The impact of participation in arts and cultural activities on personal wellbeing

Motu economic & public policy research

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Abstract

Using data from the 2016 and 2021 New Zealand General Social Surveys, this study investigates the impact of arts and cultural (AC) participation on personal wellbeing and quantifies in monetary terms the value of such participation to individuals. While it is not significantly associated with life satisfaction, we find that active AC participation (taking part) is associated with higher eudaimonic wellbeing (specifically, a greater sense of purpose), which may be a contributor to greater long-term wellbeing. We find that passive AC participation (observing or being audience) is associated with higher life satisfaction and higher short-term wellbeing, in the form of greater happiness and mental wellbeing. We show that an important pathway through which passive AC participation affects life satisfaction is via mental health, by increasing how often one feels calm and peaceful and reducing how often one feels downhearted and depressed. Using the Wellbeing Valuation approach, we estimate that on average people value passive AC participation at around 6-20% of their income, which is equivalent to $2,800-$9,300 per person per year at the median income level.

JEL codes

Z11 Economics of the arts and literature

I31 General welfare, Well-being

Keywords

Arts and cultural participation; life satisfaction; Wellbeing Valuation approach

Summary haiku

Arts and culture help

lift the health and wellbeing

of those who engage.

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Executive summary

People choose to participate in arts and cultural (AC) activities for a wide range of social, economic, and health-related reasons. Such participation is important to personal wellbeing because it is a means of creative expression and accomplishment, fosters personal growth, and creates opportunities to meet diverse and like-minded people. Although conceptually AC participation may have a positive effect on wellbeing, the empirical relationship is nuanced and requires careful examination. Using New Zealand household survey data, this study investigates the impact of AC participation on wellbeing and quantifies the value of such participation to individuals.

Data

Our two data sources are the 2016 and 2021 General Social Surveys, which contain detailed information on AC participation in New Zealand alongside data on wellbeing and household income. Our definition of AC participation is based on whether an individual participated in at least one of 10 types of AC activities within the last 4 weeks. Following the literature, we distinguish between active participation (taking part) and passive participation (observing or being audience) in AC activities. Our main wellbeing measure is life satisfaction, although to gain greater understanding of the possible mechanisms involved we also use sense of purpose, happiness, and the WHO-5 mental wellbeing index.

Methodology

Our empirical methodology consists of two parts. In the first part, we examine the impact of AC participation on wellbeing using OLS regressions. In our baseline analysis we regress life satisfaction on AC participation, household income, and various individual characteristics which may influence wellbeing. We also conduct a mediation analysis to investigate the possible pathways through which AC participation affects life satisfaction.

In the second part we employ the Wellbeing Valuation approach to quantify the value of AC participation to individuals. This approach uses econometric techniques to estimate the life satisfaction created by AC participation, and then converts this into a monetary value by relating it to an estimate of the effect of income on life satisfaction. This monetary value represents the amount of income that an individual is willing to forego in return for the benefit of AC participation while maintaining the same level of wellbeing.

Key findings

- Passive participation in AC activities is associated with greater happiness, improved mental wellbeing, and higher life satisfaction. This suggests that passive participation improves short- and medium-term wellbeing.

- Active AC participation has no significant association with life satisfaction, but it is associated with a higher sense of purpose, suggesting that active participation improves eudaimonic wellbeing, which may influence long-term wellbeing.

- In addition to its direct influence, passive AC participation enhances life satisfaction by increasing how often one feels calm and peaceful and reducing how often one feels downhearted and depressed.

- On average, people value passive AC participation at around 6-20% of their income, which equates to $2,800-$9,300 per person per year at the median equivalised income level ($45,800).

Conclusion

Our main result is that passive AC participation is positively associated with higher life satisfaction. We show that this association is partially driven by the positive influence passive AC participation has on mental health. In contrast to previous studies, we find no significant association between active AC participation and life satisfaction. This result is consistent with the 'unhappy artist' theory – active AC activities may enhance wellbeing but those who participate in them might, by nature, have lower wellbeing.

Using the Wellbeing Valuation approach, we estimate that on average people value passive AC participation at around 6-20% of their income. This means that an individual with the median equivalised income is willing to forgo $2,800-$9,300 of that income in return for the wellbeing benefits that passive AC participation brings. An alternative interpretation is that the median value of consumer surplus from 'consuming' passive AC activities is around $2,800-$9,300 per person per year. This suggests that individuals in New Zealand place significant value on passive AC participation, and we show this value is comparable to that placed on sport participation.

We note that our estimates might not be generalisable to the wider population since we do not control for selection into AC participation. Controlling for selection into AC participation would shed light on whether AC participation improves wellbeing for the general population or just those who have an interest in AC activities. We leave this topic for future research.

1   Introduction

There are many reasons why people choose to participate in arts and cultural (AC) activities: for pleasure and entertainment, as a means of creative expression, for personal growth and to develop new skills, to meet new people, and to celebrate cultural traditions (Ministry of Social Development, 2016). Such experiences may enhance overall wellbeing by improving self-esteem and confidence (Auckland Council, 2018), providing a sense of accomplishment, pride, and identity (Savage et al., 2017), and inducing social interaction that engenders feelings of belonging and shared identity (Daykin et al., 2021). Furthermore, participation in AC activities is associated with better general health (Leadbetter & O'Connor, 2013) and is believed to reduce stress, anxiety, and depression (Węziak-Białowolska et al., 2019). This is especially the case in clinical settings, where artistic activities have proven effective as stress and anxiety-reducing therapies for specific patient groups, due to their ability to enhance mood, emotions, and psychological state (Węziak-Białowolska et al., 2019). Engagement in the arts has also been found to improve the perceived health, experience of pain, and sense of community of elderly people (Phinney et al., 2014), and increase the wellbeing, confidence, and future hopes of young people living in poverty (Nugent & Deacon, 2022).

Using data from the New Zealand General Social Survey (GSS), this study explores the relationship between AC participation and personal wellbeing. The empirical approach consists of two parts. First, we estimate the impact of AC participation on wellbeing and investigate whether this impact varies by type of activity (active or passive) and population group (e.g. gender, age, income levels). Second, we quantify the value placed on AC participation by individuals using the Wellbeing Valuation (WV) approach. This study makes two main contributions to the literature. First, we use a mediation analysis framework to identify key pathways through which AC participation influences wellbeing. Second, we expand the international empirical base by estimating the impact and value of AC participation in a New Zealand context using econometric techniques, which to our best knowledge has not been done before.

The focus of this study is on the wellbeing derived from participation in AC activities. Wellbeing can be defined as the state of being healthy, happy, or prosperous (Oxford English Dictionary, 2023). Life satisfaction is often regarded as the best single measure of evaluative subjective wellbeing due to its holistic nature and ease of measurement and interpretability (Frijters & Krekel, 2021). However, wellbeing is a multidimensional concept that encompasses more than just a global evaluation of one's life. Wellbeing can relate to short-term feelings of happiness and pleasure (hedonic wellbeing) and long-term assessments of how meaningful and

well-functioning one's life is (eudaimonic wellbeing). Life satisfaction, being a medium-term measure, can only indirectly capture such wellbeing dimensions. Furthermore, life satisfaction can be disaggregated into multiple domains which capture how one feels about different aspects of their life, such as job, health, and leisure satisfaction (van Praag et al., 2003). Hence, to provide a more complete picture of the impact of active and passive AC participation on wellbeing, we use multiple wellbeing measures in our empirical analysis.

We find that passive participation (observing or being audience) in AC activities is positively associated with short- and medium-term wellbeing, while active participation (taking part) is positively associated with eudaimonic wellbeing, which may be a contributor to greater long-term wellbeing. An important pathway through which passive AC participation affects life satisfaction is via mental health, by increasing how often one feels calm and peaceful and reducing how often one feels downhearted and depressed. Using the Wellbeing Valuation approach, we estimate that on average people value passive AC participation at around 6-20% of their income, which is equivalent to $2,800-$9,300 per person per year at the median income level. Note these results pertain to individuals who have an interest in AC activities and might not be generalisable to the wider population.

The rest of the report proceeds as follows. Section 2 reviews the related literature. In sections 3 to 4 we describe the data and methods. Sections 5 and 6 respectively present the results on estimating the impact of AC participation on wellbeing and using the WV approach to quantify the value of AC participation. Section 7 summarises and concludes.

2 Literature review

This study draws from two strands of literature. Section 2.1 reviews the literature on the impact of AC participation on wellbeing while Section 2.2 reviews the small but growing literature that quantifies the value of AC participation. We also summarise the New Zealand studies which quantitatively explore the relationship between AC participation and wellbeing in Section 2.3.

2.1 The relationship between arts and cultural participation and wellbeing

Most of the empirical literature points towards a positive impact of AC participation on wellbeing. However, there are many nuances involved with the estimation and interpretation of the relationship. First, most studies make a clear distinction between active engagement (taking part) and passive participation (observing or being audience) in AC activities. Second, the wellbeing impacts of AC participation may vary by the type of activity and the frequency of participation.

The studies by Leadbetter and O'Connor (2013), Brown et al. (2015), Wheatley and Bickerton (2017), and Briguglio et al. (2020) employ cross-sectional regression models to show that participation in AC activities is positively associated with life satisfaction, leisure satisfaction, and general happiness.[2] Actively participating in AC activities, attending AC events, visiting museums and historical places, and engaging in heritage hobbies are amongst the activities that are significantly associated with greater wellbeing. However, issues with omitted variable bias and reverse causality prevent these studies from proving causality. The positive relationship between AC participation and wellbeing may appear causal but could be a result of unobserved personal characteristics or the possibility that happier people are more likely to participate in the arts (Węziak-Białowolska, 2016).

Employing data from Understanding Society: The UK Household Longitudinal Study (2010/11, 2011/12 and 2013/14 waves), Węziak-Białowolska et al. (2019) attempt to establish a causal relationship between AC participation and wellbeing by employing a panel data regression model to control for confounding variables prior to the exposure of the AC participation treatment. Active engagement and passive participation with arts and culture are shown to exhibit a significant causal link to life satisfaction. However, they also show that passive participation leads to increased feelings of inability to overcome one's difficulties and reduced ability to enjoy one's day-to-day activities and feel calm and relaxed. This may reflect that although the effects of

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[2] Brown et al. (2015) and Wheatley and Bickerton (2017) both use data from the 2010/11 wave of Understanding Society: The UK Household Longitudinal Study. Leadbetter and O'Connor (2013) source their data from the Scottish Household Survey (2010/11) and Briguglio et al. (2020) source theirs from the 2016 Cultural Participation Survey in Malta.

AC participation are generally positive, AC experiences can prompt a wide variety of emotional reactions.

Węziak-Białowolska (2016) presents the only study we could find that does not support the argument that AC participation improves wellbeing. Employing data (2010 and 2013 waves) from the Swiss Household Panel study, the author uses propensity score matching and panel regression models to mitigate selection bias and the influence of unobserved characteristics. Her results suggest that voluntary AC activity of any type does not have any causative influence on life satisfaction, at least amongst the general population. The author notes that her analysis does not consider the impact of AC participation on other dimensions of wellbeing, and also that different artistic forms not included in the study (like dance and creative writing) may contribute to wellbeing.

Brown et al. (2015) provide a stark example of how the wellbeing impacts of AC participation can vary significantly by the type of activity. Their results show that participation in heritage and active-creative activities (dance, singing, and performing) is positively associated with life satisfaction, whilst reading hobbies and sedentary-creative activities (playing music, painting, and writing) are negatively associated with life satisfaction. The authors argue AC activities that involve a degree of physical activity are likely to have a stronger association with wellbeing than sedentary activities due to the health-related benefits of physical activity. Furthermore, wellbeing impacts are likely stronger for activities which involve social interaction, which has been shown to be associated with greater satisfaction and happiness (Wang & Wong, 2014[3]). Reading and sedentary-creative activities do not involve physical activity and are typically done in isolation or with little social interaction, which may explain their negative association with life satisfaction. However, such activities may positively impact other domains of wellbeing not looked at in the study, such as mood and happiness.

Evidence of the impact of the frequency of AC participation on wellbeing is mixed. Brown et al. (2015) do not find any significant association between life satisfaction and frequency of AC participation, and instead suggest that the number of different activities engaged with is more relevant for wellbeing. In contrast, Wheatley and Bickerton (2017) find that frequency of participation is central for some AC activities and less of a concern for others. Their results show that engaging in arts activities is associated with greater life and leisure satisfaction only when people engage in these activities at least once per week. This suggests that non-passive activities which require greater personal effort, such as playing an instrument or acting in a play, only deliver

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[3] Wang and Wong (2014) use survey data from 33, mostly OECD, countries in 2007.

positive wellbeing effects when engaged with frequently. Passive activities like visiting historical sites and museums are associated with greater life and leisure satisfaction irrespective of frequency, suggesting that the quality of leisure time, rather than simply the quantity, is relevant in generating positive wellbeing benefits.

2.2   Valuing arts and cultural participation

It is difficult to infer the value individuals place on AC activities because different people choose to engage in them for a variety of different reasons and the benefits derived are typically non-market related (Wheatley & Bickerton, 2022). This makes it difficult for policymakers to quantify the impact of AC participation in monetary terms when conducting cost-benefit analysis. A method that has gained acceptance in the last decade is the WV approach, which uses econometric techniques to estimate the life satisfaction (a proxy for wellbeing) created by a particular non-market good, and then converts this into a monetary value by relating it to an estimate of the effect of income on life satisfaction. This monetary value represents the amount of income one could forego in the presence of the non-market good such that wellbeing is unchanged. This approach has been shown to be fully consistent with the economic theory and principles underlying cost-benefit analysis (Fujiwara et al., 2014), and has been used by public agencies in a range of policy areas to measure social impacts, understand where value is created, and justify investment (Davies et al., 2021).

Most studies that formally quantify the impact of AC participation using the WV approach have been conducted in the UK, differing in the regression methodologies and wellbeing measures used. Fujiwara (2013b) employs a single OLS equation model to estimate the effects of AC participation and income on happiness. The value of participating in the arts in the UK is £1,500 per person per year, and the value of being audience to the arts is £2,000 per person per year.

