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# Cultural Consumption in Scotland

Arts and Culture



social  
research

**CULTURAL CONSUMPTION IN SCOTLAND**

**ANALYSIS OF THE SCOTTISH  
HOUSEHOLD SURVEY CULTURE MODULE**

**Paul Widdop and David Cutts**

**Institute for Social Change, University of Manchester**

Scottish Government Social Research  
2011

This report is available on the Scottish Government Social Research website only [www.scotland.gov.uk/socialresearch](http://www.scotland.gov.uk/socialresearch).

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## **EXECUTIVE SUMMARY**

### **Introduction**

This research was commissioned by the Scottish Government to explore statistical evidence from survey data to establish whether taking part in culture in Scotland depends both on who you are and where you live. Previous descriptive analyses had suggested that some socio-demographic factors were associated with cultural choices. This research quantifies the relative importance of each of these factors and provides a useful addition to existing quantitative and qualitative research evidence in this area. The research provides strong evidence that some demographic factors (e.g. education) are more important than others. Using this information, it will be possible to target those individuals who may be at a disadvantage in terms of engaging with culture.

In this report, we analyse the cultural data from the Scottish Government's Scottish Household Survey Culture (and Sport) Module, examining both attendance and participation in different cultural activities. The Scottish Government aims to overcome and remove barriers that exist for some people to engage with culture, given that evidence suggests that such engagement enhances socialisation and a sense of belonging. Our aim is to look at whether people can be categorized on the basis of their cultural consumption, and then examine whether belonging to those categories can be explained by the socio-demographic characteristics of the individual and wider geographical influences. This information will identify target groups and geographical areas where new initiatives to encourage engagement in culture could be piloted.

In the first part of the report, we provide an overview of attendance and participation in Scotland in respect of self reported activity (done - yes or no) from the previous calendar year, captured by the SHS Culture Module through face to face interviews covering a list of cultural activities. Critically, we show from the survey data that attendance and participation differ by education, gender, age, and the local authority (LA) of residence. In the second part of the report we explore relatively well defined types of individuals that can be parcelled together using a Latent Class Analysis (LCA) modelling approach based on their attendance and participation habits. Two

separate models were run, one for attendance and one for participation (based on a restricted selection of cultural indicator variables). The Latent Class Analysis showed that there was a sound empirical basis for grouping respondents on the basis of their pattern of activity based on this data. With this modelling approach, we found that four such groupings existed in the SHS data for attendance, and three for participation (see descriptions of groupings below). These groups were labelled according to their characteristics. The key points from this modelling process were:

**For attendance:**

- Four lifestyle groupings were identified within the data for attendance: these lifestyle groups were labelled, 'omnivores'; 'heritage & libraries'; 'audio visual arts'; and 'low attendants'.
- **Omnivores:** individual members of the 'omnivores' are likely to be engaged in all attendance measures; they are engaged in activities that are traditionally associated with popular and contemporary cultural activities.
- **Heritage & Libraries:** Members of the 'heritage & libraries' group have less depth to their participation habits compared to 'omnivores', and are likely to be engaged in historical sites, museums, and libraries
- **Audio Visual Arts:** Members of the 'audio visual arts' class are differentiated from other groups through their apparent engagement in activities such as the theatre, cinema and music.
- **Low Attendants:** The 'low attendants' tend to be less likely to be engaged in any attendance activity.
- The 'omnivores' make up 26% of the population (survey); the 'heritage & libraries' group 15%; the 'audio visual arts' category 28%; and the 'low attendants' 31%.

'Omnivores' are over-represented in the urban centres of Scotland, and under-represented in the sparsely populated areas. The 'heritage & libraries' class are over-represented in the central Local Authorities of Scotland. High concentrations of the 'audio visual arts' class are apparent across Scotland, perhaps indicating that variation by LA is less important.

### For **participation**:

- Three lifestyle groupings were uncovered in the participation field. These were labelled, 'omnivores'; 'home based participants'; and 'low participants'.
- **Omnivores:** Individuals who make up the 'omnivore' latent group are highly engaged in all activities associated with participation in this report. In other words, they have great depth and range to their cultural participation behaviours.
- **Home-based Participants:** They are most likely to partake in reading, craft work and the visual arts. They are active but much less so than the 'omnivores'.
- **Low Participants:** The 'low participants' tend to engage in few if any activities; although 49% of this group will be regular readers of literature this is well below the national average of over 60%.
- The 'omnivores' were the smallest group 7%, followed by the 'home based participants' group with 30%. Whilst the 'low participants' group were the greatest proportion of the survey with 63%.
- These lifestyle groupings in participation appear clustered in space. High levels of the 'omnivore' group are present in Northern Scotland. The 'home based participants' are clustered in the more ruralised areas. While, the 'low participants' are concentrated in greater numbers in the East, Central and Southern Scotland.

### **Individual Characteristics**

Having grouped respondents and activities together using the latent class approach, we next looked at the characteristics of individuals that were associated with membership of each class or group. We did this through a multilevel multinomial regression model, which measures associational effects of various socio-demographic variables against the latent class groups, thereby determining who is likely to be a member of what group.

#### - **Attendance**

For attendance, education, income, age, gender, health and car ownership were all powerful predictors of group membership. The more active groups ('omnivores',



'heritage & libraries') were much more likely to be highly educated, and have higher occupational standing. There were gender differences amongst groups, with males more inclined than females to be members of the 'low attendant' group, whilst females were more likely to be in the highly engaged group compared to their male counterparts. Age was related to participation in predictable ways. Older people were less likely to participate, whilst the young were more inclined to be engaged in a variety of activities. Individuals in all three active classes measured against the 'low attendant' group were significantly more likely to reside in urban areas than rural parts of Scotland.

#### - **Participation**

The participation field followed similar patterns to that of the attendance field. Education was the key driver, with the highly educated being much more likely to be active as opposed to inactive. For both active classes ('omnivores' and 'home based participants') measured against the 'low participant' group, gender had a significant effect on class membership. Females were significantly less likely to be 'omnivores' than males, but were more likely to be in the 'home based participants' group. One clear distinction between attendance and participation was locality. Individuals in both active classes for participation were significantly more likely to live in rural as opposed to urban areas, while the opposite was the case for cultural attendance.

#### **Area Lived In**

By adopting a multilevel modelling approach, it is possible to identify any residual structure in the data after the effects of known demographic factors have been taken into account. This residual information has been shown to be explained in part by geography (the areas respondents live in). For both attendance and participation, membership of a latent grouping is influenced to some degree by where an individual resides. The local authority area inhibits or facilitates membership of cultural lifestyle groups. We also examined the effect of deprivation in an area on these groupings. For both models (attendance and participation) we found that residing in a deprived local authority inhibits cultural attendance and participation, even when controlling for other factors. Therefore, there is little doubt that there are different opportunity

structures in deprived areas that restricts cultural participation, over and above individual level socio-demographic characteristics.

### **Low attendants and Low Participants**

The final chapter examined those individuals who were disengaged from attending and participating in cultural activities. In total, 28% of individuals surveyed were both 'low attendants' and 'low participants'. Here we examine each field separately.

#### **- Attendance**

Individuals who were disengaged from attending cultural events were significantly more likely to have low or no educational qualifications, to be male, from the older age groups, particularly the 65 and over age bracket, and also more likely to be single. It also seems evident that members of the low activity group are significantly more likely to be individually deprived; less likely to be owner occupiers and to come from the highest income bracket, and more likely to suffer long term illness and have no car. Moreover, those living in urban areas are significantly less likely to be members of the low activity group.

#### **- Participation**

Similar drivers were found for those individuals who were disengaged from participating. Members of the 'low attendants' group were significantly more likely to have no educational qualifications, to be male and less likely to be from the youngest age bracket. While there was no discernible effect of having long term illness on cultural participation, there is some evidence that members of the low activity group are significantly more likely to be individually deprived. They are significantly less likely to be homeowners and more likely not to own a car. Members of the 'low participants' group are more likely to live in urban areas as opposed to rural parts of Scotland, whereas the opposite is true for cultural attendance with those in the low cultural attendance group more likely to live in remote rural areas. Many of the activities included in participation can be done at home (e.g. craft, reading) whereas cultural attendance may depend on the location of a facility (e.g. theatre) nearby.

## ***Conclusion***

Using a quantitative approach, it is possible to examine survey findings for taking part in cultural activity and allows estimation of the relative influence that different demographic factors have on taking part. This new information provides cultural policymakers with a tool that allows them to target those groups of people who are at greatest cultural disadvantage, possibly by initiatives promoting activities, shown by this analysis, in which these groups are more likely to take part.

However, like all reports that rely on one source of data, this analysis has an important caveat. The consumption patterns discussed in this report are derived from a selected number of cultural indicators in the SHS Culture Module for participation and attendance. It is possible that different cultural indicators could provide different lifestyle groups and subsequently alternative findings. For example, it is possible that low consumption groups may be active in other forms of culture not measured here, especially those activities that are based in the home. Our findings relating to place or where you live may also be dependent on the cultural indicators used in the analysis. Moreover, our analysis uses cross-sectional data and does not take account of any increases or decreases in participation or attendance over time. So we are providing only a snapshot of cultural attendance and participation in Scotland at one point in time. To enhance validity, future studies of cultural consumption in Scotland should use similar indicators and ideally the survey should have a panel element to robustly assess changes over time.

# CHAPTER ONE: BACKGROUND AND CONTEXT OF RESEARCH

## Introduction

- 1.1 The aim of this document is to look for statistical evidence to support current theories on cultural engagement. It is important that the results can be extrapolated to represent the whole population otherwise there is a danger that the findings only relate to the sample that is selected. Statistical evidence in social research is most easily captured by surveys. Up until 2007, there had been no robust statistical data source covering cultural engagement in the whole of Scotland.
- 1.2 In 2007, the Scottish Government began a random survey of adults resident in Scotland, asking about cultural participation and attending cultural events along with their motivations and attitudes. Collected over two years, the Scottish Household Survey (SHS: Culture and Sport Module) is the first nationally representative survey of cultural consumption in Scotland. It provides a unique insight into the participation and attendance habits of individuals residing in Scotland and for the first time allows a picture of cultural consumption to be drawn.
- 1.3 As this survey is in module form and is harmonized with the full Scottish household survey, it contains a rich source of socio-demographic information. This enables researchers to examine what type of cultural activity is undertaken by Scottish residents and who does what. We have used the Scottish Household Survey Culture and Sport Module (SHS C&S) data because the sample is a stratified random sample which allows national inference and a wide range of activities including attending libraries and archives offices is covered.
- 1.4 An initial exploration of the survey data was conducted in the report 'People and Culture in Scotland 2008' (2009), which focused extensively on the participation and attendance of those individuals residing in Scotland. The main findings of that report were that females, young people (16-24), high

income earners, those with high level qualifications and those living in the least deprived areas were more likely to be participants in cultural activities and attend cultural events.

- 1.5 We see this current report as a complementary extension to the 'People and Culture in Scotland 2008' report, exploring deeper into interesting aspects of the findings, first through social stratification, i.e. the relationship/association with links between education and income on activity; second, the importance of individual level characteristics, age, gender, and marital status on who is engaged in culture and to what levels and those that are culturally excluded; and finally how attendance and participation are influenced by a sense of place.
- 1.6 Therefore, this report uses the Scottish Government's Household Survey Culture Module to provide robust explanations for the existing patterns of cultural participation and attendance in Scotland.

### **Aims and Objectives**

- 1.7 The overall aims of the research were to gather evidence to inform the Scottish Government's understanding of cultural participation and attendance habits of individuals residing in Scotland. This analysis will, for the first time, provide an in-depth statistical analysis of cultural consumption which can inform Scottish Government Culture Policy with target groups and areas where new initiatives to encourage engagement in culture can be put in place.
- 1.8 In order to meet these aims the research pursued the following objectives:
  - Uncover cultural lifestyle types in two domains, namely Attendance and Participation;
  - Use empirical analysis to determine the characteristics of cultural lifestyle types, measured by stratification and other socio-demographic variables;

- Determine if cultural lifestyle types differ across different local authority areas (LA) in Scotland and what influence living in deprived local authority areas, or rural as opposed to urban areas, has on cultural behaviour;
- Examine if the variation in cultural behaviour is still accounted for at the local authority area level even when controlling for individual level compositional effects and area level characteristics;
- Explore the low-consumer typology group found in the two domains and examine what activities this group is more likely to be engaged in and their socio-economic/demographic profile;
- Account for the different reasons why certain groups do or do not take part in or attend cultural events, and make any links between the two.

## **Methodology and Modelling Approach**

- 1.9 The simplest way at looking at whether socio-demographic factors influence the survey estimation of taking part in culture is to compare the proportion who do an activity in two or more groups. The problem with this is that within those groups, other demographic variables (for example, age) might be unequally distributed. We then do not know whether the difference in participation is due to the first factor of interest or age. The next stage would be to try to make the comparison groups equal for these additional demographic variables. However, there are insufficient observations to do this for all of the demographic factors which, when looked at in isolation, appear to influence taking part.
- 1.10 A modelling approach establishes where in the data the variation in the results lies rather than trying to test whether the result for one group is different to another. This is a more powerful statistical technique that allows you to control for other demographic factors with less data. We will therefore use such a modelling approach in this analysis.
- 1.11 This research uses three statistical models to empirically test cultural attendance and participation using the 'Scottish Household Survey Culture

Module'. First, we will try to identify cultural lifestyle types from the data using an approach which clusters activities and looks at underlying engagement using a tool called latent class analysis (LCA). Second, using the groups defined from the data, we will try to explain which individuals belong to those groups in relation to their socio-demographic variables using a multinomial regression model. Finally, we will try to determine whether any of the variation in the survey data (in terms of belonging to cultural lifestyle groups) is accounted for by the LA in which individuals reside. For this we will use an approach known as multilevel modelling. In the appendix we provide a detailed breakdown and additional technical information on the modelling strategies used. However, below we provide a brief overview of the modelling approaches to demonstrate their overall function and applicability for the research.

### ***Latent Class Analysis***

- 1.12 In this report we use Latent Class Analysis (LCA) to determine which cultural activities can be grouped together on an empirical basis. The aim is to identify sub-groups of respondents on the basis of them doing more or less of different types of cultural activities. For instance, those people who go to museums are also more likely to visit the library. Hence, there may be a correlation between the two variables. Models to explain data do not work well when there is correlation between variables. One way around this is to consider the separate activities in terms of a cluster of activities variable which we don't measure directly (a latent variable). Whilst it is possible to be subjective and place groupings together based on personal experience, in order to have a greater understanding of cultural engagement, it is far more beneficial to base such a classification on empirical data.
  
- 1.13 Using LCA allows the researcher to determine whether respondents fall into particular groups, classes or subtypes. Here we use LCA to reduce the number of observations into a small number of classes on the basis of responses to a series of cultural activities. The number of classes is obtained

by comparing the statistical fit of models with differing number of classes. The selection is then made on the basis of which model provides the best account of the observed data. Once we have established the number of classes for both cultural attendance and participation, we then assign each individual to a particular class according to their scores on the cultural activity variables. A more detailed explanation of this whole process is outlined in the appendix. At this point, it is then possible to use regression based modelling to determine which factors are associated with membership of a particular class.

### ***Multinomial Regression***

- 1.14 Using the latent variable identified in the LCA as a dependent variable we can investigate the relationship between latent class groups and a set of explanatory variables by regressing them onto this dependent variable. By incorporating stratification variables such as age, gender, health, and family composition to a multinomial regression model, we can set about establishing with statistical significance which factors are associated with membership of a particular class. This modelling approach is similar to a standard logistic regression model using a dependent variable that is indirectly measured by questions covering a range of cultural activities.

### ***Multilevel Modelling***

- 1.15 Within the population at large there are clear hierarchical structures. Individuals reside in households, in neighbourhoods, which are located in local authorities, which, in turn are situated in regions. The failure to model hierarchical data ignores the fact that clustering occurs in a population. Simple regression models are based around the assumption that the observations are independent. This is unlikely if two observations are drawn from the same geographical area. They are more likely to be similar than each other than the average person from the whole population. In practical terms, this can lead to socio-demographic variables being wrongly found to have influence on the cultural behaviour.



- 1.16 Multilevel modelling is a methodology which provides a framework for exploring how relationships vary across hierarchical structures, whether these be natural, or introduced to the sample design. The approach is especially useful in this report as it allows us to understand the variability associated with individuals and geography. To do this, the variance left over after consideration of individual level demographic variables is examined to see if it can be explained by residing in the Local Authority area. Initially, the primary purpose of these models is not to identify the causes of attending or participating in a cultural activity but to estimate the sources of variance i.e. how much is attendance and participation in a cultural activity dependent on who you are (socio-demographic variables) and how much is it dependent on where you are?
- 1.17 This multilevel approach will capture the variation that exists at the individual level and LA level simultaneously, determining the effect of place on fostering cultural lifestyles, after controlling for composition and context.

### ***SHS Culture Data***

- 1.18 The SHS Culture (and Sport) Module pooled across 2007 and 2008 collated cultural data from 6,764 adults via face to face interviews. Households were drawn from the postcode address file, with interviews conducted randomly from a selected member of the household aged 16 or over. The fundamental aim of the SHS Culture (and Sport) Module is to collect data on the cultural consumption behaviours and attitudes of the population. The Module is therefore a representative sample of adults aged 16 and over who are resident in Scotland.
- 1.19 The data and modelling approach does have some limitations. The data is collected by face to face survey and depends on personal recollection over the last year. Some individuals might have reduced capacity to do this. The survey is quite long, lasting forty five minutes. For those who have low interest

in culture, the engagement with the survey and accuracy of answers may be poor. The cultural variables selected in our modelling approach are derived from questions on whether the respondent did an activity (yes or no). Information about whether an individual did an activity more than once a week etc is not examined here. Similarly, this study does not evaluate the experience and whether it is something the respondent wants to do in the future. Here the focus is on whether a respondent does an activity or not as it provides a comprehensive overview of cultural lifestyle in Scotland.

### ***Cultural Indicators***

- 1.20 Due to data constraints it was necessary to limit the analysis to a reduced selection of cultural participation and attendance variables. However, the selection did have a strong theoretical basis to ensure that both popular and more 'high brow' activities were covered.
- 1.21 Table 1 shows the seven cultural indicators for attendance and how they were constructed, through the collapsing of other variables. These indicators will be used throughout the duration of this report.

**Table 1.1 Cultural Attendance (Key Indicators)**

<b><i>Cultural Indicator</i></b>	<b><i>SHS Variables (in the last 12 months have you visited...)</i></b>
Library	Library
Museums	Museum or Art Gallery
Any theatre	Play/drama Other theatre performances (e.g. musical, pantomime) Opera/opera Classical music Ballet
Any music	Jazz performance Traditional Scottish music Live DJ event Other live music event
Historical site	Historic city or town Historic building (non-religious) Historic park, garden or landscape Place connected with industrial history A historic place of worship (as a visitor, not to worship) Monument e.g. castle, fort or ruin Site of archaeological interest e.g. standing stones Site connected with sports heritage (to visit, not watch sports) Other historical site
Cinema	Film at cinema or other venue
Craft	Craft Event

1.22 Table 2 below shows the cultural indicators for participation and how they were constructed. The participation field in this project consists of six cultural indicators and these will be used throughout this report.

**Table 1.2 Cultural Participation (Key Indicators)**

<b><i>Cultural Indicator</i></b>	<b><i>SHS Variables (in the last 12 months have you visited...)</i></b>
Reading	Read for pleasure (not newspapers, magazines or comics) Read a Scottish book or book by Scottish author Bought a novel, or book of short stories, poetry or plays for yourself Attended a reading group
Visual Arts	Paint, draw, print or sculpture Photography as an artistic activity (not family or holiday snaps) Made film or video as artistic activity (not family or holiday film) Use computer to create original artwork
Performing Arts	Sang to an audience or rehearsed for a performance (not karaoke) Played a music instrument to an audience or rehearsed for a performance Danced ballet Danced (not for fitness) Rehearsed or performed in a play/drama Rehearsed or performed in a opera/operetta
Craft Work	Textile crafts such as embroidery, crocheting or knitting Wood crafts such as wood turning, carving or furniture making Other crafts such as calligraphy, pottery or jewellery making Textile crafts such as embroidery, crocheting or knitting
Musical Instrument	Play musical instrument for own pleasure
Creative Writing	Written any stories, books or plays Written any poetry Written music

### ***Socio-Demographic Variables***

1.23 One of the key aims of the research was to determine the socio-demographic factors associated with membership of a particular class. We identified from the SHS Culture Module a number of socio-demographic characteristics which might predict membership of each latent class for cultural attendance and participation in Scotland.

