



Perceived place qualities, restorative effects and self-reported wellbeing benefits of visits to heritage sites: Empirical evidence from a visitor survey in England

Eirini Gallou^{a,1}, David Uzzell^b, Joanna Sofaer^{c,*}

^a Policy and Evidence (Analytics), Historic England, London, United Kingdom

^b University of Surrey, School of Psychology, Guildford, United Kingdom

^c Department of Archaeology, University of Southampton, Avenue Campus Highfield, Southampton, United Kingdom

ARTICLE INFO

Keywords:

Heritage sites
Subjective wellbeing
Restorative effects
Attention Restoration Theory

ABSTRACT

Heritage sites are complex environments that cannot be easily be located within a nature – built space dichotomy. Although a small but growing body of evidence supports the potential of visits to heritage sites in generating wellbeing benefits, there is a gap in understanding how such benefits may be related to the perceived qualities or affordances of heritage sites. We present an exploratory survey instrument designed and tested to generate empirical evidence on the association between the qualities of heritage sites, the restorative effects of a heritage visit, and the extent to which these are positively associated with self-reported subjective wellbeing benefits. The survey was given to sample of 780 visitors to 7 heritage sites in England from June to October 2020. Factor analysis of responses led to extraction of 3 core components related to how participants evaluated their experience of the qualities of place, and 2 core components linked to the restorative effects of the visit. Using these core components to create composite variables, regression models were fitted to understand which qualities of place and effects of the visit predict self-reported wellbeing benefits. The results suggest that different components of heritage sites may contribute to increase in positive affect and reduction in anxiety elements of wellbeing. They suggest potential therapeutic benefits of visits to heritage sites for self-directed visits, and thus potential means of sustainably delivering support for public wellbeing at scale.

Introduction

The COVID-19 pandemic has highlighted the importance of the outdoors, public spaces and cultural infrastructure as resources to support community and individual wellbeing (Burnett et al., 2021). A small but growing body of evidence supports the potential of visits to heritage sites and the historic environment to generate wellbeing benefits, both before and during the pandemic (e.g. Sofaer et al., 2021, Scopelliti et al., 2019, Grossi et al., 2019, Pennington et al., 2018, Fujiwara et al., 2014), while intervention studies across historic landscapes in the UK report positive benefits for the psychological recovery and mental health uplift of participants (Darvill et al., 2019; Heaslip et al., 2020). However, there is a gap in understanding what fosters those benefits. In particular, how they may be related to the perceived affordances or qualities of historic sites, and the values people attach to those qualities. Furthermore,

although previous studies have focussed on assessing the mental health benefits of specific heritage interventions, these are difficult to deliver at scale and the majority of visits to heritage sites in England do not take place within directed therapeutic frameworks. There is a lack of pre-existing research on self-electing, undirected experiences of heritage sites, and few benchmarks for the wellbeing effects of visits.

Capitalising on advances in environmental psychology (Lewicka, 2011; Twigger-Ross and Uzzell, 1996; Kopec and Bliss, 2020) and the study of restorative effects developed during the last two decades (Belto, 2005; Kaplan, 1995; Hartig et al., 1997; Pasini et al., 2014, 2009; Han, 2003; Menardo et al., 2021), this paper applies a newly developed instrument to generate empirical evidence on the association between the qualities of heritage sites and the extent to which they are positively associated with self-perceived wellbeing benefits of self-electing, undirected visits from the participant's perspective. We aim to develop a tool

* Corresponding author.

E-mail address: jrsd@soton.ac.uk (J. Sofaer).

¹ Present address: University of Strathclyde, Strathclyde Business School, Glasgow

to identify qualities of heritage sites valued by visitors that shape their overall experience of place, and to examine how these support wellbeing-related experiences. In particular, this empirical study seeks to examine the relationship between perceived place qualities, restorative effects, and self-reported wellbeing benefits of visits to heritage sites at a time of significant national wellbeing need. On the basis that previous research has identified the positive psychological outcomes of natural world experiences in terms of stress and anxiety reduction, we hypothesise that the experience of visiting heritage sites can make a significant contribution to overcoming mental fatigue and improving ability to focus and direct attention effectively, and thereby lead to a feeling of restoration. We are interested in ascertaining whether the distinctive affordances of heritage sites have a differential effect on visitors' responses.

Heritage and Attention Restoration Theory (ART)

Heritage has come to have a multitude of meanings (Harrison, 2010; Harvey, 2016). In this paper we use heritage sites to refer to historic places that are protected and recognised for their national significance. Heritage sites cannot be easily located within the natural-built space dichotomy that frames much of the existing research on the relationship between the environment and wellbeing. The historicity (time depth) that distinguishes heritage sites means that they offer a combined physical and cultural experience. They frequently encompass both green space and architecture to different degrees, whilst 'natural' or green spaces at heritage sites emerge from, and are part of, the historic environment. This poses challenges in terms of identifying which attributes may trigger restorative effects and thus contribute to wellbeing.

Wellbeing can be understood as "how people feel and how they function, both on a personal and a social level, and how they evaluate their lives as a whole" (New Economics Foundation, 2012, 6). Within this wide-ranging definition sit several different components of wellbeing, revealing a complex and multi-faceted notion. *Subjective wellbeing* (SWB) is a commonly used measure of wellbeing, which is generally seen to comprise three elements: the presence of positive affect experienced as feelings of pleasure such as happiness, joy, contentment, and excitement, low negative affect experienced as feelings of sadness, worry, stress and anxiety, and life satisfaction (Eid and Diener, 2004; Martella and Sheldon, 2019). It thus describes wellbeing in terms of the feelings, experiences and sentiments arising from what people do and how they think (Dolan, 2014).