Fujiwara et al. (2014) use a modified version of the WV approach, titled the three-stage WV approach, to quantify the impact of AC and sport participation. This three-stage approach estimates the effects of AC participation and income on life satisfaction in two stages: the first stage involves estimating the income effect using one equation, and the second stage involves estimating the effect of AC participation in another equation. The authors use an instrument variable for income in the first stage because OLS estimates of the income effect typically suffer from downward bias caused by measurement error and selection effects. Such downward bias can lead to implausibly high values for non-market goods (Fujiwara et al., 2014). Using the three-

stage approach, the values of cultural participation and being audience to arts events in the UK are £1,000 and £900 per person per year respectively. [4]

Wheatley and Bickerton (2022) opt with using the single-equation approach but differ to Fujiwara (2013b) by estimating the effects of AC participation and income on multiple domains of satisfaction. Their analysis shows that the value of AC activities in the UK differs significantly depending on which domain of satisfaction is used as the wellbeing measure. For example, the value of being audience to arts events to life satisfaction, health satisfaction, job satisfaction, and leisure satisfaction is £2,667, £2,500, £1,200, and £889 respectively. Moreover, certain activities have greater relevance for certain domains: the value to leisure satisfaction is particularly high for arts activities, and arts events are relevant for job satisfaction likely because of the social interaction they involve.

Many studies have used the WV approach to quantify the value of participation in sport and physical activity. Such studies have been largely conducted in the UK and confirm the hypothesis that sport participation has a positive impact on wellbeing for those who participate. Downward and Rasciute (2011) estimate the value of sport participation in the UK to be between £19,000 and £23,000, whereas Fujiwara et al. (2014) estimate a more modest value of £1,127. [5] Using German household panel data, Orlowski and Wicker (2018) find that more frequent participation is associated with higher values. In contrast, Downward and Dawson (2016) find less scarce and less intense activity is likely to have a greater overall value to individuals in the UK than more intense activity, perhaps due to the social, recreational, or fun purpose of the former. Finally, similar to Wheatley and Bickerton (2022), Thormann et al. (2022) demonstrate how the value of sport participation can vary depending on the wellbeing measure and type of estimator employed.

2.3   New Zealand studies on arts and cultural participation

Every three years Creative New Zealand runs a nationally representative survey to measure New Zealanders' engagement in and attitudes towards AC activities (Creative New Zealand, 2020). The most recent survey shows that 68% of participants attended at least one arts event within the last 12 months in 2020, down from 73% in 2017. This decline in participation was likely due to the disruptions caused by the Covid-19 pandemic, rather than a declining interest in arts events. In

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[4] Fujiwara et al. (2013b) use data from the Taking Part survey (2005-2011). Fujiwara et al. (2014) use the 2010/11 wave while Wheatley and Bickerton (2022) use the 2010/11 and 2013/14 waves of Understanding Society: The UK Household Longitudinal Study. Applying Fujiwara et al.'s (2014) three-stage WV approach to data from Canada's General Social Survey 2010, Lemyre et al. (2018) find their estimates of the values of participation in AC activities higher but of a similar magnitude to those obtained by Fujiwara et al. (2014).

[5] It is not clear what might explain the large difference in estimates between these two studies, other than the use of different empirical specifications and wellbeing measures.

2020, 52% of participants stated they had participated in an arts activity within the last 12 months. This shows that attending AC activities in New Zealand is more common than actively participating in them. Despite the slightly lower participation levels, the survey finds that participants are more positive than ever before in their attitudes towards the arts, with the COVID-19 restrictions likely playing a key role in inducing greater levels of appreciation towards the arts. Furthermore, four in ten participants indicated that the arts are important to their wellbeing, which outweighs the proportion who feel the arts doesn't impact their wellbeing (24%).

The importance of arts and culture to New Zealanders is further demonstrated in the smaller qualitative studies by Creative Waikato and Ihi Research. Creative Waikato (2022) measures the individual and social impact of engagement in arts, culture, and creativity in the Waikato region. The study finds that Waikato residents who rate themselves as highly engaged with the arts have 5% higher wellbeing on average than those who rate themselves with low engagement. Residents who are highly engaged with arts and culture also have a greater sense of belonging and feel they have more opportunities to connect with like-minded and diverse people, which presents possible mechanisms through which arts engagement can positively influence wellbeing. Savage et al. (2017) conduct a qualitative evaluation of the impact of Ōtautahi Creative Spaces, a programme designed to boost wellbeing and social connection in response to the high levels of mental distress caused by the Christchurch earthquakes. The analysis reveals a profound impact of the programme on the wellbeing and general health of the 20 study participants. Attending Ōtautahi Creative Spaces gave many of the participants a sense of purpose, belonging, and accomplishment. The process of being deeply engaged in creative practices also enabled the participants to develop new mindsets and learn new skills.

Although not related to AC participation, a study commissioned by Sport New Zealand uses the WV approach and data from the Active NZ and Young People Active NZ surveys to produce wellbeing values for outcomes related to play, active recreation, and sport interventions (Simetrica-Jacobs, 2020). Following the three-stage approach used by Fujiwara et al. (2014), moderate to vigorous physical activity for 30-150 minutes per week is valued at $573 per person per year, whilst such activity for 300+ minutes per week is valued at $2,113. Regular weekly volunteering and sports club membership are valued at $562 and $817 respectively.

2.4 Summary

On balance, empirical evidence suggests that participation in AC activities is positively associated with wellbeing and that this varies by type, and possibly frequency, of activity. Studies that use the WV approach to quantify the impact of AC participation in monetary terms have found that

results vary wildly with type of activity, frequency of activity, data set, measure of wellbeing or estimation method. To our knowledge, no study has estimated the monetised benefit of AC participation in New Zealand. Internationally, there is limited evidence on how the impact of AC participation on wellbeing varies across population groups. This study seeks to fill those gaps.

3   Data

3.1   Data source, variables, and sample selection

3.1.1   Data source

Our main data source is the 2016 GSS. The GSS collects data on a wide range of social and economic outcomes and has been carried out every two years since 2008. The survey has a supplement which covers additional topics on a rotating basis. Data on AC participation was collected in the 2016 and 2021 GSS supplements. We choose to use the former as our primary data source for two reasons. First, GSS 2016 has a sample size of around 8,500 responding households, which is much greater than the 3,500 households in GSS 2021.[6] Second, GSS 2021 was surveyed during the midst of the Covid-19 pandemic, meaning that any findings from the data are unlikely to be generalisable. Since GSS 2021 contains wellbeing measures that GSS 2016 does not have, such as happiness and the WHO-5 wellbeing index, we use it in the robustness analysis of our main results.

3.1.2   Key variables

Our three key variables of interest are AC participation, wellbeing, and income. Our definition of AC participation is explained in the next section. Following the literature, we use life satisfaction as our main wellbeing variable. The GSS measures life satisfaction as the response on a scale of 0 to 10 to the question "Where zero is completely dissatisfied, and ten is completely satisfied, how do you feel about your life?".

Since life satisfaction represents one dimension of subjective wellbeing, we use alternative wellbeing measures such as sense of purpose, happiness, and the WHO-5 wellbeing index to provide a more complete picture of how AC participation impacts wellbeing. Sense of purpose is based on the response to the question "To what extent do you feel the things you do in your life are worthwhile?" and happiness on the response to the question "Overall how happy did you feel yesterday?". Both variables are measured on a scale from 0 to 10.

The WHO-5 wellbeing index measures current mental wellbeing using five questions about how often in the last two weeks the respondent felt 'cheerful and in good spirits', 'calm and relaxed', 'active and vigorous', 'fresh and rested' after waking up, and that their life was filled with things that interest them. Response to each question ranges from 0 (at no time) to 5 (all the time), thus the total index is measured on a scale of 0 to 25.

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[6] The 2021 GSS went into the field on 1 April 2021 and was due to run for one year. However, collection was stopped on 17 August 2021 due to Covid-19 restrictions following the Delta outbreak and never resumed later (Statistics New Zealand, 2022).

Some analyses incorporate mental health and physical health, either as dummy or continuous (index) variables. The mental health and physical health indices are derived by Statistics New Zealand (in GSS 2016) based on the SF-12 questions.[7] The definitions of all variables used in the regression analyses are provided in Appendix Table 1.

We use household income as our income variable. The main downside of the GSS is that income data are banded rather than continuous. The WV approach requires an income coefficient that is derived from a continuous income measure, so we assign to each band the median income of the band.[8] Carver and Grimes (2019) note that most studies find income band mid-points to be a reasonable approximation of the real data and that the income bands used in the GSS are very narrow. Hence, we believe our use of banded income data (as opposed to continuous income data) does not materially affect our results. To allow for the possibility that households of different sizes require different levels of per capita income to achieve the same utility, we equivalise household income by dividing it by the square root of the household size.

3.1.3   Sample selection

The starting point for our estimation sample is all respondents who provided answers to the cultural participation-related questions in the GSS surveys. We exclude respondents who did not respond to the questions about subjective wellbeing and household income. Since we use the natural log of equivalised household income in our regression models, we drop observations with zero or negative household income.

Carver and Grimes (2019) and Smith and Davies (2020) observe several respondents in the GSS with low reported household incomes but levels of life satisfaction and wellbeing that are higher than what would be implied by their income. These low reported incomes could be reporting errors, but it is plausible for some people to have low income and high life satisfaction. For example, retired people usually have low income but tend to have high life satisfaction because their permanent (or lifetime) income is high. Permanent income is likely a better indicator of a person's wellbeing than current income, but wellbeing research often uses the latter due to the lack of data on the former. Consequently, we exclude respondents with low reported household incomes to avoid introducing a downwards bias to the income coefficient in our

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[7] SF-12 is a standard set of questions used internationally to assess an individual's health. It consists of 6 questions on physical health, 5 questions on mental health and 1 on both health dimensions. Factor loadings, which are often sourced from reputable published studies, are combined with responses to compute the physical and mental health indices. Index score ranges from 0 (worst) to 100 (best), with a mean of 50 and standard deviation of 10.

[8] These median income values are routinely derived by Statistics New Zealand based on the New Zealand Income Survey (which from July 2016 became the Income Supplement to Household Labour Force Survey). These surveys are carried annually and provide continuous values of income. The median income is a better proxy for the 'average' income in the band than the mid-point, as median incomes tend to change over time but income bands tend to stay the same across surveys.

regression models. To determine an income threshold for dropping observations, we follow Smith and Davies (2020) by estimating the relationship between life satisfaction and household income to identify the turning point at which household income becomes positively associated with life satisfaction. We identify a turning point at about $10,000 and thus exclude all individuals who have (equivalised) household income of $10,000 or less from our sample.

3.2   Definition of arts and cultural participation

AC participation is typically measured by asking survey participants whether or how often they participated in a selection of AC activities within the last 12 months (Leadbetter and O'Connor, 2013; Wheatley and Bickerton, 2017; Briguglio et al., 2020). Individual activities are typically grouped together to form multiple distinct types (e.g. Brown et al., 2015; Wheatley and Bickerton, 2017) or two broad types that distinguish active engagement from passive participation (e.g. Leadbetter and O'Connor, 2013; Briguglio et al., 2020). Dummy variables capturing participation of any amount or categorical variables capturing frequency of participation are the two main variable types used in regression equations.

In GSS 2016, respondents are first asked how often they participated in 'active' AC activities within the last 4 weeks. Active AC activities include performing arts, writing, crafts, and video.[9] The possible responses are every day, at least once a week, at least once a fortnight, at least once in the last 4 weeks, and not at all. Next, participants are asked if they participated in a 'passive' AC activity within the last 12 months. Passive AC activities include performing arts event, live music, movies, gallery/museum, historic site, and community event. Those who answer yes to participating in a given passive AC activity within the last 12 months are subsequently asked how often they engaged in that activity within the last 4 weeks.

Given the questions mentioned above, we define AC participation as participation in at least one AC activity within the last 4 weeks. This gives rise to four sets of AC participation variables:

(1)   Any AC participation = 1 if an individual participated in at least one AC activity (performing arts, writing, crafts, video, performing arts event, live music, movies, gallery/museum, historical site, community event) within the last 4 weeks; 0 otherwise

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[9] Rather than providing an exhaustive list of activities to choose from, the AC participation questions ask participants to answer based on whether they think they have participated in AC or not. Examples of the AC activity in question are provided to help participants provide accurate answers. For example, the first question asks participants how often they had taken part in performing arts "such as dance, music, or theatre".

(2)   Active AC participation = 1 if an individual participated in at least one active AC activity (performing arts, writing, crafts, video) within the last 4 weeks; 0 otherwise

(3)   Passive AC participation = 1 if an individual participated in at least one passive AC activity (performing arts event, live music, movies, gallery/museum, historical site, community event) within the last 4 weeks; 0 otherwise

(4)   Specific activity participation = 1 if an individual participated in the specified type of AC activity (either performing arts, writing, crafts, video, performing arts event, live music, movies, gallery/museum, historical site, or community event) within the last 4 weeks; 0 otherwise.

We distinguish between active and passive participation because the literature shows these two types can have differing impacts on wellbeing. We define active participation as doing, creating, or actively taking part in arts and culture and define passive participation as observing or being audience to arts and culture. The GSS 2016 and 2021 appear to separate cultural activities based on this definition and hence we treat performing arts, writing, crafts, and video as active AC activities and the rest as passive AC activities.[10]

3.3   Descriptive analysis

Based on our definition of any AC participation, about 7 in 10 New Zealand adults participate in AC activities within a 4-week period. In GSS 2016, 37% of individuals reported participating in passive AC activities only and 26% reported participating in both active and passive AC activities (see Table 1). About 9% reported participating in active AC activities only**.**[11]

Figure 1 shows how participation in passive AC activities tends to be higher than participation in active AC activities. Going to the movies was the most common passive AC activity, followed by attending a community event, whilst visiting a historical site was the least common. Taking part in arts or craft was the most common active AC activity, with participating in the performing arts being the least common.

