

**SCIENCE MUSEUM'S DANA CENTRE
ANNUAL AUDIENCE RESEARCH REPORT**

September 2007 – July 2008



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EXECUTIVE SUMMARY

- From September 2007 to July 2008, a total of 5143 participants visited 95 events at the Science Museum's Dana Centre. This averages 54 participants per event.
- During this period 16 events were evaluated in-depth.
- Between 1 September 2007 and 10 July 2008 the Science Museum's Dana Centre website received 98,566 absolute unique visitors and 128,665 visits. Visitors came from 170 countries. 74.93% of visitors were new.

EVENT EVALUATION

- The Science Museum's Dana Centre events continued to be successful and engaging for its main target audience, non-specialist adults. Overall, those who visit continued to be very positive about the events.
- The Science Museum's Dana Centre continued to use innovative and experimental event formats. These included physical game events, beatboxing workshops, live experiments/concerts, and audience participation via the talkaoke (a live chat show table) and speakoloscope, (a live interactive video booth). These formats were successful in engaging and entertaining those who took part. They created informal, friendly and non-threatening atmospheres that appeared to encourage active engagement in the event topic.
- There is strong evidence that different forms of learning occur during the Science Museum's Dana Centre events. Evidence for learning amongst audience members has been found at all of the evaluated events. In addition, the *Fine Tuning* series evaluation found that participating engineers also learnt from taking part in the events
- Poor acoustics in the Dana Café continue to be a physical barrier during events and often affected speakers and visiting participants' ability to hear comments, questions and discussions. This had a negative impact on their experiences during events.

SPEAKER LEARNING

- Speaker learning is associated with an increased understanding of how to interact with a lay audience and how to present their work in an informal setting, and with encountering the work of other speakers. Expert speakers found participating in dialogue and receiving feedback from non-experts valuable for gaining innovative ideas about their own work.
- The engineer communication workshop which formed a key part of the *Fine Tuning* series enabled both speakers and audience members to benefit from enhanced dialogue and mutual learning at events. The workshop provides a useful model for future events targeting scientists and engineers with little previous experience of public engagement activities.

AUDIENCE-LED WORK

- Continued work with the Black African and Caribbean audience group resulted in 4 successful audience-led events and helped the Science Museum's Dana Centre staff to learn more about specific needs and barriers of particular groups, and how best to sustain audience-led consultation relationships.
- A key result of this work has been a sense in the Black African and Caribbean community that they now feel more welcome in the Science Museum's Dana Centre than before.
- New recruits for this group were recruited at an audience-led event by the Dana team, refreshing the group and bringing new ideas for further Black African and Caribbean audience-led events.

OUTREACH AND NEW AUDIENCES

- The Science Museum's Dana Centre outreach showed that events have a great potential to reach and successfully engage new audiences with science in new venues. In addition to the *Whodunnit, Whoknewit?* event, the *Fine Tuning* event series and audience-led programme attracted new audiences.

KEY RECOMMENDATIONS

The Science Museum's Dana Centre should continue to:

- Create innovative event formats to seek better engagement with specific target audiences;
- Target specific audiences for particular events
- Invest in speaker training to create more mutual learning at dialogue-based events
- Use audience-led consultation to create events
- Build on its existing relationship with London's African-Caribbean community via the focus group
- Programme events within Science Museum galleries around content
- Resolve noise issues with the building, e.g. holding discussion groups in more enclosed areas or minimising noise from scraping chairs with carpet or other methods.

In addition to this, the Science Museum's Dana Centre should:

- Conduct more research into the effectiveness of the web in engaging our audiences, for example, the effectiveness of post-event films and podcasts. New ways of engaging potential Dana audiences should be investigated.
- Seek to integrate particular learning points into the museum. These include:
 - audience-led consultation mechanisms to generate content
 - innovative event formats being integrated into Science Museum events such as Lates. This will help to incorporate the Dana Centre better within the Science Museum.
- Build on its investment in speakers by working with research councils and other funded bodies e.g. Wellcome Trust, to set up specific training courses for scientists. This would create new partnerships with a specific outcome and also provide more resources for event speakers.
- Consider continuing to host events in different locations to attract new audiences. When planning outreach, research into the venue and methods of engagement needs to be carried out so that events appeal to audiences.
- Lessons from work with new audiences e.g. the Black African and Caribbean community group should be taken on board to determine the best places for future outreach events.
- Use ongoing research into potential new partnerships with other London-based cultural institutions to feed into the Science Museum's Dana Centre strategy for Sept 08-July 09 events, so that it can remain at the cutting edge of adult science engagement.