Stress and anxiety are detrimental to SWB. ART provides a framework for understanding the degree to which the experience of the environment can lead to restorative effects. ART suggests four underlying constructs to restorative environments: 'Being away' (physical and psychological escape from everyday life); 'Fascination' (exploring and making sense of an environment by engaging with content and events); 'Extent' (composed of the 'scope' of an environment in terms of ability to enter and spend time there, and the physical or conceptual 'coherence' of a setting that promotes engagement, exploration and interpretation); 'Compatibility' (the fit between place, intended activities and the individual's inclinations) (Herzog et al., 2003; Kaplan, 1995). Much of the research that has employed Attention-Restoration Theory has typically focussed on nature and natural environments. Partly this is because it is argued that soft fascination (i.e., those aspects of the environment that capture attention effortlessly) are an important part of the restorative process, and the natural environment is more likely to facilitate soft fascination, as well as being immersed in the environment and a sense of escaping from habitual environments. This might be expressed as the distinction between more directed "top-down" attention and more passive "bottom-up" involuntary attention (Fan et al., 2002). Compared with gazing at a rural landscape or a walk through woodland, visiting historic heritage environments potentially places a heavier cognitive load on the individual, as appreciating and immersing oneself in an historical environment may require more mental engagement as the

visitor engages with issues such as historical and power relations. This can be an enjoyable and escapist experience as required by ART but it is a different form of attention from the soft fascination in a, say, forest environment. This raises a critical issue with regard to ART where the focus has often been on the restorative *effects* rather than the attentional *causes*. Ohly et al. (2016) argue that ART researchers need to articulate more clearly which measures of attention are likely to assess the impact of restoration most appropriately.

Methods

Ethics

Ethical approval was obtained from the University of Southampton Faculty of Arts and Humanities (ERGO2 ID57947).

Study setting

The study took place during a 4-month period (24/June/2020 – 29/October/2020), coinciding with the release of the first COVID-19 lockdown in England and the imposition of a second national lockdown. This was a period of heightened wellbeing need and visitor awareness of why they visited heritage sites (Sofaer et al., 2021). We recognise that this may influence our results, but the physical characteristics of heritage sites were unaffected by the pandemic and the potential long-term impact of the pandemic on wellbeing means that our results have continued relevance (see Campion et al., 2020). Seven heritage destinations in the south of England were selected: Stansted Park, Avebury, Mottisfont Abbey, Kingston Lacy, Corfe Castle, Hampton Court and Tower of London. These represent different kinds of attractions along a spectrum from primarily green space to house and palace interiors - a stately home surrounded by parkland, an open air prehistoric site, a house surrounded by gardens, castle ruins, and royal palaces. They range in date from the Neolithic to the Edwardian Period (Appendix 1). They include free and pay-to-enter locations with membership opportunities.

Study design

All participants visited sites in person. Data collection took place on-site where participants were directly exposed to site affordances, rather than via pictures or images of sites. Visits to heritage sites involve a 'global place experience' (Scopelliti et al., 2019) and their symbolic or non-visual values are not easily represented (Vining and Orland, 1989). Survey data were collected from a random sample of visitors at each site on at least three occasions at 3–4 week intervals on different days of the week to capture the range of visitors, with the exception of Historic Royal Palaces where participants were recruited via social media and data were digitally collected due to COVID-related safety measures applied in those sites at that time. Affective levels of response may be reduced if questionnaires are completed offsite but this was not deemed significantly different for the present analysis that our data cannot be combined. Quantitative data collection was complemented by interviews and participant observation (see Sofaer et al., 2021 for discussion of qualitative data).

Participants

A total of 780 participants were recruited across the seven heritage sites. Eligibility criteria specified that participants should be aged 16 or over, able to give informed consent, and residing in the UK at the time of the survey. Demographic data on sex and age were collected using standard ONS categories for England. Women were over-represented in the sample (33% male; 67% female) reflecting greater willingness of women to engage in this kind of research (Korpela et al., 2001). Fifty-two percent of visitors were aged over 55 years (23% 55–64; 23%

65–74; 6% 75+ years), while 48% were 16–54 years old (18% 45–54; 16% 35–44; 10% 25–34; 4% 16–25). The age profile of participants is not fully representative of the population of the UK but is considered representative of visitors to the heritage sites included in the sample. Eighty-nine percent of respondents identified as White British (compared to 86.0% of the population in the UK (ONS, 2012); 4.8% was White Other and 1.4% was White Irish, with 0.9% being of Other Asian background. Ethnic diversity in our sample is not fully representative of all groups across the population but travel restrictions in place at time of research mean that this cannot be fully understood in terms of visitor choice. With the exception of Historic Royal Palaces, sites are located in a less ethnically diverse part of England.

Instrument development

The underlying constructs of restorative environments proposed by ART have previously been used to develop and test Perceived Restorativeness Scales (PRS), designed to study the extent to which natural and built environments have restorative qualities (Hartig et al., 1997; Pasini et al., 2009; Han, 2003; Laumann et al., 2001). However, while PRS may be useful in evaluating settings (Herzog et al., 2003), more recent studies suggest that they are not suitable for measuring changes in restorative state over time (Van den Berg et al., 2014). Furthermore, whilst ‘Fascination’, ‘Extent’ and ‘Compatibility’ imply assessment of an environment, ‘Being away’ is distinct from these as it implies reflection on self-distance rather than evaluation of setting (Herzog et al., 2003), and may be more closely related to a sequence of levels of restorativeness (Van den Berg et al., 2014). Our survey therefore distinguished between the *qualities of place* affecting visitors’ experience of the visit, and the *restorative effects* of the visit. Participants also completed a set of questions on pre- and post-visit subjective wellbeing. The survey therefore comprised three distinct question sets (see Appendix 2 for list of questions).