1.24 In the literature on cultural consumption (see Bourdieu, 1984; Peterson 2005) education, occupational class, and income are used as measures to explain why there is variation in consumption. The SHS C&S variable for occupational class is not detailed enough to test this factor, therefore we use income and education instead (both as banded categories). We consider income as a proxy for social position. Income is coded into five categories (see appendix for full details) while education (highest qualification achieved) in the analysis

is coded to seven categories ranging from the highest level degree (level 5) to no qualifications (Education Base = No Qualifications).

- 1.25 Other important socio-demographic variables have been shown to be associated with cultural attendance and/or participation in Scotland (People and Culture in Scotland, 2008). To reflect this we include age; gender; marital status; limiting long-term illness; car ownership (access to a car); tenure and urban-rural identifier. These will serve as control variables to remove the possibility of any hidden confounding effects with those of income and education. This research seeks to test whether these variables do have subtle effects on choice of cultural lifestyle, alongside the more dramatic influences previously demonstrated for income and education.

### ***Area Level Variables***

- 1.26 It is important to clearly identify which spatial scale this analysis will be set at. We know that individuals reside in households that are situated in neighbourhoods. These neighbourhoods are located in administration wards, which are located in local authorities, and further grounded by region. Therefore, these spatial scales will have contextual or composition (macro level factors) forces that may influence participation and attendance habits. Ideally we would take into account local geographical influences (including social networks, budget and what facilities are nearby). Unfortunately, the SHS Module data only allows study at the larger local authority area. This might capture some but not all of the more local influences.
- 1.27 There are technical limitations regarding the number of area level variables we can utilise. In this analysis, we only include the Scottish 2006 multiple index of deprivation or SIMD (15% by rank of most deprived areas) as a binary variable. If the SIMD measure is statistically significant in the model even when accounting for other compositional variables (the individual level explanatory variables i.e. education, income and age etc), it will be possible to assume that deprivation has a genuine independent effect and that it is not

simply an artefact of population composition. After we have taken account of area level deprivation, we make the assumption that any variance in the data still outstanding can be explained by residing in the Local Authority area.

## **Report Structure**

1.28 This initial chapter of the report has presented the background and introduction to the project. From this point forward, the report is structured in the following way. Chapter Two will provide an overview of cultural consumption in Scotland, examining participation and attendance as defined by the categories described in tables 1 and 2 through cross tabulations with the key demographic variables presented previously. Chapter three will present the results from the latent class models, identifying the lifestyle types that exist in both participation and attendance. Chapter Four will empirically examine the socio-demographic composition of these lifestyle groups, whilst also exploring if any variation in these latent groups is accounted for by local authority area level geography. Chapter Five will examine the key drivers of cultural disengagement, both in terms of participation and attendance. Finally, chapter Six will be a discussion and conclusion of the results.

## **CHAPTER TWO: CONSUMPTION OF CULTURAL ACTIVITIES IN SCOTLAND**

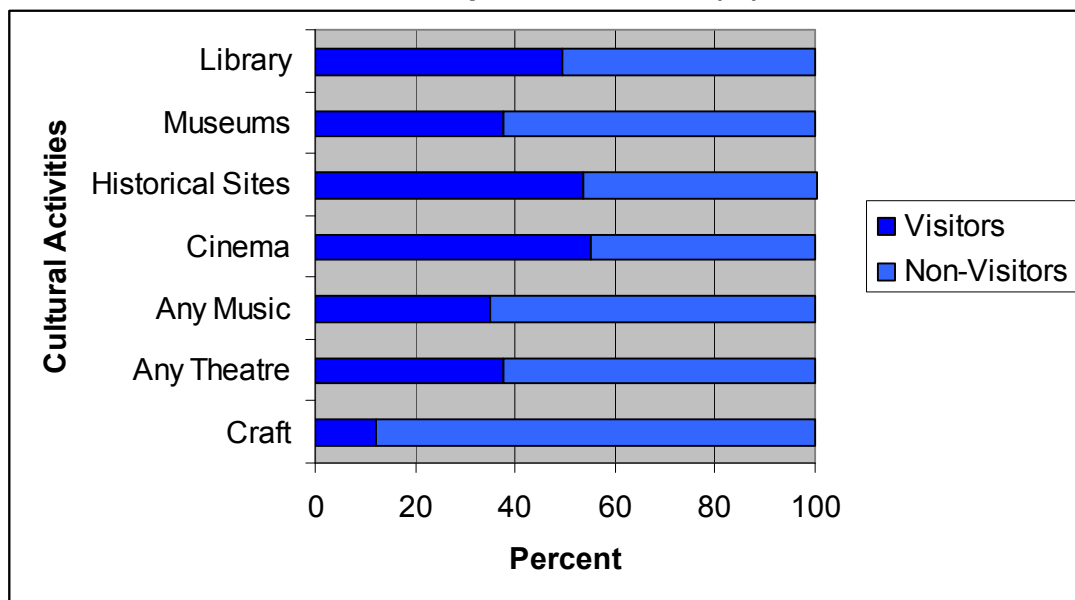
### **Introduction**

- 2.1 In this chapter, we use a combination of summary statistics and cross-tabulations to gain an insight into those who attend and engage in cultural activities across Scotland. Whilst we are aware of the comprehensive descriptive analysis in the 'People and Culture in Scotland' report, the indicators here differ (some are derived variables combining several activities) and require exploration here. This chapter will therefore include an in-depth exploration of the relationship between our chosen cultural indicators and various stratification variables. We will then end this chapter by mapping attendance and participation in these cultural activities across the thirty-two Local Authority areas of Scotland.
- 2.2 We define attendance as visiting a cultural event or activity on one or more occasions in the past 12 months. Seven cultural activities are examined: Library, Theatre, Music event, Cinema, Historical Site, Museum and Craft event.
- 2.3 Participation refers to those individuals who have actually taken part or been engaged in a cultural activity on one or more occasions over the past 12 months. Here six cultural activities are examined: Visual Arts, Reading, Performing Arts, Craft Work, Playing a Musical Instrument and Creative Writing.
- 2.4 We will therefore structure the following sections by examining attendance and participation separately before comparing the results later in the chapter. When we talk about attendance or participation in context of the results of this study, we mean the indicators shown in table 1 and 2.

## Attendance

2.5 Of the seven indicators used in this study, the most popular attractions are historical sites and the cinema, with more than half of the people sampled reporting attending such venues (see figure 2.1). Libraries are also popular with just under half the population reporting that they attended. Visiting theatre based activities, museums, and music events share similar levels of engagement with over one third of the population attending these activities. Around 12% of respondents report attending Craft events.

**Figure 2.1: Attendance and Non-Attendance of Cultural Activities over the past 12 months (%)**



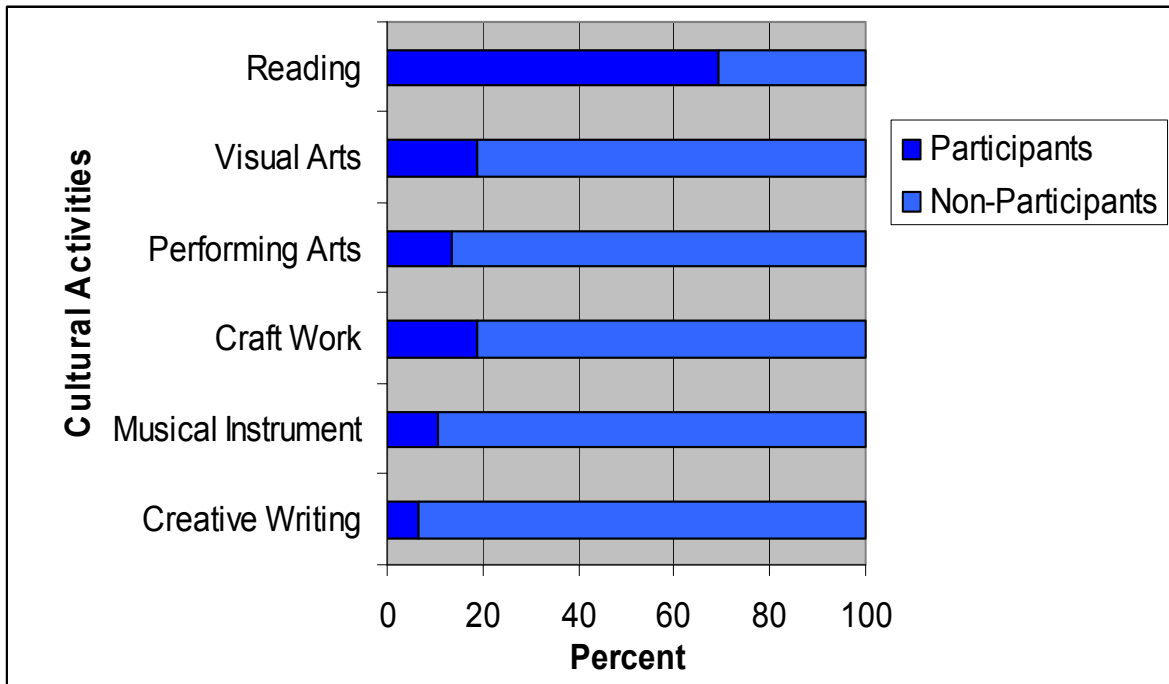
## Participation

2.6 Reading is by far the most popular (see figure 2.2) with more than two thirds of the population doing this activity. By contrast, engagement levels in other cultural activities are much lower. Only 10% percent reported playing a musical instrument for their own pleasure, whilst 7% percent reported being active in creative writing. Visual arts and the performing arts have slightly more participants, although less than a fifth of the population participated in



these activities. As regards craft work, levels of participation were only slightly higher than other activities, with one fifth of the population reported to partake in this activity. The descriptive data suggests that categories of cultural participation generally show a lower uptake than the categories of cultural attendance selected in this study.

**Figure 2.2: Participation and Non-Participation of Cultural Activities over the Past 12 months (%)**



***Demographic breakdown of participation and attendance***

2.7 The breakdown of participation and attendance by demographic variables is shown in the appendix. Education, income and age show the strongest association. These are likely to be important factors in any model to explain cultural lifestyle choice. In sum we found the following interesting patterns:

- Those with the highest qualifications and most disposable income are more likely to attend and participate in culture. The level of attendance and participation decreases steadily as you move down through the education and income categories.

- Of those who attended and participated, women are more likely than men to report being active.
- Attendance by age varies according to the cultural activity consumed. In the attendance field several cultural activities are popular with the youngest group aged 16-29. Indeed, there is a negative relationship between attendance and age for the cinema, going to a music event and visiting the library, although the latter is consumed in healthy numbers by all age groups. In participation, there is evidence of a negative relationship between age and the visual arts, creative writing and playing a musical instrument: as age increases, participation in these activities decreases.

### ***Examining Geography: Mapping Cultural Consumption by Local Authority***

2.8 To fully understand cultural behaviour, it is important not to ignore the influence that the context in which people live out their daily lives imparts on their participation habits. Any form of cultural engagement will undoubtedly be influenced by place, not only through interaction with people they reside with but also through location, as this interaction must take place somewhere. Furthermore, access to facilities and opportunity structures in more urban areas will perhaps act as an additional influence, as well as other environmental (macro level) factors. Therefore, place is as important as the previous measures in determining cultural participation. The results are shown in [appendix 1](#). It is clear that there are clusters of local authorities with a similar proportion of people engaged in culture and so geography is likely to be a factor which influences cultural choices.

### ***Next Step***

2.9 The descriptive account of attendance and participation activity provides an overview of patterns of cultural consumption in Scotland. The demographic and geographical variables studied (see [appendix 1](#)) show an association with cultural consumption and so are logical choices of variables to include in any

models of this behaviour. In the next section, we will use a latent class analysis to determine if there are any underlying cultural attendance and participation typologies.

## CHAPTER THREE: LATENT CLASS ANALYSIS OF CULTURAL ATTENDANCE AND PARTICIPATION IN SCOTLAND

### Introduction

- 3.1 In this report, we use Latent Class Analysis (LCA) to examine which activities can be meaningfully grouped together on an empirical basis to form cultural lifestyle groups (based on the indicators of attendance and participation). Cultural lifestyles are formed through consumption habits of various activities, which can be captured through a Latent Class Analysis (LCA). The LCA model reduces a large number of observations to a smaller number of classes or categories on the basis of responses to a vector of variables. The LCA will uncover the cultural lifestyle typologies that exist, the size of these typologies, and the probabilities of consuming a cultural indicator given membership of a given lifestyle group (typologies). For attendance and participation, we used the activities defined in table 1.1 and table 1.2.
- 3.2 Before trying to assign respondents to lifestyle groups, it is necessary to check whether grouping the activities is appropriate for this data. If it is, we need to know how many groups are needed for an optimal fit. To do this, a series of LCA models were run using the software package Mplus, each containing a different number of groups. This was done to ensure that the correct number of latent groups was identified. The usual model building strategy is to start with a specification of two latent classes and then increase this by one incrementally until one arrives at an acceptable model. By testing the model fit statistics of each model (with different number of classes) we can determine which model fitted the data the best (how many groups best fitted the data). The [appendix](#) contains full details of this process and how we used the goodness of fit statistics to arrive at the optimum number of classes for the data. From our data, we identified four different lifestyle groups for attendance and three groups for participation. The following section examines cultural attendance and participation separately and includes the results of the LCA model, an interpretation of the different groups, the size of each lifestyle

group, and the probabilities of participating in different activities given membership of each group.

### Latent Class Model of Cultural Attendance

3.3 The latent class model of cultural attendance is shown in Table 3.1. We can identify four lifestyle groups or classes from the data. We have named these groups as follows: ‘omnivores’, ‘heritage & libraries’, ‘audio visual arts’ and ‘low attendants’.

**Table 3.1 Latent Class Model of Cultural Attendance in Scotland**

	<b>Class One 26%</b>	<b>Class Two 15%</b>	<b>Class Three 28%</b>	<b>Class Four 31%</b>
Activities	Omnivores	Heritage & Libraries	Audio Visual Arts	Low Attendants
Library	<b>77%</b>	<b>62%</b>	47%	23%
Any Theatre	<b>84%</b>	29%	<b>42%</b>	8%
Any Music	<b>66%</b>	21%	<b>50%</b>	9%
Cinema	<b>90%</b>	44%	<b>80%</b>	15%
Historical Site	<b>95%</b>	<b>76%</b>	50%	14%
Museums	<b>86%</b>	<b>57%</b>	27%	2%
Craft event	<b>35%</b>	15%	5%	1%

#### **Class 1: Omnivores**

3.4 The ‘omnivore’ group has the highest chance of consuming all seven cultural attendance indicators. This group make up 26% of the population (relatively speaking), and are more likely to be engaged in all of the cultural activities studied than members of the other groups. Indeed an individual assigned to this group is almost certainly a museum visitor (86%), will partake in the arts,

and are highly likely to visit historic sites (95%). Despite it being their least popular activity, this group is the most likely to visit craft event (35%).

### ***Class 2: Heritage & Libraries***

3.5 There is a cluster defining a consumption typology which we have termed 'heritage & libraries', which reflects the characteristic behaviour of those in this group. An individual assigned to this group has a high probability of visiting places of historic interest, museums and libraries, yet rejects other indicators such as the theatre, music and the arts. They are specifically predisposed to enjoy heritage, museums and libraries to the exclusion of other activities, although their consumption of such activities is not as high as those individuals in the omnivore group.

### ***Class 3: Audio Visual Arts***

3.6 This group represents 38% of the population. It has been labelled here the 'audio visual arts' group, as members of this class are highly engaged with the cinema, and to a lesser degree music and the theatre. Indeed, a member of this class has a 70% probability of visiting the cinema, which is clearly their cultural activity of choice, although the probability of them attending music events and theatres is high relative to the national average attendance for these activities (as shown earlier in the document – see Figure 2.1). This is not the case for visiting museums, historic sites, libraries and craft events.

### ***Class 4: Low Attendants***

3.7 The 'low attendants' class is the least likely to partake in any of the cultural activities within this domain. It forms just over a third of society. This non-consumer group largely rejects high cultural activities (museums, art exhibitions, and castles and archaeological sites etc) but also more popularised cultural activities (libraries and the cinema). If they attend cultural

events or places at all, it is most likely to be the library, although the probability of visiting is still low.

### Latent Class Model of Cultural Participation

3.8 The latent class model of cultural participation is shown in Table 3.2. We can identify three lifestyle groups or classes from the data. We have named these groups as follows: ‘omnivores’, ‘home based participants’ and ‘low participants’. The following will examine each of the typologies created through the latent class model, and attempt to understand these types of individuals in relation to their participation habits.

**Table 3.2 Latent Class Model of Cultural Participation in Scotland**

	<b>Class One</b> <b>7%</b>	<b>Class Two</b> <b>30%</b>	<b>Class Three</b> <b>63%</b>
	Omnivores	Home Based Participants	Low Participants
Visual Arts	<b>59%</b>	27%	4%
Reading	<b>92%</b>	<b>88%</b>	49%
Performance	<b>58%</b>	15%	4%
Craft work	<b>24%</b>	<b>35%</b>	4%
Playing musical instrument	<b>75%</b>	9%	1%
Creative Writing	<b>48%</b>	5%	1%

#### ***Class 1: Omnivores***

3.9 The ‘omnivore’ group has the highest chance of consuming all six cultural participation indicators. This group is much smaller than the cultural attendance ‘omnivore’ group, with only 7% of the population forming membership. It is the smallest of the lifestyle groups for cultural participation. Nonetheless, apart from craft work, individuals assigned to this group are

more likely to participate in all of the cultural activities than members of the other groups. An individual who is a member of this group is particularly likely to read for pleasure (92%), play a musical instrument (74%) and rehearse or perform an activity classed as the performing arts (58%). Individuals in this group, based on their conditional probability of consumption have an insatiable hunger for all cultural pursuits chosen in this study.

### ***Class 2: Home Based Participants***

3.10 This group represents 30% of the population. This group is labelled the 'home based participants' because they have a high probability of reading and engagement in craft based activities, both of which can be done in the home environment. An individual assigned to this group has an 89% probability of reading literature and 38% of partaking in craft based activities. While they are modest in their engagement in arts and performance they do not reject these forms and take part in these activities, but at more modest levels.

### ***Class 3: Low Participants***

3.11 This class of participants are the least likely to partake in any of the cultural activities identified. They represent nearly two thirds of the population. This 'low participant' group reject both highbrow and popularised cultural activities. If they participate in any cultural activities at all, it is most likely to be reading, although the probability of participating in reading is still well below the average.

## **Mapping Lifestyle Groups by Local Authority Areas**

3.12 In [appendix 3](#) we map the lifestyle groups across the thirty two Scottish local authority areas (Figures 3.1 – 3.2). The maps are split into local authority areas with latent types below the national average, and those with average or above levels within their geographical boundary. The purpose of these maps is to illustrate where the lifestyle groups identified in the latent class models of



attendance and participation are under and over represented. This provides evidence for an effect of geography on choice of cultural lifestyle. We cannot assume that this geography factor only affects those people currently living in that local authority; it may affect anybody who might live there.

### ***Next Step***

3.13 This chapter has identified the lifestyle groups that are present in the data relating to attendance and participation. One of the key aims of this report is to examine who these groups are and what the key drivers of cultural attendance and participation are at both the individual level and at the area level. Therefore, in the next part of the report we use statistical modelling to determine what factors drive membership of these groups. In other words, whether the socio-demographic profile of individuals in one class is distinctive from membership of another.

