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Quantifying the Social Impacts of Culture and Sport

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This analysis was conducted using Understanding Society data supplied under the standard End User Licence (EUL) agreement from the Economic and Social Data Service (ESDS). Responsibility for the analysis and interpretation of these data are solely that of the authors.

Chapter 1: Introduction

1.1 Aims, objectives and report overview

The Department for Culture, Media and Sport (DCMS) commissioned researchers from the London School of Economics (LSE) to undertake analysis of Understanding Society data to develop the evidence base on the social and wellbeing impacts of cultural engagement and sport participation. This work gives us new evidence of the link between our policies and the social impacts of engagement in both sport and culture.

This report is the first of two outputs from the analysis carried out by the researchers. This report presents the results from an analysis of the association between culture and sport participation and a range of social outcomes. This report focuses on cashable or financial benefits and savings. The second output presents an analysis of the association between culture, sport and measures of subjective wellbeing. The second report therefore looks at the perceived benefits for the individual using wellbeing valuation. Both are important aspects of the Green Book and policy evaluation.

The aims of the analysis presented in this report are:

- To investigate the association between sport participation and cultural engagement and a range of social outcomes (e.g. on measures of health, education, employment and civic participation).
- To explore indicative financial values associated with identified social impacts of engagement in culture and sport (e.g. on measures of health, education, employment and civic participation). We assess impacts on public sector costs savings.

Each report presents background to the consideration of social and wellbeing impacts along with the key findings. The annexes contain the full papers and analysis produced by the authors from the LSE.

1.2 Background

The sports and culture sectors play a key role in generating benefits for society. Many of these benefits are difficult to measure and value, and can therefore get neglected or completely ignored in discussions about how best to allocate scarce resources.

It is useful and policy relevant to consider wider social benefits, such as health, education, employment and civic participation, which may come about from specific policies encouraging engagement with, and participation in, culture and sport. Economic appraisal conducted properly should account for all the ripple effects of policy and not just the easy to measure outcomes.

This analysis used data from the Understanding Society survey, which is a large and representative sample of the UK population. With DCMS engagement as a co-government funder of the Understanding Society study, the second wave of the survey contained information on a wealth of activities relating to engagement in sports and culture. The Wave 2 data released in January 2013 contained both the measures of sports and culture activities alongside a range of wider measures of social outcomes. These data have never been analysed to show such activities' impact upon a range of social outcomes and therefore provide a valuable opportunity to do so.

This analysis looks at the impacts of engagement and participation on four key social outcome measures as enabled by the Understanding Society data source:

i. Health.
ii. Education.
iii. Employment and economic productivity.
iv. Civic participation.

Where possible, these impacts have been valued in monetary terms so that they can input into cost-benefit analysis (CBA). It should be noted that it is out of the scope of this paper to estimate these cost savings directly using the relevant data. We, therefore, provide indicative cost savings based on readily available data to demonstrate how the impact estimates in this analysis *could* be used in appraising policy.

We estimate financial impacts on the public purse. These figures are demonstrated as conceptual ones and are dependent on the underlying assumptions which could not be tested in the Understanding Society dataset. For example, we had to assume that all people who reported being 'very likely' to go onto further education did in fact go on to university education, when we know that intentions are in fact a notoriously poor predictor of behaviour (explaining only about 3% of the variance in health behaviour change, for example). Finally, it would require a whole other piece of analysis to fully consider the spillover effects from one behaviour to the next. We know that no behaviour sits in a vacuum and going to the

cinema, say, could crowd in other related behaviours but also crowd them out. It is beyond the scope of the present work to consider these possible effects, including any other behavioural responses that may result from different amounts and types of engagement in arts and sports. The important point of note is that this analysis lays out the *foundation* for estimating cost savings by estimating the impacts of culture and sport participation on health, education, employment and civic participation. Where better/more robust exchequer-related financial savings data are available they should be used instead, alongside the impact results set out here.

The richness of the Understanding Society data allows us to look at a range of culture and sports variables. Throughout the analysis we control for as many of the determinants of the main outcomes as possible in regression analysis in order to get a better understanding of cause and effect relationships. The general issue of causality in relation to the methods used in this study is discussed in greater detail in Annex B. We look at the impacts on social outcomes associated with:

- Participation in arts and cultural activities.
- Attending arts and cultural events.
- Participation in sports, team sports and individual sports.
- Visiting museums, heritage sites and libraries.

In the analyses we look at the impacts on different groups in the population broken down by (i) age; (ii) gender; (iii) income group; and (iv) area of residence.

Chapter 2: Summary of findings

Our analysis has identified statistically significant associations between cultural and sport engagement and a range of social impacts. Holistic consideration of all identified impacts will help to build a broad narrative on the social impacts of culture and sport.

