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# *Space, the universe and everything: listening to visitors to the Luxmuralis son et lumiere installation at Liverpool Cathedral in 2022*

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## ABSTRACT

High profile (and sometimes controversial) events and installations have drawn attention to innovation and public engagement within Anglican cathedrals. One strong category of such events and installations has promoted clear engagement with scientific themes. Taking the Luxmuralis son et lumiere installation, *Space, the Universe and Everything*, as an example of such engagement, the present study examined the demographic and religious profile of 283 visitors to this installation at Liverpool Cathedral and explored their views on the connection between science and religion. The data demonstrated that 94% of the participants agreed that a cathedral is an ideal place for this type of installation. Reflecting on their experience of the installation in Liverpool Cathedral, 73% agreed that we need both science and religion in our lives.

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Cathedral studies; sacred space; visitor studies; science and religion

## Introduction

The positioning of Anglican cathedrals as visitor attractions within the wider context of tourism and leisure industries has been designed to meet two primary aims of those mandated with the preservation and future development of these iconic edifices, often constructed in an age when Christianity held a more prominent position within the heart of the nation. The first aim is financial and commercial. These buildings are costly to maintain and sustainable recurrent sources of income need to be secured. Leisure, tourism and the visitor market offer one exploitable source of income. The second aim is broadly religious in a way that fits with Anglican ecclesiology. These buildings have been conceptualised as ‘Shop-windows of the Church of England’ (Archbishops’ Commission on Cathedrals 1994, 17), as ‘Flagships of the Spirit’ (Platten and Lewis 1998), as ‘Beacons for the Gospel’ (Richmond-Tulloch 2013), and as ‘Sacred spaces and common ground’ (Percy 2015, 7; see also Muskett 2019). Once drawn across the threshold, tourists and visitors may be tempted to ask questions about the God who inspired the creation of such magnificent buildings and about the clergy and lay

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people who continue to animate these buildings through the daily worship offered to God and through the daily services offered to the local community.

The dual focus to the cathedrals' commitment to leisure, tourism and the visitor market was highlighted by the Archbishops' Commission on Cathedrals (1994), *Heritage and Renewal*, by dedicating chapter 12 specifically to the topic of 'Tourism'. Here the report draws attention to both 'the importance of cathedrals for tourism' (135–137) and 'the importance of tourism for cathedrals' (137–142). According to the report, cathedrals are important to tourism in three ways: the large number of visitors attracted to cathedrals, the wider economic benefits generated, and the contributions that cathedrals make to the sense of British heritage offered to tourists. Tourism is important to cathedrals because of the income generated, and because of the opportunities offered to fulfil the core mission of the cathedrals themselves. Elsewhere the report draws attention to the evangelistic potential held by cathedrals since they are 'more in touch with nonchurchgoers than any other part of the Church' (31).

The economic impact of cathedrals on their local communities has not gone unnoticed, and the part played by tourism and visitors in this regard has not been inconsiderable. For example, Ecorys (2021), in their report to the Association of English Cathedrals, *The economic and social impact of England's cathedrals*, estimated over 9.5 million tourists or leisure visitors to cathedrals in 2019, an increase of 15% over the total of 8.2 million estimated by Ecorys (2014). The Church of England's own statistics support this narrative of growth in the tourism and visitor market. The report, *Cathedral Statistics 2018* highlighted the finding that during 2018, cathedrals reported nearly 10 million visitors, an increase of over 10% on the previous year (Church of England 2019). The report also noted that 33% of these visitors were either paying or donating for entry.

The report to the Association of English Cathedrals by Ecorys (2021) also assessed the impact of these tourists or leisure visitors to cathedrals on the local economy. According to this report additional expenditure was brought to the local communities in the region of £128 million by the 9.5 million tourists or leisure visitors in 2019. In addition to the direct economic benefit, Ecorys (2021) also calculated the wider positive social and economic impact of cathedrals on their local communities. In 2019 the 42 Anglican cathedrals in England provided 6,065 full-time equivalent jobs and 15,400 volunteering posts, many of which served visitors and tourists.

### **Science of cathedral studies**

It is against this background that the science of cathedral studies is taking a greater interest in exploring and mapping the characteristics and motivations of cathedral visitors. Early examples of studies concerned with visitors to Anglican cathedrals are provided by Jackson and Hudman (1995) and by Winter and Gasson (1996). In the first of these two studies, Jackson and Hudman (1995) reported on a survey conducted among 483 visitors to five English cathedrals. They found that the proportion of visitors stating a religious motivation for visiting fell from 49% among those 'nearest 60' to 20% among those aged between 30 and 50, and to 13% among those 'nearest 20' (43). In the second of these two studies Winter and Gasson (1996) reported on a survey conducted among 814 visitors to four English cathedrals. They found that 34% of visitors attended church weekly, compared with 36% who never attended church.