The level of AC participation reported in GSS 2021 is similar to that reported in GSS 2016. Appendix Figure 1 shows that the proportion of individuals who reported participating in arts and culture is similar for each of the 10 different activities across the two survey years, except for going

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[10] The GSS asks if participants went to a park or reserve within the last 4 weeks. We do not consider this to be an AC activity, so we exclude it from our definition of AC participation.
[11] As required by Statistics New Zealand's microdata confidentiality protocols, all unweighted counts of individuals and households in the GSS reported in this study have been randomly rounded to base 3 while weighted counts have been rounded to the nearest 1000. Proportions have been calculated based on rounded counts.

to the movies. The proportion of individuals reporting they had been to the movies in the last 4 weeks dropped from 31% in 2016 to 19% in 2021. This is likely due to the disruptions caused by the Covid-19 pandemic, although interestingly no other activity involving large groups of people, such as performing arts events, live music, and community events, experienced such a drop in participation.

Figure 1: Participation in arts and cultural activities by activity type
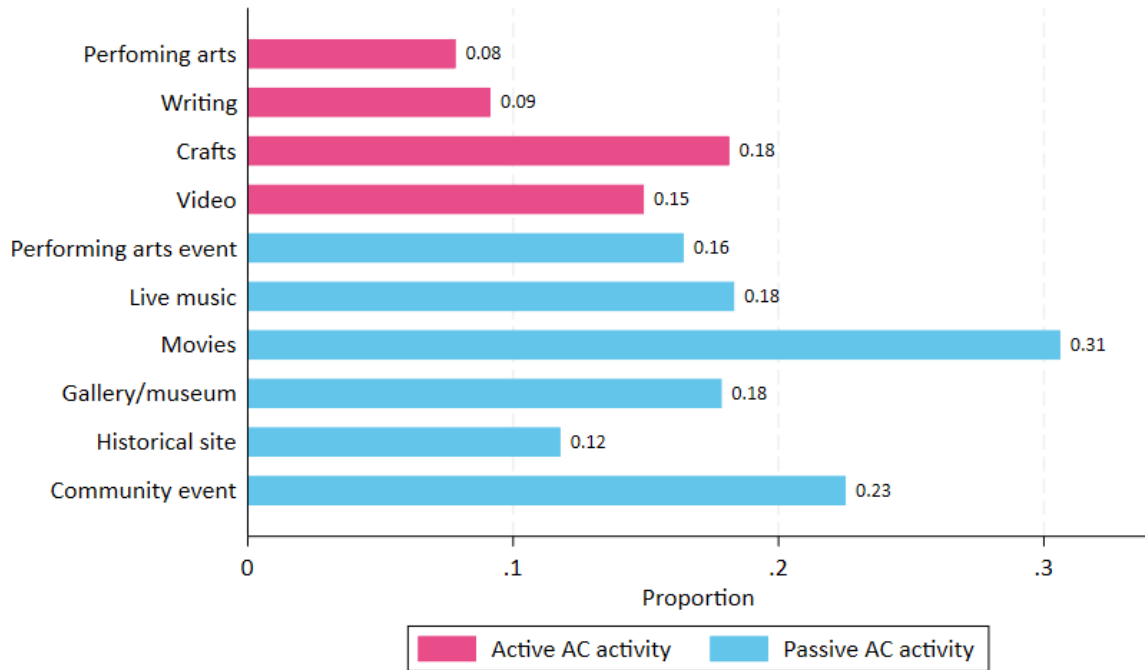
Source: General Social Survey 2016
Notes: This figure shows the proportion of individuals who reported participating in each of the 10 arts and cultural activities within the last 4 weeks prior to their interview date.

Table 1 compares the demographic and wellbeing characteristics of individuals who did and did not report participating in AC activities in GSS 2016. Individuals are divided into four groups which are respectively presented in columns 1-4: (1) those who did not participate in AC activities (within the last 4 weeks), (2) those who participated in active AC activities only, (3) those who participated in passive AC activities only, and (4) those who participated in both active and passive AC activities. We label these groups non-participants, active (only) participants, passive (only) participants, and active-passive (AP) participants.

Table 1 shows that active, passive, and AP participants are more likely to be female, aged 15-24, have a Bachelor's or Postgraduate degree, have very good or excellent health, and have participated in sports than non-participants. They are less likely to be aged 65 and above, have no qualification and have poor health. In some cases, the difference between non-participants and

active participants is minimal, and passive and AP participants appear to be quite different to the other two groups.

Table 1: Demographic characteristics by AC participant type

	Arts and cultural participation			
	Non-participants	Active (only) participants	Passive (only) participants	Active and passive (AP) participants
	(1)	(2)	(3)	(4)
Sport participation in the last 4 weeks				
Participated	0.642	0.797	0.832	0.902
Did not participate	0.358	0.203	0.168	0.098
Sex				
Female	0.424	0.594	0.464	0.641
Male	0.576	0.406	0.536	0.359
Prioritised ethnicity[12]				
NZ European	0.622	0.679	0.663	0.674
Māori	0.145	0.136	0.106	0.133
Pacific	0.087	0.067	0.069	0.059
Asian	0.126	0.082	0.140	0.113
Other	0.020	0.036	0.022	0.023
Migrant status				
Migrant	0.308	0.261	0.321	0.287
NZ born	0.692	0.739	0.679	0.713
Age				
15 to 24	0.106	0.170	0.163	0.263
25 to 44	0.287	0.273	0.367	0.328
45 to 64	0.363	0.345	0.314	0.271
65 and above	0.245	0.215	0.156	0.139
Highest qualification				
No qualification	0.260	0.200	0.128	0.109
School qualification	0.328	0.309	0.332	0.324
Post-school certificate or diploma	0.242	0.248	0.256	0.234
Bachelor's degree	0.097	0.121	0.153	0.159
Postgraduate degree	0.054	0.100	0.119	0.162
Not elsewhere included	0.017	0.018	0.012	0.012
Partner status				
Has a partner	0.636	0.591	0.649	0.544
Does not have a partner	0.364	0.409	0.351	0.456
Dependent child status				
Has at least one dependent child	0.339	0.364	0.401	0.390
No dependent children	0.661	0.636	0.599	0.610
Employment status				
Employed	0.620	0.576	0.751	0.687

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[12] 'Prioritised ethnicity' means each person is allocated a single ethnic group in an order of priority, even if they report multiple ethnicities. Our priority order is Māori, Pacific Peoples, Asian, Other, and New Zealand European. For example, if someone reports Māori and Japanese ethnicities, they are classified as Māori. This is the priority rule that Statistics New Zealand suggested (see Allan (2001)) and has been widely adopted by New Zealand studies since. Prioritisation is necessary for ensuring total responses add up to 100% while not having too many small categories.

	Arts and cultural participation			
	Non-participants	Active (only) participants	Passive (only) participants	Active and passive (AP) participants
	(1)	(2)	(3)	(4)
Unemployed	0.035	0.042	0.027	0.042
Not in the labour force	0.347	0.379	0.222	0.271
Region				
Auckland	0.334	0.285	0.374	0.344
Wellington	0.112	0.097	0.098	0.127
Canterbury	0.131	0.142	0.138	0.112
Rest of North Island	0.321	0.364	0.271	0.326
Rest of South Island	0.102	0.109	0.119	0.092
Urban/rural status				
Lives in a rural area	0.153	0.118	0.156	0.148
Lives in an urban area	0.847	0.882	0.844	0.852
Health status				
Poor	0.055	0.045	0.019	0.015
Fair	0.147	0.136	0.093	0.097
Good	0.317	0.279	0.268	0.243
Very good	0.339	0.373	0.405	0.425
Excellent	0.143	0.167	0.214	0.222
Disability status				
Has a disability	0.140	0.112	0.057	0.069
Does not have a disability	0.860	0.888	0.943	0.931
Contact with friends in last 4 weeks				
None	0.103	0.061	0.041	0.030
At least once in the last 4 weeks	0.089	0.070	0.080	0.062
At least once a fortnight	0.095	0.106	0.103	0.084
At least once a week	0.475	0.509	0.480	0.473
Every day	0.240	0.255	0.297	0.352
Mean life satisfaction score	7.65	7.69	7.93	7.90
Mean equivalised household income	51,101	51,393	62,395	61,708
Mean age	50.11	47.45	43.97	40.66
Observations	2,505	789	2,850	2,058

Source: General Social Survey 2016

Notes: See page 14 for definitions of each group. Proportions in each block within each column sum to 1. Some blocks do not add up to exactly 1 due to rounding.

For example, passive and AP participants are more likely to be employed and less likely to have a disability than non-participants and active participants. The difference between these two subgroups is especially pronounced when comparing life satisfaction, income, and health. Non-participants and active participants have a mean life satisfaction score of roughly 7.67, which is much lower than the mean life satisfaction score of 7.92 for passive and AP participants. This suggests that passive AC participation is positively associated with life satisfaction, whilst active

AC participation is only positively associated with life satisfaction when it is coupled with passive AC participation. These associations could be driven by the fact that non-participants and active participants have almost $10,000 less in household income than passive and AP participants. They also are more likely to have poor health and less likely to have excellent health, which are typically associated with lower life satisfaction (Bakkeli, 2021).

Appendix Table 2 replicates Table 1 using GSS 2021 data. Like in Table 1, active, passive, and AP participants are more likely to be female, aged 15-24, have a postgrad degree, have very good or excellent health, and have participated in sports than non-participants. Furthermore, non-participants and active participants have lower mean life satisfaction scores and less household income than passive and AP participants.

To provide a more complete picture of the relationship between AC participation and demographic characteristics, Appendix Table 3 presents the participation rates across the different demographic groups. Of note are the education and age gradients: column 4 shows that 38% of individuals with a postgraduate degree are AP participants compared to only 17% of those with no qualifications, and 39% of individuals aged 15 to 24 are AP participants compared to 20% of those aged 65 and above. Column 3 shows a similar pattern amongst lower and higher educated individuals with being a passive participant. Moreover, both columns 3 and 4 show that healthy individuals (fair to excellent health) are more likely to participate in AC activities than those with poor health. This, alongside with the lower AC participation rate among individuals with a disability than those without, suggests that poor health and having a disability may be barriers to AC participation. Finally, both columns also show that individuals who had relatively frequent contact with friends (between once in the last 4 weeks and everyday) are more likely to participate in AC activities than those who had no contact. [13]

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[13] Appendix Table 4 replicates Appendix Table 3 using GSS 2021 and shows broadly similar patterns.

4   Methodology

We undertake two main analyses. The first analysis examines the potential impact of participation in AC activities on wellbeing. The second analysis uses use the WV approach to monetise the value of AC participation using the regression coefficients estimated in the first analysis. Sections 4.1 and 4.2 respectively outline the methods for these analyses.

4.1   Impact of participation in arts and cultural activities on wellbeing

4.1.1   Regression model

To examine the impact of AC participation on wellbeing, a reduced-form model is estimated:

$$W_i = \alpha + \boldsymbol{\beta_Z Z_i} + \beta_Y Y_i + \boldsymbol{\beta_X X_i} + \epsilon_i \tag{1}$$

where i indexes individuals, W is a measure of wellbeing, $\boldsymbol{Z}$ is a vector of dummy variables capturing whether or not an individual participates in a range of AC activities, Y is income, and $\boldsymbol{X}$ is a vector of characteristics that influence wellbeing. $\alpha, \boldsymbol{\beta_Z}, \beta_Y$ and $\boldsymbol{\beta_X}$ are parameters to be estimated, with $\boldsymbol{\beta_Z}$ capturing the total direct effects of AC participation on wellbeing, holding constant other observed factors.

$\boldsymbol{Z}$ can encompass participation in any AC activity in general or a specific AC activity. We estimate several variants of equation (1).

$$W_i = \alpha + \beta_Z Z_i + \beta_Y Y_i + \boldsymbol{\beta_X X_i} + \epsilon_i \tag{2}$$
$$W_i = \alpha + \beta_A A_i + \beta_P P_i + \beta_Y Y_i + \boldsymbol{\beta_X X_i} + \epsilon_i \tag{3}$$
$$W_i = \alpha + \boldsymbol{\beta_A A_i} + \beta_P P_i + \beta_Y Y_i + \boldsymbol{\beta_X X_i} + \epsilon_i \tag{4}$$
$$W_i = \alpha + \beta_A A_i + \boldsymbol{\beta_P P_i} + \beta_Y Y_i + \boldsymbol{\beta_X X_i} + \epsilon_i \tag{5}$$
$$W_i = \alpha + \boldsymbol{\beta_A A_i} + \boldsymbol{\beta_P P_i} + \beta_Y Y_i + \boldsymbol{\beta_X X_i} + \epsilon_i \tag{6}$$

- Equation (2): $\boldsymbol{Z}$ includes only one dummy Z indicating whether an individual participates in any AC activity or not.
- Equation (3): $\boldsymbol{Z}$ includes two dummies, A and P, respectively indicating active engagement and passive participation in AC activities (see definitions in section 2.1).
- Equation (4): $\boldsymbol{Z}$ includes five dummies, P and $\boldsymbol{A} = A^1, , , A^4$, where the latter four dummies indicate whether an individual participates in each of the four active AC activities listed in section 3.2. This model is useful for examining whether participation

in different active AC activities has different impacts on wellbeing. Here we only control for global passive AC participation instead of specific passive activities to minimise potential multicollinearity, given moderate correlations between participation in different AC activities. [14]

- Equation (5): $\boldsymbol{Z}$ includes seven dummies, A and $\boldsymbol{P} = P^1, , , P^6$, where the latter six dummies indicate whether an individual participates in each of the six passive AC activities listed in section 3.2. This model mirrors equation (4) where the focus is now on individual passive AC activities.

- Equation (6): $\boldsymbol{Z}$ includes ten dummies, $\boldsymbol{A} = A^1, , , A^4$ and $\boldsymbol{P} = P^1, , , P^6$.