1. INTRODUCTION

The Science Museum's Dana Centre aims to:

- Provide a key part of the Science Museum's cultural offer for adults
 - Engage public audiences with science
 - Achieve genuine dialogue between all participants at events
 - Promote learning amongst target audiences at events
 - Use innovative formats to engage a non specialist audience with scientific topics
 - Develop events which target specific audience groups
 - Develop events which will engage new and hard-to-reach audiences with science, e.g. Black and Minority Ethnic (BME) audiences, Lesbian, Gay, Bisexual and Transgender (LGBT) audiences.
- During the research period September 2007-July 2008, a total of 5143 participants visited the 95 Science Museum's Dana Centre events developed and delivered by the Science Museum, an average of 54 per event.
 - During this period, 16 of the 95 events were evaluated in-depth.

Purpose of evaluation

The purpose of evaluation was to ensure that the Science Museum's Dana Centre events maintain their high quality; that they continually improve; and that they are engaging, interesting and appealing to those who participate. Evaluation also aimed to measure the success of any new, innovative and experimental event formats

that were used during this period. The audience-led project with the Black African and Caribbean community has continued and resulted in four events since October 2007. This is still on-going and will result in an event delivered during Black History Month 2008. The consultation project was refreshed with new members recruited at our *Intelligence* event in July 2008. This will result in more events delivered in the Winter–Spring season 2009.

This report is a summary of findings from audience research conducted from September 2007 to July 2008. For further information about the audience-led work with the Black African and Caribbean community, including a report of the community consultation, or for individual reports, please contact the Science Museum's Dana Project Team, on talk@danacentre.org.uk.

2. EVALUATION SEPTEMBER 2007 – JULY 2008: AIMS AND METHODOLOGIES

This evaluation period focused on a range of areas and used different methods:

EVENT EVALUATION

- Event evaluation aims to ensure that the Science Museum's Dana Centre events are successful in achieving both the Science Museum's Dana Centre strategic objectives, e.g. that they are interesting, engaging and appealing to the target audience, in addition to any particular event objectives. Evaluation aims to monitor events, so that quality is not only maintained, but also improved, and that any innovative and experimental event formats are tested.
- In total, 16 events were evaluated during this year's evaluation period (see Appendix for each event's objectives, evaluation objectives and whether these were met). These had different formats and covered a range of subjects, some of which were new to the Science Museum's Dana Centre programme.
- At each of the 16 events a detailed observation was conducted. This allowed participants' reactions to be observed and any barriers to engagement and enjoyment to be recorded.
- Email questionnaires were sent to randomly selected members of the audience after all evaluated events. Email questionnaires were also sent to speakers after each evaluated event.
- Accompanied visits continued at *Scientific Racism* and *Fine Tuning* series events. This methodology follows a group of visiting participants throughout the event and provides an in-depth case-study of a visit. When used, it was always combined with shorter face-to-face interviews with other visiting participants.
- A focus group was conducted with members of the target audience after one of the events.
- Face-to-face interviews were conducted with participants at the *Fine Tuning* series events.

AUDIENCE-LED PROJECTS

- During the evaluation period the consultation with the Black African and Caribbean community continued. Further recruitment into the Black African and Caribbean focus group took place at the audience-led *Intelligence* event to feed into audience-led programming strand over autumn 2008.
- Continuing aims of the project were to:
 - 1) involve a target audience group in identifying how to approach a specific event topic and influencing the format of the event both before and during the event development.
 - 2) generate an understanding of the needs, expectations, barriers and motivations of the selected audience group involved in the audience-led project.
- Four focus groups were conducted to develop four audience-led events for the African-Caribbean community in London. In addition, the *Scientific Racism* series involved a trip to Blythe house followed by discussion via an online forum. Events were delivered during Black History Month 2007, and then in March and July 2008 to fulfil a target of delivering one event per season with the group. This was agreed with the group as a way of continuing the commitment to the relationship with this target audience.

Please see Appendix for details of evaluation outcomes and recommendations.

