card resulting in right-censored and interval-censored WTP data. The WTP is observed directly only for those individuals who receive the open-ended WTP question and for those who select “0” DKK in the payment card. In all the other cases, we have $c_l < WTP < c_u$, where c_l and c_u denote, respectively, the lower and upper bound of the selected interval in the payment card. If a respondent chooses the option “More than 3000” DKK, we have $c_l = 3000$ and $c_u = +\infty$.

Based on the data, we estimate an interval regression model, which can be thought of as a generalization of a censored regression. We assume a linear functional form of WTP, so that:

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

where x is a vector of explanatory variables, α and β are coefficients to be estimated, and ε is a normally distributed error term with a mean of zero and a variance of σ^2 . The interval regression model allows for the same interpretation of the parameters as in the case of a standard OLS model, and the log-likelihood function can incorporate both point values and the intervals defined above (Vossler and Zawojka, 2020).

We estimate two specifications of the model. The first includes only a constant, which provides the average WTP for the Danish sample and is used in the value transfer. The second specification also includes socio-demographics variables, which provide estimates for the function transfer.

Econometric model for the Polish data

Modeling of preferences disclosed by respondents in discrete choice experiment tasks is grounded in a random utility framework (McFadden, 1974). According to this framework, the utility of individual i from policy scenario p , $U_{ip}(\cdot)$, is a function of (1) observed characteristics of the policy—captured in the non-monetary attributes used in the choice tasks, X_{ip} , and the monetary attribute, C_{ip} —and (2) unobserved idiosyncrasies expressed as an unobservable error term, ε_{ip} . Formally, the utility function can be represented 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's marginal utilities from the non-monetary attributes and the monetary attribute, respectively. The parameters are allowed to vary over individuals according to a predefined multivariate distribution (Train, 2009), as indicated by indexing the parameters over i . This accounts for heterogeneity of preferences across individuals, resulting in the random-parameter (also called mixed) logit specification.

We estimate the model in WTA space to ease the interpretation—the preference parameters can then be readily interpreted 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 β_i denotes a

vector of underlying marginal utilities associated with these attributes. We further assume error term ε_{ip} to follow an i.i.d. type I extreme value distribution with constant variance equal to $\pi^2 / 6$ (Scarpa et al., 2008; Train and Weeks, 2005). A marginal WTA value (an implicit price) for a change in a given non-monetary attribute can be calculated as a ratio of the coefficient on the attribute and the monetary coefficient: $\omega_i = \beta_i / \alpha_i = \lambda_i / \gamma_i$. Specification (4), defined in preference space, can be reformulated into a behaviorally equivalent specification, but in WTA space:

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

The WTA parameters in ω_i are allowed to vary across individuals according to a predefined distribution. In our empirical application, we assume ω_i elements to be normally distributed. We define $\alpha_i = e^{\nu_i}$, with ν_i being an underlying latent normal factor that defines the lognormal distribution of the monetary coefficient. This assumption reflects a standard practice in discrete choice models to ensure a positive marginal utility of income.

In our application, vector \mathbf{X}_{ip} of the non-monetary attributes also includes a constant for the status quo, equal to one for the status quo option and zero otherwise, in order to measure the marginal utility and the associated WTA for maintaining the current state. In addition, for the function transfer approach, another specification of the model is estimated, in which the status-quo constant is interacted with the socio-demographic variables in order to observe how the WTA for maintaining the current state varies in the observed characteristics of individuals. Both specifications of the random-parameter model are estimated using the simulated maximum likelihood method with 4,000 Sobol draws.

5. Results

For our examination of the performance of the international benefit transfer when applied to performing arts, we conduct the transfers between Denmark and Poland. Specifically, the value of the current state of theater services calculated for Denmark based on the Danish data is transferred to estimate the value of the current state of theater services in Poland, and vice versa—the value estimated for Poland based on the Polish data is transferred to obtain the value

in Denmark. Hereafter, when referring to a value of theater services, we are referring to the value of their current state (status quo). We assess the reliability of the transferred value estimates based on transfer errors.

To begin with, we report the value estimates as calculated separately for Denmark and Poland based on each country's own data. For each country, we present results of two model specifications: a basic one without socio-demographic characteristics and an extended one with these characteristics. Next, these two specifications are used in the benefit transfer: the basic one is employed for value transfers and the extended one is employed for function transfers.