Income enters the regression in natural logarithms to reflect the generally accepted view that income has a diminishing effect on wellbeing. Measures of subjective wellbeing such as life satisfaction are ordinal, yet in our regressions we treat wellbeing as cardinal. Such treatment is common in the economic literature following the influential finding by Ferrer-i-Carbonell and Frijters (2004) that assuming ordinality or cardinality of happiness scores makes little difference. Assuming cardinality allows the researcher to make use of a wide range of models to address important issues such as endogeneity and mediating effects, as ordinal regressions are limited in dealing with such issues. [15]

4.1.2   Endogeneity

While a significant positive relationship between AC participation and wellbeing indicates that AC participants have higher wellbeing, it does not necessarily mean that the participation *per se* leads to the higher wellbeing. It may be that happier people are systematically more likely to participate in AC activities than others. Furthermore, the relationship between AC participation and wellbeing may suffer from omitted-variable bias (both AC participation and wellbeing are driven by the same omitted factors, such as tastes and preferences, which are often unobserved), or relatedly sample selection bias (not all factors that influence selection into AC participation are controlled for). Conversely, it may be that *unhappier* people are systematically more likely than others to participate in AC activities (Krekel & MacKerron, 2023). For example, individuals who experience loneliness and stress may be unhappier and may be more likely to participate in AC activities to express themselves (i.e. the unhappy artist). Such selection would offset any positive effect of AC

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[14] Multicollinearity arises when some explanatory variables in a regression are correlated with each other. This consequently inflates the standard errors of regression coefficients and likely renders them statistically insignificant. For our sample, the tetrachoric correlations range from 0.21 to 0.47 between active AC activities, and 0.2 to 0.67 between passive AC activities.
[15] While the cardinality assumption is commonly used, the assumption is not uncontroversial (see Bond and Lang (2019)).

participation on wellbeing, resulting in a lower, or non-existent observed effect. It is unclear whether happy or unhappy individuals select into participating in a given AC activity, thus making it difficult to ascertain the direction of the bias *a priori*.

When endogeneity of AC participation is ignored, its impact on wellbeing will be biased. In the absence of stronger data-enabled methods,[16] this study uses two approaches to address endogeneity. The first approach involves estimating the regression models using multiple measures representing different aspects of wellbeing. The second approach uses a mediation analysis to examine the proportion of the total effect of AC participation on wellbeing that is 'explained' by the mediators (the 'indirect effect') and the proportion that remains attributable to AC participation (the 'direct effect'). Although these approaches offer no conclusive proof, together they provide insights into the extent to which the estimated association may represent a causal effect.

4.1.3   Mediation analysis

We examine the possibility that AC participation does not only affect wellbeing directly, but also indirectly via a mediator. For example, we hypothesise that in addition to enhancing wellbeing directly, AC participation enhances mental health, which in turn enhances wellbeing. To demonstrate how we conduct our mediation analysis, we start with equation (2) where Z includes only one dummy Z for AC participation and β_Z captures the *total effect* of AC participation on wellbeing. To incorporate mediating effects, we estimate two further equations:

$$W_i = \alpha + \beta_Z^D Z_i + \beta_M M_i + \beta_Y Y_i + \boldsymbol{\beta_X X_i} + \epsilon_i \qquad (7)$$

$$M_i = \alpha^M + \beta_Z^M Z_i + \boldsymbol{\beta_X^M X_i^M} + \varepsilon_i^M \qquad (8)$$

Equation (7) expands equation (2) by introducing a mediator variable M, with β_M capturing the effect of the mediator on wellbeing. By including the mediator as an explanatory variable, equation (7) controls for the pathway (via the mediator) through which AC participation affects wellbeing. Thus, β_Z^D captures the *direct effect* and $\beta_Z - \beta_Z^D$ captures the *indirect effect* of AC participation on wellbeing. To ensure that AC participation has a statistically significant effect on the mediator, and therefore the mediator is a plausible pathway, we estimate equation (8).

Gelbach (2016) shows that the indirect effect can be calculated as:

$$\delta = \beta_Z - \beta_Z^D = \beta_Z^M \beta_M \qquad (9)$$

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[16] Such as a randomised controlled trial, natural experiment, or instrumental variable, which are not available in the data.

Equation (9) holds for when there are multiple mediators in (7) and (8). Figure 2 depicts the relationships between AC participation, mental health (as a mediator), and wellbeing.

Figure 2: Total effect, direct effect, and indirect effect of AC participation on wellbeing
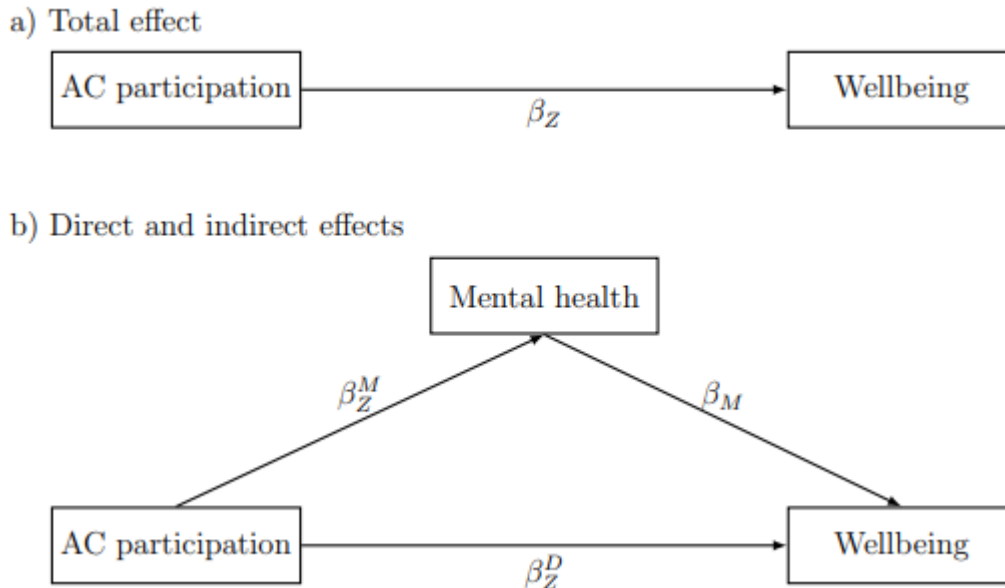
4.2 Wellbeing Valuation approach

In economics, the marginal rate of substitution (MRS) is the rate at which an individual would be willing to forgo a specific quantity of one good in exchange for more units of another good while maintaining the same *utility* level. By estimating the MRS between income (a monetary measure) and AC participation, one can estimate the monetary value of AC participation. In practice, the economist's notion of utility is not directly observable. By equating wellbeing to utility, the WV approach can be used to estimate the MRS between income and AC participation and calculate the monetary value of AC participation.

This study adopts a three-stage WV approach proposed by Fujiwara (2013a) to estimate the monetary value of AC participation. As in existing studies, we use life satisfaction as our measure of wellbeing, which is often argued to be closest to the economist's notion of utility.[17] The first two stages respectively estimate the effects of income and AC participation on life satisfaction through separate models, while the last stage calculates the monetary value of AC participation

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[17] We use a similar approach to Smith and Davies (2020), especially in regard to the first stage.

as the average compensating surplus (CS), the amount of income that an individual is willing to forgo in return for the benefit of AC participation while maintaining their utility (approximated by wellbeing) level.

Specifically, the first stage estimates the effect of income (in logarithmic form) on life satisfaction using the following equation:

$$LS_i = \alpha^Y + \beta_1 Y_i + \boldsymbol{\beta}_X^Y \boldsymbol{X}_i^Y + \varepsilon_i^Y \tag{10}$$

The second stage estimates the effect of AC participation on life satisfaction whilst controlling for income and other characteristics, as in equations (2)-(6) but for simplicity of notation here we focus on equation (2), where $\boldsymbol{Z}$ includes only one dummy Z for AC participation.

The final stage calculates the CS as:

$$CS_i = Y_i[1 - e^{\left(-\frac{\beta_Z}{\beta_1}\right)}] \tag{11}$$

where β_Z is the effect of AC participation on life satisfaction estimated from equation (2), and β_1 is the effect of income on wellbeing estimated from equation (10). Here equation (11) calculates the CS of a given individual. The term inside the square bracket represents the proportion of their income an individual is willing to forgo in return for the wellbeing benefit of AC participation. To obtain an 'average' value of the CS for the population, it is often evaluated at the mean or median income ($Y_i = Y^0$).

A challenge with the WV approach is obtaining a robust causal estimate of the income coefficient β_1. The income coefficient in life satisfaction models tends to be downwardly biased due to reverse causality, selection effects, and measurement error (Fujiwara et al., 2014). Furthermore, by including many control variables in the model, there is a risk of underestimating the impact of income on life satisfaction. An important reason why income affects life satisfaction is because it allows people to obtain goods, services, and other desirable non-market outcomes that positively influence life satisfaction (Fujiwara & Campbell, 2011). For example, income may allow people to improve their health, which in turn positively influences life satisfaction. When variables that are correlated with income, such as health, are controlled for, they capture the indirect effects of income on life satisfaction. The coefficient on income is thus reduced and underestimates the full impact of income on life satisfaction. This partly explains why many studies estimate a relatively small income coefficient that leads to implausibly high estimates of the CS

(Fujiwara and Campbell, 2011). Indeed, when β_1 is underestimated $e^{\left(-\frac{\beta_Z}{\beta_1}\right)}$ approaches 0 and CS approaches Y^0, resulting in unrealistically high values of CS.

To obtain an unbiased estimate, Fujiwara (2013a) proposes estimating β_1 in a separate model, rather than taking β_Y from equation (2). This means a more robust approach can be used, such as using an instrumental variable (Fujiwara, 2013a), and the control variables can differ from those used in the life satisfaction model. In the absence of stronger data-enabled methods, we estimate equation (10) using an OLS model where X^Y includes a small number of control variables: age (and age squared), sex, ethnicity, region, and urban/rural dummy. Hence, we do not account for potential endogeneity but we seek to estimate a total (i.e. direct and indirect) impact of income on life satisfaction.

5 Estimation results: impact of participation in arts and cultural activities on wellbeing

This section presents the results from estimating the impact of AC participation on wellbeing using the methods described in section 4.1. We start with the results from our baseline analysis. Section 5.2 checks the robustness of the baseline results by using alternative measures of wellbeing while section 5.3 presents results from the mediation analysis. Estimates for different demographic groups are reported in section 5.4.

5.1 Baseline analysis

Our baseline model estimates equations (2)-(6) using data from GSS 2016 and life satisfaction as the dependent variable in all specifications. The mean life satisfaction score for the estimation sample across AC participants and non-participants is 7.76. Table 2 summarises the baseline results. As reported in Appendix Table 2, all regressions include 'standard' controls in the wellbeing literature, such as (log equivalised household) income,[18] personal demographics, labour force status, geographic location of residence, and disability and health status. We also control for participation in sports and frequency of talking with friends, which have often been found to be associated with greater wellbeing in the literature and which are correlated with AC participation, thus reducing the potential for endogeneity bias.

The first specification (column 1) is based on equation (2), where Z includes only one dummy for any AC participation. We find that participation in any AC activity is associated with an increase of 0.1 in life satisfaction score, similar to the effect of sport participation (0.09). These are relatively large effects given that a 10% increase in household income is estimated to be associated with an increase of 0.023 in life satisfaction score.[19]

When active and passive participation in AC activities are distinguished (column 2, based on equation (3)), passive participation is found to be associated with an increase of 0.12 in life satisfaction score whereas no significant association is found for active participation. This positive association of passive participation holds in column 3 (based on equation (4)). In this column, no individual active AC activity is found to have a significant association with life satisfaction. In column 4 (based on equation (5)), attending performing arts events and visiting galleries and

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[18] Similar estimation results are obtained when household income is equivalised using the modified OECD scale instead of the square root scale. The modified OECD scale assigns a value of 1 to the first adult in a household, 0.5 to each additional adult and 0.3 to each child.

[19] As discussed in section 4.2, the impact of income on life satisfaction is downwardly biased in this 'full' model. Given the extensive controls, the coefficient on the income variable represents the direct, rather than total, effect of income on life satisfaction.

museums are found to be associated with an increase in life satisfaction score of 0.09 and 0.11 respectively, but no significant association is found for the other four passive activities (or for active participation in general). Column 5 (based on equation (6)) shows similar results to columns 3-4, albeit with slightly higher standard errors.

Table 2: Regression results: relationship between participation in arts and cultural activities and life satisfaction

	(1)	(2)	(3)	(4)	(5)
Any AC participation	0.1032**				
	(0.0431)				
Active participation		-0.0269		-0.0366	
		(0.0383)		(0.0385)	
Passive participation		0.1155***	0.1131***		
		(0.0393)	(0.0395)		
Performing arts			0.0703		0.0517
			(0.0677)		(0.0687)
Writing			-0.0379		-0.0524
			(0.0635)		(0.0640)
Crafts			-0.0226		-0.0281
			(0.0495)		(0.0497)
Video			-0.0402		-0.0520
			(0.0497)		(0.0499)
Perform. arts events				0.0903*	0.0860*
				(0.0486)	(0.0491)
Live music				0.0546	0.0533
				(0.0469)	(0.0470)
Movies				0.0270	0.0282
				(0.0374)	(0.0374)
Gallery/museum				0.1094**	0.1135**
				(0.0462)	(0.0463)
Historic sites				-0.0624	-0.0596
				(0.0564)	(0.0567)
Community event				0.0613	0.0625
				(0.0408)	(0.0409)
Sport participation	0.0863*	0.0887*	0.0885*	0.0847*	0.0852*
	(0.0507)	(0.0509)	(0.0510)	(0.0509)	(0.0510)
Log equiv. income	0.2351***	0.2329***	0.2333***	0.2295***	0.2299***
	(0.0376)	(0.0376)	(0.0376)	(0.0378)	(0.0378)
Observations	8,193	8,193	8,193	8,175	8,175
Adjusted R-squared	0.188	0.189	0.188	0.188	0.188

Source: Estimated using General Social Survey 2016
Notes: Dependent variable is life satisfaction (scale 0-10). Standard errors in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$. Detailed results shown in Appendix Table 5.