Although causal direction needs to be considered further, this analysis has controlled for the main determinants of the social outcomes in question (e.g. income, gender, education). This is the optimal statistical strategy for this kind of non-experimental data (where interventions have not been randomised) in order to identify cause and effect relationships.

The social benefits of culture and sport are wide ranging. We found that a range of social impacts were statistically significantly associated with both culture and sport engagement. These are:

Health impacts:
- Those engaging with the arts as an audience member were 5.4% more likely to report good health.
- Sports participants were 14.1% more likely to report good health than non-participants.

Education impacts:
- Participants in arts are 14.1% more likely to report an intention to go on to further education.

Economic productivity related impacts:
- Unemployed people who engage with the arts as an audience member were 12% more likely to have looked for a job in the last four weeks when compared with unemployed people who had not engaged with the arts.
- Unemployed people who participate in sports are 11% more likely than non-participants to have looked for a job in the last four weeks

Civic participation impacts:
- People who engage with the arts as an audience member are 6% more likely to have volunteered frequently (once a fortnight or more).
- People who participate in sport are 3% more likely to volunteer frequently.
- Those who engage with the arts as an audience member are also gave £50 per person more in charitable donations over the last year.
- People who participate in sport gave £25 more per person in charitable donations over the last year.

Annex A: Literature review

A selective literature review was conducted to investigate the social impact of engaging in culture and sports on social measures included within the Understanding Society dataset available to this analysis. It was important for the purposes of this paper to ensure an evidence base existed to support the analysis undertaken. Participating in cultural activities, such as attending cultural events, reading books or periodicals, making music, singing, and participating in creative activities were associated with improved health; in particular, through a reduction in mortality rates and risk factors for disease, and improved healthy eating and physical activity (Bygren, Konlaan, and Johansson 1996; Konlaan et al., 2000; Renton et al. 2012). Participating in sports, including DIY activities, cycling, general physical activity programmes, small-sided football games, and running were also associated with longer life expectancy and reduced anxiety, depression, and risk factors for disease (Andersen et al., 2000, Krustrup et al., 2010; Sabia et al., 2012; Murphy et al., 2012). In view of these findings, health was identified as a wider social impact, with self-reported health and the general health questionnaire selected as measures based on the availability of these measures within Understanding Society data.

Several studies also indicated an association between engaging in culture and sports and economic impacts, especially employment and skills development. People who attend cultural events like music festivals, or who participate in community based art projects, believe they develop transferrable skills such as communication, confidence and public speaking (Matarasso, 1996, 1997; Williams, 1997). Playing sports may reduce workplace absenteeism (Heuvel et al., 2005), and participating in arts organisations may make it easier to find work (Matarasso, 1997; Matarasso and Halls, 1998). The analysis thus modelled job-seeking behaviour amongst the unemployed and job satisfaction among the employed. Job satisfaction is a powerful predictor of quit rates in other research (Clark, 2001).

There were also a number of studies pointing to the benefits of engaging in culture and sports on civic participation, in particular on volunteering and charity giving. There were positive associations between engaging in the arts and the likelihood of volunteering, including specific cultural activities like reading books, creating art, attending dance events, purchasing books or magazines and general spending on the arts (Jeannotte, 2003; Nichols, 2005, 2007; Carroll, McCarthy & Newman, 2005). People who participate in sports are also more likely to volunteer

(Tsiotsou, 1998; Lopez & Moore, 2006; Nichols, 2005, 2007). Frequency of volunteering and amount of charitable giving were thus selected as further indicators of the wider social benefits of engaging in culture and sports. Finally, people who attend or engage in culture and play in or attend sports events are more likely to be adult learners (Sargant & Aldridge, 2002; Ruuskanen, 2013), and the present analysis extends these findings to look at whether teenagers and young adults are more likely to report intentions to attend further education.

Annex B: Methodology

We use Wave 2 of Understanding Society and run a number of regression models to look at the impacts of engagement and participation on each of the four domains (health, education, economy and civic participation) as follows:

$$D_i = \alpha + \beta_1 Q_i + \beta_2 X_{3i} + \varepsilon_i \qquad (11)$$

where D_i is the domain of interest (health, education, employment or civic participation), Q_i is a vector of culture and sports engagement variables and X_{3i} are other determinants of D_i. In terms of Q_i we run the same basic models as set out in equations (8.1) - (8.6) but drop the first visits model so we have five models (an overall model and two models each for sports and arts) per domain. Within the domains we use two different outcome measures for health, employment and civic participation and one outcome measure for education. In total we, therefore, estimate 35 base models, plus a number of interaction models.

