**Autism Spectrum Condition and the Built Environment: New Perspectives on Place Attachment and Cultural Heritage**

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**Abstract**

Values have long provided essential foundation for cultural heritage policy and practice. Traditionally these values were determined by practitioners, suitably trained and qualified, and employed by heritage agencies with responsibility for managing and protecting heritage for society and the future. But these values tended to focus on a single authorised and normative view of the past, excluding the perspectives of those people with a different outlook. More recently, heritage values have been applied with greater flexibility, yet this requires a good understanding of why perspectives vary. In some areas, we think this understanding may be deficient. In this paper we set out new findings which demonstrate that individuals with autism, in comparison with neurotypical individuals, engage with the built heritage around them in different ways, and have a differing perception of buildings and places which affects the type of attachments that they form towards them. Only through understanding such differences and their implications can heritage strategies be established that can genuinely extend to and include everyone in society.

**Keywords:** Heritage, Historic environment, Place attachment, Architecture, Autism Spectrum Condition.

**Introduction**

In this study, we considered how individuals with autism (the ‘AT sample’), in comparison with neurotypical individuals (the ‘NT sample’), engage with the built heritage around them, how their differing perception of buildings affects the attachments they formed towards them, and what features of those buildings they found significant, developing the first large-scale survey of its kind. We undertook this study in the context of two related fields of research. One is research into the characteristics of Autism Spectrum Condition (ASC). The second is critical heritage studies, with its focus on creating methods and perspectives that recognise diversity, difference and equality. We begin with a review of autism research before presenting the methodology and results of our study. We then frame these results in the context of some relevant heritage frameworks.

**Autism and attachment**

At museum and heritage sites there is recognition that inclusivity is important[[1]](#endnote-1), with museums often providing additional resources to engage diversity[[2]](#endnote-2). Yet much of the literature on accessibility has focussed on physical disability, with less attention paid to ‘unseen’ disabilities or differences, the assumption being that more evidence is needed to inform practice and policy in this area. With respect to ASC specifically, alongside general recommendations such as periods with reduced visitors and less noise or light stimulation, giving more attention to ‘ASC-friendly’ architectural and functional details would contribute to making such specific heritage attractions more inclusive.

As various recent studies have shown, approximately 0.5-2% of the population has an Autism Spectrum Condition (ASC)[[3]](#endnote-3). ASCs are typically associated with social, perceptive and behavioural differences and there is growing evidence that fundamental differences in brain connectivity from neurotypical people underlie differences in cognitive functioning[[4]](#endnote-4), leading to large differences in the way that individuals engage with the world. The World Health Organisation[[5]](#endnote-5) describes ASCs as a collection of conditions where there is impaired social behaviour, communication and language, with a narrow range of interests, preoccupations and repetitive behaviours. The social world for people with ASC is therefore likely to be smaller with less use of empathy in interactions[[6]](#endnote-6). These differences are related to less well developed brain empathy networks[[7]](#endnote-7) and a more prominent focus on logical, literal, concrete perceptions of surroundings or events[[8]](#endnote-8). People with ASCs are often drawn to specific detail rather than the broader picture. Although there is variance between studies[[9]](#endnote-9), discrepancies based upon geographical, cultural or socioeconomic differences are not supported[[10]](#endnote-10).

People with ASC often have difficulties understanding how other people think and feel, causing social differences and problems in everyday life. This is due to delays and atypicalities in the development of these empathy skills, known in psychology as ‘Theory of Mind’[[11]](#endnote-11). Thus predicting the social world becomes much more difficult. Understanding metaphor, subjective topics, the emotions and motivations of others, and the nuances necessary when conversing with different groups, can also be difficult[[12]](#endnote-12). Conversational reciprocity is also challenging for people with ASC[[13]](#endnote-13) thus altering the way individuals socialize. As Ochs and Solomon[[14]](#endnote-14) have observed, people with ASC prefer objective topics, and have a preference to relate to details which would seem unimportant to neurotypical individuals but are important and relevant for individuals with ASC. Due to these differences, they may become isolated and uncertain, which can lead to depression and anxiety[[15]](#endnote-15).

Alongside these social and empathy differences are differences in the way people with ASC process information from their environment[[16]](#endnote-16), notably a cognitive perceptual style that leads people with ASC to be drawn to the detail in their environments and thus an orientation towards inanimate objects and geometric shapes[[17]](#endnote-17). Frequently comfort is derived from these objects[[18]](#endnote-18), and individuals may develop an extraordinarily strong bond with particular items[[19]](#endnote-19). For example, Forrester-Jones and Broadhurst[[20]](#endnote-20) describe the case of Jenny, an individual with ASC, using gemstones to calm herself when overwhelmed. She has a strong bond to these objects and knows every detail of them, to the extent that she does not process information when looking at them. This enables her to block out the external world and calm herself. Thus, the stability and certainty of the objects provides comfort when the unpredictability of the social world cannot. Further, individuals who score high on Baron-Cohen et al.’s[[21]](#endnote-21) Autism Quotient (AQ) test place value on objects differently[[22]](#endnote-22). Firstly, they are more likely to still possess their favourite childhood object, suggesting a stronger bond towards it. Secondly, during a disaster scenario they are likely to take more functional or entertaining objects rather than the sentimental reminders of social relationships that individuals with lower AQ scores tend to select. This suggests that individuals with a high AQ have different priorities when assigning value to objects.

Thus far, we have determined that individuals with ASC assign value differently to topics when socializing and to objects. Consequently, we have shown that these individuals’ relationships with objects and with people differ from neurotypical individuals. Logically it would follow that their relationships with the built environment, and the value they assign to particular aspects of it may also be different. This has never previously been studied.

That said, understanding how ASC has influenced building *design* has been the subject of research and practice[[23]](#endnote-23). It is known, for example, that buildings designed for individuals with more severe forms of ASC can be carefully organized to reduce the chances of overstimulation[[24]](#endnote-24), for example by limiting loud sounds and flickering lights. Rather, buildings would ideally have interesting features such as curved walls, harmonious proportions, a predictable layout, and the ability for the user to control environmental conditions within rooms[[25]](#endnote-25). Dong and Heylighen[[26]](#endnote-26) have also noted that designers with ASC use different cognitive abilities to construct their work. It follows that buildings that do not follow these rules, including those considered significant to the wider community, could lead to discomfort in individuals with more severe forms of ASC. These design principles demonstrate how individuals with ASC find comfort in the certainty of the built environment, when the social and political world is frequently uncertain[[27]](#endnote-27). Further, Willey[[28]](#endnote-28) has described how a single aspect of a building (e.g. a small alcove) may provide comfort. This also aligns with Grenville’s[[29]](#endnote-29) arguments around ontological security, and may add a significant new dimension to the ideas she presents. Place can therefore bring comfort and stability to people with ASC, a principle that one assumes will translate into their attitudes towards the historic built environment.

A further principle that is assumed to have relevance concerns change. Individuals with ASC are associated with increased sensitivity and resistance to change. Smith and Milne[[30]](#endnote-30)tested and confirmed that adolescents with ASC were better able to identify continuity errors in a short film, suggesting that this is due to enhanced perceptual abilities. Gomot and Wicker[[31]](#endnote-31) have suggested that an increase in sensory abilities at the expense of more context based, integrative, predictive cognition may lead to more stressful reactions to change. An extreme example of this is Donna Williams[[32]](#endnote-32), an artist, musician and author with Autism, who struggles to recognise objects if they are not in their expected place. This is likely caused by processing information through ‘sensing’ and identifying patterns rather than through strict definition and interpretation. Due to this, when an individual with severe ASC moves house they may struggle to identify it as ‘home’. As Forrester-Jones and Broadhurst[[33]](#endnote-33) put it,

‘...their concept of “home” is different. Their idea of “home” was based upon a mixture of smells, feelings, patterns and themes, and “their things” being in the right places, rather than a building made of bricks and mortar with a bedroom where they slept. What they will be aware of is that nothing “feels” the same whilst having no concept of where the familiar patterns, themes and feelings have gone’.