1. Qualities of Place: In order to examine the qualities of place affecting visitors’ experience, participants were provided with a set of 13 statements covering a wide range of physical, social and activity-enabling attributes of place, and asked ‘How important are each of the following to your overall experience of the visit?’ on a Likert scale of 1 (not at all) to 5 (extremely). Statements were mapped to concepts of ‘Fascination’, ‘Extent’ and ‘Compatibility’, and further developed to take account of the distinctive qualities of heritage sites that may affect scope: meanings associated with their history (Williams, 2014), time-depth (Powell et al., 2020; Jorgensen et al., 2017; Fairclough, 2003), and the special character/uniqueness of historic places that are core characteristics differentiating them from natural settings (Twigger-Ross and Uzzell, 1996). Historic places can accommodate variant affordances (Gibson, 1979), as the result of real-time or direct perception–action processes (i.e., they are dependant on users’ perceptions and actions). Thus, statements were also designed to take account of functional and emotional elements identified in the place attachment literature that describe relationships between people and historic places (see Lewicka, 2011, Twigger-Ross and Uzzell, 1996. Scannell and Gifford, 2010). Functional aspects include the physical affordances, accessibility and maintenance of spaces which enable particular activities to happen on site. Emotional elements relate to the affective bond between an individual and a specific place (Hidalgo and Hernández, 2001), including reasons for visiting such as those pertaining to a sense of community, aesthetics, historical narrative, or emotional responses due to sensory stimuli (e.g., smells, sights, sounds or textures), the latter being less pronounced in sense of place literature (Raymond et al., 2017). Statements were refined following pilot interviews with visitors to ensure that questions were intelligible and that commonly cited qualities of historic places were included in the survey.

2. Effects of the Visit: To assess the effects of the visit participants were asked, ‘Thinking about the effects of this visit on you, how much do you agree or disagree with each of the following statements?’ on a Likert

scale of 1 (not at all) to 5 (extremely). This 12-statement question set was largely based on the validated scale for the restorative effects of natural places developed by Van den Berg et al. (2014) but modified for heritage environments and refined based on results from piloting the survey at the heritage sites. Thus, ‘I feel connected to the natural world’ was adapted to ‘I feel connected to the past’. Three items were removed from the scale as participants in the pilot study perceived them to pertain to natural or wild environment qualities only: ‘I am thinking about everything and nothing at the same time’; ‘My mind just wanders in infinity’; ‘I can imagine myself as part of the larger cyclical process of living’. Participants often found the first two of these statements confusing in the context of a heritage visit where explicit attention to the past is an important aspect of eudaimonic experience (Sofaer et al., 2021) whilst the ‘cyclical process of living’ was considered more appropriate to cycles of nature than the evolving character of historical narrative. An additional item (‘I can heal’), was added to our scale to reflect previous studies looking at healing properties of heritage sites, including visitors’ belief in the therapeutic power of prehistoric places (Gessler, 1992; Darvill et al., 2019; Heaslip et al., 2020). Further additions to the scale were also made to account for recent work suggesting that heritage offers a special quality of contemplation and connection to the past that can promote feelings of ontological security fundamental to wellbeing (Grenville, 2007; Nolan, 2019; Sofaer et al., 2021) and, as a result of pilot work and on-site testing of the instrument, to capture aspects of self-esteem and resilience. These additions include ‘I have a sense of security and the familiar’, ‘Being here gives purpose to my day’, ‘I feel good about myself’, ‘I feel better able to deal with life’s difficulties’. Finally, although not an effect of the visit (nor a quality of place) ‘I can exercise’ was added to the questionnaire in order to acknowledge mechanisms leading to health benefits identified in studies of the wellbeing effects of green spaces (e.g., Rogerson et al., 2020; Barton et al., 2009).

3. Subjective Wellbeing: Previous research on the wellbeing effects of heritage engagement has followed a variety of approaches to measurement of wellbeing (e.g., PANAS and MVAS in Sayer, 2015; PGWBI in Grossi et al., 2019; WEMWBS in Darvill et al., 2019 and Heaslip et al., 2020; multiple metrics in Ander et al., 2013; see Baxter and Burnell, 2022 for wider discussion). This frequently differs from measurement of subjective wellbeing and anxiety in epidemiological and medical literature which typically uses full-length validated scales such as WEMWBS, GHQ or GAD-7). We opted not to follow these approaches as they are more usefully applied to assess the effects of repeated interventions rather than singular visit experiences (Ander et al., 2013), may be considered intrusive by visitors in the context of a heritage visit, and are too long to embed in visitor surveys and mixed methods research looking to gather information on a range of aspects of the visitor experience.

In this study participants completed a set of questions on their sense of wellbeing and anxiety components of pre- and post-visit subjective wellbeing as measures of positive and negative affect. These were based on ONS wellbeing survey questions on a scale of 1 (low) to 10 (high) (ONS 2021). We excluded ONS components of ‘life satisfaction’ and ‘life being worthwhile’ from our analysis as these are better suited to longitudinal studies rather than before / after visit assessments, and the complexity of controlling for factors affecting them is out of the scope of this research. Although these metrics cannot be compared to those for clinical diagnosis, such measures have been well used and validated and provide reliable indicators of wellbeing for a sample with unknown mental health status (ONS 2021). The use of ONS questions and scale also enabled us to assess the baseline wellbeing of our self-selecting sample in relation to the wider population; pre-visit responses are line with those reported at a population level during the study period (Sofaer et al., Forthcoming). Participants were also asked to self-assess the ‘overall wellbeing effect of the visit’ on a scale of 1 (low) to 10 (high).

Analysis

Using principal component analysis (PCA) in SPSS, exploratory factor analysis was applied to consolidate survey answers on the qualities of place and the effects of the visit into a shorter set of factors that describe 'place qualities' and 'effects of the visit' identified by participants. This allows us to detect the constructs that underlie a dataset based on the correlations between variables (Tabachnick and Fidell, 2013). The approach for factor extraction followed here included the creation of a scree plot and eigenvalue for each of these question sets in the survey instrument (see Cattell, 1966, Thompson, 2004). Scree tests plot eigenvalues against the number of factors in order to best determine where a significant drop occurs within factor numbers (Netemeyer et al., 2003). The factor solution was determined based on the number of eigenvalues greater than one. Following recommendations by Floyd and Widaman (1995), 0.30 was used as the factor loading criterion. The rotation method used was Varimax with Kaiser Normalization. Sample sizes for each item exceed the minimum required for reliable factor analysis (Boomsma, 1982; Comrey and Lee, 1992). Reliability tests were applied to test the internal consistency of the factor structure proposed by the analysis.