The general strategy used in this paper has been to control for as many of the determinants of a given outcome as possible using regression analysis. This methodology for causal inference is at least as robust as most research in this area (certainly, there are many studies that make no attempt to control for any differences across the two groups of interest). **It is the optimal method given the nature of the data and hence we believe that the results presented in this paper are informative for policy-making purposes.**

Throughout the analysis we control for as many of the determinants of the main outcomes as possible in regression analysis and we note we cannot fully attribute causality in this type of analysis since we cannot control for unobservable factors. The general issue of causality in relation to the methods used in this study is discussed in greater detail in Annex D.

B.1. Health models

In the health domain, **we look at impacts on self-reported health and General Health Questionnaire 36** (GHQ36).

Self-reported health is measured on a scale of 1 ('very poor') to 5 ('excellent') and we form a binary variable that takes on 1 if self-reported health = 4 or 5, and 0 otherwise. This is run using a logit model and the marginal percentage effects are calculated at the sample mean value for the other covariates.

GHQ measures 12 aspects of mental and physical health. GHQ36 is an aggregate measure of health based on the responses to these 12 questions, where 36 = worst possible health state and 0 = no health problems. This model is run using OLS.

Based on the literature review, in both models we control for age, education household income, gender, employment status, marital status, fruit and vegetables consumption, smoker, alcohol consumption, social relations, housing and region.

B.2. Education model

We look at the likelihood of 16-18 year olds stating that they will go on to further education (university or college-level). This is reported on a five-point scale. We drop the response 'depends' (only 1% of the sample) and create a dummy variable for the likelihood of entering further education that = 1 if respondent says 'very likely' and 0 = otherwise. The model is run using a logit model and the marginal percentage effects are calculated at the sample mean value for the other covariates. Based on the literature reviews we control for household income, previous education, gender, age and region.

B.3. Employment and economic growth models

There are two outcomes studied in the employment and economic growth models, one for people who are employed and the other for people who are unemployed.

For the employed, we look at how satisfied they are with their jobs. Job satisfaction is reported on a seven-point scale with 1 being completely dissatisfied and 7 being completely satisfied. We treat the ordinal responses as ratio/interval and run a multiple linear regression using OLS. There are a number of control variables based on the literature review of employment and economic growth, as well as a literature review of papers on job satisfaction (not reported here). We control household income (in logs to correct for heteroskedasticity of the residuals of income), age, region, social class, marital status, health (GHQ 36), education, number of

children, number of hours normally worked per week, type of job (temporary or permanent), managerial responsibilities at work, number of employees at the workplace, physicality of the job, the autonomy one has over job tasks, job security and distance of work commute.

For people who are unemployed, we look at the likelihood that they have looked for work in the last four weeks. This is a binary variable, where 0 = the respondent reports that they have not looked for work and 1 = they have. This is run as a logit model and the marginal percentage effects are calculated at the sample mean for the other covariates. Control variables were selected based on the literature review of employment and economic growth, as well as a literature review on job search behaviour (not reported here). These were household income, the number of unemployment spells the respondent had experienced since the last interview, whether or not they receive unemployment benefits, the percentage of people who are also unemployed in the respondent's government office region, gender, age, geographic region, marital status, health (GHQ36), education and number of children.

B.4. Civic participation models

There were two outcomes in the civic participation models: volunteering and charitable giving. In the volunteering model, we look at the likelihood of frequently volunteering in the last 12 months, with 'frequently' defined as once a fortnight or more. Frequently volunteering is a binary variable where 1 = frequently volunteers and 0 = does not frequently volunteer. This is run as a logit model and the marginal percentage effects are calculated at the sample mean for the other covariates. The control variables were selected based on the literature review and are household income, education, employment status, whether or not the respondent owns their own home, savings, gender, age, region, marital status, number of children and number of rooms in the house.

For the charitable giving model, we look at amount of money (UK pounds sterling) donated to charity in the last year. This is run as OLS. The control variables were selected based on the literature review and are income, education, employment status, whether or not the respondent owns their own home, savings, gender, age, region, marital status, number of children in the household and number of rooms in the house.

Distributional analysis

We assess whether the impacts differ across different population groups[1] - for example whether the positive impact of sports is larger for men or women or for younger age groups. The large sample size in Understanding Society allows us to test whether impacts differ. We look at whether there are heterogenous impacts of culture and sports by (i) gender; (ii) age; (iii) income level and (iv) region by interacting these variables with culture and sports. In order to balance samples in each group we set these demographic and socio-economic variables as binary variables determined by the sample median value as follows:

- Gender = male/female
- Age = >46/<47 (we split age around the median sample age of 46.6 years)
- Income group = >£2,868 gross household income pm/<£2,868 gross household income pm. This is a bit higher than the national average in 2010/2011 which was £2,425 (Office for National Statistics, 2013)
- Region = London/not London

[1] We have called this issue 'distributional impacts'. They are also known as heterogenous impacts in the policy evaluation literature.