## CHAPTER FOUR: UNDERSTANDING THE DRIVERS OF CULTURAL ATTENDANCE AND PARTICIPATION IN SCOTLAND

### Introduction

- 4.1 During this section of the report, we determine the key drivers of cultural attendance and participation in Scotland. Here we use different modelling techniques to explain cultural behaviour by taking account of the factors which influence the individual as well as determining whether consumption varies by geographical area after controlling for individual and area level predictors of cultural behaviour.
- 4.2 We will study attendance and participation in two separate models. The latent classes identified earlier are treated as categorical dependent variables in our models. The individual level explanatory variables include education, income, gender, age, tenure, car access, marital status, limiting long-term illness and an urban-rural identifier for where the individual resides. We also include an explanatory variable at the Scottish local authority level (2006 multiple index of deprivation or SIMD: 15% by rank of most deprived areas) to act as a proxy for both compositional and contextual effects. The explanatory variables used in this analysis were discussed in the Executive Summary. However, a detailed overview of how each explanatory variable was constructed is provided in the appendix.
- 4.3 We have shown that 'cultural domains' is a useful way of describing cultural attendance and participation as it groups individuals with similar behaviour over a spectrum of activities. To study the influence of explanatory variables on cultural behaviour, it is more useful to model the probability of belonging to one of the identified groups relative to belonging to any one of the others. In statistical terms, where you have a categorical dependent variable with more than two possible values, it is necessary to use an extension of the binary logistic regression model (where you can only model the membership of a single group). These models are called multinomial to reflect the fact that each of the combination of values or covariate pattern is assumed to have a

multinomial distribution. In probability theory, a multinomial distribution is a generalisation of the binomial distribution. The counts at the different combinations are also assumed to be independent of each other with a fixed total. The categories for attendance and participation are not ordinal, so the following models are characterised as unordered multinomial regression models. A detailed overview of this modelling technique is provided in the appendix.

- 4.4 The Scottish data has a hierarchical sample design – individuals sampled within Scottish local authority areas. To estimate the spatial source of variation in cultural attendance and participation, a hierarchical or multilevel modelling is necessary. Hierarchical or multilevel modelling is a methodology which provides a framework for exploring how relationships vary across hierarchical structures, whether these be natural, or introduced in the sample design. The approach is used to gauge the variability associated with each level of the hierarchy. For our analysis, the purpose of this statistical technique is to model the variation in cultural attendance and participation among individuals within Scottish local authority areas. If variation at the local authority level still exists once individual and area level variables are taken into account, then this would suggest that processes operating in these places (local authority areas) impact on cultural behaviour. In summary, where individuals reside has important influence on cultural attendance and participation in Scotland. A more in-depth account of multilevel modelling, why it is was chosen and its benefits is provided in the appendix.
- 4.5 Computationally, multilevel modelling can be regarded as a two step process. In the first stage, a separate individual regression is obtained for each local authority. Following this, each of the local authority-specific coefficients are modelled as a function of local authority variables. Put simply, the multilevel analysis permits the partition of the local authority-specific coefficients, specifically a fixed part that is common across local authorities and a random part that varies between local authority areas. This is discussed in more depth in the appendix.

4.6 The following sections examine the key drivers of cultural attendance and participation. Here we are modelling the latent typologies of attendance and participation as derived and explained in Chapter 3. Two levels (individual and LA) were stated in the multilevel regression. For ease of interpretation, we provide a summary table of the model results containing only those variables which were found to be statistically significant (at the 95% confidence level) and whether they had a positive or negative effect. We also interpret the model findings in terms of relative risk. This is defined as the ratio of the probability of choosing one outcome category over the probability of choosing the reference category is often referred as relative risk (and it is also more commonly known as odds). For example, we can determine from the model results how many times a female is more likely to be a member of a particular attendance or participation group than a male. We do however provide full details of the model results (coefficients/standard errors) and residual plots with confidence intervals in the appendix.

### **Key Drivers of Cultural Attendance**

4.7 The results of the multinomial multilevel logistic analysis in which the intercept is allowed to vary among Scottish local authority areas are shown in Table 4.1. The random intercept corrects for the dependency of the observations within Scottish local authority areas. This is a summary of the findings with full statistical results provided in the appendix. Here we only include those variables which are statistically significant at the 95% confidence level. Cultural attendance contains four categories derived in Chapter 3 ('omnivores', 'heritage & libraries', 'audio visual arts' and 'low attendants'). This is used as the dependent variable. The 'low attendant' latent class is placed as the reference category which means that for a particular demographic, the coefficient given under one latent class is that for the predictive power of belonging to that class relative to belonging to the 'low attendant' class. In this situation, in which a categorical variable with four groups is considered as the dependent variable, three random intercepts are added to the model. This is discussed in more depth in the appendix.

- 4.8 **Gender** has a significant relationship with class membership when compared against the reference category 'low attendants'. Females are 1.9 times more likely than males to be members of the 'omnivore' class than 'low attendants'. The odds for both the 'heritage & libraries' group and the 'audio visual arts' class, are 1.4 times respectively. This confirms that females rather than males are more likely to members of these classes than of the 'low attendants' group. The results here identify that the real gender divide is between attendance (different levels) and non-attendance.
- 4.9 **Age** is also an important indicator of cultural attendance. Here we use the base category age 30-45 or middle age. The results suggest older people are significantly less likely to attend cultural events. They are significantly less likely to be 'omnivores' or in the 'heritage & libraries' or 'audio visual arts' class when compared against 'low attendants'. A similar pattern exists for the 45-64 age group although not for those in the 'heritage & libraries' class who have a high probability of visiting places of historic interest and museums. Those in the younger age group 18-29 are 1.5 times more likely than the middle age group to be members of the 'audio visual arts' class than 'low attendants'. This reflects their penchant for visiting the cinema and music events.
- 4.10 Previous scholarly work suggests that **married couples** should be significantly more likely to attend cultural events than single people. This may be because of children or more generally a 'companion' effect resulting from having someone to attend the event with. This is largely borne out in the results, with individuals who are married being significantly more likely to be in the 'omnivore' and 'heritage & libraries' groups when compared against 'low attendants'. No such effect is found for the 'audio visual arts' class which largely remains the domain of the younger age group.

**Table 4.1 Multinomial Multilevel Model of Cultural Attendance: Summary Table**

Predictor Variables	Omnivore	Heritage & Libraries	Audio Visual Arts
<b>Individual Level Predictors</b>			
Gender (Base = Male)			
Female	+	+	+
Age (Base = Age 30-44)			
Age 18-29	NS	NS	+
Age 45-64	-	NS	-
Age 65 and over	-	-	-
Marital Status (Base = Single)			
Married	+	+	NS
Separated/Widowed/Divorced	NS	NS	NS
Education (Base = No Qualifications)			
Degree (Level 5)	+	+	+
HND/HNC (Level 4)	+	+	+
A-level (Level 3)	+	+	+
O-level (Level 2)	+	+	+
Other Qualifications	+	+	+
Unknown Qualifications	NS	NS	NS
Income (Base = Bottom Quintile)			
Highest Income Quintile	+	NS	+
Second Highest Income Quintile	+	NS	+
Middle Income Quintile	NS	-	NS
Second Bottom Income Quintile	NS	NS	+
Tenure (Base = Renting)			
Owner Occupation	NS	NS	NS
Long Term Ill (Base = Not Ill)			
Long Term Illness	-	-	-
Cars (Base = One or more cars)			
No Cars	-	-	-
Urban/Rural (Base = Rural)			
Urban	+	+	+
<b>Area Level Variables</b>			
Multiple Index of Deprivation			
Index of Deprivation 15% Most Deprived	-	-	-
Random parts			
Between-Local Authority Variance	+	+	+
Covariance between Intercepts	-	+	+
			NS

NS = Not significant; + Positive coefficient and significant; - Negative coefficient and significant

- 4.11 Both long term illness and no cars are proxies for **individual deprivation**. Those individuals with a long term illness or no cars are significantly less likely to be members of all three classes when compared against the 'low attendants' group. Owner occupation was included as a measure of affluence but didn't have an effect on membership of the three lifestyle groups.
- 4.12 **Urban areas** usually have a high population density and are more likely to house cultural attractions. Therefore, individuals living in urban areas are likely to have higher levels of cultural attendance than those in rural areas perhaps because they have greater opportunities for cultural attendance. This is borne out by the results. When compared with the 'low attendants', living in an urban area as opposed to a rural location has a significant positive effect on membership of the three lifestyle groups. It has the largest effect on the 'omnivores', the utmost consumer group. Those living in urban areas are 1.3 times more likely than those from rural locations to be members of the 'omnivore' class than of 'low attendants'.
- 4.13 We also included an area level predictor: **SIMD** (multiple index of deprivation - 15% most deprived areas). When compared with the 'low attendant' reference group, living in a more deprived local authority area is significantly negatively associated with membership of the three lifestyle groups. It has the largest negative effect on the 'omnivores', who tend to live in more affluent areas. Yet similar patterns are found for the 'heritage & libraries' and the 'audio visual arts' class when compared against the 'low attendant' group. It is therefore apparent that those with low levels of cultural attendance tend to live in those Scottish local authorities' areas which are the most deprived.
- 4.14 The model results also show that there is significant unexplained variation between **local authorities** in the membership of each of the three lifestyle groups for cultural attendance, even after controlling for individual and area level factors. The variation is fairly small but significant at the 95% confidence level (see [appendix 4](#) for full details). This suggests that an individual's cultural attendance is a function of the nature of the society in which they reside. Put simply, *place is significant* and acts as a further cleavage

influencing cultural attendance. Moreover, those local authorities with high (low) membership of a latent class ('omnivore', 'heritage & libraries' and 'audio visual arts) were also significantly more likely to have high (low) membership of other classes. A full statistical explanation of the findings is discussed in the appendix.



## Key Drivers of Cultural Participation

- 4.15 The multilevel multinomial model for participation (see Table 4.4) follows the same format as the attendance model, with a different dependent variable. Here participation which contains three categories ('omnivores', 'home based participants' and 'low participants') is the dependent variable. Using the 'low participant' latent class as the reference category means that for a particular demographic, the coefficient given under one latent class is that for the predictive power of belonging to that class relative to belonging to the 'low participant' class.
- 4.16 **Education**, as it was for attendance, is a key driver of cultural lifestyle variation. In addition, **gender** appears a salient measure of class membership. While other variables offer some statistically significant findings, it is education and gender which appear to be the largest determinants of segregating the different latent lifestyle classes. The following will examine these key socio-demographic drivers.
- 4.17 **Education** has the most significant influence on any class membership when compared with the reference category 'low participants'. The higher the education level the more likely an individual is to participate in cultural activities. It is the 'omnivore' class that is dominated most by the highly educated. Members of the 'low participant' group have low educational attainment when compared to the two more active groups. Those with degrees (level 5), are over 13 times more likely to be in the omnivore class as opposed to the 'low participant' group. Furthermore, those with a Level 4 and 3 qualification are 8 times and 7 times more likely to be an 'omnivore' rather than a 'low participant'. While the influence of education for the 'home based participant' class measured against the inactive class is not as pronounced as that of the 'omnivore' grouping, it is a key segmentation driver. Those with degrees are almost 4 times more likely to be in the 'home based participant' group compared against the 'low participants', almost 3 times for those

educated to Level 4, twice as likely if they have a Level 3 attainment level, and over 1.5 times more likely if they have a Level 1 or 2 grade.

**Table 4.4: Multinomial Multilevel Model of Cultural Participation: Summary**

Predictor Variables	Omnivore	Home Based Participants
<b>Individual Level Predictors</b>		
Gender (Base = Male)		
Female	-	+
Age (Base = Age 30-44)		
Age 18-29	+	NS
Age 45-64	NS	NS
Age 65 and over	NS	NS
Marital Status (Base = Single)		
Married	NS	NS
Separated/Widowed/Divorced	NS	NS
Education (Base = No Qualifications)		
Degree (Level 5)	+	+
HND/HNC (Level 4)	+	+
A-level (Level 3)	+	+
O-level (Level 2)	+	+
Other Qualifications	+	+
Unknown Qualifications	NS	NS
Income (Base = Bottom Quintile)		
Highest Income Quintile	NS	NS
Second Highest Income Quintile	NS	NS
Middle Income Quintile	NS	NS
Second Bottom Income Quintile	NS	NS
Tenure (Base = Renting)		
Owner Occupation	NS	+
Long Term Ill (Base = Not Ill)		
Long Term Illness	NS	NS
Cars (Base = One or more cars)		
No Cars	NS	-
Urban/Rural (Base = Rural)		
Urban	-	-
<b>Area Level Variables</b>		
Multiple Index of Deprivation		
Index of Deprivation 15% Most Deprived	-	NS
Random parts		
Between-Local Authority Variance	+	+
Covariance between Intercepts		+

NS = Not significant; + Positive coefficient and significant; - Negative coefficient and significant

- 4.18 Once education is controlled for, the other stratification measure that is used, namely **income**, is not significant. That is, income does not influence membership of the 'home based participant' and the 'omnivore' class measured against the 'low participant' group.
- 4.19 **Gender** is also a key driver across the participation lifestyle classes. Females are significantly less likely to be 'omnivores' than males when compared against the reference category 'low participants'. In effect, females are 1.3 times more likely to be 'low participants' than an 'omnivore'. Yet, the opposite is true for membership of the 'home based participant' class. Here, females are twice more likely than males to be 'home based participants' than 'low participants'.
- 4.20 Generally, **age** does not influence group membership in the participation model. However, there is one statistically significant finding and it involves the young age cohort (18-29) in the 'omnivore' class. Young people are twice more likely to be 'omnivores' than 'low participants'. Furthermore, marital status and disability measures do not offer any significant insight into class membership.
- 4.21 Of the remaining individual level explanatory variables both **car ownership** and **tenure** were significant influences on membership of the 'home based participant' class. Measured against the reference category (renting), owner occupiers are 1.2 times more likely to be in the 'home based participant' class opposed to the 'low participant' grouping. Members of the 'home based participants' group are significantly more likely to have access to a car when compared against the 'low participants' group. Unlike cultural attendance, those living in **rural areas** are more likely to be members of the 'omnivore' and 'home based participants' groups as opposed to being 'low participants'. Perhaps this is a reflection on the types of activities that make up the participation model, that is, these are more receptive to individuals in less urbanised areas. Alternatively, with so many attendance opportunities in urban areas, it is possible that individuals tend to be more selective and therefore participate less in some activities.

- 4.22 As with the attendance model, we include one predictor at the local authority area level of the model: **multiple index of deprivation** (15% most deprived areas). An area's deprivation is also significant when comparing 'omnivores' against the 'low participants'. Indeed, a local authority area in the top 15% most deprived is more likely to have 'low participants' in their relative populations compared to 'omnivores'. There is no significant effect of area level deprivation on membership of the 'home based participants' group.
- 4.23 The model results also show that there is significant unexplained variation between **local authorities** in the membership of each of the three lifestyle groups for cultural participation, even after controlling for individual and area level factors. Like cultural attendance, the variation is fairly small but significant at the 95% confidence level (see [appendix 4](#) for full details). This implies that unexplained processes operating at the local authority area level matter and that *place is a significant influence on cultural participation* even after accounting for individual and area level factors. Moreover, those local authorities with high (low) membership of a latent class ('omnivore', 'home based participants' and 'low participants') were also significantly more likely to have high (low) membership of other classes. A full statistical explanation of the findings is discussed in the appendix.

### **Next Step**

- 4.24 Using statistical modelling, this chapter of the report has examined the key drivers of cultural attendance and participation. It has also shown that place is important even after controlling for individual and area level factors. This chapter focussed on what factors determined membership of the different lifestyle groups for attendance and participation. In Chapter Three, we found that one of the groups for both attendance and participation separately included individuals who were less active than others. The next chapter focuses on the 'low attendants' and 'low participants'. Here we establish the

individual and area level characteristics of those who consume low levels of culture rather than look at the influence of these characteristics on belonging to the other classes of cultural consumption relative to these low active groups.

## CHAPTER FIVE: WHO ARE MEMBERS OF THE ‘LOW ACTIVITY’ GROUPS?

### Introduction

- 5.1 In Chapter Four, we examined the key drivers of cultural attendance and participation in Scotland. The latent class analysis (described in Chapter Three) derived categorical dependent variables with more than two values for both cultural attendance and participation. To reflect this, an unordered multinomial regression model was used and explanatory variables were added at the individual level to gauge the key drivers of cultural attendance and participation. We also wanted to take into account the variation in cultural consumption between Scottish local authority areas and explain any existing variation after controlling for both individual and area level factors, including explanatory variables at the Scottish local authority level to act as a proxy for both compositional and contextual effects.
- 5.2 The multilevel multinomial regression analyses in Chapter Four used the low activity groups (‘low attendants’ for cultural attendance and ‘low participants’ for cultural participation) as the reference category. The models show that those in these low attendants or participants groups are generally more likely to be male, old and less likely to be highly educated and be on a high income. At the area level, those local authorities that are amongst the top 15% deprived are more likely to have a greater proportion from these low activity groups.
- 5.3 For brevity and as a means of specifically focusing on the low activity group (for cultural attendance and participation separately), we now use a multilevel binary logistic model where those in the low activity group are coded as one and all other classes are zero. This will allow us to fully establish the individual and area level characteristics of those who consume low levels of culture rather than look at the influence of these characteristics on belonging to the other classes of cultural consumption relative to the inactive group. We

include the equivalent individual level and area level variables as discussed previously in Chapter Four.

- 5.4 Descriptive statistics show that 28% of individuals in SHS are both ‘low attendants’ and ‘low participants’. However, as in Chapters 3 and 4, the purpose of this report is to model attendance and participation separately. The outcome for cultural attendance is a binary variable (‘Low Attendants’ group: yes/no). The same applies to participation, except the binary outcome variable is ‘Low Participants’: yes/no. Separate logistic models are used to assess the influence of independent variables on the odds of being in the low activity group or not. A multilevel analysis is used to model the relationship between membership of the low activity group for attendance and participation separately and a number of independent variables. Two levels (individual and local authority) are stated in our multilevel logistic regression.
- 5.5 In the multilevel model, the intercept or constant ( $\beta_0$ ) and the individual level coefficients (education levels, income, gender etc) and the local authority level variables (multiple index of deprivation) are the fixed part of the model. This part is used in this model to estimate the strength of associations between individual membership of the low activity group and possible explanatory variables. This strength is fixed over all the population. The local authority level variance determines the local authority level random part of the model. In other words, this is the difference between local authority variability that is not explained by the fixed effects. According to statistical theory, the local authority level random part invalidates the assumption of independence between individuals and reiterates that the dataset is hierarchical in nature (at least more than a single level). Put simply, in our models of cultural attendance and participation, the fixed effects (education, gender, income, age, tenure etc) represent what is known as the ‘average’ effects whereas the random part variance provides an estimate of what can be explained by each level (in our case local authority). We provide full details of this process in the appendix.

- 5.6 For ease of interpretation, we provide a summary table (see Table 5.1) of the model results containing only those variables which were found to be statistically significant (at the 95% confidence level) and whether they had a positive or negative effect. We also interpret the model findings in terms of odds (as defined in Chapter 4). We do however provide full details of the model results (coefficients/standard errors) and residual plots with confidence intervals in the [appendix 5](#).

### **Key Drivers of Low Cultural Attendance**

- 5.7 There is a negative linear relationship between **education** and membership of the 'low attendants' group. When compared against the reference category 'no qualifications', the higher the educational attainment the less likely an individual has low levels of cultural attendance. In other words, members of the low activity group are significantly more likely to have low levels of educational attainment when compared with those who are active.
- 5.8 Those with low levels of cultural attendance (in the low activity group) have other defining individual characteristics. They are significantly more likely to be **male**, from the **older age** groups, particularly the 65 and over age bracket, and also more likely to be **single**. For instance, those aged over 65 are 1.9 times more likely to be in the 'low attendants' class than other lifestyle groups.
- 5.9 It seems evident that members of the 'low attendants' group are significantly more likely to be **individually deprived**. Not only are such individuals more likely to be less educated, they are also significantly less likely to be owner occupiers and 1.5 times more likely to suffer long term illness when compared against the other lifestyle groups. They are also 1.6 times more likely to have no car, another key indicator of individual deprivation. As regards income, all of the income quintiles are negative when compared against the bottom quintile reference category. However, only those in the highest income are significantly less likely to be in the 'low attendants' group. Finally, those living in **urban** areas are also significantly less likely to be 'low attendants'.