The factor analysis was used to calculate a set of composite variables representing the new constructs. These were then used to perform inferential statistical tests including linear regression models and one-way Anova tests in order to identify whether some qualities of place and effects of the visit are core predictors of overall wellbeing effects, positive affect and negative affect following the visit, controlling for age and gender. For changes in positive and negative affect, pre-visit baseline well-being and anxiety scores were also included in the model. Previous analysis suggests that visitors with lower initial well-being scores, and higher initial anxiety scores, may experience greater change (Sofaer et al., Forthcoming).

Missing data was random and less than 10% of the whole. Thus, for the PCA, list wise deletion of cases was applied to deal with missing data. For the regression analysis, participant scores for each composite variable were calculated as the mean of individual participant scores for components within a factor. When more than 2 components of a composite variable had missing values, these were replaced with the series mean.

Statistical analysis

Qualities of Place: The PCA for qualities of place converged in 6 iterations and resulted in extraction of 3 factors explaining 54.4% of variance (Table 1; Appendix 3). These summarise the qualities of place by which people make discriminatory judgments and cross-cut the construction of categories proposed by ART:

Factor 1 primarily represents 'physical attributes of place' ('Green space', 'It is open and spacious', 'It is accessible', 'I can explore', 'People are kind and helpful'). The composition of this variable suggests that the physical affordances of heritage sites are linked to opportunities to access them.

Factor 2 primarily represents 'character of place' ('There is lots to do', 'Interesting architecture', 'Special atmosphere', 'I feel that it belongs to me'). This variable brings together aesthetic, activity and relationship-based characteristics of the historic environment.

Factor 3 represents experience of the 'community and sensory

Table 1

Component transformation matrix for qualities of place.

Component	1: 'Physical attributes of place'	2: 'Character of place'	3: 'Community and sensory aspects of place'
1	0.639	0.529	0.558
2	-0.538	0.826	-0.167
3	-0.549	-0.193	0.813

aspects of place' ('A sense of community', 'It is well maintained', 'It is quiet and peaceful', and 'Sensory experiences').

Effects of the Visit: The PCA for the effects of the visit converged in 3 iterations and led to extraction of two factors explaining 49.5% of variance (Table 2; Appendix 3). These factors cross-cut elements of the question set derived from Van den Berg et al. (2014) restorative effects scale which are associated with the 'being away' construct of ART:

Factor 1 represents 'relaxing, stress reducing and hedonic effects' It is composed of restorative effects including stress reduction and effects linked to feelings of hedonic wellbeing including: 'I lose sense of time', 'I can take time out of a busy life', 'My mind is not invaded by stressful thoughts', 'I feel good about myself', 'I can exercise'.

Factor 2 represents 'ontological security and life-purpose effects' including: 'I feel connected to the past', 'I can make space to think', 'I can heal', 'A sense of security', 'I feel better able to deal with life's difficulties', 'I can leave my problems behind', 'Being here gives purpose to my day'.

The internal consistency of the factors extracted from questions on the Qualities of Place and the Effects of the Visit was tested using Cronbach's Alpha (Table 3). For the Qualities of Place, the results suggest good internal consistency for the 'physical attributes' of place, and acceptable values for the 'character of place' and 'community and sensory attributes of place' (all Cronbach's Alpha thresholds over 95% CI=0.65). For the Effects of the Visit, the results indicate good internal consistency for 'relaxing, stress reducing and hedonic effects', and high internal consistency for 'ontological security and life purpose effects'. Although loadings are not equal across all items, these results suggest that regression analysis using composite variables based on these factors is justified in the context of this paper.

Results

In order to understand whether some qualities of place and effects of the visit are core predictors of overall wellbeing effects, the new construct variables were used to develop linear regression models. The results of the linear regression analysis show that age, gender, 'physical attributes of place', 'community and sensory aspects of place' and 'relaxing, stress reducing and hedonic effects' were significant predictors for the self-reported overall wellbeing effect of the visit. The regression equation indicates 34.3% explanatory power of the model based on all predictors included ($R^2 = 0.343$, $F(7, 689) = 50.84$, $p < 000$). 'Relaxing, stress reducing and hedonic effects' recorded particularly high beta coefficient values ($b = 0.406$, $t = 9.813$, $p < 000$), suggesting that overall wellbeing effect is strongly predicted by scores in this composite variable (Table 4).

For the positive affect element of wellbeing, the regression equation indicates 68.8% explanatory power of the model based on all predictors included ($R^2 = 0.688$, $F(8, 685) = 186.250$, $p < 000$). The model has three significant predictors: 'character of place', 'relaxing, stress reducing and hedonic effects', and pre-visit positive affect score. The latter is the strongest predictor of increase in positive affect following a visit to a heritage site ($b = -0.826$, $t = -36.408$, $p < 000$) (Table 5); the lower the initial level of positive affect, the greater the effect of the visit. In this model, neither age nor gender are predictors of wellbeing outcome, suggesting that all groups of visitors may experience benefits related to exposure to the historic environment.

For the negative affect element of wellbeing, the regression equation indicates 34.8% explanatory power of the model based on all predictors included ($R^2 = 0.348$, $F(8, 669) = 44.184$, $p < 000$). There are five

Table 2

Component transformation matrix for effects of the visit.

Component	1: Emotional safety	2: Relaxation and hedonic effect
1	0.776	0.630
2	-0.630	0.776

Table 3
Cronbach's Alpha for extracted factors.

New Construct Variable Qualities of Place	Cronbach's Alpha
Physical attributes of place	$\alpha = 0.706$
Character of place	$\alpha = 0.648$
Community and sensory attributes of place	$\alpha = 0.672$
New Construct Variable Effects of the Visit	Cronbach's Alpha
Relaxing, stress reducing and hedonic effects	$\alpha = 0.733$
Ontological security and life-purpose effects	$\alpha = 0.823$

Table 4
Predictor variable coefficients for overall wellbeing regression model.