Annex C: Full results

Here we present the main findings from the wider social measures models. There were 12 models per domain and so in total 84 regression models were estimated. The full results are available on request. Here in the tables below we show results for the culture and sports variables that are significant at the 5% level, but also discuss those that were close to significance too. We present the coefficient sizes, standard errors, sample sizes and R-Squared values for each model.

C.1. Health models

C.1.1 Self-reported health

Table 8 presents the changes in odds-ratios and associated probability impacts for culture and sports variables on self-reported health that were statistically significant.

Table 8. Effects of culture and sport on self-reported health

Model & variables	Coefficient	Probability impact	S.E.	Sample size	R-Squared
Sports					
All sports	0.574***	14.1%	(0.042)	14710	0.085
Team sports	0.304***	7.6%	(0.049)	14710	0.086
Individual sports	0.521***	12.9%	(0.041)	14710	0.086
Fitness	0.391***	9.7%	(0.040)	14710	0.088
Football	0.197***	4.9%	(0.066)	14710	0.088
Swimming	0.193***	4.8%	(0.039)	14710	0.088
Cycling	0.369***	9.2%	(0.045)	14710	0.088
Culture					
All audience arts	0.219***	5.4%	(0.047)	14710	0.087
Audience					
Film	0.143***	3.6%	(0.042)	14708	0.09
Exhibitions	0.121***	3.0%	(0.043)	14708	0.09
Plays	0.099**	2.5%	(0.041)	14708	0.09
Participation					
Art	-0.185***	-4.6%	(0.041)	14708	0.09

Notes: Logit model. *** 0.01 significance level, ** 0.05 significance level. S.E. = Standard errors (in parentheses). R-Squared = *Psuedo R-Squared*. Probability impacts calculated at the sample mean values of the other covariates. Probability = increase in likelihood of reporting good health.

We find that all sporting variables were highly significant determinants of self-reported health. As a whole people who do sports are 14% more likely to report good health. Team sports and individual sports were both positive, with a larger impact for individual sports on health. When broken down further fitness, football, swimming and cycling were all highly significant determinants of self-reported health.

Interestingly, **attendance at arts events has an effect on health but participation in arts does not.** Attending the arts is associated with a 5% increase in the likelihood of reporting good health. Within the audience variables film (cinema), exhibitions and plays and dramas all had significant positive impacts and music audience was positive and significant at the 10% level. The participation variables were a mix of positive and negative effects, which were all insignificant except art participation and this explains why the overall participation variable was found to be insignificant. Participation in art was actually found to have a negative impact on health, although this may be explained to some extent by reverse causality; that is, unhealthy people may be more likely to engage in arts. As we would expect the sports variables had much larger impacts on self-reported health than the arts variables.

Distributional impacts

None of the interactive effects were significant for the arts or sports related variables. **This implies that impacts of culture and sport on self-reported health are homogenous or constant across different gender, age, income and geographical groups.**

C.1.2 GHQ36

Table 9 presents the OLS estimates of the impacts of culture and sports variables on GHQ36. Since higher GHQ36 scores represent worse health states, negative coefficients suggest a positive impact on health.

Table 9. Effects of culture and sport on GHQ36

Model & variables	Coefficient	S.E.	Sample size	R-Squared
Sports				
All sports	-0.698***	(0.086)	14608	0.064
Team sports	-0.467***	(0.095)	14608	0.065
Individual sports	-0.545***	(0.085)	14608	0.065
Football	-0.672***	(0.123)	14608	0.063
Swimming	-0.197**	(0.077)	14608	0.063
Cycling	-0.175**	(0.087)	14608	0.063
Culture				
Participation				
Literature	0.202**	(0.09)	14607	0.066

Notes: OLS model. *** 0.01 significance level, ** 0.05 significance level. S.E. = Standard errors (in parentheses). Dependent variable is GHQ36, where GHQ36 = 36 is worst health and GHQ36 = 0 is best health, hence negative coefficients represent positive health impacts.

Again we find lots of positive effects for sports – all sports-related variables except fitness were significant and improved GHQ scores. **Sports as a whole improve GHQ36 scores.** Looking at the sample average GHQ36 score (13.3) we find that doing sports improves GHQ scores by 5%. Again the **impact seems to be larger for individual sports compared to team sports** and football had a very large impact compared to swimming and cycling – football alone also leads to a 5% improvement in GHQ scores, whereas swimming and cycling lead to about a 1.5% improvement.

As with self-reported health, the impact of arts was less. Arts overall had a positive but insignificant effect and when broken down by participation and audience the results still stayed insignificant (but we did find that the coefficient size was again bigger for audience than for participation). In terms of the individual arts activities only participation in literature had a statistically significant effect but it was an adverse effect on GHQ scores.