**Table 5.1 Multilevel Binary Logistic Model of Low Cultural Attendance:  
Summary Table**

<b>Predictor Variables</b>	<b>Low Attendants</b>
<b>Individual Level Predictors</b>	
Gender (Base = Male)	
Female	-
Age (Base = Age 30-44)	
Age 18-29	-
Age 45-64	+
Age 65 and over	+
Marital Status (Base = Single)	
Married	-
Separated/Widowed/Divorced	-
Education (Base = No Qualifications)	
Degree (Level 5)	-
HND/HNC (Level 4)	-
A-level (Level 3)	-
O-level (Level 2)	-
Other Qualifications	-
Unknown Qualifications	NS
Income (Base = Bottom Quintile)	
Highest Income Quintile	-
Second Highest Income Quintile	NS
Middle Income Quintile	NS
Second Bottom Income Quintile	NS
Tenure (Base = Renting)	
Owner Occupation	-
Long Term Ill (Base = Not Ill)	
Long Term Illness	+
Cars (Base = One or more cars)	
No Cars	+
Urban/Rural (Base = Rural)	
Urban	-
<b>Area Level Predictors</b>	
Multiple Index of Deprivation	
Index of Deprivation 15% Most Deprived	+
Random parts	
Between-LA Variance	+

NS = Not significant; + Positive coefficient and significant; - Negative coefficient and significant

- 5.10 At the **local authority** level, there is a positive association between individuals living in the most deprived local authorities and membership of the 'low attendants' group. Living in those Scottish local authority areas that are the most deprived along with being individually deprived are the key drivers of low cultural attendance.
- 5.11 As with the models in Chapter Four, we used a multilevel approach to determine whether there was any unexplained variation at the local authority level which could be accounted for by individual and area level variables. Initially, a statistical test was conducted to determine whether there are significant differences between Scottish local authorities. This was found to be the case (full details of the tests and results can be found in the appendix) and validated the use of the multilevel approach. To determine the variation at the local authority level where the outcome variable is binary requires a more complicated procedure than when the variable being measured is continuous. For ease of interpretation, we explain the process and detail how this is achieved in the [appendix 5](#). However, as table 5.1 shows, 1% of the variation is at the local authority level and it is statistically significant. This is fairly small, but nevertheless suggests that evidence of a local authority effect on low cultural attendance is not just a product of selection effects – that is of people with similar characteristics living in close proximity to each other.

### **Key Drivers of Low Cultural Participation**

- 5.12 As with attendance, **education** seems to be the key driver of cultural participation. There is a negative linear relationship between education and membership of the 'low participant' group. When compared against the reference category 'no qualifications', the higher the educational attainment the less likely an individual has low levels of cultural participation. Members of the 'low participants' group are significantly more likely to have low levels of educational attainment when compared with other lifestyle groups.

- 5.13 Those with low levels of cultural participation (in the ‘low participants’ group) have other defining individual characteristics. Members of the ‘low participants’ group are significantly more likely to be **male** and less likely to be from the **youngest age** bracket. Both the other age bands are non-significant when compared against the 30-44 middle age category, while neither marital status nor income is a determinant of membership of the low ‘participants’ group.
- 5.14 Despite there being no discernible effect of having a **long term illness** on low cultural participation, there is some evidence that members of the ‘low participant’ group are significantly more likely to be **individually deprived**. As with cultural attendance, not only are such individuals more likely to be less educated, they are also significantly less likely to be homeowners. Moreover, they are 1.3 times more likely not to own a car. *In contrast* to cultural attendance, members of the ‘low participant’ group are significantly more likely to live in **urban** areas as opposed to rural parts of Scotland.
- 5.15 As with attendance, a statistical test was conducted to determine whether there are significant differences between Scottish local authorities with respect to belonging to the ‘low participant’ group after controlling for other explanatory variables. This was found to be the case (full details of the tests and results can be found in the appendix). The model results suggest that just under 1% of the variation is at the local authority level, which is fairly small but nonetheless statistically significant. We can therefore conclude that low cultural participation is not just a product of selection effects – that is of people with similar characteristics living in close proximity to each other. The model findings also revealed no significant association between individuals living in the most deprived local authority areas and membership of the ‘low participant’ group. This means that the different effects of different local authorities are unlikely to purely be an artefact due to some LA having a greater proportion of deprived areas than others and that some other (unmeasured) factors within the LA variable do influence cultural behaviour.

**Table 5.2 Multilevel Binary Logistic Model of Low Cultural Participation:  
Summary Table**

Predictor Variables	Low Participants
<b>Individual Level Predictors</b>	
Gender (Base = Male)	
Female	-
Age (Base = Age 30-44)	
Age 18-29	-
Age 45-64	NS
Age 65 and over	NS
Marital Status (Base = Single)	
Married	NS
Separated/Widowed/Divorced	NS
Education (Base = No Qualifications)	
Degree (Level 5)	-
HND/HNC (Level 4)	-
A-level (Level 3)	-
O-level (Level 2)	-
Other Qualifications	-
Unknown Qualifications	NS
Income (Base = Bottom Quintile)	
Highest Income Quintile	NS
Second Highest Income Quintile	NS
Middle Income Quintile	NS
Second Bottom Income Quintile	NS
Tenure (Base = Renting)	
Owner Occupation	-
Long Term Ill (Base = Not Ill)	
Long Term Illness	NS
Cars (Base = One or more cars)	
No Cars	+
Urban/Rural (Base = Rural)	
Urban	+
<b>Area Level Predictors</b>	
Multiple Index of Deprivation	
Index of Deprivation 15% Most Deprived	NS
Random parts	
Between-LA Variance	+

NS = Not significant; + Positive coefficient and significant; - Negative coefficient and significant

## ***Next Step***

5.16 It has been shown that place is important, albeit a small influence, even after controlling for individual and area level factors. However, while low attendance and low participation is not simply the product of selection effects, it is clear that socio-economic characteristics such as no educational attainment and being individually deprived are important drivers. The next chapter provides an overview of the reports' findings. It returns to the key research objectives of the report and seeks to answer them fully using the information outlined in the earlier chapters. It also briefly discusses the implications for policy makers.

## **CHAPTER SIX: CONCLUDING THOUGHTS**

### **Introduction**

- 6.1 The overall aim of the project was 'to determine if cultural lifestyle typologies existed for attendance and participation in Scotland, and what the key drivers were that determined these lifestyle groupings'. Here we examine each of the main research objectives and discuss the implications of our findings.

### **Are there cultural lifestyle types in Attendance and Participation?**

- 6.2 The aim of this research objective was to determine whether there were relatively well defined types of individuals who can be grouped together based on their participation and attendance habits. To answer this objective we used a latent class analysis to determine if lifestyle typologies existed. We found that four lifestyle groups were identifiable in the attendance field, and that three groups were particular to the participation field. The fact that we uncovered such lifestyle groupings in the two fields, demonstrates that cultural consumption behaviours are not independent, that is, they can be grouped with other individuals who share commonality in cultural consumption practices. In other words cultural consumption does not reflect an independent choice with the average probability of being undertaken for each activity; not choosing a particular activity may put you in a different lifestyle typology where you are then less likely to choose other activities. Furthermore, membership of these groupings results in different levels of engagement in cultural activities. For policymakers, it is important that clusters of cultural practices can be identified because this can inform government initiatives and targeting. Determining the individual socio-economic characteristics of these lifestyle groups and whether there are significant differences between local authorities in their consumption patterns are also important for those developing and implementing cultural policy in Scotland. These are discussed below.

- 6.3 Exploring the lifestyle groupings in both fields (attendance and participation) offers an interesting insight into cultural consumption in Scotland. For both attendance and participation, there is a group who are generally the most likely to take part in all of the activities listed. These are the 'omnivores' and they exist in both domains, although their number is less in the participation field. They consume a wide variety of culture (both popular and highbrow). At the opposite end of the spectrum, both fields contain lifestyle groups who share similar consumption patterns in that they are either 'low attendants' or 'low participants' in any form of cultural activity. They do not engage in exclusive cultural activities and although they are slightly more likely to engage in more popularised activities (go to the cinema/library or read for pleasure) such consumption patterns are still well below the average. In both fields, these lifestyle groups appear to be less culturally engaged.
- 6.4 There were other groups uncovered both in the attendance and participation field that were positioned within these two extreme positions. Whilst they did not have the range and diversity of consumption behaviours when compared to the 'omnivores' they were legitimate consumers in their own right with fairly distinguishable lifestyle behaviours, and with a greater depth and range than those who were either 'low attendants' or 'low participants'. In the attendance field, these two groups are the 'heritage & libraries' group and the 'audio visual arts' group. The 'heritage & libraries' consumer class, are segmented from other groups, because of their penchant for visiting historical sites, museums, and libraries. For this lifestyle group, other forms of engagement such as going to music and craft events are far less appealing. The 'audio visual arts' are high consumers of the cinema product and to a lesser extent music and theatre events. In the participation field, the 'home based participants' are more likely to be active in the more popular, accessible cultural activities that can be consumed in the home environment, namely, craft work and reading for pleasure.

## **Using empirical analysis to determine the characteristics of cultural lifestyle types measured by stratification and other socio-demographic variables**

- 6.5 We found clear evidence from the data that individuals with similar cultural patterns tend to be alike in socio-demographic characteristics. Evidence points to consumption in Scotland being socially stratified, with educational attainment the key driver in conditioning lifestyles. The higher an individual is educated the more likely they are to be active in attendance and participation. The highest educated are more likely to be 'omnivores' in both fields than all the other groups and are more likely to be active in other groups as opposed to those in the low activity groups. A status order clearly exists. In each of these fields, the culturally excluded ('low attendants' and 'low participants'), are statistically more likely to be individuals of low educational attainment. Scottish cultural consumption (attendance and participation) appears to fit an omnivore-univore framework rather than the traditional Bourdieusian elite to mass homology model (for more details see Peterson, 2005). In simple terms, we stress that the highly educated are distinguished from other groups by a depth and range of consumption habits, rather than adherence to elitist cultural activities that promote their position in society.
- 6.6 Underlying the statistical results, several different processes are at work in shaping individuals' patterns of cultural consumption. While our results give gravitas to the proposition that educational stratification is centrally involved in the differentiation of lifestyle types, it is also clear that other factors facilitate and inhibit cultural lifestyles:
- 6.7 Females are more likely than males to be 'home based participants' although males are more likely to be 'omnivores' and participate in a wide range of cultural activities. Younger generations are more culturally active, whilst the older groups tend to be both 'low attendants' and 'low participants'. Individual disadvantage (illness or lack of a car) was also a key influence on cultural lifestyle group. Although educational attainment is the strongest influence, other factors play an important role in inhibiting or facilitating cultural consumption. For policymakers, it is important not to target initiatives just on



the basis of education but to take into account the salience of other determinants on the membership of particular lifestyle groups.

**Determine if cultural lifestyle types differ across different local authority areas in Scotland and what influence living in deprived local authority areas, or rural as opposed to urban areas has on cultural behaviour**

- 6.8 Individuals living in urban areas are likely to have higher levels of cultural attendance than those in rural areas perhaps because they have greater opportunities for cultural attendance. But for participation, we may expect the results to differ. This is borne out by our findings. Living in an urban area has a positive effect on membership of the three cultural attendance lifestyle groups ('omnivore', 'heritage & libraries' and 'audio visual arts') particularly for the former. However, for participation, those living in rural areas are more likely to be members of the two lifestyle groups ('omnivore' and 'home based participants'). Not only are the types of participation activities analysed here more receptive to individuals in less urbanised areas but the attendance opportunities in urban areas clearly mean that individuals tend to be more selective and therefore may participate less in some activities.
- 6.9 While social stratification variables remain empirically central to our understanding of cultural behaviour, it is also clear that other factors are facilitating and inhibiting participation. Within the cultural participation literature, it is widely assumed that individual level factors (education, class etc) account for variations in cultural lifestyles. In sum, the importance of place as a further cleavage influencing attendance and participation has been largely ignored. The evidence from our models suggests that cultural behaviour cannot simply be reduced to stratification and other compositional effects. In short, there were variations in attendance and participation at the local authority level, albeit they are fairly small at this high spatial scale. Clearly, there is a contextual relationship; an individual's cultural behaviour is a function of the nature of the society in which they reside. The social environment in which people live their daily lives influences cultural behaviour. Put simply, place is significant and it clearly matters. There is also ecology of

consumption behaviour, observable even when the principal theoretical individual level and area level characteristics are accounted for. However, it is important to identify that we make no leaps of faith to identify what contextual mechanisms are accounting for these local authority forces. That is, we can only assume that the unexplained variation at the local authority level may be due to the inbuilt culture of the area or the value different local authorities place on enhancing attendance and participation through funding, advertising or local programmes.

- 6.10 To ignore the fact that individuals reside in different places, that they cluster in space, that they interact in these places and space, and that environmental forces impact on behaviour, is to ignore the role the local authority level plays on the individual cultural behaviour. While it remains apparent that the traditional social order is still intact, and other social cleavages have become important, it is also clear that where an individual resides inhibits or facilitates cultural behaviour. Place clearly matters. Yet whilst one of the limitations of this analysis is the inability to take of other micro-spatial scales, particularly the importance of the household and the processes underpinning household behaviour on attendance and participation, these findings, for the first time in the cultural field in Scotland, show that geography is empirically vital to deliver a meaningful analysis of cultural behaviour. Its importance and influence both theoretically and empirically should therefore not be ignored.
- 6.11 After taking into account area level factors such as the index of deprivation, there remained variation at the local authority area level. The remaining variance at the local authority level is unmeasured and may be explained by supply side factors (e.g. the availability of cultural facilities) or/and the operation of particular contextual mechanisms. From the model results, local authority area level deprivation is significantly negatively related to both attendance and participation. In other words, those residing in deprived local authorities are statistically less likely to attend or participate in cultural activities and more likely to suffer opportunity structures that inhibit consumption. Disentangling contextual effects from compositional effects is difficult, partly because they are complementary and interact in a great variety

of ways. However, previous evidence suggests that opportunity structures in the poorer areas are less conducive to consumption activities than more affluent areas (Macintyre et al 2003). Our model findings concur with this evidence. Deprivation is clearly an inhibitor to consumption; living in deprived areas will impact on cultural behaviour not simply because of the presence of more non-consumers, but because the environment in which an individual finds themselves provides fewer opportunities for developing cultural behaviour.

**Examine if the variation in cultural behaviour is still accounted for at the local authority area level even when controlling for individual level compositional effects and area level characteristics**

6.12 The multilevel multinomial model examines the individual and area level influences on cultural attendance and participation. While the vast majority of variance in cultural lifestyle typologies in both fields was accounted for by the individual level factors, local authority level variation remained, even when contextual mechanisms were included (Multiple Index of Deprivation). The remaining variance at the local authority level in each field can be attributed to other supply side factors at the area level or other contextual mechanisms that are as of yet unmeasured. It is also possible that unmeasured variation at the local authority level is simply a reflection of aggregation effects. In other words, data limitations meant that we could only examine the importance of place at the local authority level and that the existence of variation at this level reflects the importance of much smaller geographical scales which were not examined in this report. For instance, the issue of how local neighbourhood or household characteristics influence cultural attendance and participation within those same neighbourhoods and households was not looked at in this report. A particularly useful insight for policy makers would be to determine how the activity patterns of the household or the local neighbourhood affect the probability of attending and participating in cultural activities at the individual level. To properly address such questions, we would require a hierarchical survey design which incorporates different spatial scales (for

example, individuals clustered within households) so that the importance of geography on consumption patterns can be fully explained. Nonetheless, the existence of variation at the local authority level *suggests* that even at this large geographical scale, where you live is important. For policymakers, overcoming barriers to participation will be much more difficult in some areas than in others. However, to determine whether interactions at smaller scales are more important to overcome requires further but necessary research.

**Explore the low-consumer typology group found in the two domains and examine what activities this group is more likely to be engaged in and their socio-economic/demographic profile**

- 6.13 We found that there was a non-consumer typology group in both the attendance and participation fields. Combined, this non-active group represented 28% of all individuals surveyed. Although the groups in each field are of different sizes, they do have similar traits. Members of both have low educational attainment, are significantly more likely to be male, less likely to be from the younger cohort, and crucially they are significantly more likely to be individually deprived and reside in areas that are more deprived. While it is too simplistic to state that members of this group do not take part in any activity, it is clear that these lifestyle groups are slightly more likely to attend or participate in the more easily accessible activities (visiting libraries/reading for pleasure) that require less knowledge and economic and cultural capital. However, it is important to remember that we only based these lifestyles from the cultural indicators in the SHS Culture Module. It is possible that these groups may be active in other forms of culture not measured here, especially those activities that are based in the home.

**Account for the different reasons why certain groups do or do not take part in or attend cultural events, and make any links between the two**

- 6.14 It is evident from the results of Chapter Five that engagement in attendance and participation are clearly a product of key individual level drivers and local authority residence. Whilst it is difficult to elaborate qualitatively why people

do not participate, our results bear evidence that non-participation or low activity is clearly a product of no/low educational attainment, which is compounded through living in deprived areas. This highlights that the culturally disengaged face restrictions in opportunity structures at both levels; they appear at least to be the socially excluded. While there are significant differences between local authorities, this only attributes a small part in explaining low cultural attendance/participation. Individual level socio-economic drivers seem to be more important, although we must bear in mind that examining or incorporating the effects of smaller spatial levels such as the neighbourhood or the household could provide much different results. Further research is needed into the reasons why these people do not attend or participate. While we can identify significant associations between low attendance/participation and socio-demographic factors, we cannot yet provide causal explanations and interpret why this is the case. However, these results offer a significant insight into culture in Scotland and provide a great foundation for further more detailed research. They also provide direction for policy makers so that culture can be promoted and enjoyed by all, irrespective of an individual's social background and where they live.

## APPENDICES

These technical appendices supplement the report document. The following information is provided to coincide with the order in which it appears in the report.

- Appendix 1: Descriptive analysis of the indicator variables
- Appendix 2: Technical detail of variable coding and discussion of contextual and composition factors.
- Appendix 3: This technical appendix provides a brief overview of latent class analysis and how we used statistical tools to derive the lifestyle groups.
- Appendix 4: This section focuses on the different modelling techniques. It includes an overview of multinomial regression and multilevel modelling, details of the model results (inclusion of coefficients and standard errors), what we mean by the intra-class correlation and why it is necessary to examine the residuals.
- Appendix 5: This section discusses the logistic regression technique and includes the full details of the models and residuals used in chapter 5.

## APPENDIX 1

### Descriptive statistics for the participation and attendance indicator variables

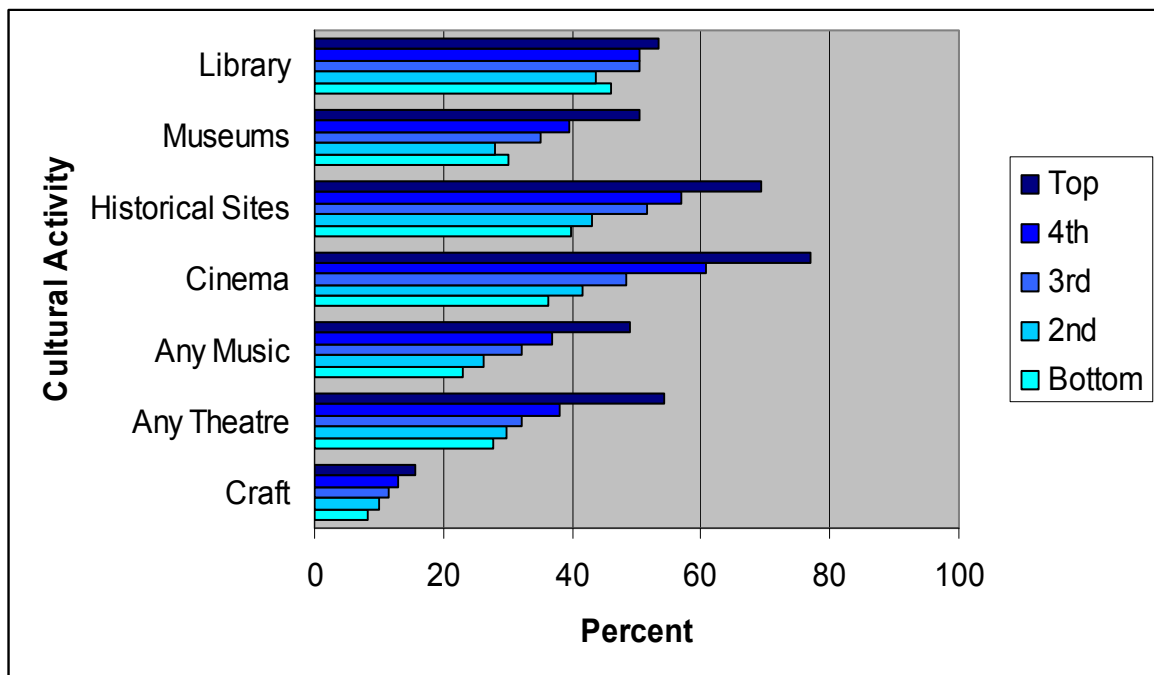
A1.1 In the main report we show the overall proportion of respondents who did each of the selected activities for participation and for attendance. Here we show how those who did these activities are divided by the demographic variables (income, education, gender and age) and, by the geographical variable; local authority

#### Attendance

##### Attendance by Income

A1.2 Figure A1.1 shows the attendance of respondents in seven cultural activities by levels of (individual and not household) income. Income is placed into quintiles, with the bottom income band roughly less than £9,500 and the top income band containing individuals who earned around £33,000 or more (see appendix for full details).