3. SUMMARY OF FINDINGS SEPTEMBER 2007 – JULY 2008

3.1 EVENT EVALUATION

- Evaluation during October 2007 – July 2008 showed that the audience continue to be very positive about the events they take part in, as well as about the Science Museum's Dana Centre in general. Comments included:

"After the event, I told my friends about the Dana amenities. It's a nice place to go after work – stimulating and fun." (Audience member, post-event interview)

"The event covered so much... it really gave an overview of so many different issues: history, race, science, culture, biology. There was something there for everyone." (Audience member interview, *Intelligence* event)

- Events featuring **dialogue** continued to be popular with audience members, highlighting the value of providing opportunities to talk about the event topic in informal situations with other visitors in addition to speakers:

"I enjoyed talking to all the other visitors in the discussion groups, as well as all the speakers." (Audience member, email questionnaire)

"I don't like speaking in front of an audience so in evening lectures I don't generally speak... It's different here because you have the discussion groups." (Audience member, post-event interview)

- **Audience-led** events were also especially well-received, and highlighted the success of involving the audience in the event development process to visitors:

"It actually made me feel proud that other visitors had chosen topics for this event... Clearly our views are important to the Dana Centre." (Visitor, short interview, audience-led event)

- The **quality of speakers** was attractive and a highlight of the event for some visitors, enhancing the dialogue aspect of the Science Museum's Dana Centre events:

"The speakers were all clearly experts in their field, I respected them and valued being able to ask them questions." (Respondent, email questionnaire)

"I really enjoyed being able to talk one-on-one with the experts at the end of the event."

- **Controversial topics** made successful events and enhanced the Science Museum's Dana Centre's reputation for tackling difficult issues:

"Some of the topics covered were very controversial and this encourages debate... It's great to have events like this, especially considering James Watson's recent comments." (Respondent, email questionnaire, *Intelligence* event)

"The event really quite unique... not many institutions dare take up the whole race and intelligence thing." (Audience member, email questionnaire)

"I didn't realise how much controversy there is... basically we don't know anything about what intelligence actually is. It's really quite exciting to consider this." (Audience member, comment during event)

3.1.1 INNOVATIVE EVENT FORMATS

This period included the evaluation of event formats that were innovative and experimental. These included:

- Highly interactive game formats
- Innovative ways to encourage audience dialogue during events
- Web-based methods to encourage audience engagement pre and post events

In addition to this, highly successful events undertaken during this period involved trips to particular Science Museum galleries e.g. Launchpad, Science Museum Arts Project gallery.

3.1.2 GAME FORMATS

The programme from September 2007 to July 2008 built on previous successful events featuring game formats. The *Rubbish Game* and *Rubbish Game Too* were a series of interactive events taking the form of a household waste management game. Actors took on the role of experts at the event (briefed by real experts during event development). The audience was divided into teams representing different types of household and the aim was for each household to become zero waste by the end of the game through creatively reducing, reusing and recycling items allocated to the 'household.'

90% of respondents rated the Rubbish Game as 'good' or 'very good.' Two thirds of participants rated the event as having an impact on their attitudes, and it had a positive effect on their behaviour, with a large number talking about it and thinking about issues raised after the event. About 20% reported that their behaviour had changed about waste management since attending the events. The greatest perceived strength of the game was its 'entertaining' element, following by its 'meaningful, thought-provoking message.'

The most frequently reported dislike was that the game did not have enough 'information or solutions.'

Use of game formats such as the *Rubbish Game* is a highly creative and effective way of achieving audience engagement with the event topic.

3.1.3 INNOVATIVE WAYS TO ENCOURAGE AUDIENCE DIALOGUE AND ENGAGEMENT

Two events in the *Mixed Messages* and *Healthy Choices* series experimented with the talkaoke and speakolascope as ways to encourage audience discussion and dialogue, alongside the use of the normal dialogue format.

Talkaoke

The talkaoke was a round table with an inbuilt lighting system and PA system. A discussion host sat in the centre of the table to facilitate the conversation in the style of a chat show. Audience members had the opportunity to voice their opinions around this table with the speakers, during the event. Conversations continued informally after the end of the event. Discussion was recorded live and projected onto café screens as it progressed, along with key words from the conversation as it occurred. Comments about the talkaoke included:

"It was like in a quiz show where you could ask any question...It's less formal than having a panel sitting in a row"

Use of the talkaoke successfully engaged the audience in conversation because the round table format encouraged audience members to speak to and ask questions to each other as well as the speakers.

Speakolascope

The speakolascope was an interactive video booth where audience members had the opportunity to record their responses to a 'question of the night' during the event, which related to the event topic. Once an audience member had contributed, their response was played back to them and incorporated into a collage of audience responses. These were shown on the Dana café screens. Observation during the event noted that the speakolascope was seen as interesting technology and worked well in engaging the audience prior to the onset of the event and generating discussion:

"I've never seen one of those before...it may be interesting to go and have a look."