Distributional impacts

Some of the interaction terms in the GHQ36 models were significant. **For team sports, we find that the effect on GHQ36 is driven by the impacts for younger generations.** When broken down by age there is no impact of team sports on GHQ36 for the older age category (>46) and a large impact for the younger age category (<46). For individual sports we find that there are large impacts on GHQ36 for the older age category. These effects are interesting and potentially policy relevant, so further research might seek to uncover some of the reasons for the age effects.

Turning to the arts variables, we find that when broken down the arts participation variable shows an effect on GHQ36 for the older age category.

C.1.3 Indicative cost savings

In order to attach a value for the financial impact of these outcomes, we look at the association between self-reported health scores and medical service usage rates in the UK, for which costs estimates are available. Using the British Household Panel Survey, we find that people who rate themselves as four or five for self-reported health are 35% less likely to visit GPs six or more times per year. This is based on simple correlational analysis but will provide some insight into the potential National Health (NHS) cost savings since self-perceived health will likely be a main determinant of people's decisions to seek medical help. If we assume here that people who visit GPs six or more times per year on average visit ten

times per year then we can estimate the NHS cost savings due to participation in culture and sports.

An average GP appointment costs the exchequer £25[2]. For those that visit GPs 10 times per year this is a cost of £250. Based on the above therefore people who report good health incur £87.50 less in NHS costs per year due to GP visits (0.35*£250).

Clearly in addition to this people in good health will also incur less health costs elsewhere, such as medication and in-patient treatment which these figures do not capture and so this could lead to an underestimate of the value of the health benefits. According to NHS statistics (2011)[3] the average NHS cost is £1,979 per person per year. If we take GP visits as one indicator of general health, then people who report six or more visits to the GP per year (the highest category for the GP visits variable in the BHPS survey) are likely to be those who at least incur this level of overall NHS cost (given that £1,979 pa is for the average person). Therefore, the overall figure of £1,979 may give us a better picture of the medical costs related to people who visit GP surgeries regularly, but it is still likely to be an underestimate of the overall NHS costs. Under this assumption, people who report good health incur £693 less in overall NHS costs per year (£1,979*0.35).

Table 10 estimates the indicative annual NHS cost savings associated with improvements in self-reported health due to engagement in culture and sports by using the results from Table 8 For example, **cycling was found to increase the probability of reporting good health by 9.2%. In turn we can assume that people who cycle incur about £64 less in NHS costs per year (0.092*£693).**

[2] http://www.northwest.nhs.uk/document_uploads/Choose%20Well/A4_feeling_unwell_posters.pdf

[3] http://www.nhsconfed.org/priorities/political-engagement/Pages/NHS-statistics.aspx

Table 10. Culture, sport and indicative NHS cost savings

Model & variables	Probability impact	NHS cost saving (£pa)
Sports		
All sports	14.1%	£97.71
Team sports	7.6%	£52.67
Individual sports	12.9%	£89.40
Fitness	9.7%	£67.22
Football	4.9%	£33.96
Swimming	4.8%	£33.26
Cycling	9.2%	£63.76
Culture		
All audience arts	5.4%	£37.42
Audience		
Film	3.6%	£24.95
Exhibitions	3.0%	£20.79
Plays	2.5%	£17.33
Participation		
Art	-4.6%	-£31.88

Note: These are per person cost saving estimates.

It should be noted that these estimates are only indicative. If better estimates of the NHS costs associated with self-reported health are available these should be used with the results from Table 7. Furthermore, we note that NHS cost savings are not the only economic impact from improved health. Better health ought to lead to less absenteeism and potentially higher productivity which will show up as positive effects for the economy and society.

We should also note that these estimates sit in something of a 'behavioural vacuum'; that is, we assume that any increase in sports and arts does not result in other behaviours that might offset some of the health benefits. Analogously, we have evidence that quitting smoking leads to weight gain, and so any models estimating the benefits of smoking association must account for health losses from weight gain. Equally though, sports and arts could 'crowd-in' other health enhancing activities; in which case, we will underestimate the health benefits. At this stage, we simply do not know.

C.2. Education model

C.2.1 Likelihood of going on to further education

Since we are only looking at a narrow age bracket in this analysis sample sizes fell to under 900, but this was still sufficient to detect some significant effects. We found that the following variables lead to an increase in the likelihood of 16-18 year olds reporting that they are very likely to go onto higher education:

- Participation in all arts
- Participation in music
- Audience to dance
- Swimming

Table 11 reports the changes in odds-ratios and associated probability impacts for culture and sports variables that were statistically significant. Probabilities were calculated at sample average means for the other explanatory variables.