Further, Forrester-Jones and Broadhurst[[34]](#endnote-34) have stated that small changes for an individual with Autism may cause ‘a total change in their world’. Due to their focus upon objects and places rather than social contacts, the emotional effects of their loss are accentuated even if that loss is only temporary[[35]](#endnote-35).

In summary, a significant minority of the population exists who may be more perceptive of change, experience stressful reactions and difficulties with change, and may not be able to contextualize changes all leading to stress and uncertainty. Individuals with ASC may also have different, often stronger, relationships with objects and buildings, and favour particular types of buildings and places. For an often neglected sector of the population the built environment may offer a sense of security which is largely invisible to others. The importance of understanding these relationships is the subject of this research.

With some key characteristics of ASC defined, and the importance of the built environment to individuals with ASC strongly implicated, the remainder of this paper will explore whether there are differences in the features of the built environment which hold significance for individuals with ASC. We hope that by assessing these differences the viewpoint of individuals with ASC can be better recognized and taken into account in a range of processes and associated decision making across the heritage sector.

**Approach**

This study aimed to test, for the first time, the hypothesis that individuals with Autism Spectrum Condition hold different values and perceptions of the historic built environment and priorities for shaping and protecting it, achieving this through a large scale population survey and statistical analysis. Specifically, we wanted this study to address how individuals with autism (the AT sample) in comparison with neurotypical individuals (the NT sample) engaged with the historic built heritage around them, how they formed attachments to buildings and what features were significant to them.

We carried out a survey of 760 people (of whom 634 completed the AQ test), advertising through university networks and autism support groups and the Autism Research Centre (Cambridge). The AQ test is a well-established self-report test used to measure individuals’ traits and determine their placement on the autism-spectrum[[36]](#endnote-36). The test has been shown to have high validity for identifying individuals with Autism, Asperger Syndrome and broader phenotypes of ASC[[37]](#endnote-37), with 80% of those scoring above 32 meeting the DSM-IV criteria for high functioning autism[[38]](#endnote-38).

The ‘Buildings and Relationships’ survey (presented here as Appendix A) was divided into four sections. Firstly, participants provided general information about themselves, their experience of heritage related topics, and their interest in buildings, as well as answering questions regarding their relationship with their local community. Secondly, participants completed the Autism Spectrum Quotient (AQ) test[[39]](#endnote-39). Thirdly, Participants were asked about their favourite buildings and what aspects they valued most. Participants were asked to select what they considered the most significant of the four high level values defined by English Heritage[[40]](#endnote-40): Aesthetic, Historical, Communal and Evidential. Lastly, participants were asked to compare different types of building and types of town/city (from a selection of aerial photographs) and decide which they would feel most comfortable living in. They were not told which towns, cities or buildings they were. This was merely a visual cue. Analysis was completed using IBM SPSS (version 24.0.0.0).

In the following section the key results are summarised, with the detailed analysis and the relevant statistics presented in Appendix B.

**Significant Findings**

Responses to our survey provided statistically significant results on several of the questions, allowing us to identify a distinctive and important difference in perception and/or engagement with buildings between survey respondents whose replies were indicative of ASC and those who were indicative of being neurotypical. These statistically significant results have never previously been reported, and open up new avenues of research as well as having potential implications for various aspects of heritage management, from training in public engagement work, to museum display and representation, to aspects of heritage protection and planning.

Firstly, statistically significant differences were encountered in engagement with heritage and with the local community in general. For example, individuals with ASC were statistically less likely to have visited any heritage sites in the last year. These same individuals were also less likely to feel a sense of connection to the community, and be less involved with it. Individuals with ASC were also less likely to say that they enjoyed visiting new places. These are significant differences related to heritage engagement that have not been previously identified. However whether they reflect a tendency to prefer solitary pursuits in individuals with autism or a lack of means of easy integration to community or accommodations for visiting heritage sites or landscape remains unclear.

Differences were also encountered in values attached to different elements of buildings. Results showed that individuals with ASC were more likely to be interested in the structure and construction of buildings. Although all participants valued the aesthetic nature of buildings and their historical significance primarily, individuals with ASC tended to rank communal aspects of buildings as being of lesser importance than did those who are neurotypical. The social function of buildings seems to have been seen as somewhat less significant to the overall value by this group. Individuals with ASC also placed a higher value on the evidential features of the building, that is the information that can be gleaned from it’s study, suggesting that buildings were valued as a source of information, rather than for their social connection.

A third realm of interest in the survey considered attitudes to changes in buildings[[41]](#endnote-41). In terms of changes made to buildings (renovations or demolitions), here the impacts were felt in perhaps more subtly different ways between the AT and NT sample populations. Individuals with ASC were somewhat less likely to be upset about changes made to a building due to the loss of historic significance, with some indication that change itself was much more significant to these individuals (supported by evidence for a preference for sameness and routine in other realms). Interestingly, 4 of the 15 ASC participants who chose ‘other’ as their reason for being upset stated that they disliked change. One participant stated that they,

‘find it sad just from empathising with the people that built something and by the things that happened in a place - it’s like destroying memories which can always be sad even if for a positive outcome. Even if I wanted something destroyed I’d still be sad about it’.

In this case, change provokes a very emotional response. Subtly different or further questions might have revealed more evidence for how changes to buildings in general (rather than a specific case) might affect individuals with high AQ.

Individuals with ASD were also less likely to be pleased by positive changes made to a building. Personal attachments to a building and a concern with change in general, rather than wider shared social/cultural values or association with people in the past, seemed particularly significant to AT individuals when buildings were changed, renovated or demolished.

Lastly, our survey addressed the issue of favourite buildings. Approximately two thirds of all participants had a favourite building, yet neither the ASC nor the neurotypical group were more likely to have one. However why buildings were selected to be a favourite building differed. Individuals whose childhood favourite building was valued for aesthetic or functional reasons were much more likely to have a higher average autism quotient than those who selected historical or personal social significance. However as adults, individuals with ASC were more likely to see the historical significance of a building as important, over and above personal reasons.

When asked to make choices about buildings in which they would like to live, or ways in which they would spend money on buildings, there were also differences. Whilst all participants preferred to live in a leafy suburb (based on selection of photographs, see Appendix A), individuals with ASC were more likely to select a highly structured urban environment (in this case Milton Keynes). Individuals of ASC were also more likely to spend money on functional aspects of the building.

In summary, the results show that differing perceptions of individuals with high AQ affects the significance of the built environment in their lives, and the value which they attach to particular buildings, particularly to their construction and architectural elements. However as a group, such individuals are less likely to visit heritage locations. We therefore conclude that the heritage sector may be failing to fully accommodate the different interests of this particular group and to recognise the significance of local buildings and the management of change to individuals with autism. In the following section, we situate this conclusion within the wider context of heritage practice, and describe opportunities to shape practice in the future.

**Discussion**

In the spirit of the 2005 ‘Faro’ Convention on the Cultural Value of Heritage for Society[[42]](#endnote-42), and English Heritage’s[[43]](#endnote-43) Conservation Principles, our research started from the premise that: everyone has heritage[[44]](#endnote-44); that people often form emotional bonds with familiar places [[45]](#endnote-45); and that everyone should have the opportunity to be involved in the definition and management of cultural heritage. In making this assertion we recognise also the important role of heritage in contributing to people’s ‘ontological security’, the importance of a sense of order and continuity in relation to one’s lived experiences[[46]](#endnote-46). We also recognise significant recent progress in unravelling the various complexities concerning the social values that people recognise in and attribute to familiar places[[47]](#endnote-47). However, in spite of these obvious and welcome developments in heritage practice, the widely-held aspiration that heritage should benefit everyone in society can only be possible where difference (in perspective, cultural background, disability etc) is not only recognised but both understood and celebrated by those responsible for facilitating heritage management.