5.1. Country-specific models of the theater services value

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

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

	Basic specification	Extended specification
	Coefficients	Coefficients
Male		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) including:	1,270	1,270
Number of uncensored observations	722	722
Number of right-censored observations	7	7
Number of interval-censored observations	541	541

Notes: Standard errors are given in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

The basic specification indicates that the average WTP for maintaining the theater services in Denmark at the current level is equal to 29 EUR (218 DKK). The results of the specification extended with the socio-demographic variables show that the WTP is affected positively by a university degree and income, while the influence of age and gender is not statistically significant. This is in line with the profile of a consumer of high culture as depicted in the literature (Seaman, 2006; McKenzie and Shin, 2020), which characterizes theater audiences as generally having higher levels of income and education than individuals who do not attend theater performances.

The results of the random-parameter logit model specifications calculated on the Polish data are presented in Table 3. The variables for the non-monetary (theater) attributes enter the model as binary variables taking a value of one for a reduction in a respective theater performance category and zero otherwise.⁹ The coefficients of the means of the non-monetary attributes can be interpreted directly as monetary amounts per annum in PLN, as they are estimated in the WTA space.

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 (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 (100 PLN)	1.17*** (0.38)	69.39** (27.27)

⁹ The model does not distinguish between the reduction by 25% and 50%, as analysis of other model specifications has revealed that respondents do not have different WTA values for these two reduction levels.

Interactions of the mean for the status quo with socio-demographics

Status quo*Male		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)
<hr/>		
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. All WTA parameters are modeled as random and normally distributed. The compensation parameter is assumed to follow a lognormal distribution, and the estimates of the underlying, preference-space equivalent, normal distribution are provided. For respondents who decline to answer the income question, the mean sample income is used.

The estimates of the basic specification indicate that respondents have a negative WTA value for no reduction of the theater services (the estimate for the status quo), meaning that they are willing to pay, on average, approximately 35 EUR¹⁰ (155 PLN) for not reducing the services. We interpret a negative WTA as a positive WTP, because a negative compensation amount implies that people want to pay a positive amount for a given good. Upon correcting the value by the WTP/WTA ratio of 3.28 identified by Tunçel and Hammitt (2014), we can conclude that the WTP for maintaining the current theater services in Poland is approximately 11 EUR (47 PLN) per annum. The respondents also have positive WTA values for the reductions in three out of the four considered theater categories, which implies that they would need to be compensated should any of the reductions be implemented. The coefficients of the standard deviations are statistically significant for almost all attributes, which suggests substantial preference heterogeneity and justifies the use of this econometric approach.

¹⁰ Means in EUR are calculated from the mean estimates, using the value change from 2018 to 2020, based on Producer Price Indices (OECD, 2022e) equal to 0.991684 PLN.

The last column in Table 3 presents the results of the extended specification for Poland, which includes interactions of the status quo constant with the socio-demographic variables.¹¹ The estimates reveal that the WTA for not reducing the theater services decreases for females compared to males, and decreases with age. As noted above, we interpret a negative WTA as a positive WTP. This implies that the WTP for maintaining the current state is higher for females and increases with age. The estimates for the means are consistent and not statistically different across the basic and extended specifications, except for the mean estimate for the status quo. However, we note that the mean estimate for the status quo, without consideration of the interactions, does not have any practical meaning, as it represents the WTA value for an individual of zero age.

5.2. Benefit transfer results

In this section, we report the results and compare the reliability of the different benefit transfer approaches, which include a simple unadjusted value transfer, a value transfer adjusted by income differences, a value transfer adjusted by differences in PPP, a function transfer relying on nominal exchange rates, and a function transfer relying on PPP-adjusted exchange rates (both function transfer approaches are based on country-specific functions). The actual and transferred value studied here is the WTP for maintaining the current state of the country-wide theater services. Given that we use different exchange rates (nominal and PPP-adjusted) for different types of benefit transfer, in this section, we refer to the values in the original currencies (DKK and PLN). These values provide the basis for the calculation of TEs needed for assessment of the benefit transfer reliability. The results of the benefit transfers are shown in Table 4.