Our baseline results are in line with those from several existing studies using UK data. For example, Wheatley and Bickerton (2017) find that participating in arts, culture, and sport at least once a week is associated with an increase of 0.06 in life satisfaction score (measured on a 7-point Likert scale). Węziak-Białowolska et al. (2019) find that passive participation in the art events at

least three or four times a year is associated with an increase of 0.11 in life satisfaction score, but the effect of active engagement in the arts at least once a month is only half as strong. Also using UK data, Fujiwara (2013b) finds that visiting a museum is associated with an increase of 0.08 in happiness score (measured on a 10-point scale).

By contrast, Briguglio et al. (2020) find that for Malta both active and passive participation activities are associated with higher life satisfaction but active participation (including production, donation and travel) shows a stronger relationship with life satisfaction than passive participation. Lemyre et al. (2018) find that participation in any cultural activity in Canada is associated with an increase of 0.25 in life satisfaction score (measured on a 0-10 scale), almost twice the effect of participation in any sport.

Overall, the main findings from the baseline analysis are that passive participation in AC activities is associated with higher life satisfaction but no significant association is found for active participation. The latter finding is consistent with the 'unhappy artist' theory – active participation in AC activities might enhance wellbeing, however the participants might, by nature, have lower wellbeing. As a result, no statistically significant effect between active participation and life satisfaction is observed.

The impact of passive AC participation on life satisfaction is similar to that of sport participation, which is relatively large when compared with the direct effect of income. The impacts of sport participation, income, and other control variables on life satisfaction, as well as the overall explanatory power (in terms of the adjusted R-squared) of the model, are very similar across the five specifications. Our preferred specification is that presented in column 2 (based on equation (3)), as it distinguishes between two important types of AC participation (active and passive) without being compromised by multicollinearity due to finer disaggregation. We will focus on this specification in the following analyses.

5.2   Robustness analysis

To assess the robustness our results, we estimate our preferred specification using other measures of wellbeing (sense of purpose, happiness, and WHO-5 wellbeing index) and another data source (GSS 2021). Table 3 presents key results from this analysis, with results from the baseline preferred specification (column 2 of Table 2) re-printed in column 1 for easy reference. Since the dependent variables (wellbeing) are measured on different scales, their means for the estimation sample are also reported to help the reader gauge the magnitude of the estimated coefficients across specifications. Even though life satisfaction, sense of purpose and happiness

are measured on the same scale, sense of purpose has a higher mean score than life satisfaction and this is true for both survey years (8.13 cf. 7.76 in 2016, 8.00 cf. 7.56 in 2021). This indicates that on average people are more likely to feel that the things they do in their life are worthwhile than to feel satisfied with their life. Mean happiness score (7.60 in 2021) is very similar to mean life satisfaction.

Table 3: Regression results: relationship between participation in arts and cultural activities and alternative measures of wellbeing

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Survey year	2016	2016	2021	2021	2021	2021
Dependent variable	LS	Purpose	LS	Purpose	Happiness	WHO-5
Scale of dep. var.	0-10	0-10	0-10	0-10	0-10	0-25
Mean dep. var.	7.759	8.133	7.556	7.995	7.602	14.91
Active participation	-0.0269	**0.1268*****	-0.0323	**0.1374****	-0.1000	0.0793
	(0.0383)	(0.0356)	(0.0624)	(0.0612)	(0.0742)	(0.1566)
Passive participation	**0.1155*****	**0.0966*****	**0.1551****	0.0530	**0.1932*****	**0.4227*****
	(0.0393)	(0.0367)	(0.0608)	(0.0585)	(0.0724)	(0.1510)
Sport participation	0.0887*	0.1064**	-0.0166	0.0239	0.2482***	0.5921***
	(0.0509)	(0.0487)	(0.0820)	(0.0769)	(0.0947)	(0.2011)
Log equiv. income	0.2329***	0.1353***	0.2040***	0.0973*	0.0499	-0.1563
	(0.0376)	(0.0352)	(0.0514)	(0.0557)	(0.0608)	(0.1288)
Intercept	3.5002***	4.4126***	3.8858***	4.7217***	4.9979***	11.1302***
	(0.4694)	(0.4394)	(0.6660)	(0.7035)	(0.7771)	(1.6306)
Observations	8,193	8,178	3,249	3,243	3,246	3,240
Adj. R-squared	0.189	0.141	0.209	0.148	0.125	0.273

Source: Estimated using General Social Survey 2016, 2021
Notes: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Significant coefficients of AC participation are bolded. All regressions include full set of controls as in Appendix Table 5.

Column 2 shows that both active and passive participation in AC activities have a significant positive association with sense of purpose. This contrasts with the baseline results (column 1), where passive participation is found to be associated with higher life satisfaction but no significant association is found for active participation. While the impact of sport participation is similar across the two specifications, household income has a much weaker effect on sense of purpose than on life satisfaction.

Columns 3-6 show estimation results using data from GSS 2021. Estimates based on GSS 2021 have higher standard errors than their GSS 2016 counterparts, as GSS 2021 has a much smaller sample, making some coefficients more likely to be statistically insignificant. Regardless, the main results for GSS 2016 (columns 1-2) also hold for GSS 2021 (columns 3-4): passive participation has a stronger impact on life satisfaction while active participation has a stronger impact on sense of purpose. Columns 5-6 show that passive participation is positively associated

with happiness and mental wellbeing, but no significant relationship is seen with active participation.[20]

Life satisfaction, sense of purpose, happiness, and WHO-5 capture different aspects of wellbeing. Life satisfaction provides a holistic assessment of wellbeing and tends to be focused on the medium term.[21] Sense of purpose can impact positively on long-term wellbeing, since people with a higher sense of purpose are more likely to focus on long-term goals by adjusting their current actions to align with future-oriented life aims (Pfund, 2023). WHO-5 captures short-term, mental wellbeing by measuring feelings and emotions experienced within the last fortnight. Happiness, as worded by the survey question, covers an even shorter term (yesterday). The results in this analysis show that active engagement in creating arts is associated with the potential for higher long-term wellbeing (sense of purpose) while being audience to the arts is associated with higher medium-term (life satisfaction) and short-term wellbeing (happiness and mental wellbeing). While household income has a significant direct effect on medium-term wellbeing it has a much weaker effect on long-term wellbeing and no statistically significant effects on short-term wellbeing.

5.3   Mediation analysis

The literature (e.g. Lee et al. (2021)) suggests that one pathway through which AC participation influences life satisfaction is via physical and mental health. To test this, we estimate a variant of equation (2) which excludes self-assessed health status as a control and a variant of equation (7) which controls for our hypothesised mediators: self-assessed health status and the SF-12 mental health index. Note that both equations include the active and passive AC participation dummy variables (instead of the single AC participation variable) because this is our preferred specification based on the empirical results in section 5.2. Since the effect of active AC participation is small and statistically insignificant in all specifications, our mediation analysis focuses solely on passive AC participation.

When treating self-assessed health status and the SF-12 mental health index as mediators, the total effect of passive AC participation on life satisfaction is 0.16 (Table 4, column 1). Column

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[20] Appendix Table 4 explores the relationships between AC participation and the five components of WHO-5. It shows that passive participation is positively associated with feeling cheerful and in good spirits, feeling active and vigorous, and feeling that life has been filled with interesting things, whereas active participation is positively associated with feeling that life has been filled with interesting things. Neither type of participation has a significant association with feeling calm and relaxed and waking up feeling fresh and rested.

[21] For example, Clark et al. (2008) find that life satisfaction tends to be affected by life events that occurred in the last 2 years and anticipation of events in the next 2 years.

2 shows that 42% (0.067) of the total effect of passive AC participation is due to the direct effect passive AC participation has on life satisfaction.

Table 4: Regression results: direct and indirect effects of participation in arts and cultural activities on life satisfaction

	(1)	(2)	(3)	(4)	(5)
Active participation	-0.0251	0.0305	0.0372	-0.0265	0.0408
	(0.0398)	(0.0348)	(0.0349)	(0.0383)	(0.0348)
Passive participation	**0.1591*****	**0.0675***	**0.0685***	**0.1110*****	**0.0649***
	(0.0408)	(0.0362)	(0.0364)	(0.0393)	(0.0360)
Sport participation	0.2381***	0.0669	0.0803*	0.0857*	0.0566
	(0.0524)	(0.0462)	(0.0465)	(0.0509)	(0.0462)
Log equiv. income	0.3244***	0.1829***	0.1940***	0.2323***	0.1899***
	(0.0390)	(0.0339)	(0.0340)	(0.0376)	(0.0338)
Self-assessed health status (reference: Poor health)					
Fair health		0.5893***		1.0412***	0.6566***
		(0.1459)		(0.1656)	(0.1495)
Good health		0.7081***		1.5125***	0.8425***
		(0.1432)		(0.1611)	(0.1482)
Very good health		0.8961***		1.9527***	1.0512***
		(0.1457)		(0.1615)	(0.1502)
Excellent health		1.0899***		2.3624***	1.2703***
		(0.1497)		(0.1640)	(0.1533)
Mental health index		0.0702***	0.0781***		
		(0.0022)	(0.0021)		
Physical health index			0.0128***		
			(0.0022)		
Mental health dummies	*No*	*No*	*No*	*No*	*Yes†*
Intercept	4.2672***	1.4951***	1.1563***	3.5034***	3.3386***
	(0.4634)	(0.4275)	(0.4212)	(0.4702)	(0.5873)
Observations	8,160	8,160	8,160	8,160	8,160
Adj. R-squared	0.122	0.318	0.311	0.188	0.325
Indirect effect					
δ_P^{PH}		0.0199***	0.0109***		‡
		(0.00526)	(0.00321)		
δ_P^{MH}		0.0716***	0.0797***		
		(0.0170)	(0.0188)		
δ_P		0.0916***	0.0906***		0.0461***
		(0.0192)	(0.0190)		(0.0166)

Source: Estimated using General Social Survey 2016
Notes: Dependent variable is life satisfaction (scale 0-10). Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Significant coefficients of AC participation are bolded. All regressions include full set of controls as in Appendix Table 5.
† 24 dummies included.
‡ $\delta_P^{MH1} = 0.00549$ (0.00421), $\delta_P^{MH2} = 0.00127$ (0.00156), $\delta_P^{MH3} = 0.0165$** (0.0068), $\delta_P^{MH4} = 0.00464$* (0.00263), $\delta_P^{MH5} = 0.0146$* (0.00807), $\delta_P^{MH6} = 0.00357$ (0.00291)

The remaining 58% ($\delta_P = 0.092$) is due to the positive association passive AC participation has with health, which in turn is positively associated with life satisfaction. Of the indirect effect, the pathway through self-assessed health status accounts for 22% ($\delta_P^{PH} = 0.02$) and the pathway through mental health accounts for 78% ($\delta_P^{MH} = 0.072$). Column 3 shows that similar results are obtained when the SF-12 physical health index replaces self-assessed health status as a mediator,[22] with mental health now accounting for 88% of the indirect effect.[23]

Given that self-assessed health status has a strong direct effect on life satisfaction but a limited role in mediating the effect of AC participation, we reintroduce it as a control variable in columns 4 and 5 and split the SF-12 mental health index into its six components[24] to gain further insight into how AC participation may influence life satisfaction through mental health. Column 4's specification is the same as column 2 of Table 2 (our preferred specification) but estimated on a slightly smaller sample size as observations with missing SF-12 data are excluded. Columns 4-5 (supplemented by the final note to the table) show that the total effect of passive AC participation on life satisfaction is 0.11, 58% (0.065) of which is the direct effect. Of the indirect effect ($\delta_P = 0.046$), 36% ($\delta_P^{MH3} = 0.017$) is due to passive AC participation increasing how often one feels calm and peaceful and 32% ($\delta_P^{MH5} = 0.015$) is due to passive AC participation reducing how often one feels downhearted and depressed. The other four factors (the frequency with which one feels like they are accomplishing less, are doing work less carefully due to emotional problems, have a lot of energy, and that physical health or emotional problems interfered with their social activities) account for the remaining 32% of the indirect effect.

This analysis shows that while physical health has a limited role in mediating the effect of AC participation, an important pathway through which AC participation affects life satisfaction is via mental health. In particular, passive AC participation is associated with enhances of life satisfaction through an increase in how often one feels calm and peaceful and a reduction in how often one feels downhearted and depressed. Even after a controlling for mental health, passive AC participation still has a significant, direct effect on life satisfaction. Moreover, the effect of sport participation is heavily reduced and loses statistical significance when both of the physical and mental health mediators are controlled for.

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[22] Self-assessed health status is one of the items on physical health in SF-12.

[23] Lee et al. (2021) suggests AC participation enhances life satisfaction through more frequent interpersonal interaction. When adding 'frequency of contact with friends' as a mediator, we find that it accounts for 14% of the indirect effect of AC participation on life satisfaction, leaving 18% and 68% respectively accounted for by self-assessed health status and mental health.

[24] The 6 components of mental health are based on questions 6, 7, 9-12 of SF-12 (see Appendix Table 1). There are 5 possible responses (from 'none of the time' to 'all of the time') to each question, creating 6x(5-1)=24 dummies.

5.4   Heterogeneity analysis

Table 5 shows that the baseline results (reprinted in column 1) hold for most demographic groups. Active AC participation has no significant association with life satisfaction for any group except for males (column 3), for whom the association is negative weakly significant (i.e. at the 10% level). By contrast, passive AC participation has a positive association with life satisfaction for all groups, which is statistically significant other than for those out of employment (column 7), having a partner (column 10) or in the prime age range (column 13).