Our research thus aligns with other studies looking to accommodate different perspectives in heritage practice, to better understand the needs of those communities currently absent from heritage discourse, and to find ways to achieve this. Kiddey’s work with homeless communities[[48]](#endnote-48) has already been mentioned, Lashua et al.[[49]](#endnote-49) describe work with young musicians living in socially deprived neighbourhoods in Liverpool, while several recent studies address the important role of heritage amongst refugee communities[[50]](#endnote-50). The research also aligns with a recent discussion of better accommodating people with ASD specifically within archaeological practice[[51]](#endnote-51). A further example of different perspectives is Wells’ psychological investigation of old and new places[[52]](#endnote-52), and the various different reasons why people consider them to be significant. This latter study concludes both with the recognition of a need for conventional and ‘civil’ experts in heritage assessment and decision making, and noting the lack of ‘empirical evidence to justify current practice in the conservation of the historic environment’[[53]](#endnote-53). We sought to contribute to that empirical evidence, to suggest ways forward and to further justify the need for new and more socially inclusive approaches to heritage and its future management.

There are however a number of challenges. Most obviously, contemporary heritage policy and practice largely involves managing change within the built historic environment. As we have seen, this often presents dilemmas grounded in debates on significance and value, and in the need to achieve social, economic and environmental sustainability. Put simply, the benefits arising from any change must be balanced against the costs of losing or reducing the cultural value of buildings or landscape[[54]](#endnote-54), and where this balance falls is very often contested. Values are central to this process, and to the decision-making and practices involved in reaching a consensual if not an agreed solution. Predominantly such value-based assessments are made using logical, quantifiable, assertions. In the UK, buildings with ‘historical’ or ‘evidential’ significance are generally considered of high value, and often of ‘national importance’ or of ‘historic interest’ in a national context. They would thus be given security through heritage protection, or special treatment within the planning process. Attributing the values that create this ‘national collection’ is typically an ‘expert-led’ process, driven by national heritage agencies with statutory responsibility for maintaining the ‘List’ (being the List comprising Listed Buildings, or for that matter the ‘Schedule’ of Ancient Monuments’). In making these assessments, less account is taken of the values ‘civil experts’[[55]](#endnote-55) might typically ascribe to places, based more on their aesthetic or communal values[[56]](#endnote-56), including any personal importance these buildings might hold. One can reasonably argue that this more subjective form of assessment is prevented by Statute. In the UK, for example, archaeological sites and historic buildings can only be legally protected (as ‘Scheduled Monuments’ or ‘Listed Buildings’) if they are demonstrably of national importance or of historic interest. Such status cannot take account of locally-held values, creating frustration amongst local communities for whom an ordinary building threatened with demolition may be highly valued. That said, there is now provision to place such buildings and sites on ‘Local Lists’, as was the case with the Bradford Odeon, in West Yorkshire, England[[57]](#endnote-57). In a similar vein, Neighbourhood Development Plans are increasingly common in the UK, allowing communities to have influence over the future of their local areas[[58]](#endnote-58). These locally listed sites are not protected in the same way as scheduled monuments and listed buildings, but their inclusion on the Local List is a material consideration in determining any planning applications that might affect them.

Thus, while historically restrictive and rather intransigent, the policy and legislative landscape is changing, though noting Jones[[59]](#endnote-59) observation that, ‘… in practical terms, social and communal values remain relatively neglected in the designation, management and conservation of heritage places’. This change seems timely and appropriate given that opinion polls show how the great majority of the UK population value their heritage, and see merit in its conservation. Increasingly, people also recognise their local, ordinary and quotidien places[[60]](#endnote-60), as heritage, and are more willing to voice opinions where this local heritage comes under threat, often doing this through online petitions and social media.

But all of this assumes everyone is equally willing and able to become involved in the discussions and debates around local and national heritage. Conservation often begins with conversation. Beyond the results described earlier which show how difficult it is for some people to participate in these important conversations, there are also many other types of differences which may affect engagement with local and national heritage. One for example is that of personality differences. Building on the theory and application of personality testing, and notably the much-debated Myers Briggs Test[[61]](#endnote-61), Schofield has argued[[62]](#endnote-62) that professional heritage practice, and therefore much heritage decision-making, is largely overseen by individuals who make their decisions based upon logic (what Myers Briggs refers to as ‘thinkers’). A now historic example of this is the application of significance criteria to archaeological sites and historic buildings[[63]](#endnote-63) in a national review of protection afforded to archaeological sites in England in the 1980s, the ‘Monuments Protection Programme’ or ‘MPP’. Such mechanical assessments (usually, as in this case, focused on historical and evidential values), alongside procedural decision making, are usually the role of suitably qualified people appointed to relevant posts to ensure that relevant principles can be applied with the necessary rigour and expertise. The perspective of ‘feelers’ (for whom communal and aesthetic values may hold greater weight), although now increasingly recognised as important, has long been ignored, their perspectives therefore having comparatively little impact on most heritage decisions. Beyond obvious differences in the definition and meaning of these categories, and the difference in those who prioritise them, there are also differences in application: ‘historic’ and ‘evidential’ criteria are simpler to define on objective grounds; ‘aesthetic’ and ‘communal’ values are more challenging by virtue of their subjectivity. Of course even within these groups of ‘thinkers’ and ‘feelers’ there are differences in how they perceive and engage with the world. How other differences impact heritage perception, prioritisation and decision-making will require further research.

In summary, within the context of contemporary heritage policy and practice, a ‘social diversity’ of perspectives is increasingly recognised, both in the context of people’s everyday encounters with their local historic environment, and the impact even minor changes to it can have upon valuation, and people’s ‘place attachment’. But some aspects of this social diversity are poorly understood, ASC being one such example. Some people will barely notice an alteration to a building which has ‘always been there’; yet for those with ASC such alteration has the potential to cause significant disappointment, confusion and disorientation. In short, and as we have seen, people react to change in different ways and these differences are not always accommodated in heritage policy or practice. For that to happen first requires different perspective to be better understood. In the case of ASC the research described in this paper provides the foundation for such an understanding. But second, it also requires those involved with heritage facilitation to have relevant skills for working effectively with people with hidden disabilities, including ASC. There is precedent. Organisations responsible for heritage visitor attractions have made significant progress in creating particular bespoke opportunities for visitors with ASC and the training of museums staff to make the museum a more accessible and autism-friendly place[[64]](#endnote-64), while the Council for British Archaeology’s long-running Young Archaeologists Club has recognised the particular needs of young people with ASC[[65]](#endnote-65). Yet despite a significant shift towards community engagement in heritage-related planning and place-making activities, searches have revealed that nothing comparable exists for community groups involved with their local heritage. Given the results of our survey, it is likely that significant numbers of people with ASC take a close and very particular interest in their local heritage, but that they rarely express this interest publicly, given the traditional nature of community heritage organisations, and of their meetings and communications. It is our suggestion that the results of this survey provide the catalyst for change, beginning with appropriate training for those involved with facilitation, and the production of good practice guidance for including people with hidden disabilities. By creating this resource (similar to that for museums, but arguably even more inclusive given that heritage is for everybody), and resourcing training and facilitation, heritage can become yet more inclusive thus gaining wider support and profile.

**Conclusion**

ASC is an important and often overlooked influence on how individuals engage with their local built environment. Differences in visual perception and social understanding can play an important role in influencing a subtly different engagement with built environment between individuals with ASC and those who are neurotypical.