More recent studies concerned with visitors to Anglican cathedrals were reported by Williams (2007), Williams et al. (2007), Voase (2007), Gutic et al. (2010), Hughes et al. (2013), and Francis, Annis, and Robbins (2015). For example, Williams et al. (2007) reported on a survey conducted among 514 visitors to St Davids Cathedral in west Wales. They found clear differences between the quest and experiences of visitors who attended church services weekly (styled religious pilgrims) and visitors who never attended church services (styled secular tourists). For example, while 77% of religious pilgrims felt a sense of God's presence from their visit, the proportion fell to 18% among secular tourists. While 72% of religious pilgrims felt a sense of the spiritual from their visit, the proportion fell to 31% among secular tourists.

Gutic et al. (2010) reported on a survey conducted among 352 visitors to Chichester Cathedral. They found that only 14% gave spiritual reasons for their visit, with 7% mentioning prayer, worship, or pilgrimage, and a further 7% mentioning a desire for peace and solitude. However, when asked to assess their experience *from* visiting the cathedral, rather than their reason *for* visiting the cathedral, between 35% and 41% gave answers that could be interpreted to indicate a sense of spirituality or emotional involvement.

Hughes et al. (2013) reported on a survey conducted among 233 visitors to Canterbury Cathedral. From these data they identified five distinctive motivational styles. According to their definition: *explorers* are driven by curiosity, with a generic interest in the site; *facilitators* are socially motivated and focus on enabling the experience and learning of others; *professional hobbyists* are motivated by a close link to the site because of their specific passion; *experience seekers* are motivated by accessing what is for them an important destination; *rechargers* are motivated by seeking out a contemplative, spiritual, or restorative experience.

Francis, Annis, and Robbins (2015) reported on a survey among 2,695 visitors to St Davids Cathedral in west Wales, designed to test the thesis advanced by Heelas and Woodhead (2005) that retreat from conventional Christianity was being replaced by the 'spiritual revolution', by the 'subjective turn', and by the espousal of alternative spiritualities. The data demonstrated that aromatherapy and horoscopes were within the experiences of almost one in five of the visitors, while at least one in ten had experienced acupuncture, counselling, homoeopathy, meditation, reflexology, and yoga. These findings helped to nuance appreciation of the spiritual quest of cathedral visitors.

Two other distinctive lenses through which the expectations, experiences, and motivations of cathedral visitors have been viewed are reported by Burton (2015) and by ap Siôn (2015a, 2015b). In the first of these approaches, Burton (2015) analysed 1,278 entries in the visitor books from one cathedral in the north west of England. His analysis confirmed that the cathedral served a double function, both as an historical attraction to secular tourists, and as a source of religious experience and spiritual insight. In the second of these approaches, ap Siôn (2015a) analysed 1,000 prayer cards from Bangor Cathedral, and compared these prayer requests with a similar study conducted in Lichfield Cathedral (ap Siôn 2015a). This study demonstrated that there were some significantly different emphases in prayer intentions among those who used the prayerboards in these two cathedrals. For example, while 13% of the prayers in Bangor concerned death, the proportion rose to 27% in Lichfield.

A third distinctive lens through which cathedral visitors has been explored was provided by psychographic segmentation theory. A series of studies, drawing on psychological type theory (Jung 1971) as operationalised by the Francis Psychological Type Scales (Francis 2005; Francis, Laycock, and Brewster 2017), has been reported by Francis, Williams et al. (2008), Francis, Mansfield et al. (2010), Francis, Annis, et al. (2012), Francis, Robbins, and Annis (2015), and Francis and Mansfield (2022). For example, in the most recent of these studies, Francis and Mansfield (2022) reported on the psychological type profile of 1,082 visitors to four cathedrals. Comparison with the population norms provided by Kendall (1998) demonstrated that extraverts and perceiving types were significantly underrepresented among cathedral visitors.