	Standardized Coefficients Beta	t	Sig.
(Constant)		3.430	0.001
Age	0.136	4.267	0.000
Gender	-0.113	-3.590	0.000
Physical attributes of place	0.101	2.380	0.018
Character of place	0.065	1.748	0.081
Community and sensory aspects of place	0.118	2.841	0.005
Relaxing, stress reducing and hedonic effects	0.406	9.813	0.000
Ontological security and life-purpose effects	0.002	0.038	0.969

Table 5
Predictor variable coefficients for positive affect regression model.

	Standardized Coefficients Beta	t	Sig.
(Constant)		6.114	0.000
Age	0.025	1.113	0.266
Gender	-0.015	-0.666	0.506
Physical attributes of place	0.037	1.273	0.203
Character of place	0.067	2.621	0.009
Community and sensory aspects of place	0.052	1.816	0.070
Relaxing, stress reducing and hedonic effects	0.141	4.779	0.000
Ontological security and life-purpose effects	0.006	0.192	0.848
Pre-visit positive affect score	-0.826	-36.408	0.000

significant predictors for change in anxiety, of which one is positive and four are negative: gender (at the limit of significance), 'physical attributes of place' ($b = -0.129, t = -3.018, p < 003$), 'community and sensory aspects of place' ($b = 0.119, t = 2.862, p < 004$), 'relaxing, stress

Table 6
Predictor variable coefficients for negative affect regression model.

	Standardized Coefficients Beta	t	Sig.
(Constant)		3.136	0.002
Age	0.035	1.076	0.282
Gender	-0.062	-1.940	0.053
Physical attributes of place	-0.129	-3.018	0.003
Character of place	0.020	0.528	0.598
Community and sensory aspects of place	0.119	2.862	0.004
Relaxing, stress reducing and hedonic effects	-0.085	-2.024	0.043
Ontological security and life-purpose effects	0.019	0.434	0.664
Pre-visit negative affect score	-0.579	-17.977	0.000

reducing and hedonic effects' ($b = -0.361, t = -2.024, p < 043$), and pre-visit anxiety score ($b = -0.579, t = -17.977, p < 000$) (Table 6). Pre-visit negative affect score is a strong predictor of anxiety reduction following a visit to a heritage site; the higher the initial level of anxiety, the lower the score following a visit and thus the greater the reduction in negative affect as a predicted effect of the visit.

Our results reveal that different qualities of place are predictors for changes in positive and negative affect elements of wellbeing (Table 7). Whereas 'character of place' is a predictor for change in positive affect, the 'physical attributes of place' and 'community and sensory attributes of place' are predictors for change in negative affect.

Discussion

This study is novel in that most research on ART has been done in natural environments with a result that the focus of data collection has been on restoration, as visiting 'green sites' is usually seen to be motivated by a desire for stress alleviation and reducing the pressures of modern urban life. But as we have pointed out, this study is unique in that it is centred on heritage destination sites where the source of restoration is to a degree arousing and stimulating. Thus, we believe that our study is of value as it identifies different kinds of stimulus variables on the attention side of the equation.

Factor analysis allowed us to extract three core constructs relating to qualities of place ('physical attributes of place', 'character of place', and 'community and sensory aspects of place'), and two core constructs relating to the effects of the visit ('relaxing, stress reducing and hedonic effects', and 'ontological security and life purpose effects'). These reflect the overall experiences of visitors to heritage sites. The factors largely have good internal consistency, suggesting that although some refinement may be useful, these constructs and our survey instrument can be recommended as the basis for future work at heritage sites in England.

Our extracted factor loadings differ from similar analyses previously carried out for nature engagement as they do not align with the priori structure suggested by ART in terms of Extent, Fascination, Compatibility and Being-Away. This may be due to the complexity of affordances and interactions that take place at heritage sites. Heritage sites are environments that bring together the natural and the cultural, that enable activities, and where meanings of place may become redefined through activities therein. How the affordances of a place may be related to its socially constructed perception, its sensory qualities, and how these can change over the life course have recently started to gain attention in environmental psychology (Raymond et al., 2017). Human responses to recreational spaces involve environmental, social, psychological and cultural factors that construct meanings of people-place interactions (Stedman, 2003; Lund, 2012). In the context of visits to heritage sites, bonds to place are affected by strong cultural factors mediated through cultural and identity meaning making processes. Thus the ways in which the affordances of historic places bring together cognitive and affective components is particularly challenging and deserves further attention.

Our composite variables for the qualities of place suggest that visitors to heritage sites perceive a relationship between the physical affordances of sites and opportunities to access them. Likewise, the relationship we find between community and sensory experiences suggests links between interpersonal relations and aspects of sensory experiences, although further work is needed to explore the causal pathways linking these. In terms of the effects of the visit our two composite variables suggest a distinction between restorative effects related to hedonic effects, and those related to ontological security and life-purpose effects which may be eudaimonic in nature. Although our variables and factors differ, this aligns with Laumann et al. (2001) who suggest that the different components of ART may play contrasting roles in promoting restoration related to relaxation and cognitive restoration. Our findings thus provide space for further reflection on the application of ART and the factorial structure of PRS within the historic environment.

Although further work is required to establish causal mechanisms,

Table 7

Summary of regression model outputs indicating variables that are significant predictors of wellbeing components.

Model	Significant Predictors								
	Age	Gender	Physical Attributes of Place	Character of Place	Community and Sensory Aspects of Place	Relaxing, Stress-reducing and Hedonic Effects	Ontological Security and Life Purpose Effects	Pre-visit Positive Affect Score	Pre-visit Negative Affect Score
1. Overall Wellbeing Effect	x	x	x		x	x			
2. Change in Positive Affect				x		x		x	
3. Change in Negative Affect		x (limit)	x		x	x			x

our regression analyses suggest that heritage sites in England provide a physical and social infrastructure where opportunities to access and engage with the historic environment foster overall wellbeing effects. This includes facilitating exercise which improves mood and mental wellbeing (Rogerson et al., 2020), while a sense of community constitutes a core mechanism for yielding mental health benefits (Dingle et al., 2021; Haslam et al., 2018). These empirical findings align with qualitative research where the built environment has been identified as important to supporting heritage-related community initiatives and human interaction with historic artefacts (Smith, 2006). Age and gender are further predictors for the present study, indicating a link between individual need and self-reported wellbeing. Further work is needed to explore the perceived benefits of heritage sites in relation to a wider range of socio-demographic factors.