Integrating this new understanding of the influence of ASC on heritage management is a challenge. Most people’s encounters with heritage concern their own local historic built environment, but this may be a particular focus for those with ASC who typically pay fewer visits to heritage attractions. Thus for people with ASC there is an even firmer grounding in their familiar places than for NT people and, as we have seen, for this community a particular concern exists for processing and dealing with change, and for the significance and arguably also the retention of points of architectural or design detail. Thus recognising how people with ASC view and understand the world is essential to ensuring that placemaking exercises and discourse do not inadvertently exclude this significant minority of the population.

For the first time, this paper provides a strong evidential foundation for understanding ASC and how it impacts perceptions and experiences of the historic built environment. From this understanding, good practice can follow, ensuring (as some heritage-based organisations have begun to do) that practitioners have relevant skills in community engagement, with staff trained in working with people on the AT spectrum, and creating opportunities for those with ASC to contribute to heritage discourse and decision making in ways that are not stressful or overwhelming.

Across the heritage sector, the recognition that different perspectives exist is a clear and obvious necessity, with differences determined by a range of social, cultural and other factors. ASC is only one of these differences, albeit a significant one in determining variations in perception and priorities. We already know how important heritage is for defining identity (local, national, even international), and the ontological security it provides for people and communities. This study shines empirical light on the needs of a significant number of adults within those communities, whose distinctive views and perspectives have previously gone unnoticed and unheard.

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Appendix A: Survey Questions

Q2.1 **We would like to know a little bit about you and your interests...**

Q2.2 What gender are you?

o Male

o Female

o Other / non gender conforming

o Prefer not to say

Q2.3 What is your age?

o Under 18

o 18-27

o 28-37

o 38-47

o 48-57

o 58-67

o 68 and over

Q2.4 How would you describe your experience of Archaeology, History, building conservation, Architecture, or building design?

o No experience, I have never studied these subjects and/or don't visit museums or other heritage sites.

o A little, I have never studied these subjects and/or very rarely visit museums or other heritage buildings.

o Moderate, I have studied one or more of these subjects at school and/or sometimes visit museums or other heritage buildings.

o Above average, I have studied one or more of these subject at university and/or frequently visit museums or other heritage buildings.

o A lot, my career is based around one of these subjects and/or I visit museums and heritage buildings very frequently.

Q2.5 What experience do you have?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q2.6 How many heritage sites have you visited in the last year?

*A heritage site is a historical site, building, or area of natural land which is considered culturally significant and valued for features beyond utility (e.g. Museums, Westminster Abbey, Stonehenge).*

o 0

o 1-3

o 4-8

o 9-15

o More than 15

Q2.7 Are you a member of a heritage organisation (e.g. The National Trust, English Heritage) ?

o Yes

o No, but I have been in the past

o No, never

Q2.8 In the next section please fill in the rest of the sentence from the options.

Q2.9 I find the structure and construction of buildings...

o Extremely interesting

o Very interesting

o Slightly interesting

o Not interesting

Q2.10 I like to look at buildings with interesting architectural features

o Not at all

o Rarely

o A little

o Quite a lot

o Very much

Q2.11 I feel strongly attached to the building(s) where I live.

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q2.12 I feel strongly attached to the community where I live.

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q2.13 I am very involved with the local community (e.g. active in civic or local amenity groups, local councils, music, arts or sports clubs etc).

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q2.14 I like to visit and explore new places.

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

NB - as explained in the text, the standard set of questions comprising the Autism Spectrum Quotient (AQ) test (for details of this test see Baron-Cohen 2001) are not repeated here, but were part of the survey.

Q4.1 **Your favourite buildings...**

In this section we would like to ask you a few questions about your favourite buildings and why you like(d) them.

Q4.2 Place these four values (which are used to inform heritage decisions) in order of importance:

Aesthetics *(ways people gain sensory and intellectual stimulation from a place)*

Historical *(ways in which people, events and aspects of life can be connected through a place to the present)*

Communal *(value derived from the meaning of a place for the people who relate to it)*

Evidential *(the potential of a place to provide evidence of past human activity)*

\_\_\_\_\_\_ Aesthetics

\_\_\_\_\_\_ Historical

\_\_\_\_\_\_ Communal

\_\_\_\_\_\_ Evidential

Q4.3 Did you have a favourite place (outside your own home) as a child?

o Yes

o No

|  |
| --- |
|  |

Q4.4 Please describe in one sentence what you liked about it.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q4.5 Which answer do you most agree with?

o I like this building because of how it looks, feels or smells (Aesthetics)

o I like this building because of the story of the place (Historical Significance)

o I like this building because of what it means to me personally (Personal Social Significance)

o I like this building because of the things I can do when I'm there (Function Reasons e.g. goods or services provided)

o Other

Q4.6 Do you have a favourite place (outside your own home) today?

o Yes

o No

|  |
| --- |
|  |

Q4.7 Please describe in one sentence what you like about it.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q4.8 Which answer do you most agree with?

o I like this building because of how it looks, feels or smells (Aesthetics)

o I like this building because of the story of the place (Historical Significance)

o I like this building because of what it means to me personally (Personal Social Significance)

o I like this building because of the things I can do when I'm there (Function Reasons e.g. goods or services provided)

o Other

Q4.9 Is your favourite building the same as when you were a child?

o Yes

o No

|  |
| --- |
|  |

Q4.10 If you could only preserve for posterity one local building that you know (such as a town hall, stately home, modern block of flats, museum, pub, shop, community center etc in a town or city near to you) which building would this be?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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|  |

Q4.11 Can you explain why?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q4.12 Which answer do you most agree with?

o I like this building because of how it looks, feels or smells (Aesthetics)

o I like this building because of the story of the place (Historical Significance)

o I like this building because of what it means to me personally (Personal Social Significance)

o I like this building because of the things I can do when I'm there (Function Reasons e.g. goods or services provided)

o Other

Q4.13 Have you ever been upset by the renovation or demolition of a building?

o Yes

o No

Q4.14 Please can you elaborate on your selection.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q4.15 Which answer do you most agree with?

o I was upset because of the loss of how it looked, felt or smelled (Aesthetics)

o I was upset because of the loss of the story of the place (Historical Significance)

o I was upset because of the loss of what it meant to me personally (Personal Social Significance)

o I was upset because of the loss of things I could do when I was there (Function Reasons e.g. goods or services provided)

o Other

Q4.16 Have you ever been pleased with drastic changes made to a building (e.g. renovation, demolition etc.)?

o Yes

o No

Q4.17 Please can you elaborate on your selection.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q4.18 Which answer do you most agree with?

o I was pleased because of how it looked, felt or smelled (Aesthetics)

o I was pleased because of the story of the place (Historical Significance)

o I was pleased because of what it meant to me personally (Personal Social Significance)

o I was pleased because of the things I could do when I was there (Function Reasons e.g. goods or services provided)

o Other

Q4.19 You have been given £500,000 to build a new library in your local community. How much would you spend on functional aspects of the building (e.g. computers, books, and work-spaces) or aesthetic aspects (e.g. design and decoration)?

o 100 % function - I would like this to be the most useful building it can be.

o 75% function, 25% aesthetic - function is most important but the building needs to be welcoming.

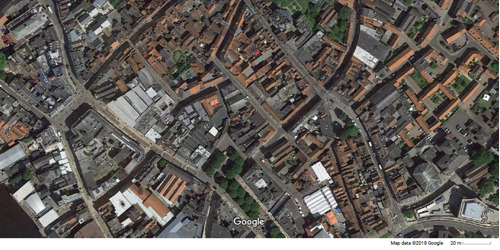
o 50% function, 50% aesthetics - function and aesthetics are equally important.