### ***Extending the reach of cathedrals***

Reviewing the increased footfall of visitors to Anglican cathedrals in 2019, since their earlier study in 2014, Ecorys (2021) speculated that this increase may be associated with the range of innovative events and exhibitions being hosted by cathedrals. In particular, Ecorys (2021) referenced the Helter-Skelter installed in Norwich Cathedral and the Crazy Golf Bridges installed in Rochester Cathedral. In order to test the extent to which Anglican cathedrals were investing in events and installation designed to appeal to a wide range of tourists and visitors, McKenna et al. (2022) undertook and reported on a detailed analysis of information publicly available on the websites of the 42 cathedrals in England and the cathedral on the Isle of Man. Their analysis of the 43 cathedral websites identified eight categories of events and installations that they characterised as scientific exhibitions, festivals, musical events, art exhibitions, theatre, markets, community events, and imposing installations. The strongest category emerging from this analysis was that of exhibitions with a scientific theme. For example, Luke Jerran's installation, *Museum of the Moon*, had been hosted at cathedrals in Bristol, Chichester, Derby, Durham, Ely, Exeter, Gloucester, Leicester, Lincoln, Liverpool, Peterborough, Rochester, and Wells. This is a 1: 500,000 scale model of the moon using NASA photography. The installation has been accompanied by a diverse programme of activities, including workshops, lectures and silent discos. This installation not only attracted thousands of visitors but also a diverse type of visitor. The Dean of Bristol Cathedral noted, 'The installation transformed our building. . . . It was wonderful to see the diversity of those who came through the doors'. At many cathedrals, visitor numbers to this event were higher than at any other exhibition held. At Peterborough Cathedral there were 40,000 visitors over the course of a 10-day showing in 2018. In three weeks at Derby Cathedral, it attracted over 45,000 visitors. At Chichester Cathedral and Bristol Cathedral visitor numbers were over 50,000 and 65,000 respectively. Liverpool Cathedral attracted 60,254 visitors over one week in 2018. It gave Durham Cathedral its highest ever visitor numbers in 2021 with over 90,500 people visiting. Some cathedrals made a direct link between science and faith by drawing attention to the wonder of creation. The Dean of Leicester Cathedral was quoted as saying, 'Cathedrals are places of wonder and discovery. We are very glad to provide another opportunity for people to be inspired, to explore, to pray, to have fun, to dance and to have our minds and hearts expanded to explore our place in God's good creation'.

## Research question

Strangely, however, no systematic research currently within the public domain has attempted to scope the characteristics of visitors attracted by such events with a scientific theme hosted within cathedrals, and to explore the impact of the experience on these visitors. The intention of the present study is to address the lacuna within the literature, and to do so by focusing on the installation ‘*Space, the Universe and Everything*’, a light and sound show created by Luxmuralis, drawing on the skills of sculptor Peter Walker and composer David Harper. The installation within Liverpool Cathedral between 18 and 27 February 2022 promised visitors a show like no other, all within the iconic space of England’s largest cathedral, constructed during the twentieth century and completed in 1978 (Kennerley 2008; Thomas 2018). Peter Walker himself envisaged the installation as taking visitors back to the start of everything, whether conceived as creation or as the big bang. As such, the installation was located throughout the vast interior of the entire cathedral. Beginning at the west end (the Well) was the location for ‘The Beginning of Everything’, with light and sound depictions of the origins of the universe from current scientific theories of the Big Bang, combined with creation as expressed in the Book of Genesis in the Bible. The main space (the Nave) was the location for a light and sound journey through space, observing galaxies emerging with humanity’s desires to adventure beyond. The Derby Transept was the location for an exhibit entitled ‘The Endless Universe’, inspired by Genesis 22:1, the story of Abraham. Here the observer was immersed in a cosmic constellation of stars, using thousands of beams of reflected light to convey the unimaginable number of stars in the universe – the closest estimate being about  $1 \times 10^{21}$ . At the centre of the War Memorial Chapel was a four metre high rocket sculpture created to represent NASA’s Saturn V rocket, as used in the 1969 moon landing; a cultural icon of engineering and innovation accompanied by music composed by David Harper. In the final location (the South Choir Aisle and Ambulatory), animal constellations from the Zodiac, were projected onto the architecture of the Cathedral. Short video clips for each of the main locations within the cathedral can be found at the following URL: <https://liverpoolcathedral.org.uk/about-us/art-in-the-cathedral/previous-installations/space-the-universe-and-everything/discover-more-about-space-the-universe-and-everything-and-its-creators/>

## Method

### Procedure

When people booked to attend the installation, they were invited to give assent to receiving a follow-up survey from the cathedral team to assess their experience. Rather than explore the immediate impact, the cathedral invited a sample of the participants to reflect on the experience six months later during August. The invitation was emailed to 2,481 individuals, of whom 48.9% opened the email and 12.2% clicked through to the site hosting the survey. In the event, 283 individuals completed the whole survey, an effective response rate of 11.4%.