The positive association between AC passive participation and life satisfaction is very similar between females (column 2) and males, and between the younger group (aged 15-49, column 4) and the older group (aged 50+, column 5). However, the association is stronger for those in employment (column 6), below median income (column 8) and without a partner (column 11) respectively than those out of employment, above median income (column 9) and having a partner. Interestingly, in these three latter groups sport participation has a large and significant association with life satisfaction, but this association is small and statistically insignificant for the three former groups. These results suggest that passive AC participation is more important for enhancing wellbeing for people in employment, below median income, and without a partner while participation in sports is more important for those out of employment, above median income and having a partner. While household income has a larger effect on life satisfaction for males than for females, and for single than partnered people, this effect is very similar across the other groups.[25]

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[25] Disaggregated mediation analysis shows that the main pathway through which passive AC participation affects life satisfaction is through increasing how often one feels calm and peaceful and reducing how often one feels downhearted and depressed. However, many of the individual effects are statistically insignificant (due to higher standard errors, which are a result of smaller estimation samples).

Table 5: Regression results: relationship between participation in arts and cultural activities and life satisfaction across population groups

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Mean dep. var.	7.759	7.833	7.676	7.630	7.894	7.742	7.792	7.570	7.856	8.008	7.444	7.586	7.575
Active participation	-0.0269	0.0247	**-0.1068***	-0.0650	0.0142	-0.0395	-0.0098	0.0351	-0.0603	-0.0133	-0.0467	-0.0568	-0.0848*
	(0.0383)	(0.0504)	(0.0590)	(0.0495)	(0.0600)	(0.0445)	(0.0736)	(0.0784)	(0.0428)	(0.0475)	(0.0629)	(0.0443)	(0.0500)
Passive participation	**0.1155***	**0.1375**	**0.0954***	**0.0973***	**0.1280**	**0.1307***	0.0890	**0.1603**	**0.0819***	0.0630	**0.1809***	**0.1115**	0.0841
	(0.0393)	(0.0548)	(0.0560)	(0.0531)	(0.0586)	(0.0467)	(0.0720)	(0.0760)	(0.0449)	(0.0488)	(0.0654)	(0.0460)	(0.0513)
Sport participation	0.0887*	0.1034	0.0746	0.0734	0.0890	-0.0285	0.2707***	0.0604	0.1130*	0.1186*	0.0503	0.0119	-0.0129
	(0.0509)	(0.0698)	(0.0750)	(0.0727)	(0.0711)	(0.0618)	(0.0877)	(0.0886)	(0.0606)	(0.0647)	(0.0811)	(0.0612)	(0.0684)
Log equiv. inc.	0.2329***	0.1782***	0.2984***	0.2129***	0.2689***	0.2422***	0.2170***	0.2181*	0.2631***	0.1861***	0.2795***	0.2476***	0.2723***
	(0.0376)	(0.0532)	(0.0540)	(0.0499)	(0.0589)	(0.0475)	(0.0653)	(0.1200)	(0.0536)	(0.0502)	(0.0585)	(0.0453)	(0.0536)
Intercept	3.5002***	4.4438***	2.6324***	4.2182***	-0.6097	3.6212***	3.4259***	3.3127**	3.4471***	4.6223***	2.8893***	3.3423***	2.5876***
	(0.4694)	(0.6468)	(0.6800)	(0.7028)	(1.3903)	(0.5882)	(0.8152)	(1.3023)	(0.6561)	(0.6164)	(0.7393)	(0.5737)	(0.7441)
Observations	8,193	4,353	3,840	4,188	4,008	5,391	2,802	2,769	5,424	4,581	3,612	5,979	4,743
Adj. R-squared	0.189	0.168	0.211	0.181	0.188	0.167	0.217	0.206	0.166	0.146	0.190	0.195	0.197

Source: Estimated using General Social Survey 2016

Notes: Dependent variable is life satisfaction (scale 0-10). Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Significant coefficients of AC participation are bolded. All regressions include full set of controls as in Appendix Table 5.

1) Total sample, 2) Female, 3) Male, 4) Aged 15-49, 5) Aged 50+, 6) Employed, 7) Not in labour force or unemployed, 8) Below median (equivalised household) income, 9) At or above median income, 10) Partnered, 11) Single, 12) Aged 18-64 only, 13) Aged 25-59 only

6   Estimation results: using the Wellbeing Valuation Approach to monetise the benefit of participation in arts and cultural activities on wellbeing

As outlined in section 4.2, we adopt a three-stage WV approach to estimate the monetary value of AC participation. The first stage estimates the effect of income on life satisfaction, the second stage estimates the effect of AC participation on life satisfaction, and the third stage calculates the average CS.

Appendix Table 5 presents the results from estimating equation (10). Our estimated coefficient of log equivalised household income (β_1) to use in equation (11) is 0.51. This is much higher than the coefficients estimated in studies that employ an OLS model with a wide range of controls (Fujiwara, 2013b; Wheatley and Bickerton, 2022) and is similar to the coefficients estimated in studies that employ an OLS model with minimal controls (Carver & Grimes, 2019; Smith and Davies, 2020). However, it is much lower than the coefficient of 1.82 obtained by Fujiwara et al. (2014).[26] This may be because Fujiwara et al. (2014) employ an instrumental variable model that reduces the downward bias caused by reverse causality, selection effects, and measurement error.

We use two income coefficient estimates to calculate a range of CS values: our income coefficient of 0.51 and a coefficient of 1.82 derived from Fujiwara et al. (2014). Given the likely biased nature of our OLS income coefficient and the uncertainty associated with estimating values for non-market goods, it is best to provide a range within which the true CS value lies rather than a precise point estimate (Smith and Davies, 2020). Hence, we treat our income coefficient and the income coefficient derived from Fujiwara et al. (2014) as plausible lower- and upper-bound estimates of the income coefficient, which respectively translate into an upper and lower bound of CS values.

Our estimates of β_Z in equation (11) come from Table 2. We only calculate CS values using AC participation coefficients that are statistically significant. Hence, we estimate CS values for passive AC participation, using the coefficient in column 2 of Table 2, and values for going to a performing arts event and attending a gallery, using the coefficient estimates in column 4. For comparison, we calculate CS values for sport participation using the coefficient estimate in column 2.

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[26] Fujiwara et al. (2014) use a life satisfaction scale of 1 to 7 and report a log household income coefficient of 1.158. We adjust this coefficient to an equivalent value on a 0 to 10 life satisfaction scale by multiplying it by 11/7 (Veenhoven et al., 1993).

Table 6 presents our estimates of the CS associated with different types of AC participation. All values are reported in 2016 New Zealand dollars. Focussing on the upper-bound values, which are calculated using our estimated income coefficient, we estimate that passive AC participation is valued at 20% of personal income (column 2). This means that an individual with the median[27] (equivalised household) income is willing to forgo $9,300 of that income in return for the wellbeing benefits that passive AC participation brings (column 3). To put this into perspective, we find that sport participation is valued at 15% of personal income ($7,000 at the median income), which is lower than the value of AC participation. This contrasts with Fujiwara et al. (2014), who find that sport participation has a higher value than arts participation in the UK but is consistent with Lemyre et al. (2018) who find that participation in cultural activities has a higher value than engaging in sports regularly. The two most valued individual AC activities are attending a performing arts event ($7,400) and going to an arts gallery ($8,800).

Table 6: Value of participation in arts and cultural activities

| Activity | Coefficient (1) | Upper bound ($\beta_1 = 0.51$) | | Lower bound ($\beta_1 = 1.82$) | | |
		% of income (2)	Max CS value[†] (3)	% of income (4)	Min. CS value 2[†] (5)	Min. CS value 1[§] (6)
Passive AC participation	0.1155***	20.3%	9,286	6.1%	2,818	1,950
	(0.0393)					
Performing arts event	0.0903*	16.2%	7,435	4.8%	2,218	1,535
	(0.0486)					
Gallery	0.1094**	19.3%	8,846	5.8%	2,673	1,851
	(0.0462)					
Sport	0.0847*	15.3%	7,012	4.5%	2,084	1,442
	(0.0509)					

Source: General Social Survey 2016
Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
[†]Evaluated at the median equivalised household income (Y = $45,821).
[§]Evaluated at the full-time minimum wage salary (Y = $31,720). The full-time minimum wage salary is calculated using the April 2016 minimum wage of $15.25 per hour.

Using the income coefficient derived from Fujiwara et al. (2014), we estimate that passive AC participation has a minimum value of 6.1% of income ($2,800 at the median income, columns 4-5). For context, this is higher than the minimum value of 4.5% of income ($2,100) for sport

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[27] In a typical income distribution the median is lower than the mean.

participation[28] and higher than the average household expenditure on AC goods and services of around 3%.[29] Even when evaluated at a more conservative income level, the full-time minimum wage salary, passive AC participation is valued at $1,900, compared with $1,400 for sport participation (column 6). These CS values are of a similar magnitude to the CS values calculated by Fujiwara et al. (2014): they estimate a CS value of approximately 3.7% of income (£935 in 2010/11 Great British pounds, approximately $1,900 in 2010/11 NZ dollars) for being audience to the arts and 4.4% of income (£1,127, approximately $2,300) for sport participation.[30]

Taken together, the value of AC participation is estimated to range between 6.1% and 20% of income, compared with 4.5% and 15% for sport participation. Due to the challenges with estimating a robust income coefficient, we cannot provide a precise estimate of the value of AC participation. However, the range of CS values we estimate suggest that individuals in New Zealand place significant value on participating in passive AC activities, in particular attending performing arts events and going to art galleries. Our CS values also suggest that the value of such AC participation is comparable to sport participation, an activity that gets a lot of focus in public policy due to its potential health and wellbeing benefits (Downward and Rasciute, 2011).

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[28] Simetrica-Jacobs (2020) defines sport participation at a finer breakdown so it is not straightforward to compare our estimate with theirs. Their estimates of sport participation range from 1.5% of income (vigorous physical activity for 30-150 minutes a week, $573 out of the minimum-wage income of $39,312) to 5.4% of income (vigorous physical activity for at least 5 hours a week).

[29] Data from the 2015/16 Household Economic Survey show that on average households spend 2.95% of their total expenditure on AC goods and services (Audio-visual equipment; Recording media; Repair of audio-visual, photographic and information processing equipment; Major recreational and cultural equipment; Cultural services; Books; and Stationery and drawing materials). This is only a rough estimate, as it overcounts some items (e.g. 'books' include school textbooks) and undercounts others (e.g. travel and accommodation for attending a concert). See https://www.stats.govt.nz/information-releases/household-expenditure-statistics-year-ended-june-2019/ ("Household expenditure statistics: Year ended June 2019" contains data for both 2015/16 and 2018/19).

[30] The average monthly NZD/GBP exchange rate in 2011 was 0.4934 (Reserve Bank of New Zealand, 2023).

7   Conclusion

This study uses data from the New Zealand GSS to examine and quantify the impact of participation in AC activities on wellbeing. We find that passive AC participation is associated with greater happiness, improved mental wellbeing, and higher life satisfaction, suggesting that passive participation improves short- and medium-term wellbeing. Although active AC participation has no significant association with life satisfaction, it is associated with a higher sense of purpose, suggesting that active participation improves eudaimonic wellbeing, which may be a contributor to greater long-term wellbeing.

Using a mediation analysis framework, we find that an important pathway through which AC participation affects life satisfaction is via mental health. In particular, passive AC participation enhances life satisfaction through increasing how often one feels calm and peaceful and reducing how often one feels downhearted and depressed. Disaggregated analysis suggests that passive AC participation is more important for enhancing wellbeing for people in employment, below median income, and without a partner while participation in sports is more important for those out of employment, above median income and having a partner.

Based on the WV approach, we estimate that on average people value passive AC participation at around 6-20% of their income. Evaluated at median equivalised income, this is equivalent to $2,800-$9,300 per person per year. This indicates the amount of money an individual who earns the median equivalised income is willing to forgo in return for the wellbeing benefits that passive AC participation brings. It can also be viewed as representing the consumer surplus of 'consuming' passive AC activities (i.e. the difference between the perceived benefits and the actual direct cost of participating in passive AC activities).

It is unclear why we do not find active AC participation to be significantly associated with life satisfaction, happiness, and mental wellbeing. It may be that individuals with lower wellbeing choose to participate in active AC activities, which offsets the positive impact active AC participation may have on short- and medium-term wellbeing. We are unable to control for this endogeneity and therefore leave the estimation of AC participation using more robust methods for future work. Alternatively, future studies could take a different approach by conducting a qualitative study to gain insight into why people participate in AC activities and how such participation affects their wellbeing. This may help to explain why active AC participation has a more muted impact on wellbeing than passive AC participation.

We note that our estimates might not be generalisable to the wider population. AC participation might have a positive effect on wellbeing for individuals who *wish* to participate in

AC activities, but a zero or negative effect for those who *do not wish* to participate. People have different preferences for how they choose to spend their time, meaning AC participation cannot be expected to improve utility or wellbeing for everyone. For example, someone who does not like rock music is unlikely to see an improvement in their wellbeing after attending a rock concert. Consequently, there is a selection effect where AC participants comprise individuals who wish to participate, likely because they expect a positive utility payoff from participating, whilst non-participants comprise individuals who do not wish to participate, likely because they expect a zero or negative utility payoff from participating. If non-participants were somehow made to participate, we may observe a smaller average impact of AC participation on wellbeing. Hence, we caution against generalising the findings across the whole population.

Controlling for selection into AC participation would shed light on whether AC participation improves wellbeing for the general population or just those who have an interest in AC activities. Understanding how people select into AC participation would help policymakers better target policies aimed at improving people's wellbeing. We leave this for future research.