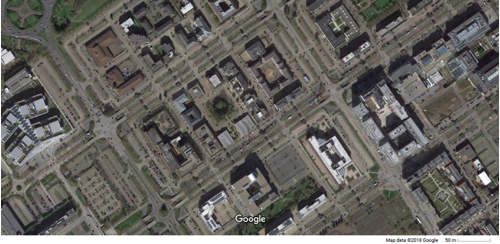
o 25% function 75% aesthetics - aesthetics are most important, I want the building to have an impact, but it also needs to be useful.

o 100% aesthetics - I want this building to have the best appearance it can.

Q5.1 **We will now show you some images of aerial views of cities and buildings and asked to compare them.**

Q5.2 Judging from these pictures, which city do you think you would feel most comfortable living in?







Q5.3 In which of these houses or flats would you feel most comfortable?









Appendix B: Survey results

760 people filled in our survey (634 completed the AQ test). Of those 42.9% scored in the range indicative of ASC and 57.1% in the type indicative of being neurotypical.

In the high risk of autism sample (hereby AT), 36.0% were male, 59.2% female and 4.8% were non gender conforming. In the neurotypical sample (hereby NT) of those who disclosed their gender identity 29.9% were male, 69.5% female, 0.3% non gender conforming and 0.3% preferred not to say.

*Engagement with heritage and with the local community in general*

In the first section, we asked questions to explore how autism effected the level of engagement with heritage and with the local community in general.

The results suggested that, over the whole population sampled, 87.7% had visited heritage sites in the last year, that 21.3% are currently members of a heritage group, and that 21.5% have been members in the past (meaning that 42.8% are or have been members of heritage groups of some kind). However AT participants were statistically less likely to have visited any heritage sites (F4,628 = 4.043, P < 0.01, see also Figure 1).

*Figure 1. Showing AT participants were less likely to visit heritage sites. Mean AQ scores with 95% confidence intervals. Groups sharing a letter are not significantly different, LSD p<0.05.*

Over the whole population, 48.9% felt strongly attached to the community in which they lived. This was lower in the AT group at only 35.7%. In fact, there was a significant negative correlation between being a member of the AT group and attachment to the community (rs = -0.238, P < 0.01). Using a binary logistic regression it was found that AT participants are approximately 70% less likely to say they feel connected to their community. Additionally, 42.3% of AT participants strongly disagreed with being involved with their local community compared to 20.7% amongst the NT sample. A chi squared test showed that the AT group was significantly different from the NT group (χ2 = 35.739, d.f. = 4, P < 0.01). Further, participants who chose strongly disagree (32.1 ± 11.7) were significantly different in AQ to those who chose the other categories (strongly agree = 24.4 ± 12.9, somewhat agree = 25.0 ± 12.6, neither agree nor disagree = 24.6 ± 12.4, somewhat disagree = 26.6 ± 12.2. ANOVA, F4,629 = 10.612, P < 0.01; LSD test, P < 0.01).

The results also showed that AT participants were less likely to explore new places (rs = -0.271, χ2 = 63.86, d.f. = 4, P < 0.01). For example, only 1.1% of the NT sample somewhat or strongly disagree that they like to visit or explore new places, compared to 14.4% of AT participants. More broadly, this was found to be significantly correlated with AQ (rs = -0.304, P < 0.01). Using a binary logistic regression it was shown that AT participants were approximately 94% less likely to say they enjoy visiting new places (P < 0.01).

Whether these differences reflect a tendency to prefer solitary pursuits in individuals with autism or a lack of means of easy integration to community or accommodations for visiting heritage sites or landscape remains unclear.

*The value attached to different elements of buildings*

The second section of the survey considered values placed on different elements of buildings. This also varied between those in the autism (AT) and neurotypical (NT) groups. First, there was a slight correlation between finding the structure and construction of buildings interesting and being in the AT group (rs = 0.087, P < 0.028). However, no significant differences were found using a chi squared test or a binary logistic regression. Therefore, while we may suggest there is a relationship between AQ category and interest in buildings there is only a slight association. Secondly, being an AT participant was significantly correlated with selecting more extreme answers (‘Not at all’, ‘Very much’) rather than less extreme replies (‘Rarely’, ‘A little’, ‘Quite a lot’) when asked whether they like to look at buildings with interesting architectural features (rs = 0.106, P = 0.007). Using a binary logistic regression, AT participants were 60% more likely to select extreme answers (P = 0.008). In other words whilst some individuals with autism were far more likely than usual to look at buildings with interesting architectural features others were less likely than usual to do so. These non-linear associations suggest that AT participants are likely to have more pronounced views when it comes to their interests in buildings.

Most individuals overall valued aesthetic and historical elements of buildings over functional elements - 40.6% of NT participants and 39.2% of AT participants selected aesthetics as the most important feature of a building, while similarly, 34.3% of NT and 32.5% of AT participants ranked historical features as the most important. However participants who rank communal elements lower had a higher AQ (F3,444 = 5.183, P = 0.002, figure 2). For example, 52.6% of AT participants ranked communal factors last, compared to only 37.7% NT participants. There was a significant correlation between AQ category and placing less value on communal aspects of the building, with AT participants being more likely to put it lower on their list (rs = 0.146, P = 0.002). The social function of buildings does not seem to be valued as highly by AT individuals as by those who are neurotypical.

Finally, participants who valued the evidential basis of a building (value in terms of what can be learnt about past activities) had a higher AQ (F 3,444 = 3.670, P = 0.012, figure 3). Being an AT participant also significantly correlated with placing a greater value on evidential features of a building (rs = 0.124, P = 0.009). Buildings seem to be being valued as a source of interesting knowledge rather than means of social connection.

*Figure 2. Participants with a higher AQ placed less value on the Communal features of a building. Participants were asked to rank the importance of the four high level values (Aesthetic, Historical, Communal and Evidential), with 1 being most important and 4 being least important. Mean AQ scores with 95% confidence intervals. Groups sharing a letter are not significantly different, LSD p < 0.05.*

*Figure 3. Participants with a higher AQ placed greater value on the Evidential features of a building. Participants were asked to rank the importance of the four high level values (Aesthetic, Historical, Communal and Evidential), with 1 being most important and 4 being least important. Mean AQ scores with 95% confidence intervals. Groups sharing a letter are not significantly different, LSD p < 0.05.*

*The evaluation of change*

A third set of questions in the survey considered attitudes to changes in buildings. In terms of changes made to buildings (renovations or demolitions), here the impacts were felt in perhaps more subtly different ways between the AT and NT sample populations. In all, 68.3% of individuals were upset when a building was changed (with no significant difference between AT and NT participants found using a chi squared test, P = 0.211), the majority (36.3%) for reasons related to its historical integrity. However, while NT participants selected historical significance more than expected, AT participants selected it less than expected (rs = -0.110, P = 0.03). Using a binary logistic regression it was shown AT participants were approximately 37% less likely to say they were upset due to the loss of historic significance. Further, participants who selected personal reasons for why they were upset when a building was changed (24.2%) rather than historical reasons, were more likely to have higher AQ scores (P = 0.007). However, this finding did not have significance when comparing AT and NT groups. Participants who had ‘other’ reasons for why they were upset were likely to have a higher AQ score (χ2 = 15.589, d.f. = 4, P < 0.01, see Figure 4). Further there was a correlation between being an AT participant and selecting ‘other’ reasons (rs = 0.115, P = 0.023), with AT participants being approximately 1.8× more likely (P = 0.029). This may imply that a more personal rather than communal significance is being attached to buildings by individuals with higher AQ, and it is change to this personal significance which is most upsetting.

Interestingly, 4 of the 15 AT participants who chose ‘other’ as their reason for being upset stated that they disliked change. Subtly different or further questions might have revealed more evidence for how changes to buildings in general (rather than a specific case) might affect individuals with high AQ.