Figure A1.1: Attendance by Income (Quintiles) (%)



A1.3 For every one of the seven cultural activities, attendance was greatest for those in the highest income category. As you move down the income scale, attendance decreases. For five of the seven cultural activities, there is a clear positive relationship between attendance and income. The two anomalies are visiting museums and visiting the library where the bottom quintile or lowest income category has higher levels of attendance than the second income category. A possible explanation is that the lower income category maybe captures students or spouses of higher income partners who hold part time positions both of whom are more likely to visit these cultural venues than groups in the second income category. Furthermore, it may be a product of pensioners with spare time.

A1.4 Visiting historical sites (69%) and visiting the cinema (70%) are the activities most likely to be consumed by the highest income band. These activities also show the steepest gradient of attendance increasing with income band. In terms of relative odds (the ratio of the probability of choosing one outcome category over the probability of choosing the reference category), those in the higher income band are 5.9 times more likely to visit the cinema and 3.4 times more likely to visit an historic site than those in the lowest income group. More than fifty percent of those in the highest income band also visited a theatre, with individuals from this income group being 3.5 times more likely to visit this cultural venue than those from the bottom income quintile. Figure 2.3 also shows a clear linear relationship between visiting a music event and the level of income.

A1.5 Like other activities, visiting a museum and visiting a library was highest among the top earners. However, library consumption patterns were fairly similar across the income bands. More than forty-five percent of those in the bottom income quintile visited a library compared to just over fifty-three percent of those in the top income bracket. Unlike the other cultural activities studied, libraries are unique in their wide appeal across the income range. Of all the cultural activities, craft events were visited by the lowest proportion of respondents. Fewer than sixteen percent of those in the highest income band visited this cultural venue, yet this figure was twice that for the lowest income



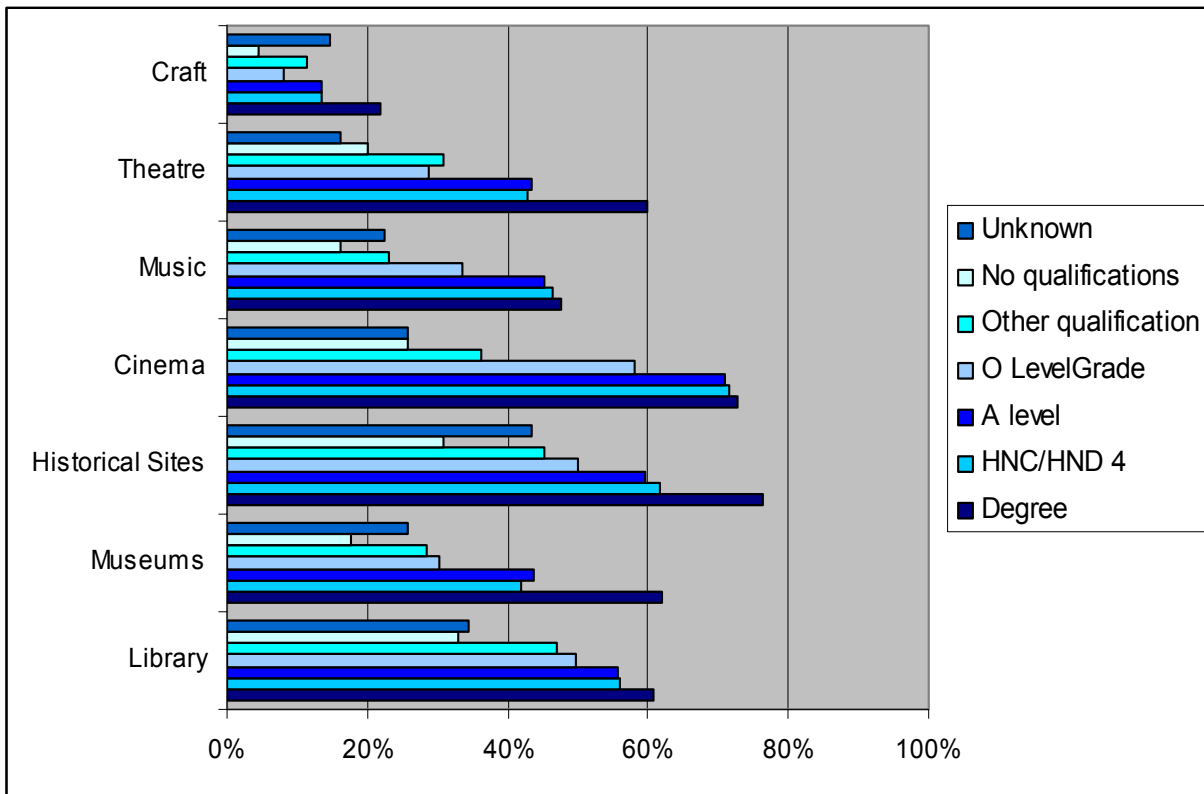
quintile. Despite the low proportion visiting a craft event, there was a positive relationship between income and attendance. The higher the income, the more likely an individual visited a cultural venue or event. In general, there was a positive relationship between the level of income and attending cultural activities, with the exception of visiting the library.

### ***Attendance by Education***

A1.6 Individuals with degrees or professional qualifications had the highest attendance. More than 70% of individuals with a degree either visited historic sites or the cinema, while more than 60% attended the theatre or visited a museum and/or library. Those with no qualifications were the least likely to visit these cultural venues. For example, of those with no qualifications, only 16% went to the theatre compared to more than 60% of those with a degree. While less than 5% of people with no qualifications went to a craft event, the figure was more than four times as much for those with a degree. In terms of relative odds, those individuals with degrees are 7.9 times more likely to go to the cinema, 6.1 times more likely to visit the theatre and 7.3 times more likely to go to an historic site than those with no qualifications.

A1.7 Across all cultural activities there is little difference in attendance between those with HNC/HND level 4 qualifications and those individuals with Higher/A-level or level 3 qualifications. Attendance then declines markedly among those with O-level/Standard or level 2 qualifications. This drop in attendance for those with lower qualifications is less pronounced for library attendance. While just over 60% of degree holders visited the library in the past 12 months, around 50% of those with O-level or standard qualifications also visited. While those with degrees were 3.8 (calculated from raw counts and placed into odds ratio's) times more likely to visit a museum than those with O-level or standard qualifications, they were only 1.6 times more likely to have visited a library.

**Figure A1.2: Attendance by Educational Attainment (%)**

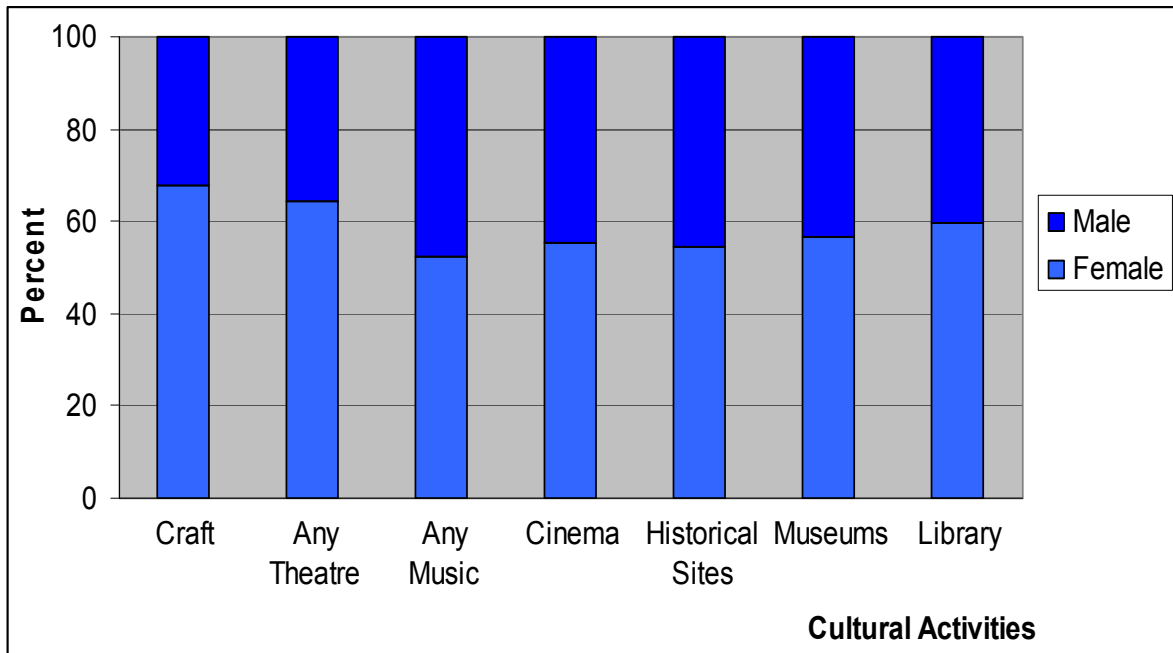


A1.8 There is a clear positive relationship between going to a music event and educational attainment. Those with degrees being 1.8 times more likely to visit this cultural venue than those with O-level or standard qualifications. Craft events are the least attended, although even here, of those with degrees more than one-fifth attend craft events compared to 8% among those with O-level or standard qualifications and less than 5% of those with no qualifications.

**Attendance by Gender**

A1.9 Of those who attended, women visited all the cultural activities in far greater numbers than men (see Figure A1.3). More than two-thirds of those visiting a craft event were female, while just over a third of those who attended the theatre were male. Gender differentiation was less noticeable for those visiting the cinema, historic sites and particularly attending a music event, although more females attended these activities than males.

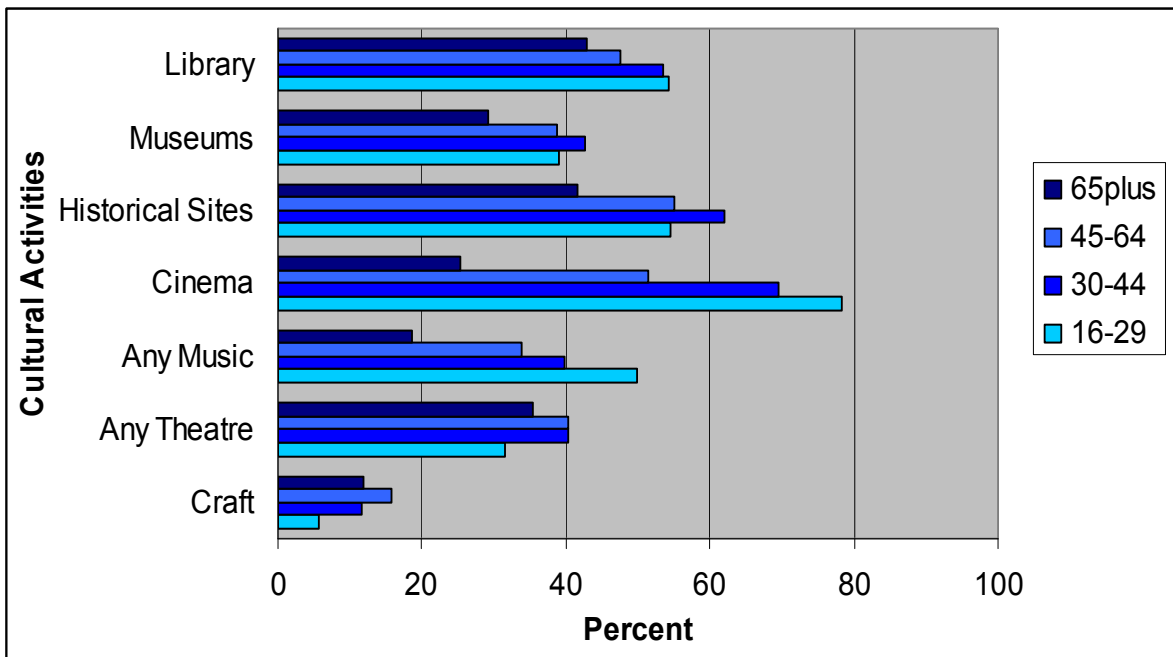
**Figure A1.3: Attendance by Gender (%)**



**Attendance by Age**

A1.10 Attendance by age varies according to the cultural activity consumed (see Figure 2.5). Several cultural activities are popular with the youngest group aged 16-29. Indeed, there is a negative relationship between attendance and age for the cinema, going to a music event and visiting the library, although the latter is consumed in healthy numbers by all age groups. Almost eighty percent of young people (16-29yrs) report visiting cinemas, which is 9% greater than those aged 30-44yrs and just over 27% higher than those in the 45-64 year old age group. By contrast, just over a quarter of those in the oldest age group (65 plus) visited the cinema. In fact, those in the younger age group were 10.7 times more likely to visit the cinema than those in aged 65 plus. Unsurprisingly, a similar pattern exists for attending a music event, with those in an older age group 4.4 times less likely to attend than those in the youngest age group.

**Figure A1.4: Attendance by Age (%)**



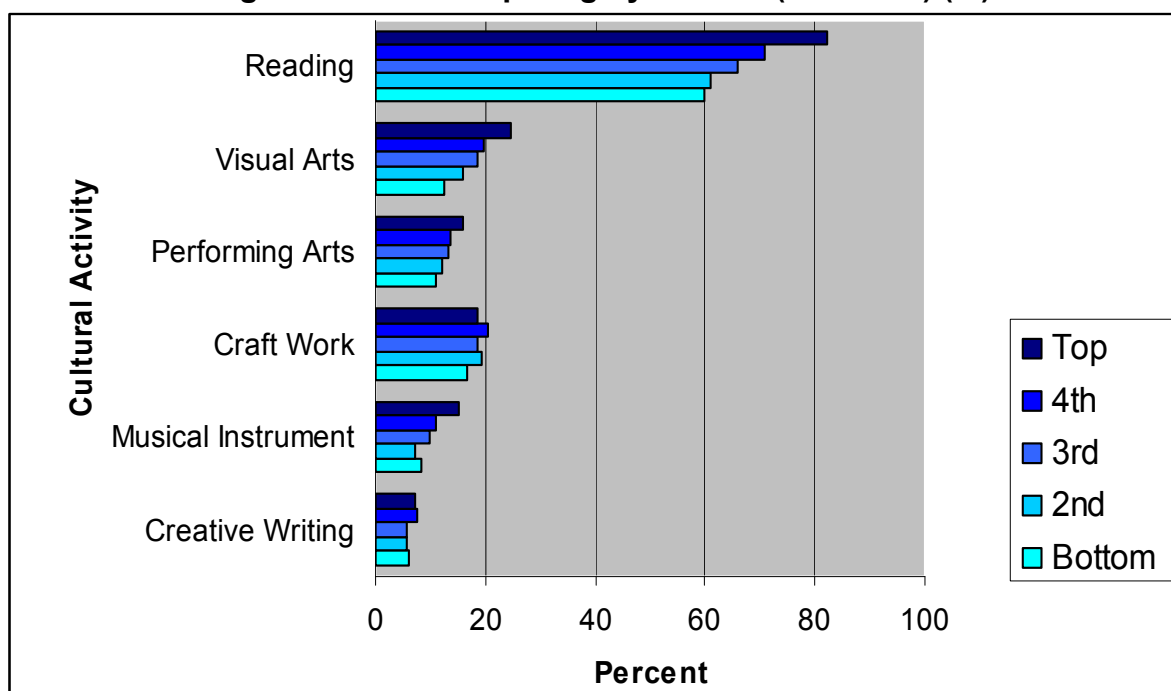
A1.11 Attending theatre based events and visiting historic sites are more popular among those in the lower middle age bracket (30-44). While the theatre is also popular with the oldest age group and less so with the young, it is apparent that those aged 65 plus are the least engaged of all the age groups. One exception is visiting craft based events. Like theatre based events, attending a craft event is least popular among the young, and with the exception of the aged 65 plus group, of which 11.9% attend compared to 15.8% of those aged 44-64, craft based events become more popular as age increases. In summary, several cultural activities are popular with the youngest age group. Most are engaged in by the lower middle age groups, whilst the elderly are generally the least likely to visiting these cultural attractions.

## Participation

### *Participation by Income*

A1.12 Unlike attendance, the relationship between income and participation is less consistent across the activities studied. In general, there is an increasing relationship between income and participation. That relationship is more marked for some activities e.g. reading; those in the top income bracket were 3.1 times more likely to read than those in the bottom income group (80% v 60%), less marked for performing arts; those in the top income quintile were 1.6 times more likely to participate in the performance arts than those in the bottom income band. Furthermore for two of the six cultural activities (craft work and creative writing), participation is not highest in the top income quintile and the proportion doing this activities does not show a clear pattern with income group (see Figure A1.5).

**Figure A1.5: Participating by Income (Quintiles) (%)**



A1.13 Of course, a number of these cultural activities have low rates of participation. Rather than examine participation by those in each income group, it is also prudent to look at who does a particular activity in terms of the stratification variable. For instance, of the 18.8% of the population who participated in craft

work, 48.7% were from the top two income quintiles; of the 6.6% who participated in creative writing, 53.8% were from the top two income brackets. Just under 11% of sampled respondents played a musical instrument with those in the top income bracket (34%) being over-represented. For most participation variables there was a clear positive trend, with participation rates increasing with income.

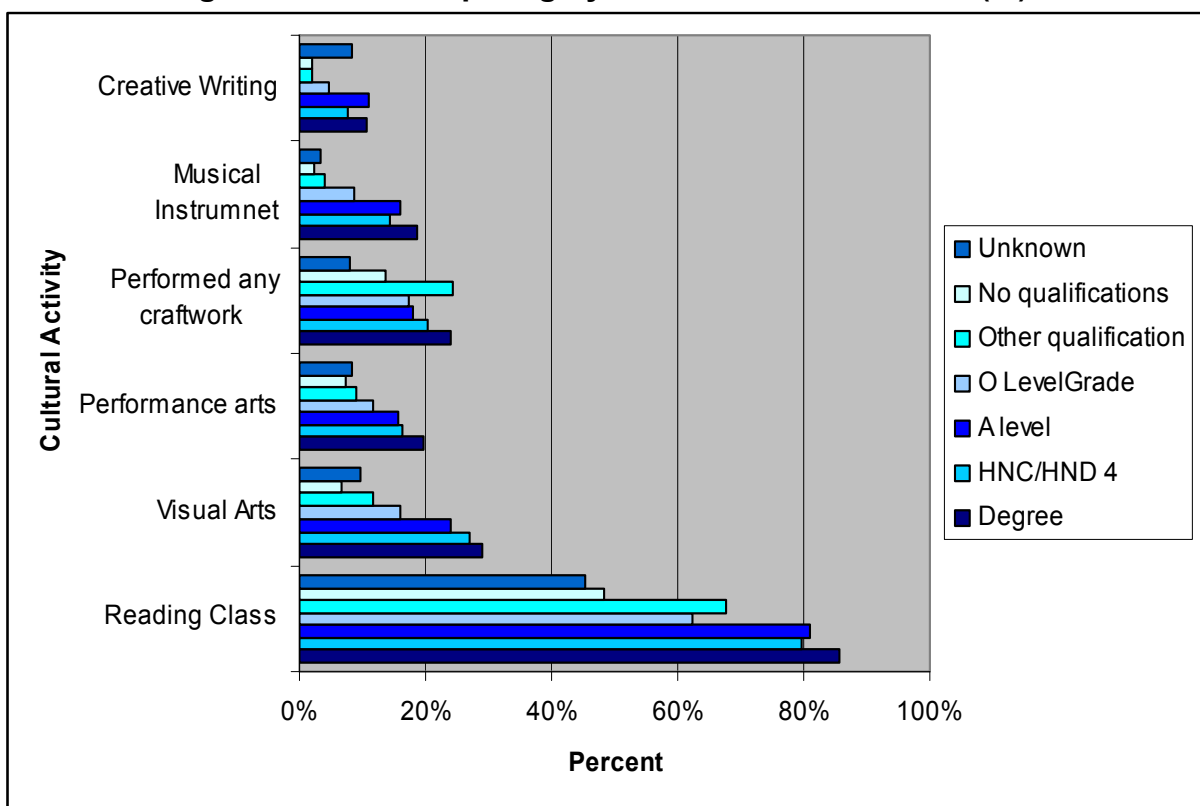
### ***Participation by Education***

A1.13 Like attendance, Figure A1.6 reveals that participation is highest among those with degrees and professional qualifications. One exception is participating in craft work. Of those with other qualifications, 24.6% participated compared to 24.3% of those with a degree. However, generally those with degrees participated in greater numbers than those with lower educational qualifications. For many of the cultural activities, while those with degrees participated most, there is some evidence of a general negative linear relationship between participation across most cultural activities and educational attainment. There wasn't a major difference in participation levels between those with degrees and those with level 4 and level 3 qualifications. The latter two categories had fairly similar levels of participation across all cultural activities. For example, of those with degrees, just under 86% read for pleasure, while the figure was around 80% of those with HNC/HND qualifications and 81% of those with Higher or A-levels.