Table 11. Effects of culture and sport on reported likelihood of entering further education

Model & variables	Coefficient	Probability impact	S.E.	Sample size	R-Squared
Sports					
Swimming	0.345**	6.7%	(0.077)	847	0.026
Culture					
All participation arts	0.655***	14.1%	(0.229)	847	0.025
Participation					
Music	0.466**	8.4%	(0.206)	847	0.053
Audience					
Dance	0.834**	13.2%	(0.372)	847	0.053

Notes: Logit model. Sample restricted to 16-18 year olds. *** 0.01 significance level, ** 0.05 significance level. S.E. = Standard errors (in parentheses). R-Squared = *Psuedo R-Squared*. Probability impacts calculated at the sample mean values of the other covariates. Probability = increase in probability of reporting being 'very likely' to go on to further education.

Among the sports variables, we find that only swimming is significant and it is associated with a 7% increase in the likelihood of reporting being 'very likely' to go on to further education. Participation in arts is associated with a 14% increase in the likelihood of a 16-18 year old reporting they are 'very likely' to go on to further education. When we break down the arts variables we find that people who participate in music are 8% more likely to report being 'very likely' to go on to further education and people who are audience to dance are 13% more likely.

Distributional impacts

The small sample sizes made it impossible to run interactive models.

C.2.2 Indicative cost savings

In terms of attaching a value to this we could look at the economic returns associated with a university degree measured as the wage premium associated with degree-level education. This can only provide a rough measure of the economic value of further education here for a number of reasons. First, we are observing people's self-reports about the likelihood of going on to further education rather than their actual behaviour, and so we need to assume that people who say they are 'very likely' to go actually do go. Second, further education could be non-university/non-degree education, but we will look at the returns to degree education, for which some evidence exists. Therefore, we will assume here that people who say they will go on to further education go on to degree education. These assumptions are likely to over-bias our estimates of the economic returns here, but on the flipside it may be that some of those that go on to further education go on to postgraduate level studies, for which the wage return is likely to be larger than for undergraduate degrees and this would potentially offset the bias to some degree.

The Department for Education and Skills (2003) used a figure of £400,000 for the difference in lifetime earnings for graduates over non-graduates. In Table 12, we apply this figure to the probability estimates in Table 11 assuming that someone who reports they are 'very likely' to go on to further education actually go on to and complete university (degree) education. The last column shows the estimated increase in lifetime earnings associated with the impact that each activity has on likelihood of higher education. Since these are only rough indicative estimates (which are likely to be biased upwards) we do not up-rate the figures to 2013 prices.

Table 12. Culture, sport and indicative economic (wage) returns

Model & variables	Probability impact	Additional lifetime earnings
Sports		
Swimming	6.7%	£26,800
Culture		
All participation arts	14.1%	£56,400
Participation		
Music	8.4%	£33,600
Audience		
Dance	13.2%	£52,800

Note: Based on wage premium studies/data from 2003 (not uprated). Values are per person.

So, for example, participation in music (playing a musical instrument) is associated with an 8.4% increase in the probability of a teenager reporting that he is 'very likely' to go on to further education. Assuming that he does

go on to further education and receives a university degree then we can assume that the **participation in music is associated with an increase in lifetime earnings of £33,600.** As discussed, these figures should be seen as an upper limit and we feel that they overstate the gains in lifetime earnings due to the well-observed mismatch between intentions and behaviour we find in most choice domains - it is likely that many of the young adults who report intending to go onto further education will end up not doing so.

C.3. Employment and economic growth models

C.3.1 Job satisfaction

For job satisfaction, when we break down the sports variables we find that participation in team sports is associated with an increase in job satisfaction. There is also a small positive effect of swimming. Among the arts variables, we find that participation in art activities is associated with a 0.06 lower job satisfaction score. This could again be explained by reverse causality if those who are less satisfied at work seek out participation in the arts. Being an audience member at a film event is associated with a 0.06 increase in job satisfaction. As discussed, job satisfaction is a powerful predictor of quit rates in other research (Clark, 2001).

Distributional impacts

The effect of playing any sport on job satisfaction depends on income. Playing any sport in the last year and being in the high income group is associated with .09 higher job satisfaction. The main effect of playing any sport is not significant so **it is only among people with high income that playing any sport is associated with higher job satisfaction.**

Table 13. Effects of culture and sport on job satisfaction

Model & variables	Coefficient	S.E.	Sample size	R-Squared
Sports				
Team sports	0.108***	(0.028)	14643	0.15
Swimming	0.066**	(0.023)	14643	0.15
Culture				
Audience				
Film	0.058**	(0.029)	14642	0.151
Participation				
Art	-0.061**	(0.026)	14642	0.151

Notes: OLS model. *** 0.01 significance level, ** 0.05 significance level. S.E. = Standard errors (in parentheses). R-Squared = *Psuedo R-Squared*.