Use of the talkaoke and speakolascope was therefore an effective method of encouraging dialogue amongst the audience members and speakers. These innovative mechanisms encouraged better engagement and dialogue amongst the audience, who perceived them to be new and interesting.

3.1.4 ENGAGEMENT WITH EVENT TOPICS VIA THE DANA WEBSITE

Online visits to the Science Museum's Dana Centre have risen significantly over the past year, from 74,959 visits (54,128 absolute unique visitors) to 128,665 visits (98,566 absolute unique visitors). This represents an increase of 58%. Just over 5170 people are subscribed to our monthly e-alert. This has risen by 500 people over the past year.

The *Rubbish Game* and *Mixed Message* and *Healthy Choices* event series both used the web as a means of engaging potential visitors prior to the event.

- **Rubbish Game website**

A key part of the *Rubbish Game* was an online component. Prior to the physical event, audience members had the opportunity to answer the question 'what stops you recycling?' through the game website as a starting point, and to interact with the 'experts' prior to and between the events themselves. This proved to be a successful way of engaging out audience, with 1744 unique IP address visits to the site and 33 postings to the starting question 'what stops you recycling?'

Evaluation findings suggest that although this method was relatively successful, it could have been used to greater effect. Recommendations included using the online component to provide more 'information/science/solutions' and encourage more dialogue between those visiting and contributing, e.g. getting people to share information, offer advice and comment on other peoples' issues, as well as including more 'expert' advice and possible solutions to issues raised.

- **Filmed trailers**

Mixed Messages events were advertised on the Science Museum's Dana Centre website by providing an introductory text and a short video in which actors took on a role that outlined the event topic from a personal angle and the potential lifestyle choices they could choose. In addition to this the Science Museum's Dana Centre website provided an opportunity for comments relating to the event to be posted. The use of the video on the Science Museum's Dana Centre website worked well in generating interest in the event and encouraging participation in the event. Audience comments included:

"I knew what to expect because it said that there would be discussion on the website... I wanted to share my views so this event was for me." (Audience member, post-event interview)

"The video looked good and professionally done, watching it is more interesting than reading... I liked the video and it did encourage me to come." (Audience member, post-event interview)

"I liked the woman in the video, she's not what one might expect of a pregnant woman and it didn't have a government health message attached to it." (Audience member, post-event interview)

- **Comments board**

The opportunity to post comments on the website worked well in demonstrating that the Science Museum's Dana Centre encourages different views and audience participation.

"I saw that you can post comments on the website. I think that's a good thing because it shows that views of the audience are valued and that the Dana Centre wants our views." (Audience member, post-event interview)

There is a need for more research into the effectiveness of the web in engaging our audiences, for example, the effectiveness of post-event films and podcasts. This evaluation suggests that pre-event engagement via the Dana website encourages audience participation in the actual event. It also helps to manage expectations of the event, and therefore enhances audience's experience of the event.

Further research into using the website to effectively engage visitors and potential visitors should be conducted and new ways of engaging potential audiences should be investigated.

3.1.5 USING SCIENCE MUSEUM GALLERIES TO ENGAGE AUDIENCES

Three events during the research period used various Science Museum galleries as part of the event. These included *In Your Own Time* (November 2007), *Launchpad for grown-ups* (January 2008) and *Takeaway Festival: Listening Post* (May 2008).

All events successfully engaged their audiences, with comments including:

"Pleased that you are tackling more topics, also viewing from perspective of art, philosophy and science"

"Thank you for expanding my mind - tonight was mental aerobics - I enjoyed that"

“This event also taught me that science; philosophy and art are very closely related than one might think” (In Your Own Time, audience profile forms)

“More playtime for grown-ups please!” (Launchpad for grown ups audience profile form)

The Science Museum provides a great resource for Dana-style events, and enhances the adult offer of the Science Museum. Connection to the Science Museum Arts Project and Launchpad galleries during Dana events created stronger links between the Dana Centre and Science Museum. This also helped to create thought-provoking events for our target audiences. Future Dana Centre programming should continue to use Science Museum galleries as this would help to integrate the Dana Centre better within the Science Museum.

3.1.6 LEARNING DURING DANA EVENTS

The Science Museum’s Dana Centre evaluation considers how those who participate engage with the subject matter of the event and whether learning occurs. By learning we mean more than just the acquisition of new information and the learning that occurs in an informal learning environment, such as a Science Museum Dana Centre event, can fall into one or more of five categories: Cognitive; Affective; Social; Developing Skills; and Personal (Table 1). When evaluating events we also look for potential barriers to learning taking place.