A1.14 The gap in participation between those with highest level qualifications (degree or professional) and those with lower level qualifications became progressively larger with each step down the ladder of qualifications. Those with degrees are 3.6 times more likely to read for pleasure than those with standard level 2 qualifications, and 6.4 times more likely than those with no qualifications. Of those with no qualifications, less than 10% participated in four of the six cultural indicators. For example, those with degrees were 11.5 times more likely to play a musical instrument and 6 times more likely to participate in creative writing than those with no qualifications. Again, one

major caveat is craft work. For instance, 13.6% of those with no qualifications and 17.2% of those with level 2 or O-level qualifications participated compared to just over 24% of those with degrees. However, in general, those with no qualifications are more likely to be non-participants in all activities, with the exception of music events. This finding suggests that encouraging those with no qualifications and low qualifications to participate in cultural activities could be one of the most important policy objectives and also one of the most challenging (People and Culture in Scotland 2008).

**Figure A1.6: Participating by Educational Attainment (%)**

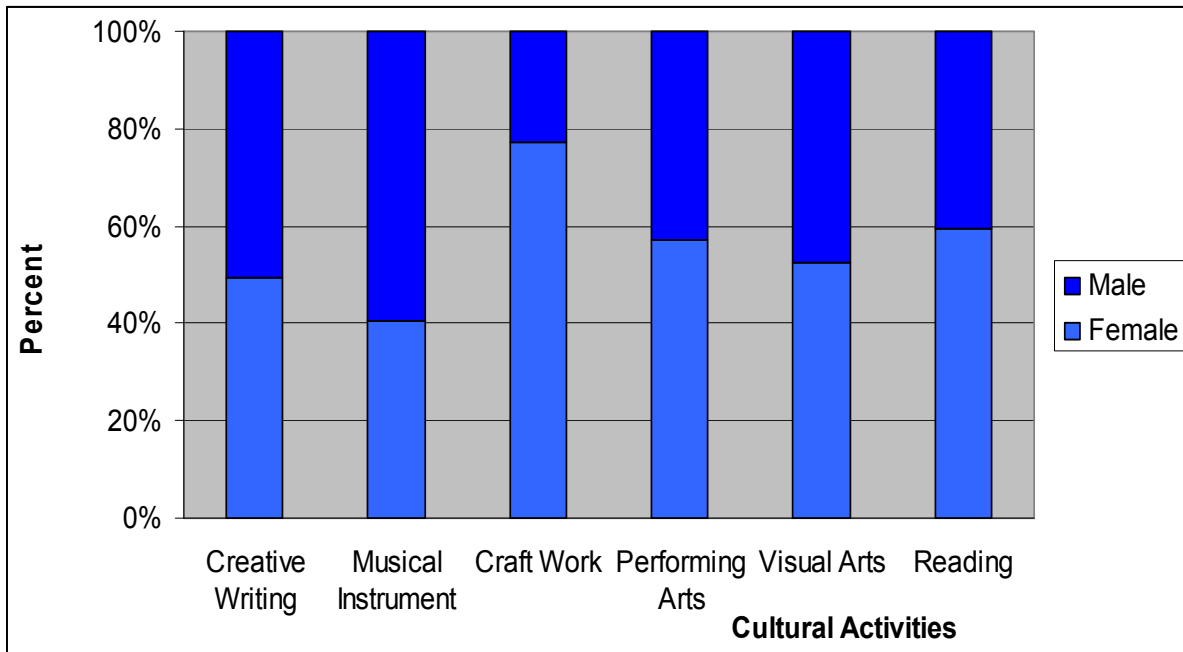


**Participation by Gender**

A1.15 As with attendance, women participated more than men in all but one of the cultural activities (Figure A1.7). The difference was most marked for craft work, where more than three-quarters of those who participated were women but such differences were also evident for the performing arts and reading. Nearly 60% of those who read for pleasure were female. The one major exception to this pattern was playing a musical instrument. Men were 1.8

times more likely to play a musical instrument over the past 12 months than women.

**Figure A1.7: Participating by Gender (%)**

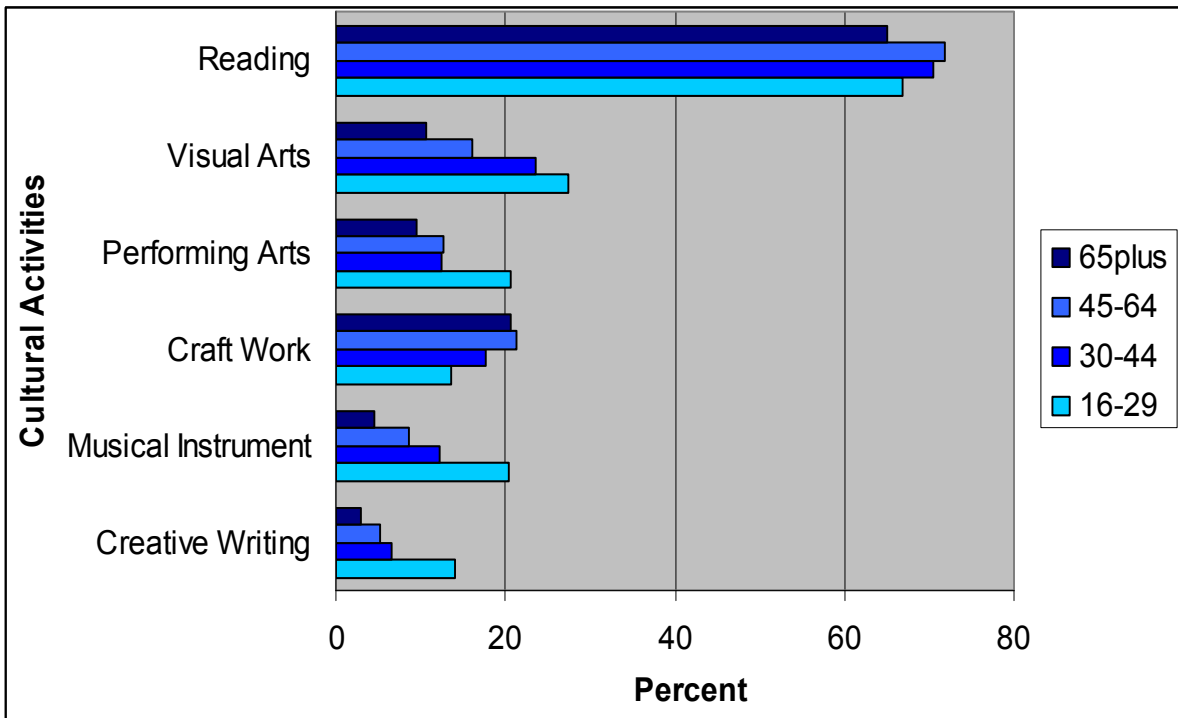


**Participation by Age**

A1.16 For each age group reading is by far the most popular activity, peaking in the 45-64 age category (see Figure A1.8). Those in the youngest age category (16-29) participate most in every activity, with the exception of reading and craft work. There is evidence of a negative relationship between age and participation in the visual arts, creative writing and playing a musical instrument: as age increases, participation in these activities decreases. The effect is greatest for playing a musical instrument. For example, those in the youngest age group were 5.2 times more likely to play a musical instrument over the past year than those respondents who were aged 65 or over. Participating in craft work is an exception to the pattern of lower participation in the older age bands, with those aged 45-64 being 1.7 times more likely to participate in performing craft work than those in the younger age bracket.



**Figure A1.8: Participating by Age (%)**



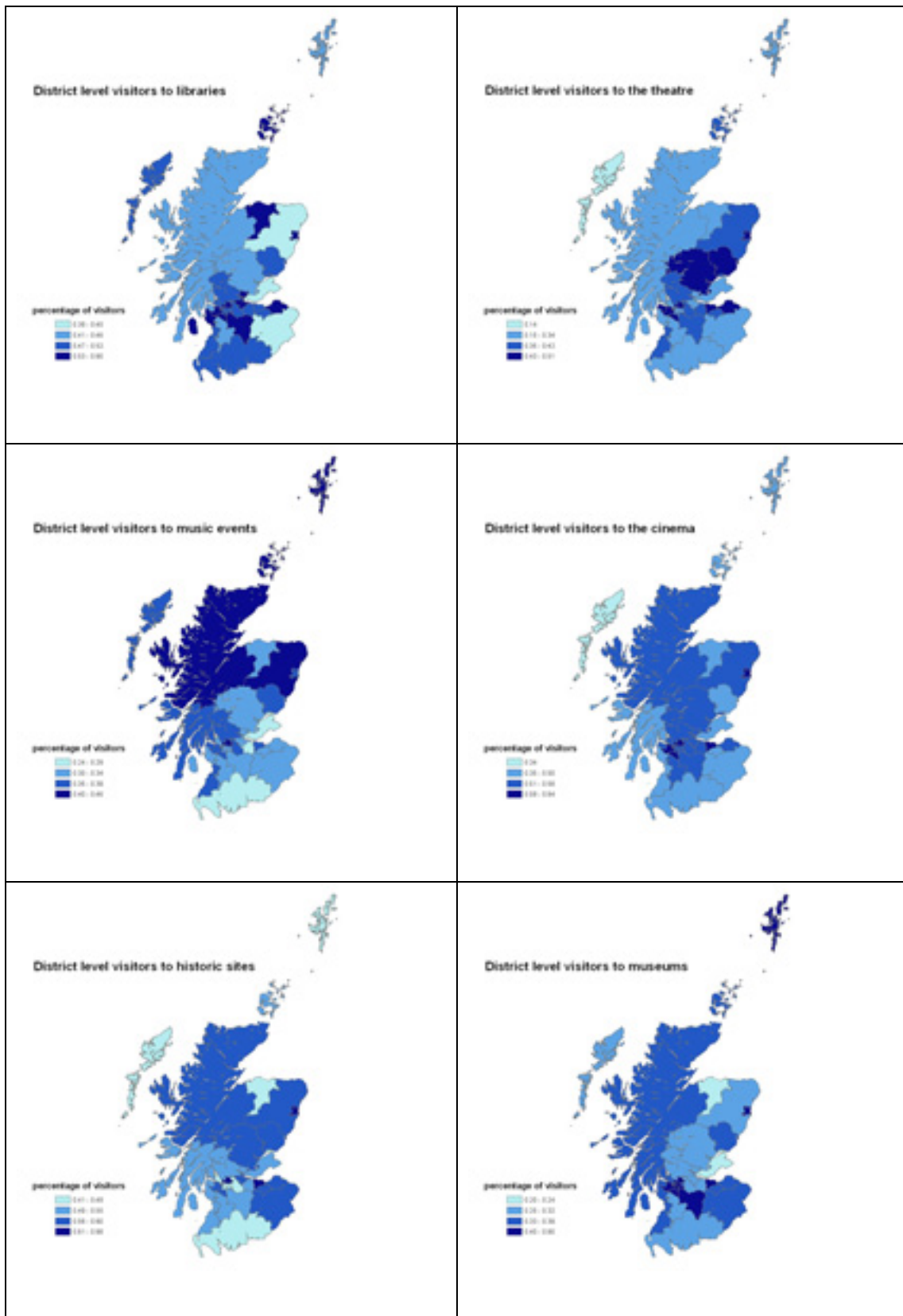
**Attendance by Local Authority Area<sup>1</sup>**

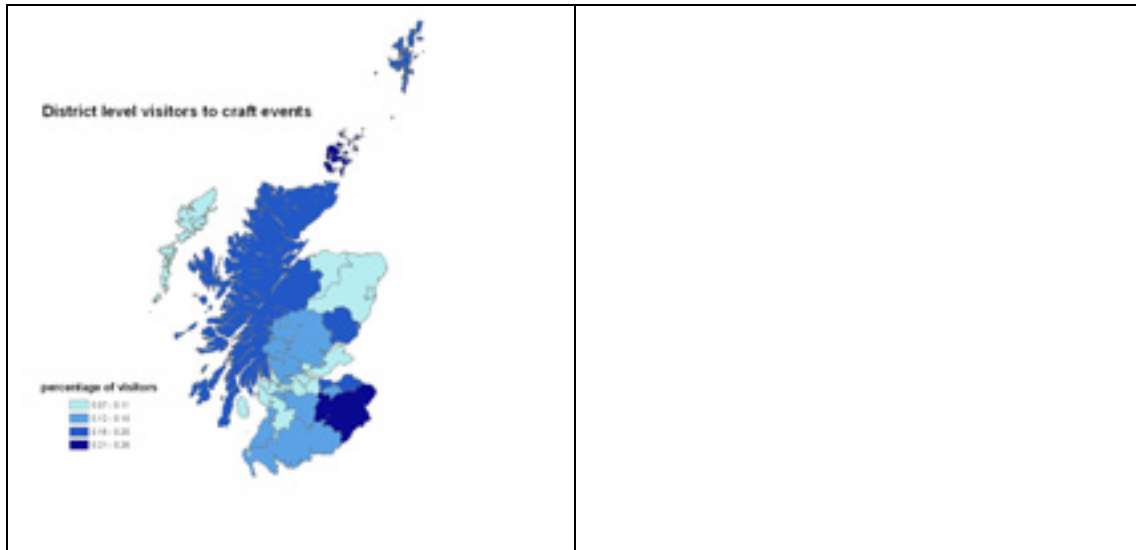
A1.17 Figure A1.9 shows the percentage attendance for the seven different cultural activities by Scottish local authority area. Starting with the first map, library attendance by local authority area, high participation appears to be clustered in space. The local authority areas with high levels of library attendance include Central and West Scotland, namely, Glasgow, South Lanarkshire, Renfrewshire, East Renfrewshire, and North Ayrshire. The local authority area with the highest level of library attendance was Renfrewshire (sixty percent), while the lowest attendance was Aberdeenshire (thirty-nine percent). Fife and Clackmannanshire also had relatively low attendance at forty percent. These

<sup>1</sup> It is important to **note** that findings for LAs are based solely on the cultural indicators used in the CM modelling approach; if the indicators were to change not only would lifestyle groups have a chance of altering, but so would the levels, for highest and lowest levels. Further, we are utilising a cross sectional survey data source, therefore, we are measuring a point in time. If a new sample was to be delivered results may alter, although we would expect similar results. This caveat note can also be applied to the participation section of the report.

areas are significantly below the national average for library attendance which stands at forty-nine percent.

Figure A1.9: Mapping of Attendance by Local Authority District





Geographical patterns for theatre attendance show pockets of high attendance in the local authority areas of Angus and Bute, and Edinburgh. There is an

over-representation of these visitors in central Scotland from east to west, with a band of high attendance clustering in the west (Renfrewshire, East Renfrewshire, and Inverclyde). In the east (central) a clustering of high attendance is found in Edinburgh and East Lothian local authority areas. It appears here at least that areas with a high proportion of theatre visitors share spatial proximity to other high attendance areas. Low theatre attendance is clearly evident in the lowlands, namely the Scottish Borders and Dumfries and Galloway. It is also clustered in the highlands, especially in the local authority areas of Eilean Siar, Argyll and Bute, Highland, and Moray. This suggests that these local authority areas contain a large proportion of individuals disengaged from theatre based events, which may be a product of these local authority areas lacking facilities or venues. The local authority area with the highest attendance rate in music based events is East Dunbartonshire, with an engagement rate of forty-six percent, eleven percent higher than the national average. There is also clustering of participation in the more rural highland areas. Indeed, there is high participation in Highland, Aberdeenshire, the Orkney Islands, and the Shetland Islands. Local authority areas with low attendance include Dundee, Fife, Dumfries and Galloway, and West Lothian, the latter being the lowest, eleven percent below the national average.

A1.18 The national average for cinema attendance was fifty-four percent. The local authority areas with the highest level of attendance were the Highlands, South Lanarkshire, Dundee, Glasgow, and North Lanarkshire, all at fifty-seven percent. The local authority area with the lowest cinema visitors was Eilean Siar, which is perhaps a reflection of a limited number of cinemas on the island, compared with the more urbanised centres. For visitors to historic sites there are clusters of high participation in the east and to the North of Scotland. The local authority areas with the highest attendance are the urban centres, East Dunbartonshire, Aberdeen City, and Edinburgh. Lower attendances were reported in Eilean Siar, followed by Dumfries and Galloway, which are both predominantly rural. Attendance at Craft based events is higher in rural areas, such as the Shetland Islands, the Orkney Islands, Highlands, Scottish Borders, Argyll and Bute and Angus. Glasgow is the local authority area

where individuals are least likely to go to craft based events, with only seven percent visiting these cultural venues.

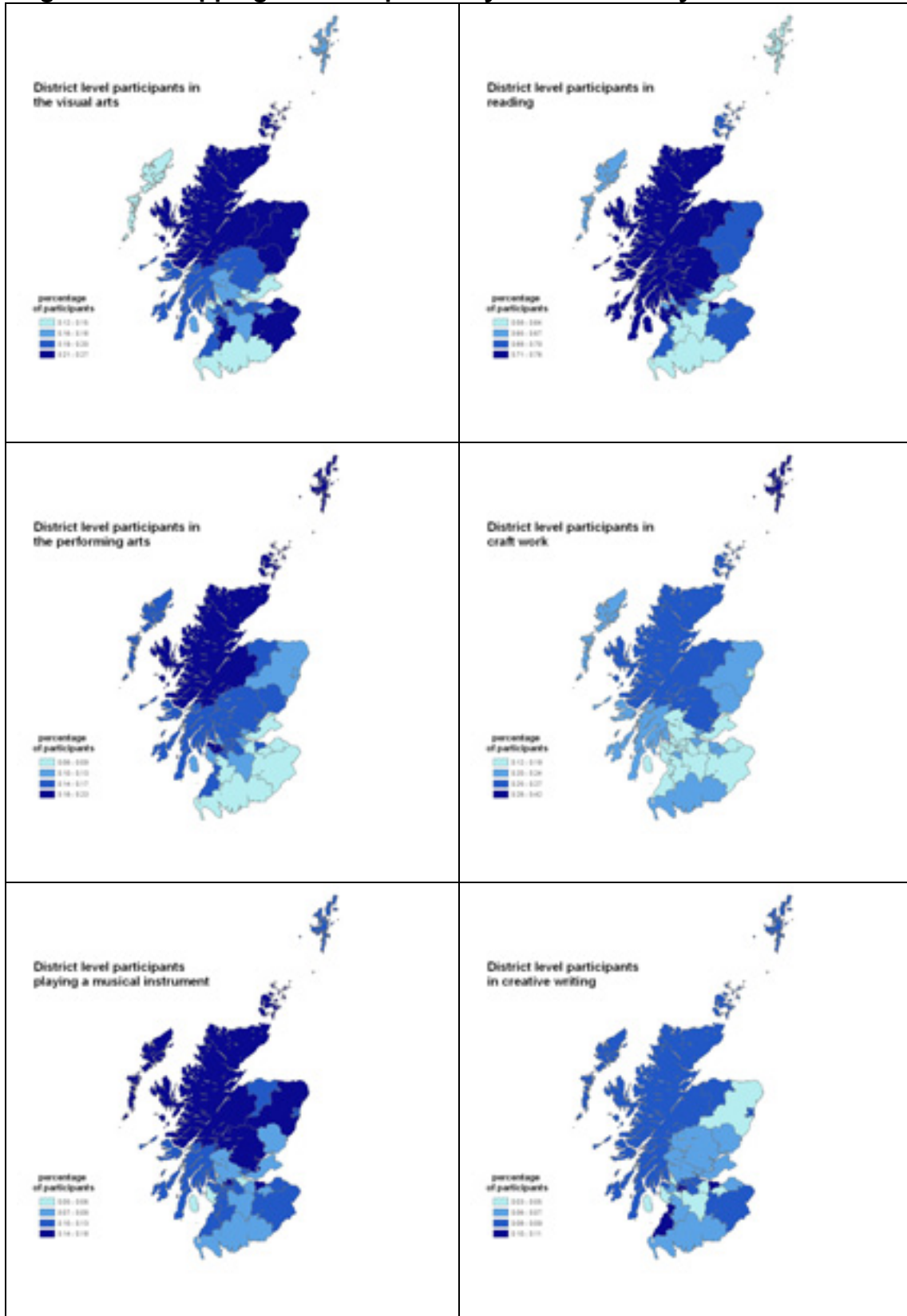
### ***Participation by Local Authority Area<sup>2</sup>***

A1.19 Figure A.10 shows the percentage participation for the different cultural activities by Scottish local authority area. A cluster of local authority areas in Northern Scotland have high participation rates in the visual arts: Angus, Aberdeenshire, Moray, and the Orkney Islands and the Highlands. However, the local authority area with the highest overall participation in this cultural activity is East Ayrshire (27%), whilst Fife has the lowest participation rate (12%).