Our finding that different qualities of place are predictors for changes in positive and negative affect elements of wellbeing highlights the importance of understanding the attentional causes of restorative effects. It suggests that visits to sites with different qualities might be directed towards different wellbeing needs. Where visits to sites include combinations of predictors, these may be particularly powerful in creating wellbeing effects. Such effects are most strongly predicted by low pre-visit well-being and high pre-visit levels of anxiety. These results offer strong evidence for the potential therapeutic effects of self-directed visits to heritage sites.

Although 'relaxing, stress reducing and hedonic effects' are an important predictor for all regression models, the absence of 'ontological security and life purpose effects' as a significant predictor is surprising given the importance of those components to the visitor experience within our qualitative data (see Sofaer et al., 2021). Further work on 'soft' vs 'hard' fascination and their relationship to restorative effects, and comparing the effects of heritage and nature engagement, is needed to understand this difference and to gain insights into the implications of different forms of attention for restoration. It is possible that some aspects of on-site experience may be associated with more frequent visits and familiarisation with particular kinds of heritage sites, since they demand greater appreciation of the historical context of place. Future research may also better capture 'ontological security and life purpose effects' by developing validated metrics suited for use in historic environments. Some elements of experience important for historic places may differ across types of sites and are arguably hard to capture through single-line survey statements (see Lewicka, 2011). Nonetheless, our results provide a foundation to test the restorative qualities of heritage sites and to begin to understand different kinds of wellbeing experienced through exposure to historic environments.

Limitations

The self-selecting nature of our sample, its lack of ethnic diversity, and the cultural specificity of the sites studied in this research mean that caution should be exercised in extrapolating evidence for the wellbeing

effects of visits to heritage sites in England reported by our participants to other settings and diverse ethnic groups. Heritage sites are places in which there is "a complex cultural interaction between people, place and memory" (Smith, 2006, p.272). The heritage sector is increasingly aware of the impact of colonial histories on present-day inequities (e.g., Carter et al., 2014, Huxtable et al., 2020) but there is currently little empirical data on the potentially complex wellbeing effects of visits in relation to this. It is also possible that there may be differences in visitor experience between places where difficult histories are acknowledged and those where they are not (see Smith, 2021). However, we also caution against the simplistic assumption that visits to 'difficult heritage' are necessarily bad for all visitors and for all aspects of wellbeing. Whilst hedonic pleasure may not be experienced, such visits may have eudaimonic benefits (Filep, 2016). To understand the complexity of these kinds of heritage interactions requires closer attention to site histories and the development of an analytical approach beyond subjective wellbeing employed here. We encourage further research that can add those dimensions to visitor perceptions on the basis of suitable, purposeful sampling frames and mixed methods approaches.

Conclusion

The affordances of heritage sites arise from both physical and cultural experiences. This poses challenges in terms of identifying what attributes of such places may enhance visitor wellbeing. This study identifies a set of constructs that can be measured to better understand visitor perceptions of qualities of place and the effects of a self-directed visit to heritage sites in England. We find that the affordances of heritage sites facilitate restoration and are important predictors for the wellbeing outcomes of visits to heritage sites.

This study offers a first step in applying ART to historic environments. Although the distinctive attributes of heritage sites may be inferred from previous research studies, the value of this paper lies in the development and testing of a theoretically-driven survey instrument for the wellbeing effects of visits to heritage sites. The results of the regression analysis provide empirical evidence for the wellbeing benefits of particular affordances provided by historic places. Thus, different qualities of place may contribute differently to wellbeing needs by increasing positive affect and reducing negative affect elements of wellbeing. Our work therefore provides initial insights into the attentional causes of restoration at heritage sites.

The results of the study provide evidence for potential therapeutic benefits of self-directed visits to heritage sites at a time of exceptional wellbeing need. This has implications for development of policy aimed at supporting public health and wellbeing. In particular, the wellbeing benefits derived from self-directed visits to heritage sites provide a means by which to respond to calls to maximise use of existing resources and to promote self-help to address the scale of a potential long-term crisis in wellbeing triggered by the COVID-19 pandemic (Campion et al., 2020). This may require initiatives to increase public recognition

of the wellbeing benefits of visits to historic places. The research results also lead us to suggest that the public health function of heritage sites may be further harnessed by site management strategies that sensitively support the affordances of sites for visitor wellbeing. For example, by capitalising on the potential of heritage sites as social spaces that connect people, in tandem with the heritage protection that is critical to maintaining the physical attributes and character of historic places, and facilitating the restorative effects of visits to heritage sites for different groups of visitors.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

We would like to thank the anonymous referees for their thoughtful comments. We also thank Historic England and The Heritage Alliance for supporting the Places of Joy: Heritage After Lockdown project, as well as staff and visitors at the sites where we conducted fieldwork.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.wss.2022.100106.