Table 1: Categories of learning (after Gammon 2003)

Cognitive	Acquire new knowledge; reinforce prior knowledge through repetition/direct concrete experience; accommodate/assimilate new knowledge into existing schemas; set prior knowledge into context; learn how to apply existing knowledge e.g. experimenting, problem solving, finding creative solutions; connect concepts; draw analogies
Affective	Challenge beliefs, attitudes and values; increase understanding and empathy with other people’s view-points
Social	Develop skills of co-operation, communication, helping others to learn; developing social capital
Developing skills [mental and physical]	Prediction, deduction, problem solving, investigation, observation, measuring, classification, making/telling stories, decision-making Physical skills e.g. manual dexterity, craft skills, etc. Skills of artistic appreciation and criticism Skills of numeracy, literacy, use of Information Technology Skills of research and science process – designing experiments and fair tests, data collection, testing theories, data analysis, drawing conclusions, assessing evidence
Personal	Increase self-confidence and self-efficacy; motivate to investigate further; associate curiosity and thinking with enjoyable experiences; inspire interest and curiosity; inspire awe and wonder; increased sense of identity and self-worth

Event evaluation this year continues to show that participants often acquire new knowledge as a result of their *Science Museum’s Dana Centre* event experience. Audience responses indicate that they are engaged with the subject matter during events. In post-event interviews many audience members commented on the learning potential of the events:

“I really learnt a lot about how the body works - I know it’s probably all quite basic but I didn’t know much about stress.” (Audience member, Mixed Messages & Healthy Choices interview)

“I was taking copious notes during the presentations because there were things that I want to follow up on.” (Audience member, Fine Tuning series interview)

“The real importance of genes is new to me; they play more than just a minor role.” (Audience member, Cancer: In the genes? post-event interview)

“I’ve seen this amazing contraptions with which you can pick up an object that’s not there... You can sense it, feel it...It blew my mind.” (Audience interview, Touch event)

"There were many opportunities to learn. The event wasn't intimidating because you had the opportunity to find out information in the groups and the round table discussion." (Audience member, *Cancer: In the genes?* post-event interview)

Evaluated events during the past year show the breadth of different types of learning that occurred at events for both audience members and speaker participants. Events with a dialogue format often promoted affective, personal and social learning, for example:

"We spoke about similar issues in two of the group discussions but from an entirely different perspective. It was good that the speakers referred to each others' arguments because it allowed us to make a connection between their perspectives." (Visitor, short interview)

Some cognitive learning was also observed:

"Normally I find graphs really difficult to understand. Tonight they really made sense to me - I've learnt how to read them." (Audience member, *Fine Tuning* series interview)

Audience responses also indicated that participants seem to acquire information during Science Museum's Dana Centre events that is personally relevant to their own lives:

"I'm a scientist but I don't know much about racism in intelligence research and practice; it was interesting for me to hear about this." (Audience member, *Intelligence*, interview)

"I thought certain foods are bad, but it seems more complicated... you can't say that any food is bad by itself and if eaten in moderation." (Audience member, interview during event)

"As a visually impaired person, it was interesting to find out about possible future developments in engineering and discuss them afterwards with work colleagues and friends."

The Science Museum's Dana Centre events aim to create an informal, friendly and non-threatening atmosphere during events. This helps to create an environment that is likely to promote engagement and learning.

Speaker/audience interactions

Selecting speakers who can communicate clearly and cover diverse areas of expertise provided the audience with a range of differing views and gave the audience confidence in expressing their own views, even if these conflicted with the views of others.

"The speakers had differing views so I felt confident to express views that weren't in line with what others were thinking." (Audience member, post-event interview)

"The speakers didn't use complex scientific language; even I could follow what was being said." (Audience member, post-event interview)

Secondly, the audience found the speakers to be approachable because speakers encouraged the audience to ask any question and express their thoughts and feelings. This allowed for a more equal discussion between speakers and audience members:

"They (the speakers) weren't patronising... they encouraged us to ask anything and I wasn't worried about asking questions or saying something wrong." (Audience member, post-event interview)

"Because the speakers were so open to any question we had a real discussion with them... it wasn't like they were the teachers and we were just listening." (Audience member, post-event interview)

It is clear that audience perspectives also provide important stimuli for dialogue. These offer opportunities to access other viewpoints, and this challenges people's own opinions and ideas. For example, one audience member commented that:

"The event was interesting to me because it considered personal accounts rather than just pure science." (Audience member, interview during *Keeping Your Marbles* event)

Whilst the majority of evaluation findings over the last year show that audiences are engaged with event topics and finding out more, the main barrier to learning during events remains the poor acoustics of the Dana café and other spaces.