C.3.2 Job search

For the likelihood of job search behaviour among people who are unemployed, we find that **participation in any sport is associated with an 11% increase in the likelihood of having looked for a job in the last four weeks. For engagement in arts, the figure is 12%.** When we break down the sports variables we find that participating in individual sports is associated with a 9% increase in the likelihood of looking for a job. Being an audience member at an arts activity is associated with an 8% increase in the likelihood of looking for a job and the effect is an 11% increase for people who participate in drama.

Distributional impacts

The effect of individual sports on job search behaviour depends on income. **Participating in individual sports and being in the high income group is associated with 9.5% lower likelihood of looking for a job.**

These are all mostly positive and fairly substantial increases in the likelihood of looking for a job that are statistically significant even given the small sample size.

Table 14. Effects of culture and sport on job search

Model & variables	Coefficient	Probability Impact	S.E.	Sample size	R-Squared
Sports					
All sports	0.4470***	10.5%	(0.034)	1214	0.1644
Individual sports	0.3816***	8.9%	(0.033)	1214	0.1647
Culture					
All arts	0.4847**	11.7%	(0.048)	1214	0.1644
All audience arts	0.3251**	7.7%	(0.036)	1214	0.1668
Participation					
Drama	0.4954**	10.8%	(0.051)	1214	0.173

Notes: Logit model. *** 0.01 significance level, ** 0.05 significance level. S.E. = Standard errors (in parentheses). R-Squared = *Psuedo R-Squared*. Probability impacts calculated at the sample mean values of the other covariates. Probability = increase in likelihood of reporting good health.

C.3.3 Indicative cost savings

These findings suggest that participation in culture and sport could lead to increased employment in the economy as there are associations between culture, sport and job satisfaction (which predicts job quits) and with job search. The difficulty in attaching a value to these outcomes is that we cannot assess the number of likely jobs saved or created (which would need to also include an estimate of displacement of other jobs). If assumptions can be made between, say, job search intensity and job finds then the figures in Table 14 could be

used to assess the impact of participation in culture and sport on job creation with values attached to those jobs.

C.4. Civic participation models

C.4.1 Volunteering

The effect of engaging in any sports is associated with a 3% increase in the likelihood of volunteering frequently (once a fortnight or more) and engaging in any arts is associated with a 7% increase. Participating in team sports is associated with a 5% increase and individual sports with a 2% increase in the likelihood of volunteering frequently. When we break up the sports variables, participating in football, swimming, and cycling are associated with 2%, 1% and 2% (respectively) increases in the likelihood of volunteering frequently.

Participation in any art event and being an audience member at any art event are both associated with a 5% increase in the likelihood of volunteering frequently. Participating in drama is associated with an 8% increase in the likelihood of volunteering frequently, participating in an art activity with a 2% increase, participating in crafts with a 1% increase, participating in literature activities with a 2% increase, being an audience member of a film with a 1% increase, being an audience member at an exhibition with a 3% increase, being an audience member at a play with a 2% increase.

Table 15. Effects of culture and sport on volunteering

Model & variables	Coefficient	Probability Impact	S.E.	Sample size	R-Squared
Sports					
All sports	0.3988***	3.4%	(0.004)	32111	0.0537
Team sports	0.5456***	5.5%	(0.006)	32111	0.0856
Individual sports	0.2874***	2.5%	(0.004)	32111	0.0856
Football	0.2477***	2.4%	(0.007)	32111	0.0531
Swimming	0.1245***	1.1%	(0.004)	32111	0.0531
Cycling	0.2243***	2.1%	(0.005)	32111	0.0531
Culture					
All arts	1.1111***	7%	(0.004)	32111	0.0537
All audience arts	0.6318***	4.8%	(0.004)	32111	0.0674
All participation arts	0.7442***	5.4%	(0.004)	32111	0.0674
Audience					
Film	0.1282***	1.1%	(0.004)	32106	0.0856
Exhibitions	0.3161***	2.8%	(0.004)	32106	0.0856
Plays	0.2714***	2.4%	(0.004)	32106	0.0856
Participation					
Drama	0.7716***	8.4%	(0.007)	32106	0.0856
Art	0.1777***	1.6%	(0.004)	32106	0.0856
Craft	0.1712***	1.5%	(0.004)	32106	0.0856
Literature	0.3056***	2.5%	(0.004)	32106	0.0856

Notes: Logit model. *** 0.01 significance level, ** 0.05 significance level. S.E. = Standard errors (in parentheses). R-Squared = *Psuedo R-Squared*. Probability impacts calculated at the sample mean values of the other covariates. Probability = increase in likelihood of reporting good health.