In terms of positive changes, 56.1% of our participants had been pleased with drastic changes made to a building (e.g. renovation or demolition). Using a chi squared test the AT sample was significantly less likely to be pleased by these changes (NT = 61%, AT = 49.4%, rs = -0.116, P = 0.006). Those who hadn’t been pleased had a higher mean AQ (29.13 ± 12.78) than those who had (26.21 ± 12.26) and AT participants were 37% less likely to have been pleased. When assessing the reasons why people were pleased no significant differences between AT and NT groups were found.

Personal attachments to a building and a concern with change in general, rather than wider shared social/cultural values or association with people in the past, seemed particularly significant to AT individuals when buildings were changed, renovated or demolished. This was particularly so if they viewed the change as negative.

*Figure 4.Showing why participants were upset by changes made to a building. Mean AQ scores with 95% confidence intervals.*

*Favourite buildings*

Lastly, participants were asked whether they had a favourite building both when they were a child and today, and asked what they liked about those buildings. In both questions no group was significantly more likely to have had a favourite building, with approximately two-thirds of participants stating that they did. Nevertheless, there were differences in why AT and NT participants liked their buildings both as adults (χ2 = 21.710, d.f. = 4, P < 0.01) and as children (χ2 = 22.927, d.f. = 4, P < 0.01), and these differences varied with age. As children, participants who favoured their buildings for aesthetic and functional reasons had a much higher average AQ (30.45 ± 12.13, 32.58 ± 12.16) than those who selected historical or personal social significance as reasons (24.69 ± 12.77, 24.28 ± 12.16, P < 0.01). Being an AT participant significantly correlated with selecting an aesthetic or functional reason (rs = 0.229, P < 0.01). AT participants were approximately 2.5× more likely to select an aesthetic or functional reason than NT participants. This was also found when discussing their current favourite buildings (rs = 0.167, P < 0.01), with AT participants being approximately 98% more likely to select Aesthetic or functional reasons than NT participants. However, as adults, participants who found the historical significance of a building important had a higher mean AQ (27.97 ± 12.88) and this group was now significantly different in AQ from those who chose personal social significance (P = 0.002). Being an AT participant significantly correlated with finding the historic significance of their favourite building more important than the personal significance (rs = 0.222, P < 0.01). While inconclusive, these findings are interesting and may suggest that the personal social significance is the least important feature of the building for AT participants. It may, however, show that personal significance is only important to AT individuals when the building comes under threat of change or demolition. This is one aspect of the study that would benefit from further research.

In the final questions, participants were asked to compare different types of buildings and urban landscape, and state which of these they’d prefer to live in (see the images in Appendix A). Participants who preferred to live in a highly structured built environment, being more likely to choose the town we can now identify as Milton Keynes, were likely to have a higher AQ (31.49 ± 11.40) than those choosing the less structured built environment of York (25.04 ± 11.70, P = 0.009) or the suburbs of Peterborough (27.60 ± 12.73, approaching significance P = 0.063). This relationship was also found when participants were grouped according to their AQ category. AT participants were 2.3× more likely to select Milton Keynes rather than York when compared to NT participants (rs = 0.198, P = 0.034). However, the majority of participants (79.9%) chose the latter, being a more green suburb. When asked about how they would spend money on different elements of a new building (100% functional, 75% functional 25% aesthetics, 50% functional 50% aesthetics etc.), those in the AT (10.1%) sample were more likely to spend entirely on ‘function’ compared to NT participants (3.4%, χ2 = 15.879, d.f. = 4, P < 0.01). There was a nonlinear association with participants with a higher AQ selecting the more extreme options (e.g. 100% functional or 100% aesthetic). Using a Mann-Whitney U test it was found that these associations were significant when the ‘100% functional’ group was tested against the more intermediate options (P < 0.001), however they weren’t significant when comparing the ‘100% aesthetic group’. AT participants were 3× more likely to select an extreme answer compared to NT participants (rs = 0.140, P < 0.01).

Whilst a preference for green suburbs across both groups is not surprising, highly structured environments seem to be attractive *in some ways to some people* with high AQ differing from the typical reactions of neurotypical individuals. This finding could be further explored and suggests that certain highly ordered buildings or elements of built heritage might be particularly attractive to individuals with high AQ.