We first focus on the unit value transfers that do not take into account socio-demographic variables. These transfers are performed using the estimates from the basic model specifications. The actual mean WTP value in Denmark is 218 DKK, as shown in Table 2. The transferred WTP values in Denmark, when using the estimate obtained from the Polish data as a basis, range from 79 to 333 DKK, depending on the value transfer approach. The actual mean WTP value in Poland is 47 PLN. In turn, the transferred values for Poland, derived from estimates based on the Danish data, range from 31 to 124 PLN. For both countries, the lowest TEs are obtained for PPP-adjusted value transfers, where the TEs are equal to 20% for Denmark and 19% for Poland. Slightly higher TEs emerge for the income-adjusted value transfers with

¹¹ We only consider the interactions with the status quo, as they are the most relevant for the study's objective.

the values of 53% and 35%, respectively. The simple unadjusted value transfer leads to the largest TEs, equal to 64% and 163%, respectively.

Next, we analyze the function transfer results, for which the estimates from the extended model specifications are used. We consider two versions of the function transfer, which account for the different currencies—specifically, for household income—using different exchange rates: one relies on the nominal exchange rate and the other applies the PPP-adjusted exchange rate. The extended model for Denmark reveals an actual average WTP of 224 DKK. The transferred values for Denmark are: 112 DKK for the function transfer that uses the nominal exchange rate and 211 DKK for the function transfer that uses the PPP-adjusted exchange rate. These are related to TEs of 50% and 6%, respectively. The actual average WTP for Poland is 49 PLN, as derived from the extended model results. The transferred values for Poland are 71 PLN for the nominal-exchange-rate-based function transfer and 48 PLN for the PPP-based function transfer. These lead to TEs of 45% and 3%, respectively. Of the two function transfer approaches, the results imply that the one using a PPP-based exchange rate performs best. This aligns with a recommendation developed in, for example, the environmental economics literature on benefit transfer that PPP-adjusted exchange rates are preferable to market-based (nominal) exchange rates in international benefit transfers because they capture differences in price levels and thus offer more relevant international comparisons (Ready and Navrud, 2006).

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 model [DKK]	216.94 ^b	217.98 ^a	
Denmark – extended model [DKK]	222.62 ^b	223.69 ^a	
Poland – basic model [PLN]	47.21 ^a	46.82 ^b	
Poland – extended model [PLN]	49.23 ^a	48.82 ^b	
Transfers 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%
Transfers 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 models' specifications reported in Section 5.1. For Poland, these values are corrected by the WTP/WTA ratio of 3.28. Values marked with ^b are the original values (^a) corrected by the inflation rates between 2018 and 2020 taken from the OECD data (1.0048 for Denmark and 0.9917 for Poland). The mean values for the extended models' specifications are calculated using population statistics as reported in the Appendix.

When comparing results across the unit value and function transfers, it appears that the PPP-based function transfer is the most reliable approach of the considered transfer techniques for both cases studied here: transfers from Poland to Denmark and from Denmark to Poland. These results point to the advantage of benefit transfer approaches adjusting for differences across countries compared to simple, unadjusted approaches. This finding is in line with the 'robust evidence' from other areas of benefit transfer applications, which suggests that, on average, the more flexible benefit transfer approaches tend to outperform the simpler ones, such as unadjusted unit value transfers (Johnston, Rolfe, and Zawojka, 2018). Although the function transfers lead to lower TEs than those resulting from the value transfers in our study, we acknowledge that that "[t]here is insufficient weight of evidence to identify specific conditions under which greater sophistication [of applied benefit transfer approaches] enhances validity and reliability" (Johnston et al., 2018, p. 188). For instance, previous benefit transfer studies within cultural economics find—in contrast to us—that function transfers do not appear to perform better than value transfers (Tuan et al., 2009; Mourato et al., 2014; Fujiwara et al., 2018; Lawton et al., 2018). This leaves the open question for future research of whether and

under what conditions (adjusted) value transfers may outperform function transfers in valuation studies of cultural goods.

In the light of the existing literature, obtaining TEs of 3-20% (as for the best performing, PPP-adjusted value and function transfer approaches) may suggest relatively good reliability of the international benefit transfers analyzed in this paper. Our results are on the lower bound of TE magnitudes reported in other areas of the literature, such as environmental economics—Ready and Navrud state (2006, p. 433) that “the average transfer error for international benefit transfers tends to be in the range of 20% to 40%, but individual transfers have errors as high as 100-200%”. These ranges overlap with the findings in our study, with some of the obtained TEs even falling below the average. This could indicate that an international benefit transfer for a cultural good may be related to a similar degree of reliability as the one obtained for benefit transfers in environmental economics, where this methodology is commonly used. We believe that our study’s finding of relatively good reliability can support future international benefit transfer studies in cultural economics.