Distributional impacts

The effects of playing any sports, or of engaging in any arts, on volunteering depends on gender and age. Playing any sport and being male is associated with 3.9% higher likelihood of volunteering frequently (significant at the 1% level), and playing any sport and being in the high age group is associated with 2.6% higher likelihood of volunteering frequently. Engaging in any art and being male is associated with 2.1% higher likelihood of volunteering frequently, and engaging in any art and being in the high age group is associated with 10% higher likelihood of volunteering frequently.

The effect of being an audience member at an art event on volunteering frequently depends on age - being an audience member and being in the high age group is associated with 6.5% higher likelihood of volunteering frequently.

The effect of participating in team sports on volunteering depends on gender and income. Participating in team sports and being male is associated with a 3.4% higher likelihood of volunteering frequently. Participating in team sports and being in the high income group is associated with 6.3% higher likelihood of volunteering frequently.

The effect of individual sports on volunteering depends on gender and age. Playing individual sports and being male is associated with 2% higher likelihood of volunteering frequently. Playing individual sports and being in the high age group is associated with 1.1% higher likelihood of volunteering frequently.

C.4.2 Charitable giving

Participating in any sport is associated with a £25 increase in charitable donations over the last year and engaging in any arts with a £50 increase. Participating in team sports is associated with a £21 increase in charitable donations and in individual sports with a £23 increase in charitable donations. Being an arts audience member is associated with a £26 increase in charitable donations and participating in the arts is associated with a £37 increase.

When we break up the arts variables, participating in drama is associated with an £83 increase in charitable donations, participating in music is associated with a £27 increase in charitable donations and participating in words-related art activities with a £32 increase. Being an audience

member at an exhibition is associated with a £20 increase in charitable giving and being an audience member of a dance event is associated with a £35 increase.

Table 16. Effects of culture and sport on charitable giving

Model & variables	Coefficient	S.E.	Sample size	R-Squared
Sports				
All sports	£25.15**	(7.59)	20839	0.065
Team sports	£20.90**	(10.31)	20839	0.066
Individual sports	£23.50**	(7.42)	20839	0.066
Culture				
All arts	£49.94***	(9.36)	20839	0.065
All audience arts	£25.77***	(8.86)	32111	0.067
All participation arts	£37.33***	(7.25)	32111	0.067
Audience				
Exhibitions	£19.89**	(8.36)	32106	0.086
Dance	£34.92**	(14.35)	32106	0.086
Participation				
Drama	£83.83***	(14.94)	32106	0.086
Music	£26.81***	(13.92)	32106	0.086
Literature	£32.48***	(6.57)	32106	0.086

Notes: OLS model. *** 0.01 significance level, ** 0.05 significance level. S.E. = Standard errors (in parentheses). R-Squared = *Psuedo R-Squared*. Probability impacts calculated at the sample mean values of the other covariates. Probability = increase in likelihood of reporting good health.

Distributional impacts

The effect of engaging in any of the arts depends on gender. Being male and engaging in any of the arts is associated with £60 more charitable donations.

C.4.3 Indicative financial impacts

The value of these impacts can be assessed by aggregating the increases in charitable donations due to participation in culture and sport set out in Table 16. For instance, if due to an intervention nationally 10,000 additional people take part in music then we could assume that this leads to a £0.3m increase in charitable giving. Similarly, it could be assumed that the same increase in sports participation following an intervention would lead to a £0.25m increase in charitable giving.

Annex D: Further research

Going forward, research in this area should aim to more conclusively address the issue of causality. Longitudinal data (either from subsequent waves of Understanding Society or from the new element of the Taking Part survey) are useful as we can control for some unobservable factors (those factors that do not change over time) through use of fixed effects regression analysis. Longitudinal data should not be seen as a panacea for the question of causality, however, because they cannot solve for the effect of unobservable factors that are not constant over time (such as people's preferences), which means that we still may not be able to attribute causality fully.

In order to conclusively address direction of causality issues, further work of the following type would be recommended. **Experimental methods -** whereby engagement in culture and sport is randomly assigned – will allow us to single out the effects of engagement and participation, although this may be difficult in practice due to non-compliance. However, this can be overcome somewhat by use of methods that randomise *encouragement to participate* in sporting and cultural activities instead - this might be through the provision of vouchers for free entry in to exhibits, art classes or sporting events. Encouragement designs allow people to ultimately decide whether they want to participate or not and they have been conducted to test the effect of adult learning on job outcomes in Switzerland (Schwerdt et al, 2012) for example.

Alternatively robust causal estimates can also be derived from **regression discontinuity design (RDD) methods**, whereby eligibility to participate in cultural and sporting activities is based on a single (pre-determined) observable criterion, such as frequency of engagement in the previous month or level of household income and here the intervention can be targeted at those groups in need or that are disadvantaged.

Annex E: References

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