1. Kennedy, “Inclusion in the Museum”. [↑](#endnote-ref-1)
2. See Varner, *Museums and Visitors with Autism*, for an overview. [↑](#endnote-ref-2)
3. For example [Baird et al.,](https://paperpile.com/c/RCepsi/a5KYI+qpg7B+Oi7Nr+evgqM+0iS8c+Rr2oC+a3H7U) “[Prevalence of Disorders](http://paperpile.com/b/RCepsi/a5KYI)”[; Baron-Cohen et al.,](https://paperpile.com/c/RCepsi/a5KYI+qpg7B+Oi7Nr+evgqM+0iS8c+Rr2oC+a3H7U) “[Prevalence of Autism-Spectrum Conditions](http://paperpile.com/b/RCepsi/qpg7B)”[; Brugha et al.,](https://paperpile.com/c/RCepsi/a5KYI+qpg7B+Oi7Nr+evgqM+0iS8c+Rr2oC+a3H7U) “[Epidemiology of Autism Spectrum Disorders in Adults](http://paperpile.com/b/RCepsi/Oi7Nr)”[; Elsabbagh et al.,](https://paperpile.com/c/RCepsi/a5KYI+qpg7B+Oi7Nr+evgqM+0iS8c+Rr2oC+a3H7U) “[Global Prevalence of Autism and Other Pervasive Developmental Disorders](http://paperpile.com/b/RCepsi/evgqM)”[; Kim et al.,](https://paperpile.com/c/RCepsi/a5KYI+qpg7B+Oi7Nr+evgqM+0iS8c+Rr2oC+a3H7U) “[Prevalence of Autism Spectrum Disorders in a Total Population Sample](http://paperpile.com/b/RCepsi/0iS8c)”[; Kogan et al.,](https://paperpile.com/c/RCepsi/a5KYI+qpg7B+Oi7Nr+evgqM+0iS8c+Rr2oC+a3H7U) “[Prevalence of Parent-Reported Diagnosis](http://paperpile.com/b/RCepsi/Rr2oC)”[; Zablotsky et al.,](https://paperpile.com/c/RCepsi/a5KYI+qpg7B+Oi7Nr+evgqM+0iS8c+Rr2oC+a3H7U) “[Estimated Prevalence of Autism](http://paperpile.com/b/RCepsi/a3H7U)”. [↑](#endnote-ref-3)
4. [Hull et al.,](https://paperpile.com/c/RCepsi/Vhs1u+N18Lc) [“Resting-State Functional Connectivity](http://paperpile.com/b/RCepsi/Vhs1u)”[; O’Reilly et al.,](https://paperpile.com/c/RCepsi/Vhs1u+N18Lc) [“Is Functional Brain Connectivity Atypical in Autism?](http://paperpile.com/b/RCepsi/N18Lc)”. [↑](#endnote-ref-4)
5. World Health Organisation, *Classification of Mental and Behavioural Disorders.* [↑](#endnote-ref-5)
6. Petrina et al., “The nature of friendship in children with autism spectrum disorders”; Orsmond et al., “Peer relationships and social and recreational activities”. [↑](#endnote-ref-6)
7. Schulte-Ruther et al., “Dysfunctions in brain networks supporting empathy”. [↑](#endnote-ref-7)
8. van de Cruys et al., “Precise minds in uncertain worlds”; Brosnan et al., “Adolescents with autism spectrum disorder show a circumspect reasoning bias”. [↑](#endnote-ref-8)
9. [Oliveira et al.,](https://paperpile.com/c/RCepsi/fv0cE+h611W) “[Epidemiology of Autism Spectrum Disorder in Portugal](http://paperpile.com/b/RCepsi/fv0cE)”[; Williams et al.,](https://paperpile.com/c/RCepsi/fv0cE+h611W) [“Systematic Review of Prevalence Studies of Autism Spectrum Disorders.”](http://paperpile.com/b/RCepsi/h611W) [↑](#endnote-ref-9)
10. See [Elsabbagh et al.,](https://paperpile.com/c/RCepsi/evgqM) [“Global Prevalence of Autism and Other Pervasive Developmental Disorders.”](http://paperpile.com/b/RCepsi/evgqM) [↑](#endnote-ref-10)
11. [Baron-Cohen et al.,](https://paperpile.com/c/RCepsi/SdFef+W8Ypo+qfiKI+Y63Ar) [“Does the Autistic Child Have a ‘Theory of Mind’ ?](http://paperpile.com/b/RCepsi/SdFef)”[; Baron-Cohen et al.,](https://paperpile.com/c/RCepsi/SdFef+W8Ypo+qfiKI+Y63Ar) [“Another Advanced Test of Theory of Mind](http://paperpile.com/b/RCepsi/W8Ypo)”[; Ochs and Solomon,](https://paperpile.com/c/RCepsi/SdFef+W8Ypo+qfiKI+Y63Ar) [“Autistic Sociality.”](http://paperpile.com/b/RCepsi/qfiKI)[; Leslie and Frith,](https://paperpile.com/c/RCepsi/SdFef+W8Ypo+qfiKI+Y63Ar) [“Autistic Children’s Understanding of Seeing, Knowing and Believing.”](http://paperpile.com/b/RCepsi/Y63Ar) [↑](#endnote-ref-11)
12. Ochs and Solomon, ibid. [↑](#endnote-ref-12)
13. Paul et al., [“Conversational Behaviors in Youth with High-Functioning ASD and Asperger Syndrome.”](http://paperpile.com/b/RCepsi/PsUh1) [↑](#endnote-ref-13)
14. Ochs and Solomon, ibid. [↑](#endnote-ref-14)
15. [Attwood,](https://paperpile.com/c/RCepsi/w4YIs+M9Cb6+QURe6+CtNtv) [“Strategies for Improving the Social Integration of Children with Asperger Syndrome”](http://paperpile.com/b/RCepsi/w4YIs)[; Bellini,](https://paperpile.com/c/RCepsi/w4YIs+M9Cb6+QURe6+CtNtv) [“Social Skill Deficits and Anxiety in High-Functioning Adolescents With Autism Spectrum Disorders”](http://paperpile.com/b/RCepsi/M9Cb6)[; Boulter et al.,](https://paperpile.com/c/RCepsi/w4YIs+M9Cb6+QURe6+CtNtv) [“Intolerance of Uncertainty as a Framework for Understanding Anxiety in Children and Adolescents with Autism Spectrum Disorders”](http://paperpile.com/b/RCepsi/QURe6)[; White et al.,](https://paperpile.com/c/RCepsi/w4YIs+M9Cb6+QURe6+CtNtv) [“Anxiety in Children and Adolescents with Autism Spectrum Disorders”](http://paperpile.com/b/RCepsi/CtNtv). [↑](#endnote-ref-15)
16. [Koenig and Rudney,](https://paperpile.com/c/RCepsi/Ul9Hi+qHT8c) [“Performance Challenges for Children and Adolescents with Difficulty Processing and Integrating Sensory Information](http://paperpile.com/b/RCepsi/Ul9Hi)”[; Vanegas and Davidson,](https://paperpile.com/c/RCepsi/Ul9Hi+qHT8c) [“Investigating Distinct and Related Contributions of Weak Central Coherence, Executive Dysfunction, and Systemizing Theories](http://paperpile.com/b/RCepsi/qHT8c)”; Vermeulen, “Context blindness in autism spectrum disorder”. [↑](#endnote-ref-16)
17. [Pierce et al.,](https://paperpile.com/c/RCepsi/aVVWq+TuUJ6+aVazA) [“Preference for Geometric Patterns Early in Life as a Risk Factor for Autism”](http://paperpile.com/b/RCepsi/aVVWq)[; Sasson and Touchstone,](https://paperpile.com/c/RCepsi/aVVWq+TuUJ6+aVazA) [“Visual Attention to Competing Social and Object Images by Preschool Children with Autism Spectrum Disorder”](http://paperpile.com/b/RCepsi/TuUJ6)[; Swettenham et al.,](https://paperpile.com/c/RCepsi/aVVWq+TuUJ6+aVazA) [“The Frequency and Distribution of Spontaneous Attention Shifts between Social and Nonsocial Stimuli in Autistic, Typically Developing, and Nonautistic Developmentally Delayed Infants”](http://paperpile.com/b/RCepsi/aVazA). [↑](#endnote-ref-17)
18. Tustin, [“Autistic Objects”](http://paperpile.com/b/RCepsi/Bliir). [↑](#endnote-ref-18)
19. [Lord et al.](https://paperpile.com/c/RCepsi/Satf9), [“Autism Diagnostic Interview-Revised](http://paperpile.com/b/RCepsi/Satf9)”. [↑](#endnote-ref-19)
20. [Forrester-Jones and Broadhurst, *Autism and Loss*](http://paperpile.com/b/RCepsi/z0oEp), p 91. [↑](#endnote-ref-20)
21. Baron-Cohen et al., [“The Autism-Spectrum Quotient (AQ)](http://paperpile.com/b/RCepsi/2OQ31)”. [↑](#endnote-ref-21)
22. [Spikins et al.](https://paperpile.com/c/RCepsi/gtYep), [“Autism Spectrum Conditions Affect Preferences in Valued Personal Possessions”](http://paperpile.com/b/RCepsi/yLSuf). [↑](#endnote-ref-22)
23. Mostafa, [“An architecture for autism: concepts of design intervention for the autistic user”](http://paperpile.com/b/RCepsi/z5c4N). [↑](#endnote-ref-23)
24. [Sánchez et al.,](https://paperpile.com/c/RCepsi/pFajg+52D6f) [“Autism and the Built Environment”](http://paperpile.com/b/RCepsi/pFajg)[; Vogel](https://paperpile.com/c/RCepsi/pFajg+52D6f), “Classroom design for living and learning with autism”. [↑](#endnote-ref-24)