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<sup>2</sup> As in the case of attendance, it is important to **note** that findings for participation levels in LAs are based solely on the cultural indicators used in the CM modelling approach; if the indicators were to change not only would lifestyle groups have a chance of altering, but so would the levels, for highest and lowest levels. Further, we are utilising a cross sectional survey data source, therefore, we are measuring a point in time. If a new sample was to be delivered results may alter, although we would expect similar results

**Figure A.10 Mapping of Participation by Local Authority District**



A1.20 Reading is the most popular of any activity asked. The national average for reading in Scotland is 69%. Sixteen of the thirty-two local authority areas recorded participation levels that were equal to or above the national average. Reading also appears to be clustered in space with high participation in the east and north of Scotland, while central and eastern local authority areas to the south appear to have less people engaged in reading. Reading for pleasure was highest in the local authority areas of Aberdeen City and Renfrewshire, while Fife and West Lothian had relatively low participation rates.

A1.21 For the performing arts, the lowlands and the east of Scotland tend to have low levels of participation, particularly the local authority areas of Dundee (6%) and Fife (6%). The local authority areas with the highest levels of participation were South Lanarkshire, Shetland Islands, and the Highlands. In terms of participation in the performing arts, there appears to be a definite clustering in space especially between the North and South of Scotland. By contrast, craft based participation is low in central and south Scotland, but increases as you move North. The local authority area with the highest participation in this activity is the Shetland Islands (42%). This is twenty-two percent higher than the national average. Dundee is the local authority area which is least likely to be engaged in craft based participation.

A1.22 Playing a musical instrument for pleasure is more prevalent in the local authority areas of Edinburgh, Eilean Siar, Aberdeenshire, Perth and Kinross, Orkney Islands, and East Dunbartonshire. There is clearly a spatial clustering of participants in the north of Scotland and on the west coast. While there is no spatial clustering of areas with low participation levels, the local authority areas of North Ayrshire and Falkirk do have a low proportion of residents who play a musical instrument for pleasure. Both Edinburgh and Glasgow have a high participation rates in creative writing (10%), which is 3% higher than the national average. However, South Ayrshire has the highest recorded participation rate of eleven percent. The local authority areas least likely to be engaged in this type of activity are North Ayrshire, and Aberdeenshire.



Interestingly, low participation is concentrated in central and southern Scotland, and is predominantly in areas that are more rural.

## APPENDIX 2

### Discussion and Coding of Variables

#### *Individual and Area Level Variables*

A2.1 At the individual level, we used nine variables to explain cultural attendance and participation in Scotland: education, income, age, gender, marital status, tenure, long term illness, access to a car and whether the individual lived in an urban or rural area.

A2.2 Education is used as a categorical variable – (seven categories: Degree, HND/HNC, A-Levels/Higher, Level 2/O-levels, Other qualifications, Unknown qualifications and those individuals with No qualifications). We used the no qualifications category as the reference in the model with each category coded 0/1.

A2.3 We placed Income into quintiles. The income range within each quintile was as follows: Highest Income quintile, Second Highest Income quintile, Middle Income quintile, Second Bottom Income quintile and Bottom Income quintile.

A2.4 Gender is simply coded as a binary variable (female = 1 and male = 0). Age is a categorical variable (young age 18-29; middle age 30-44; late middle age 45-64; old age 65 plus) with the age group 30-44 used as the reference category in the modelling. Each category is coded 0/1. Another categorical variable used in the report is marital status. Here we combined separated/widowed and divorced into one category. The other two categories are single and married. Each category is coded 0/1.

A2.5 We include home ownership as a proxy for affluence – owner occupation is coded as 1 and renting 0. Two deprivation measures are also included as the

individual level (no access to a car and long term illness). Both are binary variables.

A2.6 The urban-rural identifier is also a binary variable (urban = 1; rural = 0). Although individuals living in the City of Edinburgh were all coded as residing in an urban area, other individuals residing in a local authority were sampled from either the urban and rural part of the local authority area.

A2.7 We also include an explanatory variable at the local authority level to act as a proxy for both compositional and contextual effects. The Scottish 2006 multiple index of deprivation or SIMD (15% by rank of most deprived areas) is included as a binary variable. The SIMD is made up of number of indicators, chosen to cover a range of economic, social and housing (<http://www.scotland.gov.uk/Topics/Statistics/SIMD>). If the SIMD measure is statistically significant in the model then we can assume that deprivation has a genuine independent effect and that it is not simply an artefact of population composition.

### **Disentangling Contextual from Compositional Effects**

A2.8 In the report, we often refer to compositional and contextual effects. It is important that we define these terms clearly. If we take cultural behaviour as an example, taking a compositional approach argues that cultural behaviour predominantly influenced by either a persons' position in society or their personal evaluations/attitudes. A contextual approach stresses that people make decisions to participate in cultural activities or attend cultural events because they are influenced by elements of the environment within which their daily lives are engaged. Two local influences might be the people they talk to about a film or a play, and the availability of local opportunity e.g. the local organisations they may join (theatre group/craft group etc) Where they live and their personal geographies can have a major influence on their cultural behaviour.

### **APPENDIX 3: What is Latent Class Analysis (LCA)?**

A3.1 Latent class analysis (LCA) is a form of factor analysis for dichotomous (yes/no) variables. Factor analysis attempts to explain a large number of observed variables in terms of a small number of unobserved factors e.g. attendance at historical sites, archives and museums might reflect an underlying interest in history. This unobserved variable is termed a latent variable. LCA can be used to examine the relationships between latent variables. Put simply, the observed variables (in our case attending a museum and/or visiting the cinema) are regarded as indicators of a set of hypothesised latent classes and are conditionally independent on these underlying variables.

A3.2 Another advantage of LCA is that it determines the associations between categorical variables, specifically membership of classes that are themselves categorical (e.g. in our case the attendance classes were omnivore, heritage & libraries, audio visual arts and low attendants). This is important because it allows the researcher to determine the probabilities that an individual is assigned to each class that has been identified. Individuals are therefore divided into separate, mutually exclusive groups based on their probabilities of membership of that group. LCA assigns an individual to one of the classes identified according to the values of the observed variables – the group which they have the highest probability of membership. In LCA, an individual can only be a member of one class.

#### ***How did we obtain the lifestyle groups?***

A3.3 Before we proceed to the modelling stage, it is necessary to establish how many latent classes are needed in the model. Using the software package Mplus, it is possible to examine the goodness of fit statistics (chi-square, likelihood ratio chi-square, index of dissimilarity and the Bayesian Information Criterion or BIC). Here we adopted the customary model building strategy of specifying two latent classes and increasing this by one incrementally until we

obtained a model which the statistics suggested fitted the data best. Table A3.1 shows the latent class measurement models fitted to data on cultural consumption. The goodness of fit measure shown here is the BIC (the other fit statistics verified the BIC findings) and it shows a reduction in the BIC as more latent classes are modelled. Generally, the lower the BIC the better the fit of the model, although it is best to supplement this with the other fit statistics as we do here. On the basis of the results shown, the data identifies four different lifestyle groups for attendance and three groups for participation. These were subsequently used as our lifestyle groups for measuring cultural attendance and cultural participation in the report.

**Table A3.1: Number of Latent Classes for Attendance and Participation**

<b>Number of Classes</b>	<b>BIC: Attendance</b>	<b>BIC: Participation</b>
Class One	-	-
Class Two	54251	32908
Class Three	53922	<b>32722</b>
Class Four	<b>53817</b>	32728
Class Five	53837	-

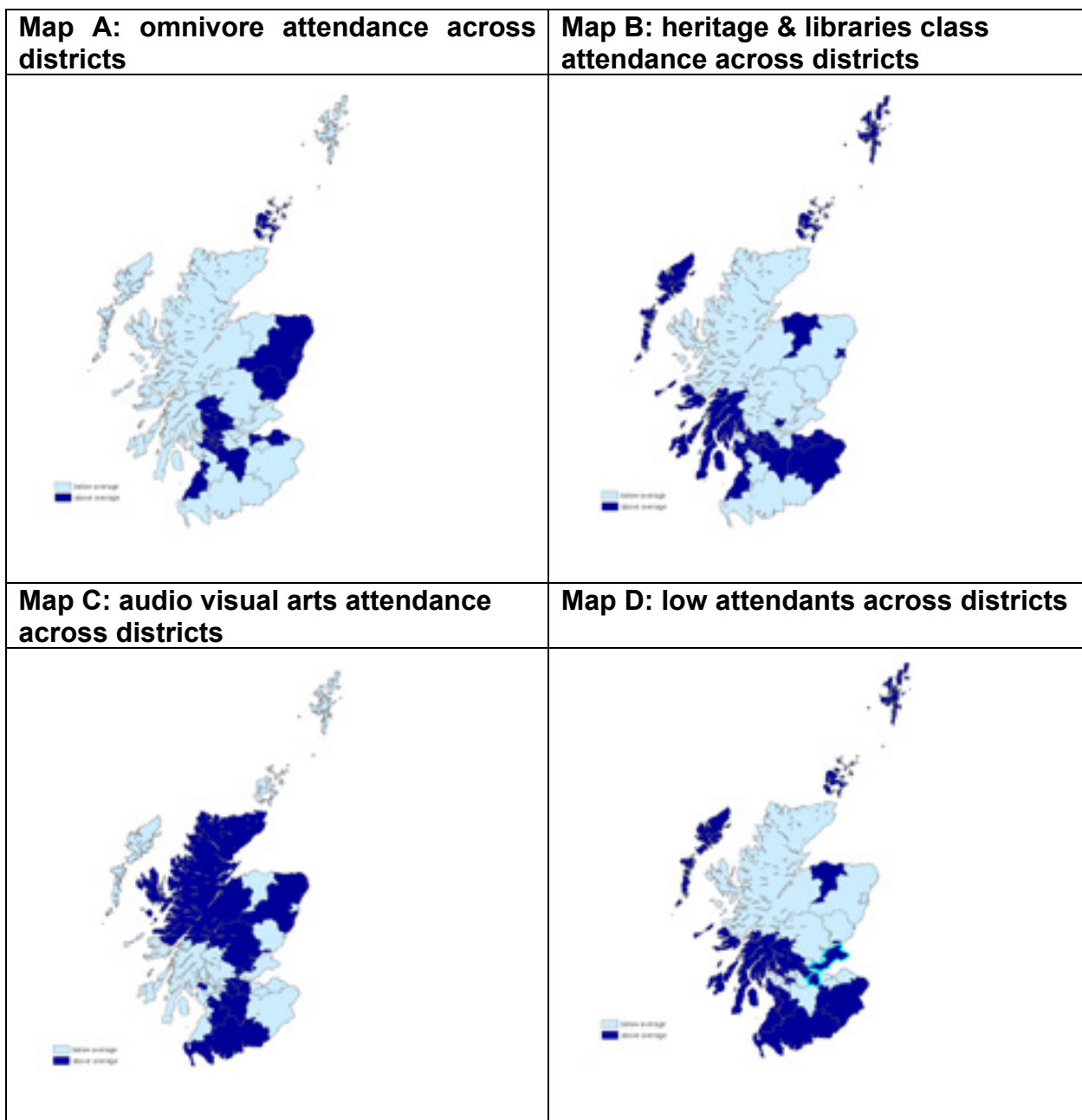
### ***Mapping the Latent Class Model of Attendance***

3.12 Figure A3.1 (Map A) illustrates the distribution of the ‘omnivore’ typology (identified previously) for attendance. There is clear evidence that the high level consumers are clustered in space. ‘Omnivores’ tend to be concentrated in central Scotland, with below average levels in local authority areas in the lowlands and east central, and to the highlands of Scotland. Omnivores tend to reside in the major urban centres of Scotland (Edinburgh, Glasgow and Aberdeen) although there are below average levels of ‘omnivores’ in Dundee. The local authority areas with the lowest proportion of omnivores is Eileen Siar (12%) followed by Fife (15%).

3.13 The heritage & libraries class is predominantly over-represented across central Scotland (See Map B). There is notable clustering to the east of

Scotland (East Lothian, Edinburgh, and Midlothian) which then runs westerly through local authority areas such as East Dunbartonshire, Glasgow, East Renfrewshire, and North Lanarkshire, and continues to the western coastline (North and South Ayrshire, Renfrewshire, and Argyle and Bute). Individuals assigned to this class are also concentrated in Aberdeen, Moray, Eilean Siar and the Shetland Islands. The local authority area with the lowest proportion of individuals in the heritage & libraries class was Dundee (10%)

**Figure A3.1: Attendance Lifestyle groups across Scottish Districts**



3.14 Like the other lifestyle groups, members of the audio visual arts are clustered in local authority areas across Scotland. Individuals assigned to this class are concentrated in a number of local authority areas including and Perth & Kinross (41%) and Falkirk (38%). East Dunbartonshire is the local authority area with the lowest proportion of this group (19%).

3.15 While a high proportion of 'low attendants' can be found in the Shetland Islands (43%) and Eilean Siar (43%), there is also a cluster of local authority areas in central and the lowlands of Scotland which contain above average 'low attendants'. These are local authority areas which are predominantly rural but close to the central belt. There are also other local authority areas with above average 'low attendants' including Fife (42%) and Dumfries and Galloway (42%). Those local authority areas with below average 'low attendants' include Edinburgh (21%) and East Dunbartonshire (18%).

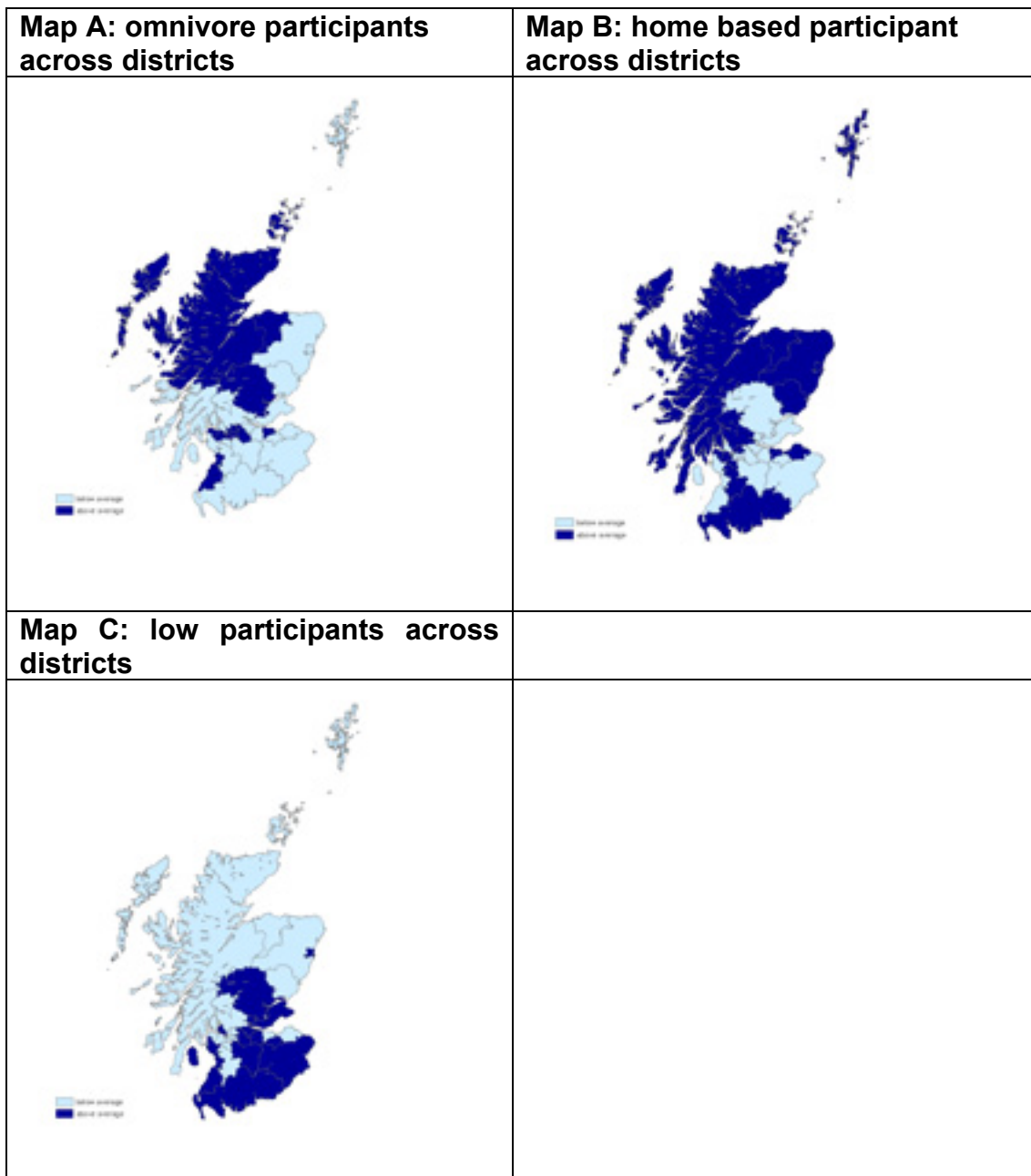
### ***Mapping the Latent Class Model of Participation***

3.16 Figure A3.2 maps the three participation groups identified in the latent class model by local authority area. The first map examines the 'omnivore' group (Map A). Interestingly, unlike the 'omnivore group in the attendance domain, over-representation of this consumer group is clustered in the more rural areas, for example, the Orkney Islands (11%), Eilean Siar (11%), and the Highlands (11%). Interestingly, Edinburgh (11%) and Glasgow (10%) both have an over-representation of this consumer group.

3.17 The 'home based participant' group (Map B) is clustered in the more rural areas of Northern Scotland and local authority areas such as Dumfries and Galloway. However, there is an under-representation of the 'home based participant' group in central Scotland, with a major cluster in eastern areas, and along the border. The local authority area with the lowest proportion of individuals assigned to this group is Fife (20%), which is 9% below the average for this consumer group.



**Figure A3.2: Participation Lifestyle groups across Scottish Districts**



3.18 The final map of Figure A3.2 (Map C) shows the ‘low participant’ group across Scottish local authority areas. There is some evidence of a north-south divide, with over-representation of ‘low participants’ in the south and a clustering of fewer ‘low participants’ in the north of Scotland. As was the case for low attendance, Fife has the largest proportion of ‘low participants’. Indeed, 76% of individuals residing in Fife can be classed as ‘low participants’ in relation to the cultural indicators that make up this domain. One interesting finding is that individuals in the remote local authority areas of the north appear to

participate far more in these cultural activities than those in many other parts of Scotland.