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Appendix

Appendix Table 1: Variable definitions

Name	Description
Any AC participation	Equals 1 if participated in at least one AC activity (performing arts, writing, crafts, video, performing arts event, live music, movies, gallery/museum, historical site, community event) within the last 4 weeks, 0 otherwise
Active AC participation	Equals 1 if participated in at least one active AC activity (performing arts, writing, crafts, video) within the last 4 weeks, 0 otherwise
Passive AC participation	Equals 1 if participated in at least one passive AC activity (performing arts event, live music, movies, gallery/museum, historical site, community event) within the last 4 weeks, 0 otherwise
Specific activity participation	Equals 1 if participated in the specified type of AC activity (either performing arts, writing, crafts, video, performing arts event, live music, movies, gallery/museum, historical site, or community event) within the last 4 weeks, 0 otherwise
Life satisfaction	"Where zero is completely dissatisfied, and ten is completely satisfied, how do you feel about your life as a whole?"
Sense of purpose	"Where zero is not at all worthwhile, and ten is completely worthwhile, overall, to what extent do you feel the things you do in your life are worthwhile?"
Happiness	"Where zero is not at all happy, and ten is completely happy, overall how happy did you feel yesterday?"
WHO-5 wellbeing index	Measures current mental wellbeing using five questions about how often in the last two weeks the respondent has felt 'cheerful and in good spirits', 'calm and relaxed', 'active and vigorous', 'woke up feeling fresh and rested', and that their life has been filled with things that interest them. Response to each question ranges from 0 (at no time) to 5 (all the time), thus the total index is measured on a scale of 0 to 25.
Sport participation	Equals one if an individual participated in any team (organised) sport, individual sport, or other active recreational activity within the last 4 weeks, 0 otherwise.
Equivalised household income	Gross annual household income divided by the square root of household size
Female	Equals 1 if female, 0 if male
Prioritised ethnicity	There are 5 ethnicity groups: New Zealand European, Māori, Pacific, Asian, and Other, defined based on Statistics New Zealand's prioritisation rule, see footnote 12 for details.
Migrant	Equals 1 if born overseas, 0 if born in New Zealand
Age	Age in years
Highest qualification	Highest educational qualification attained. Reference group is no qualification and the other options include school qualification, post-school certificate or diploma, Bachelor's degree, postgraduate degree, and not elsewhere included. School qualification refers to NCEA L1 - L3 certificate or other secondary school qualification. Post-school certificate or diploma refers to a L4 certificate, L5-L6 diploma, or other post school qualification below L7. Postgraduate degree refers to a Honour's, Master's, or doctorate degree.
Has a partner	Equals 1 if has a partner, 0 otherwise
Has a dependent child	Equals 1 if has at least one dependent child, 0 otherwise
Employment status	Current employment status. Reference group is employed and the other options include unemployed and not in the labour force.

Region	The region the household lives in. Reference group is Auckland and the other options include Wellington, Canterbury, Rest of the North Island, and Rest of the South Island
Lives in a rural area	Equals 1 if lives in a rural area, 0 if lives in an urban area
Self-assessed health status	"In general, would you say your health is excellent, very good, good, fair, or poor?"
Has a disability	Equals 1 if has a disability, 0 otherwise. Disability status based on the Washington Group Short Set
Contact with friends in last 4 weeks	"Any contact that you may have had with friends (who don't live with you). In the last four weeks how often have you talked in person with any of them?" Possible answers include everyday, at least once a week, at least once a fortnight, at least once in the last four weeks, not at all.
SF-12 mental health index, SF-12 physical health index	Mental health and physical health indices based on the SF-12 Health Survey questions. A Transformed Physical (TCPS) 0-100 score and a Transformed Mental (TCMS) 0-100 score is calculated for each individual based on answers to the following questions: 1) In general, would you say your health is excellent, very good, good, fair, or poor? 2) Please tell me if your health now limits you in the following activities: - moderate activities such as moving a table, pushing a vacuum cleaner, bowling, or playing golf. 3) Please tell me if your health now limits you in the following activities: - climbing several flights of stairs. 4) During the past four weeks, how much of the time have you accomplished less than you would like as a result of your physical health? 5) During the past four weeks, how much of the time were you limited in the kind of work or other regular daily activities you do as a result of your physical health? 6) During the past four weeks, how much of the time have you accomplished less than you would like as a result of any emotional problems, such as feeling depressed or anxious? 7) During the past four weeks, how much of the time did you do work or other regular activities less carefully than usual as a result of any emotional problems, such as feeling depressed or anxious? 8) During the past four weeks, how much did pain interfere with your normal work including both work outside the home and housework? 9) During the past four weeks: - how much of the time have you felt calm and peaceful? 10) During the past four weeks: - how much of the time did you have a lot of energy? 11) During the past four weeks: - how much of the time have you felt downhearted and depressed? 12) During the past four weeks, how much of the time has your physical health or emotional problems interfered with your social activities,

Appendix Table 2: Demographics characteristics by AC participant type (GSS 2021)

	Arts and cultural participation			
	Non-participants	Active (only) participants	Passive (only) participants	Active and passive (AP) participants
	(1)	(2)	(3)	(4)
Sport participation in the last 4 weeks				
Participated	0.705	0.770	0.838	0.893
Did not participate	0.295	0.23	0.162	0.107
Sex				
Female	0.441	0.636	0.457	0.598
Male	0.559	0.364	0.543	0.402
Prioritised ethnicity				
NZ European	0.587	0.664	0.689	0.629
Māori	0.139	0.143	0.115	0.130
Pacific	0.097	0.062	0.064	0.090
Asian	0.155	0.102	0.116	0.125
Other	0.006	0.011	0.007	0.010
Migrant status				
Migrant	0.327	0.325	0.304	0.282
NZ born	0.673	0.675	0.696	0.718
Age				
15 to 24	0.104	0.152	0.135	0.255
25 to 44	0.342	0.309	0.381	0.332
45 to 64	0.336	0.325	0.315	0.249
65 and above	0.219	0.214	0.168	0.164
Highest qualification				
No qualification	0.185	0.150	0.097	0.097
School qualification	0.332	0.355	0.342	0.324
Post-school certificate or diploma	0.249	0.249	0.276	0.236
Bachelor's degree	0.159	0.132	0.184	0.204
Postgraduate degree	0.043	0.075	0.089	0.120
Not elsewhere included	S	S	S	S
Partner status				
Has a partner	0.661	0.558	0.661	0.535
Does not have a partner	0.339	0.442	0.339	0.465
Dependent child status				
Has at least one dependent child	0.335	0.366	0.381	0.374
No dependent children	0.665	0.634	0.619	0.626
Employment status				
Employed	0.655	0.594	0.753	0.669
Unemployed	0.032	0.040	0.032	0.041
Not in the labour force	0.314	0.366	0.216	0.289
Region				
Auckland	0.313	0.322	0.324	0.370
Wellington	0.112	0.128	0.100	0.111
Canterbury	0.114	0.117	0.143	0.143
Rest of North Island	0.350	0.371	0.319	0.258
Rest of South Island	0.111	0.066	0.115	0.119

	Arts and cultural participation			
	Non-participants	Active (only) participants	Passive (only) participants	Active and passive (AP) participants
	(1)	(2)	(3)	(4)
Urban/rural status				
Lives in a rural area	0.140	0.148	0.144	0.141
Lives in an urban area	0.860	0.852	0.856	0.859
Health status				
Poor	0.066	0.057	0.017	0.026
Fair	0.150	0.132	0.086	0.137
Good	0.328	0.322	0.339	0.282
Very good	0.331	0.347	0.390	0.378
Excellent	0.125	0.139	0.169	0.177
Disability status				
Has a disability	0.122	0.130	0.071	0.099
Does not have a disability	0.878	0.870	0.929	0.901
Contact with friends in last 4 weeks				
None	0.123	0.106	0.056	0.060
At least once in the last 4 weeks	0.110	0.097	0.098	0.071
At least once a fortnight	0.122	0.128	0.138	0.106
At least once a week	0.461	0.486	0.477	0.499
Every day	0.185	0.183	0.232	0.265
Mean life satisfaction score	7.58	7.48	7.84	7.70
Mean equivalised household income	63,268	62,027	69,564	66,919
Mean age	48.71	46.93	44.93	41.30
Observations	1,224	408	948	840

Source: General Social Survey 2021

Notes: See page 14 for definitions of each group. Proportions in each block within each column sum to 1. Some blocks do not add up to exactly 1 due to rounding. S: Suppressed due to low sample counts.

Appendix Table 3: AC participation by demographic characteristics

	Arts and cultural participation			
	Non-participants	**Active (only) participants**	**Passive (only) participants**	**Active and passive (AP) participants**
	(1)	**(2)**	**(3)**	**(4)**
Total sample	0.286	0.092	0.365	0.258
Sport participation in the last 4 weeks				
Participated	0.232	0.092	0.383	0.294
Did not participate	0.493	0.090	0.295	0.122
Sex				
Female	0.238	0.107	0.332	0.324
Male	0.336	0.076	0.399	0.189
Prioritised ethnicity				
NZ European	0.271	0.095	0.369	0.265
Māori	0.328	0.098	0.303	0.271
Pacific	0.349	0.085	0.353	0.213
Asian	0.291	0.061	0.413	0.235
Other	0.253	0.145	0.349	0.253
Migrant status				
Migrant	0.291	0.079	0.386	0.244
NZ born	0.284	0.097	0.356	0.264
Age				
15 to 24	0.175	0.090	0.343	0.393
25 to 44	0.252	0.077	0.411	0.260
45 to 64	0.324	0.099	0.358	0.219
65 and above	0.384	0.108	0.312	0.196
Highest qualification				
No qualification	0.444	0.109	0.279	0.167
School qualification	0.287	0.087	0.370	0.256
Post-school certificate or diploma	0.282	0.093	0.379	0.246
Bachelor's degree	0.204	0.082	0.411	0.303
Postgraduate degree	0.141	0.083	0.394	0.381
Not elsewhere included	0.353	0.118	0.314	0.216
Partner status				
Has a partner	0.297	0.088	0.386	0.229
Does not have a partner	0.269	0.097	0.331	0.304
Dependent child status				
Has at least one dependent child	0.257	0.088	0.388	0.267
No dependent children	0.303	0.093	0.351	0.252
Employment status				
Employed	0.260	0.077	0.402	0.260
Unemployed	0.288	0.112	0.288	0.312
Not in the labour force	0.349	0.122	0.284	0.245
Region				
Auckland	0.275	0.075	0.394	0.256
Wellington	0.292	0.081	0.327	0.299
Canterbury	0.288	0.100	0.389	0.222
Rest of North Island	0.298	0.108	0.321	0.273
Rest of South Island	0.274	0.094	0.407	0.225

| | Arts and cultural participation | | | |
| | Non-participants | Active (only) participants | Passive (only) participants | Active and passive (AP) participants |
	(1)	(2)	(3)	(4)
Urban/rural status				
Lives in a rural area	0.293	0.072	0.380	0.256
Lives in an urban area	0.285	0.095	0.362	0.258
Health status				
Poor	0.514	0.135	0.225	0.126
Fair	0.372	0.110	0.298	0.220
Good	0.328	0.092	0.354	0.226
Very good	0.249	0.088	0.381	0.282
Excellent	0.213	0.080	0.409	0.299
Disability status				
Has a disability	0.450	0.116	0.234	0.200
Does not have a disability	0.270	0.089	0.377	0.264
Contact with friends in last 4 weeks				
None	0.510	0.096	0.260	0.135
At least once in the last 4 weeks	0.331	0.083	0.378	0.209
At least once a fortnight	0.282	0.101	0.392	0.225
At least once a week	0.283	0.097	0.365	0.254
Every day	0.236	0.080	0.372	0.312
Observations	2,505	789	2,850	2,058

Source: General Social Survey 2016
Notes: See page 14 for definitions of each group. Entries in each row (other than the last row) sum to 1. Some rows do not add up to exactly 1 due to rounding.

Appendix Table 4: AC participation by demographic characteristics (GSS 2021)

	Arts and cultural participation			
	Non-participants (1)	Active (only) participants (2)	Passive (only) participants (3)	Active and passive (AP) participants (4)
Total sample	0.349	0.114	0.285	0.252
Sport participation in the last 4 weeks				
Participated	0.308	0.110	0.299	0.283
Did not participate	0.509	0.129	0.229	0.133
Sex				
Female	0.303	0.143	0.257	0.297
Male	0.396	0.084	0.314	0.206
Prioritised ethnicity				
NZ European	0.322	0.119	0.309	0.250
Māori	0.372	0.125	0.250	0.252
Pacific	0.415	0.086	0.222	0.277
Asian	0.415	0.089	0.253	0.243
Other	0.258	0.161	0.258	0.323
Migrant status				
Migrant	0.369	0.120	0.280	0.231
NZ born	0.340	0.112	0.288	0.260
Age				
15 to 24	0.232	0.111	0.246	0.412
25 to 44	0.344	0.102	0.313	0.241
45 to 64	0.382	0.120	0.293	0.205
65 and above	0.402	0.128	0.251	0.218
Highest qualification				
No qualification	0.482	0.128	0.207	0.183
School qualification	0.346	0.121	0.290	0.244
Post-school certificate or diploma	0.343	0.112	0.310	0.235
Bachelor's degree	0.317	0.087	0.300	0.296
Postgraduate degree	0.188	0.108	0.322	0.382
Not elsewhere included	S	S	S	S
Partner status				
Has a partner	0.373	0.103	0.305	0.219
Does not have a partner	0.309	0.131	0.252	0.307
Dependent child status				
Has at least one dependent child	0.323	0.116	0.301	0.261
No dependent children	0.363	0.113	0.276	0.248
Employment status				
Employed	0.336	0.100	0.316	0.249
Unemployed	0.321	0.129	0.257	0.293
Not in the labour force	0.383	0.146	0.216	0.255
Region				
Auckland	0.329	0.111	0.278	0.281
Wellington	0.356	0.132	0.258	0.253
Canterbury	0.306	0.103	0.313	0.279
Rest of North Island	0.381	0.132	0.283	0.203
Rest of South Island	0.356	0.069	0.300	0.275

	Arts and cultural participation			
	Non-participants	Active (only) participants	Passive (only) participants	Active and passive (AP) participants
	(1)	(2)	(3)	(4)
Urban/rural status				
Lives in a rural area	0.343	0.118	0.288	0.251
Lives in an urban area	0.350	0.113	0.284	0.253
Health status				
Poor	0.564	0.160	0.117	0.160
Fair	0.414	0.119	0.193	0.274
Good	0.359	0.115	0.303	0.223
Very good	0.319	0.109	0.307	0.264
Excellent	0.286	0.104	0.316	0.294
Disability status				
Has a disability	0.414	0.145	0.199	0.243
Does not have a disability	0.341	0.111	0.295	0.254
Contact with friends in last 4 weeks				
None	0.500	0.140	0.184	0.175
At least once in the last 4 weeks	0.402	0.116	0.294	0.188
At least once a fortnight	0.346	0.119	0.319	0.217
At least once a week	0.337	0.116	0.284	0.264
Every day	0.296	0.096	0.303	0.306
Observations	1,224	408	948	840

Source: General Social Survey 2021

Notes: See page 14 for definitions of each group. Entries in each row (other than the last row) sum to 1. Some blocks do not add up to exactly 1 due to rounding. S: Suppressed due to low sample counts.