25. [Beaver,](https://paperpile.com/c/RCepsi/tI28X+c5Wr9+pFajg+pig0y) [“Designing Environments for Children and Adults on the Autism Spectrum”](http://paperpile.com/b/RCepsi/tI28X)[; Kanakri,](https://paperpile.com/c/RCepsi/tI28X+c5Wr9+pFajg+pig0y) [“Spaces Matters: Classroom Acoustics and Repetitive Behaviors in Preschool Children with Autism”](http://paperpile.com/b/RCepsi/c5Wr9) [; Sánchez et al., ibid; Scott,](https://paperpile.com/c/RCepsi/tI28X+c5Wr9+pFajg+pig0y) [“Designing Learning Spaces for Children on the Autism Spectrum.”](http://paperpile.com/b/RCepsi/pig0y) [↑](#endnote-ref-25)
26. Dong and Heylighen, [“What Can We Learn from Autistic People About Cognitive Abilities Essential to Design?](http://paperpile.com/b/RCepsi/dY6uF)”. [↑](#endnote-ref-26)
27. [Baumers and Heylighen](https://paperpile.com/c/RCepsi/dk0ZS), “[Beyond the Designers’ View](http://paperpile.com/b/RCepsi/dk0ZS)”. [↑](#endnote-ref-27)
28. Willey, [*Pretending to be Normal*](http://paperpile.com/b/RCepsi/jLHVy), p. 30. [↑](#endnote-ref-28)
29. Grenville, [“Conservation as Psychology](http://paperpile.com/b/RCepsi/f0iRl)”. [↑](#endnote-ref-29)
30. Smith and Milne, [“Reduced Change Blindness Suggests Enhanced Attention to Detail in Individuals with Autism”](http://paperpile.com/b/RCepsi/7bzly). [↑](#endnote-ref-30)
31. Gomot and Wicker, [“A Challenging, Unpredictable World for People with Autism Spectrum Disorder”](http://paperpile.com/b/RCepsi/T7nFs). [↑](#endnote-ref-31)
32. Williams, [*The Jumbled Jigsaw*](http://paperpile.com/b/RCepsi/Xxh0k), p. 55. [↑](#endnote-ref-32)
33. Forrester-Jones and Broadhurst, [*Autism and Loss*](http://paperpile.com/b/RCepsi/z0oEp), p. 92. [↑](#endnote-ref-33)
34. Ibid, p. 91. [↑](#endnote-ref-34)
35. Ibid, p. 90-108; Mitchell, [*Glass Half-Empty, Glass Half-Full*](http://paperpile.com/b/RCepsi/3PnOS). [↑](#endnote-ref-35)
36. [Baron-Cohen et al.](https://paperpile.com/c/RCepsi/2OQ31), [“The Autism-Spectrum Quotient (AQ)](http://paperpile.com/b/RCepsi/2OQ31)”. [↑](#endnote-ref-36)
37. [Wheelwright et al.,](https://paperpile.com/c/RCepsi/fk5Im+hx427) [“Defining the Broader, Medium and Narrow Autism Phenotype among Parents Using the Autism Spectrum Quotient (AQ)”](http://paperpile.com/b/RCepsi/fk5Im); [Woodbury-Smith et](https://paperpile.com/c/RCepsi/fk5Im+hx427) al., [“Screening Adults for Asperger Syndrome Using the AQ](http://paperpile.com/b/RCepsi/hx427)”. [↑](#endnote-ref-37)
38. [Baron-Cohen et al.](https://paperpile.com/c/RCepsi/2OQ31), [“The Autism-Spectrum Quotient (AQ)](http://paperpile.com/b/RCepsi/2OQ31)”. [↑](#endnote-ref-38)
39. For details of this test see Baron-Cohen ibid; these questions are standard and are widely accessible, and are therefore excluded from the list of questions presented as Appendix A. [↑](#endnote-ref-39)
40. English Heritage, *Conservation Principles*, p. 27-32. [↑](#endnote-ref-40)
41. See Read, *Returning to Nothing* for a detailed discussion of how loss of a favourite place such as a home can create trauma. [↑](#endnote-ref-41)
42. Council of Europe, *Heritage and Beyond*. [↑](#endnote-ref-42)
43. English Heritage, *Conservation Principles*. [↑](#endnote-ref-43)
44. For example, but notably, Kiddey, *Homeless Heritage,* p. 3. [↑](#endnote-ref-44)
45. Referred to as ‘place attachment’, for example [Lewicka,](https://paperpile.com/c/RCepsi/Mkfs6+LcpY3+jK9cL) [“Place Attachment, Place Identity, and Place Memory: Restoring the Forgotten City Past](http://paperpile.com/b/RCepsi/Mkfs6)”; Lewicka, [“Place Attachment: How Far Have We Come in the Last 40 Years?”](http://paperpile.com/b/RCepsi/LcpY3)[; and Anton and Lawrence](https://paperpile.com/c/RCepsi/Mkfs6+LcpY3+jK9cL), [“Home Is Where the Heart Is](http://paperpile.com/b/RCepsi/jK9cL)”. [↑](#endnote-ref-45)
46. After [Giddens,](https://paperpile.com/c/RCepsi/KRGcc) [*Modernity and Self-Identity*](http://paperpile.com/b/RCepsi/KRGcc); for an assessment of its relevance to heritage, see [Grenville](https://paperpile.com/c/RCepsi/f0iRl), ibid. [↑](#endnote-ref-46)
47. For example Jones, [“Wrestling with the Social Value of Heritage](http://paperpile.com/b/RCepsi/uKpCf)”; Johnson, [*What Is Social Value?*](http://paperpile.com/b/RCepsi/mVs1S) [↑](#endnote-ref-47)
48. Kiddey, *Homeless Heritage*. [↑](#endnote-ref-48)
49. Lashua et al., [“Popular Music, Mapping, and the Characterization of Liverpool”](http://paperpile.com/b/RCepsi/CrVHN). [↑](#endnote-ref-49)
50. [Holtorf et al.,](https://paperpile.com/c/RCepsi/GRvM7+sEnKc) [*Cultural Heritage, Ethics and Contemporary Migrations*](http://paperpile.com/b/RCepsi/GRvM7)[; Hamilakis,](https://paperpile.com/c/RCepsi/GRvM7+sEnKc) [*The New Nomadic Age*](http://paperpile.com/b/RCepsi/sEnKc). [↑](#endnote-ref-50)
51. Farrell-Banks, “Can archaeology become a positive working environment for adults with autism spectrum disorders?” [↑](#endnote-ref-51)
52. Wells, [“How Are Old Places Different from New Places?](http://paperpile.com/b/RCepsi/hUGyh)” [↑](#endnote-ref-52)
53. Ibid. [↑](#endnote-ref-53)
54. English Heritage, ibid. [↑](#endnote-ref-54)
55. After Wells, and effectively meaning those who are expert ‘at living where they do’. [↑](#endnote-ref-55)
56. Ibid. [↑](#endnote-ref-56)
57. Jackson, [“Contesting the ‘Expert at the Former Bradford Odeon, West Yorkshire”](http://paperpile.com/b/RCepsi/At0ix). [↑](#endnote-ref-57)
58. For example Bailey, “Housing at the neighbourhood level”. [↑](#endnote-ref-58)
59. Jones, ibid. p. 24. [↑](#endnote-ref-59)
60. Their ‘home’, after [Anton and Lawrence](https://paperpile.com/c/RCepsi/jK9cL), ibid. [↑](#endnote-ref-60)
61. For example Barbuto et al., [“A Critique of the Myers-Briggs Type Indicator and Its Operationalization of Carl Jung’s Psychological Types”](http://paperpile.com/b/RCepsi/Vn98J). [↑](#endnote-ref-61)
62. Schofield, “Thinkers and Feelers”. [↑](#endnote-ref-62)
63. Darvill et al., [“A Question of National Importance](http://paperpile.com/b/RCepsi/xJxIM)”. [↑](#endnote-ref-63)
64. e.g. <https://www.autisminmuseums.com/resources/>. Ashley Fisher (University of York) has worked with the Jorvik Group, which manages a range of heritage attraction in York. She describes a number of initiatives they have instituted: 1) Living Autism training for front of house staff and managers put together by the National Autistic Society to teach people what autism is and how it can impact someone's experience in public buildings. 2) An Inclusive Hour at DIG – the lights are turned down and sounds reduced to lessen the sensory inputs. 3) Accessibility guides for all the sites. 4) Visual stories for each site, so that people can get an idea of what to expect before they arrive. Research suggests that this lessens anxiety in autistic visitors, who don't necessarily respond well to changes in their routine. 5) Sensory packs for each site, including ear defenders (which cut out extra noise to the wearer) and other sensory toys that give visitors things to "fidget" with to help them concentrate or focus, as well as a kind of soothing action. 6) Traffic Light Sticker System - visitors wear a red, yellow, or green sticker that lets staff members know the level of engagement they want. Red means no engagement, yellow means if the visitor asks a question, a staff member can respond and begin an interaction then. Green means staff members may approach and interact without any outward signal. This is because being approached by a costumed Viking can be a bit overwhelming for many people, so visitors now have a way of signalling their level of comfort. [↑](#endnote-ref-64)
65. e.g. https://www.yac-uk.org/additional-needs [↑](#endnote-ref-65)