### Instrument

The survey was hosted on the Qualtrics platform of York St John University and comprised three sections. Section 1 explored demographic and background

information, including sex, age, education, connection with Liverpool, connection with Liverpool Cathedral, planning for the visit, religious affiliation, and frequency of public worship attendance. Section 2 presented 57 Likert-style items, assessed on a five-point scale from disagree strongly (1), through not certain (3), to agree strongly (5). These items explored self-assessed religiosity, intrinsic religious motivation, quest religious orientation, experiencing the cathedral, perceived impact on wellbeing, and views on the connection between science and religion. Section 3 presented the Francis Psychological Type Scales (Francis 2005; Francis, Laycock, and Brewster 2017). The survey concluded with the open invitation: 'If you would like to write about your experience of the cathedral in your own words, you can do so here, or include anything that we had not asked that you think we should have'.

## ***Analysis***

The present paper draws on section 1 and section 2 from the survey, and on qualitative data provided in response to the open invitation that were specifically relevant to considering the connection between science and religion.

## **Results and discussion**

### ***Demographic profile***

#### ***Sex***

Three-quarters of the participants in the survey were female (75%) and 23% male, with 3% preferring not to say.

#### ***Age***

Two-thirds of the participants in the survey were within their fifties and sixties (66%), with 17% under the age of fifty, 15% aged 70 or over, and 2% preferred not to say.

#### ***Education***

Almost half of the participants in the survey were graduates (48%), among whom 18% held postgraduate degrees. A further 30% held certificate- or diploma-level qualifications, leaving 20% who had no qualifications post school, and 3% preferred not to say.

#### ***Connection with Liverpool***

Two-thirds of the participants lived within ten miles of the Cathedral (67%), with 30% living over ten miles away, and 3% preferred not to say.

#### ***Connection with Liverpool Cathedral***

The majority of the participants in the survey regarded themselves as already in some ways connected with Liverpool Cathedral: 71% saw themselves as occasional visitors, 21% as regular visitors, and 1% as members of the congregation, leaving 4% visiting for the first time and 3% preferring not to say.

### ***Planning the visit***

The nature of the event was of greater significance to the participants than the location in the Cathedral when they were planning to attend. Thus, 63% said that the event was the most important factor, compared with 28% who said that it was the location in Liverpool Cathedral, and 9% who opted not to answer the question. The building was more important to the participants than the fact that it is a cathedral. Thus, 59% said that the building itself is what is more important to them, compared with 36% who said the fact that it is a cathedral is more important to them, and 6% who opted not to answer the question.

### ***Religious profile***

#### ***Religious affiliation***

Two-thirds of the participants in the survey self-identified as Christian (67%), compared with 24% who self-identified as religiously unaffiliated, 6% who self-identified with another faith tradition, and 3% who opted not to answer the question.

#### ***Public worship attendance***

If the threshold of at least six attendances a year is an acceptable definition for a churchgoer (Francis and Richter 2007; Richter and Francis 1998), just under one-third of the participants in the survey would qualify as churchgoers (31%), with 15% attending weekly, 6% at least once a month, and 11% at least six times a year. Of the other two-thirds, 38% never attended, 27% attended at least once a year, and 3% opted not to answer the question.

#### ***Self-assessed religiosity***

Responding to three separate questions, 39% agreed or agreed strongly with the statement, 'I am a religious person'; 55% agreed or agreed strongly with the statement, 'I believe in God'; and 69% agreed or agreed strongly with the statement, 'I am a spiritual person'.

#### ***Intrinsic religious motivation***

The notion of intrinsic religious motivation, rooted in the work of Allport and Ross (1967), is concerned with the importance that individuals attribute to religion in shaping their personal lives. The three components of this construct, identified as integration, public religion, and personal religion, were assessed by the New Indices of Religious Orientation (NIRO; Francis 2007). Table 1 indicates that, while just 12% agreed or agreed strongly that they allow almost nothing to prevent them from going to church on Sundays (a figure closely reflected in the 15% who said that they attend worship services every week), 34% agreed or agreed strongly that church is important to them as a place to share fellowship with other Christians. A much higher proportion of the participants attributed importance to personal prayer, compared with those who attributed importance to weekly church attendance. Thus, 32% agreed or agreed strongly that they pray chiefly because it deepens their relationship with God, and 40% agreed or agreed strongly that they pray at home because it helps them to be aware of God's presence. Around two-fifths of the participants agreed or agreed

**Table 1.** Intrinsic religious motivation.

	%
My religious beliefs really shape my whole approach to life	41
I try hard to carry my religion over into all my other dealings in life	37
I allow almost nothing to prevent me from going to church on Sundays	12
The church is important to me as a place to share fellowship with other Christians	34
I pray at home because it helps me to be aware of God's presence	40
I pray chiefly because it deepens my relationship with God	32

% = sum of agree and agree strongly responses.

strongly that they try hard to carry their religion over into all their other dealings in life (37%) or that their religious beliefs really shape their whole approach to life (41%).