References

- Ander, E., Thomson, L., Noble, G., Lanceley, A., Menon, U., Chatterjee, H., 2013. Heritage, health and well-being: assessing the impact of a heritage focused intervention on health and well-being. *Int. J. Herit. Stud.* 19 (3), 229–242.
- Barton, J., Hine, R., Pretty, J., 2009. The health benefits of walking in greenspaces of high natural and heritage value. *J. Integr. Environ. Sci.* 6 (4), 261–278.
- Baxter, L., Burnell, K., Everill, P., Burnell, K., 2022. What is wellbeing and how do we measure and evaluate it? *Archaeology, Heritage, and Wellbeing. Authentic, Powerful, and Therapeutic Engagem narratives* With the Past. Routledge, pp. 7–25.
- Berto, R., 2005. Exposure to restorative environments helps restore attentional capacity. *J. Environ. Psychol.* 25 (3), 249–259.
- Boomsma, A., Wold, H., Jöreskog, K., 1982. The robustness of LISREL against small sample sizes in factor analysis models. *Systems Under Indirect Observations*. New York: Elsevier North-Holland, pp. 147–173.
- Burnett, H., Olsen, J.R., Nicholls, N., Mitchell, R., 2021. Change in time spent visiting and experiences of green space following restrictions on movement during the COVID-19 pandemic: a nationally representative cross-sectional study of UK adults. *BMJ Open* 11 (3), e044067.
- Campion, J., Javed, A., Sartorius, N., Marmot, M., 2020. Addressing the public mental health challenge of COVID-19. *Lancet Psychiatry*. [https://doi.org/10.1016/S2215-0366\(20\)30240-6](https://doi.org/10.1016/S2215-0366(20)30240-6).
- Carter, P., Butler, D.L., Alderman, D.H., 2014. The house that story built: the place of slavery in plantation museum narratives. *Prof. Geogr.* 66 (4), 547–557. Oct 2.
- Cattell, R.B., 1966. The scree test for the number of factors. *Multivar. Behav. Res.* 1 (2), 245–276.
- Comrey, A.L., Lee, H.B., 1992. *A First Course in Factor Analysis*, 2nd ed. Erlbaum, Hillsdale, NJ.
- Darvill, T., Barrass, K., Drysdale, L., Heaslip, V., Staelens, Y., 2019. *Historic Landscapes and Mental Well-Being*. Archaeopress, Oxford.
- Dingle, G.A., Sharman, L.S., Haslam, C., Donald, M., Turner, C., Partanen, R., Lynch, J., Draper, G., van Driel, M.L., 2021. The effects of social group interventions for depression: systematic review. *J. Affect. Disord.* 281, 67–81.
- Dolan, P., 2014. *Happiness by Design: Change What You Do, Not How You Think*. Penguin.
- Eid, M., Diener, E., 2004. Global judgments of subjective well-being: situational variability and long-term stability. *Soc. Indic. Res.* 65 (3), 245–277.
- Fairclough, G., 2003. *The long chain: archaeology, historical landscape characterization and time depth in the landscape*. Landscape Interfaces. Springer, Dordrecht, pp. 295–318.
- Fan, J., McCandliss, B.D., Sommer, T., Raz, A., Posner, M.I., 2002. Testing the efficiency and independence of attentional networks. *J. Cogn. Neurosci.* 14, 340–347.
- Filep, S., 2016. Tourism and positive psychology critique: too emotional. *Ann. Tour Res.* 59 (C), 113–115.
- Floyd, F.J., Widaman, K.F., 1995. Factor analysis in the development and refinement of clinical assessment instruments. *Psychol. Assess.* 7 (3), 286.
- Fujiwara, D., Kudrna, L., Dolan, P., 2014. *Quantifying and Valuing the Wellbeing Impacts of Culture and Sport*. Department for Culture Media and Sport Research Paper.
- Gesler, W.M., 1992. Therapeutic landscapes: medical issues in light of the new cultural geography. *Soc. Sci. Med.* 34 (7), 735–746.
- Gibson, J., 1979. *The Ecological Approach to Visual Perception*. Houghton Mifflin, Boston, MA.
- Grenville, J., 2007. Conservation as psychology: ontological security and the built environment. *Int. J. Herit. Stud.* 13 (6), 447–461.
- Grossi, E., Tavano Blessi, G., Sacco, P.L., 2019. Magic moments: determinants of stress relief and subjective wellbeing from visiting a cultural heritage site. *Cult. Med. Psychiatry* 43 (1), 4–24.
- Han, K.T., 2003. A reliable and valid self-rating measure of the restorative quality of natural environments. *Landscape Urban Plan.* 64, 209–232.
- Harrison, R., 2010. *What is heritage. Understanding the Politics of Heritage*. Manchester University Press.
- Hartig, T., Kaiser, F.G., Bowler, P.A., 1997. Further development of a measure of perceived environmental restorativeness. *Inst. Bostads-Och Urbanforskning*.
- Harvey, D.C., Howard, P., Graham, B., 2016. *The history of heritage*. The Routledge Research Companion to Heritage and Identity. Routledge, pp. 19–36.
- Haslam, S.A., McMahon, C., Cruwys, T., Haslam, C., Jetten, J., Steffens, N.K., 2018. Social cure, what social cure? The propensity to underestimate the importance of social factors for health. *Soc. Sci. Med.* 198, 14–21.
- Heaslip, V., Vahdaninia, M., Hindi, M., Darvill, T., Staelens, Y., O'Donoghue, D., Sutcliffe, T., 2020. Locating oneself in the past to influence the present: impacts of neolithic landscapes on mental health well-being. *Health Place* 62, 102273.
- Herzog, T.R., Maguire, C.P., Nebel, M.B., 2003. Assessing the restorative components of environments. *J. Environ. Psychol.* 23, 159–170.
- Hidalgo, M.C., Hernández, B., 2001. Place attachment: conceptual and empirical questions. *J. Environ. Psychol.* 21 (3), 273–281.
- Huxtable, S.A., Fowler, C., Kefalas, C., Slocumbe, E., 2020. Interim report on the connections between colonialism and properties now in the care of the national trust, including links with historic slavery. *Prog. Migraine Res.*
- Jorgensen, A., Dobson, S., Heatherington, C., 2017. Parkwood springs—a fringe in time: temporality and heritage in an urban fringe landscape. *Environ. Plan. A* 49 (8), 1867–1886.
- Kaplan, S., 1995. The restorative benefits of nature: toward an integrative framework. *J. Environ. Psychol.* 15, 169–182.
- Korpela, K.M., Hartig, T., Kaiser, F.G., Fuhrer, U., 2001. Restorative experience and self-regulation in favorite places. *Environ. Behav.* 33 (4), 572–589.
- Kopec, D., Bliss, A., 2020. *Place Meaning and Attachment: Authenticity, Heritage and Preservation*. Routledge.
- Laumann, K., Gärling, T., Stormark, K.M., 2001. Rating scale measures of restorative components of environments. *J. Environ. Psychol.* 21 (1), 31–44.
- Lewicka, M., 2011. Place attachment: how far have we come in the last 40 years? *J. Environ. Psychol.* 31, 207–230.
- Lund, K., 2012. Landscapes and narratives: compositions and the walking body. *Landscape Res.* 37 (2), 225–237.
- Martella, F., Sheldon, K., 2019. Clarifying the concept of well-being: psychological need satisfaction as the common core connecting eudaimonic and subjective well-being. *Rev. Gen. Psychol.* 23 (4), 458–474.
- Menardo, E., Brondino, M., Hall, R., Pasini, M., 2021. Restorativeness in natural and urban environments: a meta-analysis. *Psychol. Rep.* 124 (2), 417–437.
- Netemeyer, R.G., Bearden, W.O., Sharma, S., 2003. *Scaling Procedures: Issues and Applications*. Sage Publications.
- New Economics Foundation (2012). *Measuring well-being. A guide for practitioners*. https://b3cdn.net/nefoundation/8d92cf44e70b3d16e6_rgm6bpd3i.pdf [Accessed December 2021].
- Nolan, C., 2019. Prehistoric landscapes as a source of ontological security for the present day. *Herit. Soc.* 12 (1), 1–25.
- Ohly, H., White, M.P., Wheeler, B.W., Bethel, A., Akoumune, O.C., Nikolaou, V., Garside, R., 2016. Attention restoration theory: a systematic review of the attention restoration potential of exposure to natural environments. *J. Toxicol. Environ. Health* 19 (7), 305–343. Part B.
- ONS (Office for National Statistics) (2021). *ONS opinions and lifestyle survey, COVID-19 Module, 2020-2021*. UK Data Service. SN: 8635.
- ONS (Office for National Statistics), 2012. *Ethnicity and National Identity in England and Wales: 2011*. <https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/articles/ethnicityandnationalidentityinenglandandwales/2012-12-11>.
- Pasini, M., Berto, R., Brondino, M., Hall, R., Ortner, C., 2014. How to measure the restorative quality of environments: the PRS-11. *Procedia Soc. Behav. Sci.* 159, 293–297.
- Pasini, M., Berto, R., Scopelliti, M., Carrus, G., 2009. Measuring the restorative qualities of the environments: contribution to the validation of the Italian version of the perceived restorativeness scale. *Boll. Psicol. Appl.* 257, 3–11.
- Pennington, A., Jones, R., Bagnall, A.M., South, J., and Corcoran R. (2018). *The impact of historic places and assets on community wellbeing - a scoping review*. London: What Works Centre for Wellbeing. <https://whatworkswellbeing.org/resources/heritage-and-wellbeing-2/>.
- Powell, J.R., Lake, J., Berry, R., Gaskell, P., Courtney, P., and Smith, K. (2020). *Heritage, natural capital and ecosystem services: historic buildings and their associated boundaries*. Project Report. Historic England, Portsmouth.
- Raymond, C.M., Kytä, M., Stedman, R., 2017. Sense of place, fast and slow: the potential contributions of affordance theory to sense of place. *Front. Psychol.* 8, 1674.
- Rogerson, M., Wood, C., Pretty, J., Schoenmakers, P., Bloomfield, D., Barton, J., 2020. Regular doses of nature: the efficacy of green exercise interventions for mental wellbeing. *Int. J. Environ. Res. Public Health* 17 (5), 1526.