## **APPENDIX 4:**

### **Explaining the Statistical Techniques used in Chapter 4**

#### ***Why do we use Multilevel Modelling?***

A4.1 Regression analysis at a single level tries to explain the observations in terms of the average effect of an explanatory variable. For this model to be valid, the assumption of independence between observations must hold. If a hierarchical variable such as area is included in this model, the variance will estimate that for the difference between individuals in the same area and not the difference between areas. If individuals within an area are more similar to each other than to those from any other area, the assumption of independence is invalid and estimates for the coefficient (how strong an influence area is) will have standard errors which are too small. You may incorrectly conclude that a variable was significant in the model. The standard error of predictors at the higher level will be the most affected if the hierarchical structure is ignored.

A4.2 Within the population at large there are clear hierarchical structures. Individuals reside in households, in neighbourhoods, which are located in local authorities, which, in turn are situated in regions. The failure to model hierarchical data ignores the fact that clustering occurs in a population. Simple regression models are based around the assumption that the observations are independent. This is unlikely if two observations are drawn from the same geographical area. They are more likely to be similar than each other than the average person from the whole population. In practical terms, this can lead to socio-demographic variables being wrongly found to have influence on the cultural behaviour. Multilevel modelling is a methodology which provides a framework for exploring how relationships vary across hierarchical structures, whether these be natural, or introduced to the sample design. The approach is especially useful in this report as it allows us to understand the variability associated with individuals and geography. To do this, the variance left over after consideration of individual level demographic variables is examined to see

if it can be explained by residing in the Local Authority area. Initially, the primary purpose of these models is not to identify the causes of attending or participating in a cultural activity but to estimate the sources of variance i.e. how much is attendance and participation in a cultural activity is dependent on who you are (socio-demographic variables) and how much is it dependent on where you are.

A4.3 This multilevel approach will capture the variation that exists at the individual level and LA level simultaneously, determining the effect of place on fostering cultural lifestyles, after controlling for composition and context.

A4.4 Finally, multilevel modelling is a computationally efficient way of modelling variation, the alternative being incorporating separate terms for your level of interest e.g. in the case of our models, 32 separate terms for each local authority.

### ***Why do we use a Multinomial model?***

A4.5 Multinomial logistic regression is used when you have a categorical dependent variable with more than two possible values to examine the relationship between the dependent variable and a set of predictors. The models are known as multinomial because for each combination of values of the independent predictors, the counts of the dependent variable are assumed to have a multinomial distribution. The counts at the different combinations are also assumed to be independent with a fixed total. If the dependent variable has four values (as in the case of the categories of cultural attendance), you will generate three sets of non-zero coefficients – one for the comparison of each of the first three groups to the last group. In our examples, the non-active group ('low attendants' or 'low participants') were used as the base category. Because the data is hierarchical, we incorporated a multilevel element to the multinomial logistic model.

## **Model Results**

A4.6 The full model results for cultural attendance and participation are shown below. Here we include the coefficients and the standard errors in brackets.

**Table A4.1: Multinomial Multilevel Logistic Model of Cultural Attendance**

Predictor Variables	Omnivore	Heritage & Libraries	Audio Visual Arts
Constant	-2.05*	-1.27*	-0.74*
<b>Individual Level Predictors</b>			
Gender (Base = Male)			
Female	0.64* (0.06)	0.30* (0.07)	0.32* (0.06)
Age (Base = Age 30-44)			
Age 18-29	0.13 (0.10)	-0.05 (0.13)	0.41* (0.09)
Age 45-64	-0.23*(0.07)	-0.16 (0.09)	-0.42* (0.08)
Age 65 and over	-0.60*(0.10)	-0.37* (0.12)	-0.91* (0.10)
Marital Status (Base = Single)			
Married	0.17* (0.08)	0.45* (0.11)	0.05 (0.08)
Separated/Widowed/Divorced	0.16 (0.10)	0.17 (0.12)	0.02 (0.10)
Education (Base = No Qualifications)			
Degree (Level 5)	2.95* (0.11)	1.80* (0.11)	1.36* (0.10)
HND/HNC (Level 4)	2.11* (0.13)	1.21* (0.14)	1.06* (0.12)
A-level (Level 3)	2.02* (0.12)	1.01* (0.13)	1.03* (0.10)
O-level (Level 2)	1.00* (0.12)	0.59* (0.12)	0.76* (0.09)
Other Qualifications	0.74* (0.17)	0.62* (0.14)	0.66* (0.13)
Unknown Qualifications	-0.40 (0.63)	-0.12 (0.42)	0.19 (0.33)
Income (Base = Bottom Quintile)			
Highest Income Quintile	0.71* (0.12)	-0.18 (0.14)	0.69* (0.12)
Second Highest Income Quintile	0.23* (0.11)	-0.24 (0.12)	0.27* (0.11)
Middle Income Quintile	0.08 (0.11)	-0.24* (0.11)	0.09 (0.10)
Second Bottom Income Quintile	0.07 (0.11)	-0.20 (0.11)	0.23* (0.10)
Tenure (Base = Renting)			
Owner Occupation	0.07 (0.08)	-0.07 (0.09)	0.03 (0.08)
Long Term Ill (Base = Not Ill)			
Long Term Illness	-0.59* (0.08)	-0.30* (0.18)	-0.53* (0.07)
Cars (Base = One or more cars)			
No Cars	-0.58* (0.09)	-0.44* (0.10)	-0.35* (0.08)
Urban/Rural (Base = Rural)			
Urban	0.28* (0.07)	0.17* (0.08)	0.16* (0.07)
<b>Local Authority Area Level</b>			
Multiple Index of Deprivation			
Index of Deprivation 15% Most Deprived	-0.87* (0.12)	-0.25* (0.11)	-0.48* (0.10)
Random parts			
Between-Local Authority Variance	0.17* (0.05)	0.07* (0.03)	0.06* (0.02)
Covariance between Intercepts	-	0.11* (0.03)	0.06* (0.02)
			0.03 (0.02)

\*Significant at  $p = < 0.05$  or 95% confidence level.

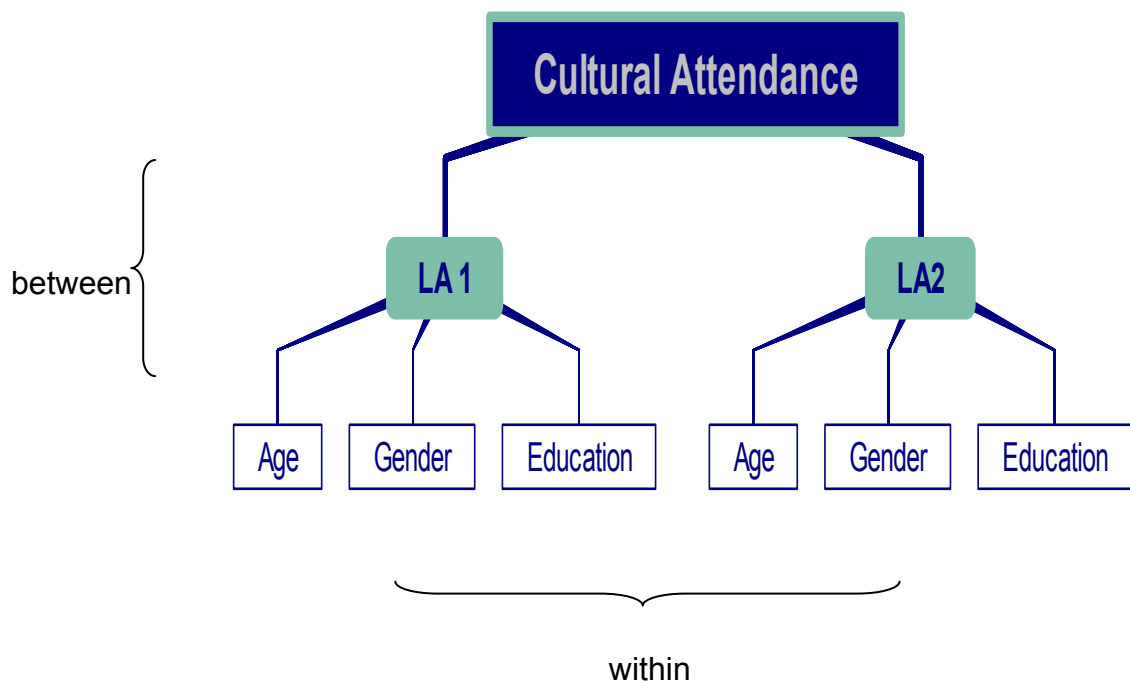
**Table A4.2: Multinomial Multilevel Logistic Model of Cultural Participation**

Predictor Variables	Omnivore	Home Based Participants
Constant	-2.91*	-1.88*
<b>Individual Level Predictors</b>		
Gender (Base = Male)		
Female	-0.21*	0.73*
Age (Base = Age 30-44)		
Age 18-29	0.69*	0.00
Age 45-64	0.15	0.01
Age 65 and over	-0.35	-0.03
Marital Status (Base = Single)		
Married	-0.20	0.09
Separated/Widowed/Divorced	-0.31	0.02
Education (Base = No Qualifications)		
Degree (Level 5)	2.58*	1.34*
HND/HNC (Level 4)	2.11*	1.04*
A-level (Level 3)	1.90*	0.91*
O-level (Level 2)	1.05*	0.53*
Other Qualifications	0.25	0.43*
Unknown Qualifications	1.05	0.29
Income (Base = Bottom Quintile)		
Highest Income Quintile	-0.3	-0.11
Second Highest Income Quintile	-0.23	-0.05
Middle Income Quintile	-0.1	0.01
Second Bottom Income Quintile	-0.19	0.17
Tenure (Base = Renting)		
Owner Occupation	-0.17	0.22*
Long Term Ill (Base = Not Ill)		
Long Term Illness	-0.27	0.07
Cars (Base = One or more cars)		
No Cars	-0.17	-0.25*
Urban/Rural (Base = Rural)		
Urban	-0.40*	-0.17*
<b>Local Authority Area Level</b>		
Multiple Index of Deprivation		
Index of Deprivation 15% Most Deprived	-0.45*	-0.13
Random parts		
Between-Local Authority Variance	0.08* (0.04)	0.02* (0.01)
Covariance between Intercepts	-	0.04* (0.02)

## Explaining the Model Results

A4.7 The main report focuses on the fixed part of the model and explains the effects of predictor variables on the dependent variables. Here we focus on the random part of the model which has a more complex statistical explanation.

A4.8 In the multilevel model, we consider variation within a local authority and variation between local authorities.



A4.9 The regression coefficients for the intercept and the slope of the predictors define the average line across all individuals in all local authorities. In a fixed model, the slopes of the regression line e.g. for participation against age, would be parallel for different local authorities with the intercept varying. A random model allows the intercept and the slope of the regression line to vary and is felt to be more realistic, reflecting context.

A4.10 The random parameters are the intercept variances at each level. A local authority level random effect is assumed to be normally distributed with a mean

of zero. The random effects are contrast-specific because local authority area level factors may affect each contrast: for instance, the effect of living in a deprived area may be very different in one LA with a high proportion of deprived areas versus one with very few. Despite this, the random effects may be correlated across contrasts and would arise if there were unobserved local authority level factors which affect the choice of more than one group or class. Looking at the correlation between the intercepts gives one way of testing the validity of using the random model.

A4.11 Looking at random effects part of the model at the bottom of table A2, for each comparison (belonging to omnivore, heritage & libraries, audio visual arts versus low attendants) the level 2 variance or between local authority effect is larger than its standard error (in brackets in the table). Similar results are found in the model of cultural participation (Table A3). This not only validates our use of the multilevel modelling technique because there is significant variation between local authorities, but more importantly suggests that there is unexplained local authority level variation in the membership of each latent class.

A4.12 In the attendance model, the variance of the first intercept (i.e. comparing the 'low attendants' group with the 'omnivore' group) is 0.17, while the intercept of the second intercept (i.e. comparing the 'low attendants' group with the 'heritage & libraries' group) is 0.07. Finally, the intercept of the third intercept (i.e. comparing the 'low attendants' group with the 'audio visual arts' group) is 0.06. These are fairly small, but nevertheless suggest local authority level variation is unexplained even after accounting for individual and area level factors. The covariance between the intercepts is also shown. The random effect covariances are all positive, indicating that, in terms of cultural attendance, local authorities with high (low) membership of a class also tend to have high (low) membership of other classes relative to the reference "low attendance class".

A4.13 For participation, the variance of the first intercept (i.e. comparing the 'low participant' group with the 'omnivore' group) is 0.08, while the intercept of the



second intercept (i.e. comparing the 'low participant' group with the 'home based participant group) is 0.02 (see the bottom part of A3). These are much smaller than for attendance but are statistically significant. Once again, the results suggest that there is unexplained local authority level variation in the membership of each latent class. Whether this is other supply side factors unaccounted for in the model or other contextual mechanisms is unclear. Nonetheless, this finding reinforces the importance of taking account of place. Like cultural attendance, the random effect covariance is positive.

## **APPENDIX 5:**

### **Explaining the Statistical Techniques used in Chapter 5**

#### ***Why do we use a Multilevel Binary Logistic model?***

A5.1 When you have a dependent variable that is dichotomous (only has two values – 0/1) it is necessary to use a binary logistic regression to model the relationship between the dependent variable and a set of independent predictor variables. In chapter 5, our focus was the non-active groups for attendance ('low attendants') and participation ('low participants'). These were coded one and the other lifestyle groups were coded zero as we attempted to determine the key factors that explained the low cultural activity. As noted previously, the data is hierarchical and there are a number of reasons why we should take account of this in our modelling approach (see discussion above). We therefore extended our model to allow for the local authority level effects on the probability of being in the 'low attendants' (for cultural attendance) and 'low participants' group (for cultural participation).

#### ***Model Results***

A5.2 The full model results for low cultural attendance and low participation are shown below. Here we include the coefficients with the standard error for the coefficients in brackets.

**Table A5.1: Multilevel Binary Logistic Model of Attendance**

<b>Predictor Variables</b>	<b>Low Activity</b>
Constant	0.36* (0.15)
<b>Individual Level Predictors</b>	
Gender (Base = Male)	
Female	-0.39* (0.06)
Age (Base = Age 30-44)	
Age 18-29	-0.28* (0.11)
Age 45-64	0.34* (0.09)
Age 65 and over	0.64* (0.10)
Marital Status (Base = Single)	
Married	-0.18* (0.09)
Separated/Widowed/Divorced	-0.21* (0.10)
Education (Base = No Qualifications)	
Degree (Level 5)	-1.95* (0.11)
HND/HNC (Level 4)	-1.42* (0.13)
A-level (Level 3)	-1.25* (0.11)
O-level (Level 2)	-0.80* (0.09)
Other Qualifications	-0.64* (0.11)
Unknown Qualifications	-0.09 (0.29)
Income (Base = Bottom Quintile)	
Highest Income Quintile	-0.51* (0.13)
Second Highest Income Quintile	-0.10 (0.11)
Middle Income Quintile	-0.04 (0.10)
Second Bottom Income Quintile	-0.13 (0.09)
Tenure (Base = Renting)	
Owner Occupation	-0.21* (0.08)
Long Term Ill (Base = Not Ill)	
Long Term Illness	0.42* (0.07)
Cars (Base = One or more cars)	
No Cars	0.49* (0.08)
Urban/Rural (Base = Rural)	
Urban	-0.28* (0.07)
<b>Local Authority Area Level Predictors</b>	
Multiple Index of Deprivation	
Index of Deprivation 15% Most Deprived	0.28* (0.10)
Random parts	
Between-Local Authority Variance	0.04* (0.02)

**Table A5.2: Multilevel Binary Logistic Model of Participation**

<b>Predictor Variables</b>	<b>Low Activity</b>
Constant	1.52* (0.14)
<b>Individual Level Predictors</b>	
Gender (Base = Male)	
Female	-0.56* (0.06)
Age (Base = Age 30-44)	
Age 18-29	-0.18* (0.09)
Age 45-64	0.01 (0.08)
Age 65 and over	0.04 (0.10)
Marital Status (Base = Single)	
Married	-0.02 (0.08)
Separated/Widowed/Divorced	0.03 (0.09)
Education (Base = No Qualifications)	
Degree (Level 5)	-1.51* (0.09)
HND/HNC (Level 4)	-1.18* (0.11)
A-level (Level 3)	-1.05* (0.10)
O-level (Level 2)	-0.58* (0.09)
Other Qualifications	-0.44* (0.12)
Unknown Qualifications	-0.39 (0.31)
Income (Base = Bottom Quintile)	
Highest Income Quintile	0.15 (0.11)
Second Highest Income Quintile	0.09 (0.10)
Middle Income Quintile	0.03 (0.10)
Second Bottom Income Quintile	-0.10 (0.09)
Tenure (Base = Renting)	
Owner Occupation	-0.16* (0.07)
Long Term Ill (Base = Not Ill)	
Long Term Illness	-0.01 (0.07)
Cars (Base = One or more cars)	
No Cars	0.26* (0.08)
Urban/Rural (Base = Rural)	
Urban	0.19* (0.06)
<b>Local Authority Level Predictors</b>	
Multiple Index of Deprivation	
Index of Deprivation 15% Most Deprived	0.16 (0.10)
<b>Random parts</b>	
Between-Local Authority Variance	0.03* (0.01)

## ***Explaining the Model Results***

A5.3 The intercept and the individual level coefficients (education levels, income, gender etc) and the LA level variables (urban-rural and the multiple index of deprivation) are the fixed part of the model (coefficients represent the average across the individuals/areas). The local authority level variance determines the local authority level random part of the model. While the fixed effects represent the 'average' effects, the random part variance provides an estimate of what can be explained by each level (in our case Local Authority).

A5.4 Table A5.1 shows the model results. The constant reflects the probability of belonging to the low attendance group, not taking any demographic variables into account at level 1. To give the intercept for LA (j) we add variance for LA from the random part of the model, where the variance of  $u_{0j}$  is estimated as 0.04 (SE = 0.02). The null hypothesis for the model is that the probability for belonging to the low activity group is the same for all local authorities i.e. that the coefficient is zero.

A5.5 We tested the significance of  $\sigma^2_{u_0}$  (local authority level variance) to determine whether there are significant differences between Scottish local authorities (after taking account of all the explanatory variables). A Wald test was used as appropriate for a dichotomous variable model. The test statistic is 5.052, which we compare to a chi-squared distribution on 1 degree of freedom to determine whether there is a significant difference or not. This provides a p-value of 0.02, from which we can conclude that there are significant differences between Scottish local authorities for low cultural attendance.

A5.6 However, we know that some of the variation in being a 'low attendant' is due to individual level explanatory variables and so we should take this into account before estimating how much variation is due to these differences between Scottish local authorities. In binary response models (as we have here), there is no single variance partition coefficient measure since the level 1 (individual) variance is a function of the mean, which therefore depends on the values of the explanatory variables included in the model. To estimate the variation at the

Scottish LA level, we use a statistical approximation based on linearization of the variance so it doesn't depend on the value of mean (Goldstein and Rasbash, 1996) where the standard variance for a logistic distribution is 3.29. For cultural attendance, the intra-class local authority correlation is estimated to be  $0.04/(0.04+3.29)$ , which suggests that 1% of the variation is at the local authority level. In other words, 1% of the variance in being a 'low attendant' can be attributed to difference between local authorities.

A5.7 For cultural participation, we adopt a similar approach. We then calculated the Wald test for low cultural participation. The test statistic is 4.414, which we compare to a chi-squared distribution on 1 degree of freedom to determine whether there is a significant difference or not. This provides a p-value of 0.03, from which we can conclude that there are statistically significant differences between Scottish local authorities for cultural participation after controlling for other explanatory variables. The intra-class local authority correlation for cultural participation is estimated to be  $0.03/(0.03+3.29)$ , which suggests that just under 1% of the variation is at the local authority level. This is small but just statistically significant. When compared to the model without explanatory variables (0.04 with a standard error of 0.01) there is little change, which suggests that the inclusion of the local authority area level deprivation variable explains little of the variation in low participation.

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