### *Quest religious motivation*

The notion of quest religious motivation, rooted in the work of Batson and Ventis (1982), is concerned with the importance that individuals attributed to the religious quest rather than to attaining religious certainty. The three components of this construct, identified as existentialism, self-criticism, and openness to change, were also assessed by the New Indices of Religious Orientation (NIRO; Francis 2007). Table 2 indicates that up to half of the participants in the survey carried with them a significant commitment to the quest orientation. Their religious commitment is one of enquiry, seeking, and testing faith, rather than longing for certainty and for unchanging truths. In terms of the existentialism component, 28% of the participants said that they were driven to ask religious questions by a growing awareness of the tensions in their world, and 47% affirmed that their life experiences had led them to rethink their religious beliefs. In terms of the self-criticism component, 46% said that for them doubting is an important part of what it means to be religious, and 55% affirmed that they value their religious doubts and uncertainties. In terms of the openness to change component, 37% said that they are constantly questioning their religious beliefs, and 51% affirmed that, as they grow, they expect their religion to grow and change as well.

### *Impact of the visit*

#### *Experiencing the Cathedral*

Table 3 indicates that visiting the Cathedral for the installation had a powerful impact on the participants in the survey. The vast majority found the Cathedral awe-inspiring (97%) and uplifting (95%). The vast majority felt a sense of peace in the Cathedral (94%).

**Table 2.** Quest religious motivation.

	%
I was driven to ask religious questions by a growing awareness of the tensions in my world	28
My life experiences have led me to rethink my religious beliefs	47
I value my religious doubts and uncertainties	55
For me, doubting is an important part of what it means to be religious	46
As I grow and change, I expect my religion to grow and change as well	51
I am constantly questioning my religious beliefs	37

% = sum of agree and agree strongly responses.

**Table 3.** Experiencing the Cathedral.

	%
I felt a sense of peace in the cathedral	94
I felt a prayerful atmosphere in the cathedral	69
I felt God's presence in the cathedral	41
I found the cathedral awe-inspiring	97
I found the cathedral uplifting	95
I found the cathedral spiritually alive	75
I felt moved to pray	44
I felt moved to worship God	38

% = sum of agree and agree strongly responses.

Between two-thirds and three-quarters of the participants experienced a sense of spirituality in the Cathedral: 75% found the Cathedral spiritually alive, and 69% felt a prayerful atmosphere in the Cathedral. A smaller proportion of the participants translated their sense of spirituality into explicitly religious terms: 44% felt moved to pray, 41% felt God's presence in the Cathedral, and 38% felt moved to worship God.

### *Assessing the personal impact*

Table 4 sets out the responses of the participants to the prompt 'Spending time in Liverpool Cathedral has helped me to'. The items following this invitation were designed to reflect the conceptualisation of spiritual health or spiritual wellbeing advanced in a series of studies by Fisher (1998, 2004, 2010, 2011, 2016). According to Fisher, spiritual wellbeing is reflected in the quality of relationships that each person has in four domains: with the self (the personal domain), with other people (the communal domain), with the world around them (the environmental domain),

**Table 4.** Perceived impact.

	%
<i>Personal</i>	
to reflect on my personal wellbeing	72
to feel better about myself	70
to feel less stressed about myself	69
to open my eyes to the good in myself	37
to connect better with my inner self	55
<i>Communal</i>	
to reflect on my relationship with other people	66
to feel better about my relationships with other people	59
to feel less stressed about my relationships with other people	56
to open my eyes to the good in other people	57
to connect better with other people close to me	49
<i>Environmental</i>	
to reflect on my relationship with the world	70
to feel better about my relationship with the world	57
to feel less stressed about my relationship with the world	50
to open my eyes to the good in the world	61
to connect better with the natural world	52
<i>Transcendental</i>	
to reflect on my relationship with God	44
to feel better about my relationship with God	39
to feel less stressed about my relationship with God	33
to open my eyes to the good in God	40
to connect better with God	36

% = sum of agree and agree strongly responses.

and with a personal or impersonal transcendent other (the transcendental domain). Fisher's conceptualisation of spiritual wellbeing has been operationalised through several instruments: the Spiritual Health in Four Domains Index (SH4DI; Fisher, Francis, and Johnson 2000), the Spiritual Health And Life-Orientation Measure (SHALOM; Fisher 2010, 2016; Gomez and Fisher 2005a, 2005b), and Feeling Good, Living Life (Fisher 2004).