6. Conclusions

In this study, we aim to investigate the reliability of an international benefit transfer for a cultural good. We examine the reliability of the benefit transfer with the use of data collected from stated preference valuation studies of theater services in Denmark and Poland.

The results are promising. Our findings closely overlap with empirical evidence from applications of international benefit transfers in other areas, suggesting good transfer reliability. Overall, the PPP-based function transfer and the PPP-adjusted value transfer produce the lowest transfer errors in both countries, ranging from approximately 3% to 20%. These results point to the advantage of benefit transfer approaches adjusting for differences across countries compared to simple, unadjusted approaches. The magnitudes of the obtained transfer errors are also in line with other recent benefit transfer studies in cultural economics—Mourato et al. (2014), Lawton et al. (2018), and Fujiwara et al. (2018) report transfer errors below 20% for selected methods or cases. Similarities between the two countries considered here (Denmark and Poland) and many other European countries open a pathway for potential reliable transfers at the European level.

We are aware that the methodology of benefit transfer requires the use of possibly similar goods placed in comparable social and economic contexts. One of the biggest challenges for benefit transfer in cultural economics lies in the scarcity of original valuation studies. It is difficult to find suitable existing studies that could serve as study sites for benefit transfers. With this article, we are providing two new and original studies—one on the value of maintaining the current state of theater services in Denmark and one on the value of maintaining the Polish theater services—adding a unit to the stock of original valuation studies within cultural economics.

Furthermore, unique sites of cultural significance do not readily lend themselves for methods of benefit transfer. Their uniqueness limits the possibility of using them as study sites for reliable transfer of values to any policy site. However, a benefit transfer method may provide a useful alternative to conducting an original valuation study for cultural institutions and assets of average significance (e.g. non-iconic museums, collections, heritage sites or services). Both surveys considered here—in Poland and in Denmark—use the total supply of theater services in the respective countries as the good to be valued in the national extent of the market (national sampling), making these theater services a good case for benefit transfer.

In many cases, non-market valuation of cultural goods also shares other problems typical of the non-market valuation method, such as scope insensitivity (lack of sensitivity towards different scopes of the valued good) and the embedding effect (difference in WTP estimates depending on whether a good is valued alone or as part of a set of goods; e.g., Baldin and Bille, 2022). Both issues may specifically affect original valuation studies, which can potentially be used later for benefit transfer. These problems were also identified by Fujiwara et al. (2018) in a cultural economics benefit transfer study.

To overcome some of the challenges, such as unfamiliarity with cultural goods, scope insensitivity, and embedding effect, recent non-market valuation studies of performing arts, and also cultural economics benefit transfer reports, tend to define an asset to be valued as a broader set of cultural goods and services: for example, all the theaters in a city or a country (Wiśniewska et al., 2020; Wiśniewska and Zawojka, 2019), all the built heritage interior of a country (Mourato et al., 2014), or historic cities as a whole (Fujiwara et al. 2018). We follow this approach in our study, defining our good to be valued as the entire theater services of the two countries, respectively. The choice of a good that is locally available, but homogenous across the whole country, mitigates the mentioned biases. It also diminishes a potential risk of

not accounting for the availability of substitutes, which may emerge when only a single site is examined. Moreover, it helps to avoid the overestimation of values of singular sites, which could result from a lack of sensitivity to scope of WTP.

Despite the challenges, we find the results of our study promising, and we would encourage further research in order to continue exploring the possibilities in benefit transfer for cultural goods. Undertaking stated preference valuation studies is difficult, expensive, and time-consuming; if reliable benefit transfer estimates can be obtained, these could be an asset to policy makers and social-welfare maximizing cultural policies. Regarding the literature on environmental economics, a poorly conducted original study can be less useful than a benefit transfer study that uses value estimates from a good-quality original study. In other words, benefit transfer may be better than original research conducted without adequate care. To help research-based cultural policies, we need both: good-quality new original studies and the development of benefit transfer applications to make best use of the existing research.