Appendix Table 5: Detailed regression results: relationship between participation in arts and cultural activities and life satisfaction

	(1)	(2)	(3)	(4)	(5)
Any AC participation	0.1032**				
	(0.0431)				
Active participation		-0.0269		-0.0366	
		(0.0383)		(0.0385)	
Passive participation		0.1155***	0.1131***		
		(0.0393)	(0.0395)		
Performing arts			0.0703		0.0517
			(0.0677)		(0.0687)
Writing			-0.0379		-0.0524
			(0.0635)		(0.0640)
Crafts			-0.0226		-0.0281
			(0.0495)		(0.0497)
Video			-0.0402		-0.0520
			(0.0497)		(0.0499)
Perform. arts events				0.0903*	0.0860*
				(0.0486)	(0.0491)
Live music				0.0546	0.0533
				(0.0469)	(0.0470)
Movies				0.0270	0.0282
				(0.0374)	(0.0374)
Gallery/museum				0.1094**	0.1135**
				(0.0462)	(0.0463)
Historic sites				-0.0624	-0.0596
				(0.0564)	(0.0567)
Community event				0.0613	0.0625
				(0.0408)	(0.0409)
Sport participation	0.0863*	0.0887*	0.0885*	0.0847*	0.0852*
	(0.0507)	(0.0509)	(0.0510)	(0.0509)	(0.0510)
Log equiv. income	0.2351***	0.2329***	0.2333***	0.2295***	0.2299***
	(0.0376)	(0.0376)	(0.0376)	(0.0378)	(0.0378)
Female	0.1807***	0.1882***	0.1882***	0.1834***	0.1835***
	(0.0366)	(0.0370)	(0.0375)	(0.0372)	(0.0376)
Migrant	0.1371***	0.1364***	0.1369***	0.1361***	0.1372***
	(0.0462)	(0.0462)	(0.0463)	(0.0464)	(0.0465)
Prioritised ethnicity (reference: NZ European)					
Māori	0.2890***	0.2889***	0.2868***	0.2878***	0.2866***
	(0.0605)	(0.0604)	(0.0606)	(0.0605)	(0.0606)
Pacific	0.3039***	0.3028***	0.2967***	0.3003***	0.2949***
	(0.0916)	(0.0915)	(0.0916)	(0.0917)	(0.0918)
Asian	0.1170*	0.1133	0.1094	0.1214*	0.1170*
	(0.0697)	(0.0697)	(0.0698)	(0.0702)	(0.0704)
Other	-0.1523	-0.1507	-0.1511	-0.1515	-0.1522
	(0.1156)	(0.1156)	(0.1158)	(0.1160)	(0.1162)
Age	-0.0678***	-0.0679***	-0.0679***	-0.0678***	-0.0680***
	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)
Age squared	0.0009***	0.0009***	0.0009***	0.0009***	0.0009***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Highest qualification (reference: No qualification)					
School quals	-0.0350	-0.0345	-0.0349	-0.0358	-0.0357
	(0.0612)	(0.0612)	(0.0612)	(0.0612)	(0.0613)
Post-school quals	-0.0555	-0.0530	-0.0527	-0.0559	-0.0549

	(1)	(2)	(3)	(4)	(5)
	(0.0610)	(0.0611)	(0.0611)	(0.0612)	(0.0612)
Bachelor	-0.1255*	-0.1230*	-0.1220*	-0.1340*	-0.1315*
	(0.0703)	(0.0704)	(0.0704)	(0.0705)	(0.0705)
Postgraduate	-0.1750**	-0.1707**	-0.1704**	-0.1819**	-0.1799**
	(0.0741)	(0.0743)	(0.0743)	(0.0747)	(0.0746)
Education NEI	0.0042	0.0058	0.0017	0.0054	0.0024
	(0.1762)	(0.1765)	(0.1766)	(0.1766)	(0.1766)
Has a partner	0.5880***	0.5871***	0.5873***	0.5876***	0.5870***
	(0.0418)	(0.0418)	(0.0419)	(0.0419)	(0.0420)
Has a dependent child	0.1206***	0.1193***	0.1195***	0.1196***	0.1196***
	(0.0437)	(0.0437)	(0.0437)	(0.0439)	(0.0439)
Employment status (reference: Employed)					
Unemployed	-0.4191***	-0.4168***	-0.4166***	-0.4183***	-0.4176***
	(0.1249)	(0.1251)	(0.1250)	(0.1251)	(0.1250)
Not in labour force	0.0747	0.0791	0.0799	0.0706	0.0713
	(0.0544)	(0.0544)	(0.0544)	(0.0545)	(0.0545)
Region (reference: Auckland)					
Wellington	0.0164	0.0162	0.0181	0.0045	0.0058
	(0.0607)	(0.0607)	(0.0608)	(0.0612)	(0.0612)
Canterbury	0.0349	0.0371	0.0391	0.0391	0.0405
	(0.0618)	(0.0617)	(0.0618)	(0.0619)	(0.0619)
Rest of North Island	0.1154**	0.1192**	0.1217**	0.1196**	0.1219**
	(0.0493)	(0.0493)	(0.0494)	(0.0495)	(0.0495)
Rest of South Island	0.1560**	0.1583**	0.1602***	0.1503**	0.1517**
	(0.0620)	(0.0620)	(0.0620)	(0.0623)	(0.0623)
Lives in a rural area	0.0991*	0.0959*	0.0958*	0.1035*	0.1030*
	(0.0529)	(0.0529)	(0.0529)	(0.0530)	(0.0530)
Self-assessed health status (reference: Poor)					
Fair	1.0266***	1.0292***	1.0298***	1.0142***	1.0141***
	(0.1647)	(0.1646)	(0.1646)	(0.1645)	(0.1645)
Good	1.5003***	1.5003***	1.5000***	1.4862***	1.4850***
	(0.1603)	(0.1602)	(0.1602)	(0.1599)	(0.1600)
Very good	1.9411***	1.9405***	1.9400***	1.9249***	1.9234***
	(0.1606)	(0.1605)	(0.1606)	(0.1603)	(0.1604)
Excellent	2.3566***	2.3551***	2.3537***	2.3404***	2.3378***
	(0.1631)	(0.1629)	(0.1630)	(0.1627)	(0.1628)
Has a disability	-0.3610***	-0.3599***	-0.3597***	-0.3597***	-0.3595***
	(0.0793)	(0.0792)	(0.0792)	(0.0793)	(0.0793)
Freq. of contact with friends (reference: None)					
At least once in last 4 weeks	0.0683	0.0623	0.0627	0.0687	0.0688
	(0.1138)	(0.1137)	(0.1137)	(0.1137)	(0.1138)
At least once a fortnight	0.1804*	0.1769*	0.1779*	0.1764*	0.1775*
	(0.1050)	(0.1049)	(0.1050)	(0.1051)	(0.1052)
At least once a week	0.3416***	0.3380***	0.3374***	0.3354***	0.3347***
	(0.0928)	(0.0927)	(0.0928)	(0.0929)	(0.0931)
Every day	0.4889***	0.4833***	0.4834***	0.4748***	0.4753***
	(0.0959)	(0.0959)	(0.0959)	(0.0962)	(0.0963)
Intercept	3.4668***	3.5002***	3.4983***	3.5828***	3.5864***
	(0.4695)	(0.4694)	(0.4696)	(0.4722)	(0.4724)
Observations	8,193	8,193	8,193	8,175	8,175
Adjusted R-squared	0.188	0.189	0.188	0.188	0.188

Source: Estimated using General Social Survey 2016

Notes: Dependent variable is life satisfaction (scale 0-10). Standard errors in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

Appendix Table 6: Summarised regression results: relationship between participation in arts and cultural activities and WHO-5 wellbeing measures

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	WHO-5	Cheerful	Calm	Active	Rested	Interested
Scale of dep. var.	0-25	0-5	0-5	0-5	0-5	0-5
Mean dep. var.	14.91	3.408	3.176	2.699	2.447	3.185
Active participation	0.0793	-0.0423	0.0088	-0.0432	-0.0189	**0.1675*****
	(0.1566)	(0.0361)	(0.0418)	(0.0473)	(0.0547)	(0.0458)
Passive participation	**0.4227*****	**0.1153*****	0.0190	**0.1197*****	0.0748	**0.1019****
	(0.1510)	(0.0348)	(0.0406)	(0.0455)	(0.0526)	(0.0449)
Sport participation	0.5921***	0.0801*	0.0280	0.3306***	0.1394**	0.0159
	(0.2011)	(0.0476)	(0.0528)	(0.0615)	(0.0668)	(0.0598)
Log equiv. income	-0.1563	0.0453	0.0491	-0.1320***	-0.0710*	-0.0451
	(0.1288)	(0.0324)	(0.0342)	(0.0362)	(0.0429)	(0.0377)
Intercept	11.1302***	1.9534***	1.6621***	3.0686***	1.6906***	2.7326***
	(1.6306)	(0.3984)	(0.4352)	(0.4628)	(0.5386)	(0.4805)
Observations	3,240	3,246	3,246	3,246	3,246	3,243
Adj. R-squared	0.273	0.185	0.150	0.231	0.161	0.127

Source: Estimated using General Social Survey 2021
Notes: Standard errors in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$. Significant coefficients of AC participation are bolded. All regressions include full set of controls as in Appendix Table 5.

**Appendix Table 7: Detailed regression results: relationship between household income and life satisfaction**

	Regression coefficient
Log equiv. income	0.5057***
	(0.0356)
Female	0.2064***
	(0.0390)
Prioritised ethnicity (reference: NZ European)	
Māori	0.1081*
	(0.0635)
Pacific	0.3298***
	(0.0942)
Asian	0.3099***
	(0.0672)
Other	-0.1184
	(0.1284)
Age	-0.0625***
	(0.0056)
Age squared	0.0008***
	(0.0001)
Region (reference: Auckland)	
Wellington	-0.0092
	(0.0637)
Canterbury	-0.0127
	(0.0661)
Rest of North Island	0.0865*
	(0.0523)
Rest of South Island	0.1284*
	(0.0675)
Lives in a rural area	0.2208***
	(0.0571)
Intercept	3.0875***
	(0.3913)
Observations	8,202
Adjusted R-squared	0.0537

Source: Estimated using General Social Survey 2016
Notes: Dependent variable is life satisfaction (scale: 0-10). Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Appendix Figure 1: Participation in arts and cultural activities by activity type (GSS 2021)
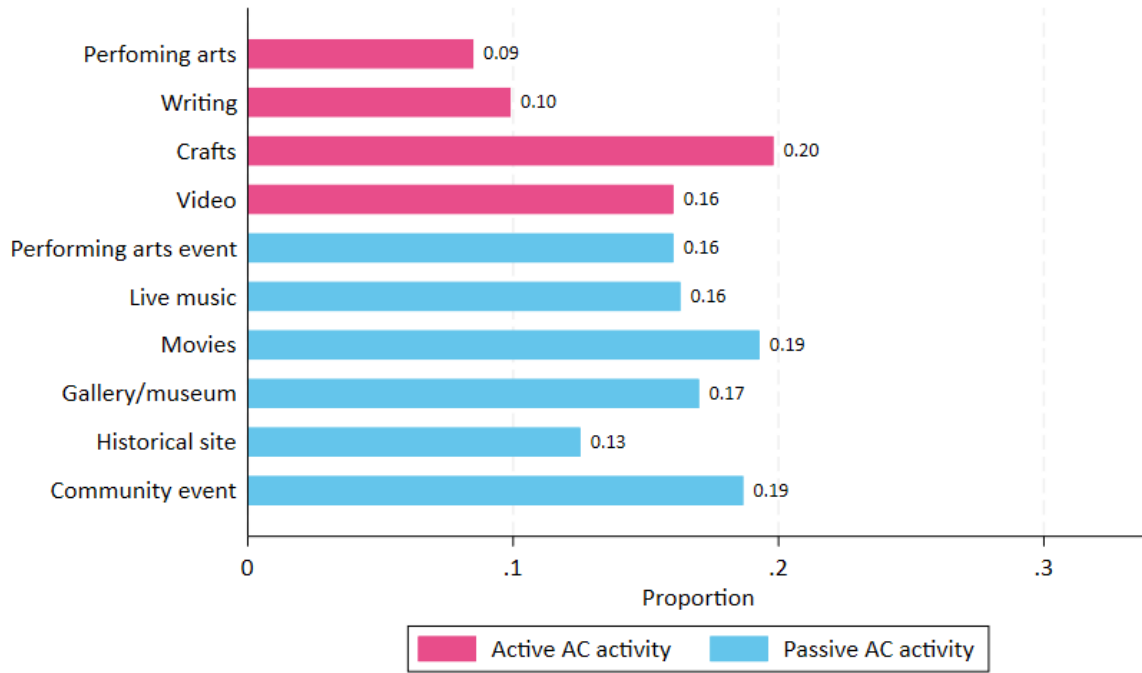
Source: General Social Survey 2021

Notes: This figure shows the proportion of individuals who reported participating in each of the 10 arts and cultural activities within the last 4 weeks prior to their interview date.