The items presented in Table 4 build on this tradition of measurement. These data suggest that across all four domains the participants perceived a positive impact of visiting the installation on their level of spiritual wellbeing as conceptualised and operationalised within Fisher's relational model. In terms of the personal domain, between half and three quarters of the participants affirmed that visiting the installation in Liverpool Cathedral has helped them to reflect on their personal wellbeing (72%), to feel better about themselves (70%), to feel less stressed about themselves (69%), and to connect better with their inner self (55%). A smaller proportion felt that the experience opened their eyes to the good in themselves (37%).

In terms of the communal domain, between half and two-thirds of the participants affirmed that attending the installation in Liverpool Cathedral has helped them to reflect on their relationships with other people (66%), to open their eyes to the good in other people (57%), to feel better about their relationships with other people (59%), to feel less stressed about their relationships with other people (56%), and to connect better with other people close to them (49%).

In terms of the environmental domain, between half and two-thirds of the participants affirmed that attending the installation in Liverpool Cathedral has helped them to reflect on their relationship with the world (70%), to open their eyes to the good in the world (61%), to feel better about their relationship with the world (57%), to connect better with the natural world (52%), and to feel less stressed about their relationship with the world (50%).

In terms of the transcendental domain, between one-third and just over two-fifths of the participants affirmed that attending the installation in Liverpool Cathedral has helped them to reflect on their relationship with God (44%), to open their eyes to the good in God (40%), to feel better about their relationship with God (39%), to connect better with God (36%), and to feel less stressed about their relationship with God (33%).

## *Science and religion*

### *Visiting the exhibition*

Table 5 sets out the responses of the participants to the prompt 'Visiting the exhibition has helped me to'. The items following this invitation were designed to assess the benefits and dangers of both science and religion within today's world. These data indicate that the installation prompted more reflection on science than on religion. Thus, 78% of the participants had been helped to reflect on the benefits of science within our world, compared with 44% who had been helped to reflect on the benefits of religion within our world. At the same time, 36% of the participants had been helped to reflect on the dangers of science within our world, compared with 28% who had been helped to reflect on the dangers of religion within our world. Similarly, 46% of the participants had been helped to

**Table 5.** Visiting the exhibition.

	%
<i>Visiting the exhibition has helped me to:</i>	
Reflect on the benefits of science within our world	78
Reflect on the dangers of science within our world	36
Reflect on the limitations of science within our world	46
Reflect on the benefits of religion within our world	44
Reflect on the dangers of religion within our world	28
Reflect on the limitations of religion within our world	33

% = sum of agree and agree strongly responses.

**Table 6.** After visiting the exhibition.

	%
<i>After visiting the exhibition, I think that:</i>	
Science does not need religion	33
Religion does not need science	21
We need both science and religion within our lives	72
A cathedral is not the right place for this type of exhibition	5
A cathedral is an ideal place for this type of exhibition	94
The exhibition is even better in a place like a cathedral	92
The exhibition would be the same anywhere – in a cathedral or a non-religious venue	11

% = sum of agree and agree strongly responses.

reflect on the limitations of science within our world, compared with 33% who had been helped to reflect on the limitations of religion within our world.

### ***After visiting the exhibition***

Table 6 sets out the responses of the participants to reflecting about the place of science within a cathedral. These data indicate that the vast majority of the participants in the survey were in favour of a cathedral engaging with science. Thus, 94% of the participants agreed or agreed strongly that a cathedral is an ideal place for this type of exhibition, and 92% went further to agree or to agree strongly that the exhibition is even better in a place like a cathedral. By contrast, very few agreed or agreed strongly that a cathedral is not the right place for this type of exhibition (5%), while just one in ten of the participants agreed or agreed strongly that the exhibition would be the same anywhere, whether in a cathedral or a non-religious venue (11%).

Coming away from the installation, around three-quarters of the participants agreed or agreed strongly that we need both science and religion within our lives (73%). One-third of the participants took the view that science does not need religion (33%) and one-fifth took the view that religion does not need science (21%). These are interesting points, when considering that 55% of the respondents believe in God and only 39% consider themselves religious.

### ***Open text responses***

The survey concluded with the open invitation for participants to write in their own words about their experience of attending the exhibition *Space, the Universe and*

*Everything*. These open qualitative responses added richness to the quantitative responses across a range of areas, including the following six themes.

First, a number of visitors commented on the distinctive effectiveness of the installation within Liverpool Cathedral.