- Sayer, F., 2015. Can digging make you happy? Archaeological excavations, happiness and heritage. *Arts Health* 7 (3), 247–260.
- Scannell, L., Gifford, R., 2010. Defining place attachment: a tripartite organizing framework. *J. Environ. Psychol.* 30 (1), 1–10.
- Scopelliti, M., Carrus, G., Bonaiuto, M., 2019. Is it really nature that restores people? A comparison with historical sites with high restorative potential. *Front. Psychol.* 9. www.frontiersin.org/article/10.3389/fpsyg.2018.02742.
- Smith, L., 2006. *Uses of Heritage*. Routledge.
- Smith, L., 2021. *Emotional Heritage: Visitor Engagement At Museums and Heritage Sites*. Routledge.
- Sofaer, J., Gallou, E. and Davenport, B. Forthcoming. *Heritage Blindness*.
- Sofaer, J., Davenport, B., Sørensen, M.L.S., Gallou, E., Uzzell, D., 2021. Heritage sites, value and wellbeing: learning from the COVID-19 pandemic in England. *Int. J. Herit. Stud.* 1–16.
- Stedman, R., 2003. Is it really just a social construction?: the contribution of the physical environment to sense of place. *Soc. Nat. Resour.* 16, 671–685. <https://doi.org/10.1080/08941920309189>.
- Tabachnick, B.G., Fidell, L.S., 2013. *Using Multivariate Statistics*. Pearson.
- Thompson, B., 2004. *Exploratory and Confirmatory Factor Analysis: Understanding Concepts and Applications*. American Psychological Association, Washington DC.
- Twigger-Ross, C.L., Uzzell, D.L., 1996. Place and identity processes. *J. Environ. Psychol.* 16, 205–220.
- Van den Berg, A.E., Jorgensen, A., Wilson, E.R., 2014. Evaluating restoration in urban green spaces: does setting type make a difference? *Landsc. Urban Plan.* 127, 173–181.
- Vining, J., Orland, B., 1989. The video advantage: a comparison of two environmental representational techniques. *J. Environ. Manag.* 29, 275–283.
- Williams, D.R., 2014. Making sense of “place”: reflections on pluralism and positionality in place research. *Landsc. Urban Plan.* 131, 74–82.