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Appendix

To assess whether the two samples are representative of their respective general adult populations of interest, we conduct z-tests for proportions and t-tests for means for the socio-demographics variables used in the function transfer. Table A1 reports the characteristics for Danish and for Polish samples and populations as well as the results of the representativeness tests.

Our intention is to use statistics for the adult (18+) populations of both countries, as our surveys are distributed to adult respondents. While such statistics are available for age and gender, statistics for education concern the 15+ populations and statistics for income pertain to the whole populations.

Table A1. Characteristics of the general populations and the survey samples for Denmark and Poland, with statistical tests of differences.

Characteristic	Denmark (2020)		P-value for equality test	Poland (2018)		P-value for equality test
	Sample	Population		Sample	Population	
Number of respondents	1,270	-		2,863	-	
Male (mean for 18+)	0.4937	0.4937 ^a	1.0000	0.4796	0.4773 ^b	0.8227
Age (mean for 18+)	52.35	49.38 ^a	0.0000	46.44	48.28 ^{b,**}	0.0000
University degree attained (mean for 15+)	0.1535	0.1421 ^a	0.2428	0.3681	0.2440 ^b	0.0000

Household income per annum		405,296.70		64,228.37	53,648.81	0.0000
		DKK ^a		PLN	PLN ^b	
Household income in EUR per annum		54,270.85		15,096.52	12,580.44	
		EUR ^{c,*}		EUR	EUR ^c	
Household adjusted income per annum	314,094.50	266,767.00	0.0000		31,835.40	
	DKK	DKK ^{a,*}			PLN ^b	
Household adjusted income in EUR per annum	42,058.72	35,721.17			7,465.28	
	EUR	EUR ^c			EUR ^c	
GDP per capita, constant prices, constant PPPs, reference year: 2015		45,352.27			27,210.31	
		EUR ^c			EUR ^c	

Notes: For characteristics measured on a discrete scale, proportions are provided. For characteristics measured on a continuous scale, means are reported. For the survey in Poland, data on income comes from a discrete choice question including fourteen income categories. Here, the responses are translated into mid-points of the income intervals presented in the categories.

Sources: ^aStatistics Denmark, ^bStatistics Poland, ^cOECD.

* Data for 2019.

**Due to data availability, this statistic is calculated on a basis of single year populations (18 years old, 19 years old, etc.) for those in the 18-29 age range, and averages for 5-year age group populations for the rest of the adult population of Poland (30-34 years old, 35-39 years old, etc.).

According to the results of the representativeness tests, the Danish sample is representative of the population with regard to gender and education, while the mean ages and incomes in the studied sample are statistically higher than the population means. The Polish sample is representative of the general adult population of Poland with regard to gender.

To account for the differences between the surveyed samples and the general populations, weights are used for modeling preferences disclosed in the stated preference questions. The weights for Denmark are provided by Statistics Denmark. They are obtained with the GREG estimator (Särndal et al., 2003). The weights for Poland are generated using the three socio-demographic characteristics for which we observe statistically significant differences between the sample and the population as reported in Table A1—age, university degree attained, and

income. The weights for Poland control for age defined by four discrete categories (18-24, 25-44, 45-64, and 65+), attained university degree defined as a zero-one-coded binary variable, and median income defined as a zero-one-coded binary variable (whether income is below or above the median income in Poland).

We note that the two data sets provide different measures of income. In the Danish study, this variable is defined as annual household adjusted income per individual. It is a measure of income per person in a household, scaled according to the number of household members and their ages. In their national statistics, EU countries use the so-called OECD-modified scale, which assigns a value of one to the household head, half to each additional adult member, and a third to each child (OECD, 2022d).¹² In the analysis for Poland, the variable income is defined as an annual household unadjusted disposable income. Given that the models providing the original value estimates are calculated on the basis of the respective data sets separately, both measures of income—adjusted and unadjusted—are considered in our empirical investigation. When conducting a function transfer between the countries, we use the statistics for income as applied in a given country's model.

Appendix references

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¹² Specifically, the household adjusted income is equal to the net household income divided by $(0.5 + (0.5 \times \text{number of persons over the age of 14}) + (0.3 \times \text{number of persons under the age of 15}))$ for all family members, including children.



UNIVERSITY OF WARSAW

FACULTY OF ECONOMIC SCIENCES

44/50 DŁUGA ST.

00-241 WARSAW

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