We had been to the cathedral before and we were really surprised by how effective the 'Space' show was, and how well it worked in a church setting. A very good, enjoyable evening. (male aged 50–59)

I think events such as The World globe and Space are fantastic showcased by the cathedral. We anticipate coming to more events like these. (female aged 50–55)

The cathedral is a magnificent and spiritual space which I always enjoy visiting particularly for the exhibitions/installations. It was wonderful to experience the awe with which the 'Universe' was received and how all the different ages and cultures absorbed the energies created therein. The atmosphere was electric and dazzling and we spent two full hours soaking this in. (female aged 60–69)

The Space, the Universe and Everything exhibition was truly stunning, moving, awe-inspiring - a never-to-be-forgotten evening. The lights, colours and special effects were wonderfully combined with the amazing music and the stunning architecture. I forwarded some of the photos I took that evening with friends as I wanted to share the event with them. I would definitely attend another event by this company and hope there will be that opportunity. (female aged 50–59)

Second, the installation exemplified ways in which the Cathedral was serving the local community.

A memorable experience enjoyed by many. The space event brought many people, including my family, into the cathedral who wouldn't normally visit a place of worship. I like that many churches etc are inviting the community through their doors in new ways. The faith sector has a massive part to play in community and things such as this should be used to increase that access. Thank you. (female aged 70–79)

I visited Space with my parents, sister and nephew and we all enjoyed it very much. Parts were incredible! Thank you for bringing the event to Liverpool Cathedral. (female aged 40–49)

The experience was uplifting and interesting. I enjoyed seeing families visiting together, people standing, sitting and lying down, listening and watching - contemplating. The atmosphere was vibrant and reflective at the same time. I love the idea that a sacred, religious space was welcoming all the community in an open and non judgemental way. I believe this does more to open minds and evangelise more than any preaching. (female aged 50–59)

Third, some visitors drew attention to the beneficial psychological impact of their visit to the installation.

Every time we visit, I feel welcomed and comfort. The building is magnificent and the exhibitions truly inspiring. As I walk around the building I feel a sense of quiet calm and reflection. It is a place I will never tire of visiting. (female aged 30–39)

I found the whole experience awe inspiring! The cathedral, well what an amazing building and I definitely felt a sense of peace during the time I spent there. I sort of lost myself in the wonderful atmosphere and can't wait to return to experience future exhibitions, and enjoy this wonderful building. (female aged 50–59)

Fourth, located within the Cathedral, the installation resourced the spirituality of visitors who would describe themselves as spiritual but not religious.

I am a spiritual person who prefers meditation to church going. But I love the events that take place in the cathedral and I am filled with joy when entering. The light and sound event you spoke of was by far the most beautiful event I have ever been to. It sent me into a state of bliss. I was sitting on the floor meditating filled with pure joy. The mixture of sound and light seemed to transport me to another dimension. Please bring it back. (male aged 60–69)

I have been to all the events at the cathedral, the moon, earth etc. The space in the building is perfect for this size of exhibition, however the fact that it is a cathedral does put a different 'feel' to it, I light a candle, I stare at the stained glass windows, the columns ... it's not a religious experience but a spiritual one x. (female aged 50–59)

Fifth, the installation brought into the Cathedral people who clearly identified themselves as atheists or as not religious and yet applauded access to this magnificent building.

I think the cathedral is a beautiful building and have enjoyed the doves and world installations as well as the space one. Although an atheist, I find spiritual comfort from lighting a candle in memory of loved ones. (female aged 70–79)

Not religious at all but love the cathedral and the event itself was simply breathtaking (male aged 50–59)

I really enjoyed the light experience and the cathedral made it a wonderful experience. Although I do not believe in God I do enjoy visiting cathedrals and the Liverpool Anglican Cathedral is my favourite. (female aged 60–69)

Sixth, the installation resourced the faith of visitors who aligned themselves with the Christian tradition.

I enjoy visits to the cathedral and feel that it is part of my roots, belonging to Liverpool and my ancestors. I feel church and religion play a big part in my life giving me faith and an anchor. I enjoyed the science evening at the cathedral in fact it was awesome. (female aged 70–79)

I welcome the developing focus on links between science and faith, the head and the heart, the what and the why, the detail and the bigger picture, the present reality and the vision. This is God's world and anything that helps prompt and supports me to serve him and others better is welcomed. (female aged 50–59)

It was a wonderful experience enjoyable and awe inspiring. It was all the better by being enjoyed by so many other people. I felt more connected with other people and with God because of the exhibition and where it was held. I experienced the kindness and thoughtfulness of others at the exhibition. (female aged 70–79)

## Conclusion

The present study was designed as a pilot project to examine the feasibility of assessing visitors responses to significant events and installations within Anglican cathedrals. The study focused on visitors to the Luxmuralis son et lumiere installation at Liverpool Cathedral during February 2022, as an example of the genre of installations concerned

with science-related themes. This genre had been identified by McKenna et al. (2022) as the most prominent among the eight categories of innovative events and installations within Anglican Cathedrals during the period 2018 and 2022. The following four tentative conclusions can be drawn from the data generated by this pilot project.

The first conclusion concerns the high proportion of participants who expressed commitment in one way or another to Liverpool Cathedral itself. Thus, 67% lived within ten miles of the Cathedral, 92% saw themselves as regular or occasional visitors. These data resonate with the Cathedral's claim that it was built by the people of Liverpool for the people of Liverpool. These data also resonate with Walker's analysis of the importance of place in generating a sense of connection with the church (Walker 2017). Of equal importance, however, was the nature of the event that had determined this particular event. Thus, 63% said that the event itself was the most important factor in the decision to book attendance. While there is clear commitment to the location, it remains important for the Cathedral to read its market carefully and to ensure that there is appetite for the events and installations hosted.

The second conclusion concerns the religious profile of the participants. Through this installation Liverpool Cathedral was able to engage both with churchgoers and with non-churchgoers: 31% of the participants attended church at least six times a year and 38% never attended church; 55% believed in God and 45% did not share that belief. These data resonate with the analysis of McKenna et al. (2022), drawing on the theory of implicit religion proposed by Bailey (1997, 1998, 2002), suggesting that cathedrals have the capacity to soften boundaries between the religious and the secular. Among the participants who espoused religious beliefs, the style of believing veered more toward quest religious motivation than toward intrinsic religious motivation. This finding resonates with the prominence of the quest orientation among participants at cathedral carol services (Francis, Jones, et al. 2021; Walker 2012). Cathedrals emerge as safe places in which to raise religious questions, to own religious doubt, and to expect religious change.

The third conclusion concerns the positive impact of visiting the installation on the participants' level of spiritual wellbeing as conceptualised by Fisher (1998, 2004, 2010, 2011, 2016). Across all four of Fisher's domains of wellbeing (styled personal, communal, environmental, and transcendental) participants reported a perceived improvement as a consequence of their visit. This, 70% affirmed that visiting the installation had resulted in them feeling better about themselves, 59% left feeling better about their relationships with other people, 57% left feeling better about their relationship with the world, and 39% left feeling better about their relationship with God. This finding resonates with the data published by Francis, Jones, and McKenna (2021) who assessed the psychological wellbeing of participants at a cathedral carol service both before the service began and again just before the service ended. These data demonstrated an increase in psychological wellbeing between time one and time two.

The fourth conclusion concerns the contribution of the installation to promoting constructive thought about the connections between science and religion. The vast majority of the participants were in favour of a cathedral engaging with science, with 94% agreeing that a cathedral is an ideal place for this type of exhibition, and 92% agreeing that the exhibition is even better in a place like a cathedral. Coming away from the installation, 73% agreed that we need both science and religion within our lives. In the

absence of previous research specifically designed to assess the impact of science-related installations within cathedrals on those who visit them, this positive finding is worth further investigation by studies appropriately designed to replicate and to extend the present project.

## Limitations

The present study was designed as a pilot project. Although the study has demonstrated both the feasibility and value of this kind of research, there are four clear limitations with the present study that now need to be addressed by future research.

The first limitation concerns focusing on the individuals who booked tickets to attend the event. The survey failed to gather information regarding the number and characteristics of the other individuals for whom tickets were booked. More importantly, the study failed to contact these individuals. If the economics of conducting research among visitors favours the current mechanism, then the research has to be reconceptualised as concerning those who book tickets to attend the installation rather than as concerning those who actually attend the installation. The second limitation concerns the time lapse between the event and conducting the survey. This time lapse may have contributed to the low response rate. Future research may need to prioritise the administration of the follow-up survey taking place closer to the event. The third limitation concerns issuing the invitation to participate in the survey on only one occasion. Future research may need to prioritise a second (or even a third) invitation within days of the initial mailing. The fourth limitation concerns the lack of sophistication in the range of questions exploring the specific connections between science and religion. This is an issue that must be addressed prior to the administration of subsequent surveys.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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## Ethical approval

Ethical approval was granted by the Research Ethics Committee for the School of Humanities, Religion and Philosophy at York St John University (approval code: HRP-RS-AV-05-22-01). All participants had to affirm they were 18 or over and give their informed consent by clicking a box that gave access to the rest of the survey.

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