Barriers to learning

Evaluation findings show that participants were often affected by the poor acoustics in the Dana café and as a result sometimes found it difficult to hear during events. This represents a serious physical barrier: if participants find it difficult to hear during the event, it will affect their enjoyment and learning.

Evaluation from the *5 Senses* series (October 07) shows that sound quality was the dominant physical barrier throughout the series, both in terms of the venue's acoustics and sound amplification technologies. Sound problems diminished the quality of the event experience for the engineers/presenters and the participants. These problems included overall acoustics, sound-bleed between venues and/or activity spaces, microphones, background noise, and chair-legs grating against the floor. In addition to this, audiences from the *Mixed Messages and Healthy Choices* series (March 08) highlighted noise as a continuing issue:

"The rooms were really noisy and I missed some of the discussion because of the noise." (Audience member, post-event interview, *Keeping Your Marbles* event)

"I just couldn't hear what was being said, it was annoying." (Audience member, post-event interview, *Keeping Your Marbles* event)

3.2 SPEAKER LEARNING

As well as finding their participation in the Science Museum's Dana Centre events worthwhile, speaker participation can provide opportunities for speakers to learn. In post-event interviews and questionnaires speakers often highlighted the value in participating in the event. This came from hearing how the audience responded to their work.

During Sept 2007 – July 2008 the Science Museum's Dana Centre built on previous evaluation regarding speaker experience at the *5 senses* series. This enabled the Science Museum's Dana Centre to offer speakers at the *Fine Tuning* series more opportunities to benefit from participating in Dana events. *Fine Tuning* speakers gained an increased understanding of:

- how to interact with a lay audience
- how to present their work in an informal setting
- the work of other experts
- new and innovative ideas for use in their own work as they received feedback from all event participants (the audience and other speakers) as part of the dialogue process.

Comments included:

"It was surprising how interesting it is to speak to lay people about our work... I would not have thought that they have such good ideas." (Engineer, questionnaire)

"I learnt a lot from the event... Speaking to people who don't know much about engineering was the most useful to me in terms of my learning." (Engineer, interview)

"I learnt how to present in an informal setting... It's quite a different skill from speaking at an academic conference." (Engineer, interview)

"The facilitator stated how we (the engineers) should also learn during the event... I would have otherwise focused entirely on the audience, but we were encouraged to speak to each other." (Engineer, interview)

"The break in the middle was good because we could speak to each other... There was a lot to learn from speaking to the other engineers." (Engineer, interview)

Having engineers ask the audience questions during the group sessions allowed for dialogue between them and the audience. It encouraged the audience to state their views, probe them by asking further questions and, in some instances, challenged the views of the engineers. Such evidence of mutual learning shows that these formats achieved the Science Museum's Dana Centre aim of genuine dialogue between experts and non-experts.

3.2.1 SPEAKER COMMUNICATION WORKSHOP

Background

Evaluation findings from the *5 senses* series (Sept-Oct '07) highlighted that although many participating engineers indicated that they found the event worthwhile, useful, and relevant, primarily based upon the interest, enjoyment, and/or learning by participants, few indicated that their attitudes changed or that they developed new skills based on their experiences. The *Mixed Messages and Healthy Choices* speaker feedback also showed that the speakers had not necessarily learned anything new.

Supported by the Royal Academy of Engineering, the *Fine Tuning* series sought to build on past experience by involving potential speakers in event and format planning, running a communication workshop with participating engineers to allow them to feed ideas into the series, and develop their communication skills.

Outcomes

Fine Tuning evaluation showed that engineers found the communication workshop valuable, informative and interactive because:

- they felt better prepared for what to expect at the events
- they gained confidence to actively seek out the views of the audience
- they saw it as valuable to their future career development
- they valued the opportunity to practice their communication skills in a supportive and non-threatening environment.

"The mock interviews were very revealing and helpful." (Engineer, questionnaire)

"In the training session it was made clear that we should also find out what the audience think. I'm not that confident in speaking to people about my work who are from outside my field of work... The training session made me confident to ask questions to the lay audience." (Engineer, interview)

- All engineers who completed the questionnaires stated that they learnt something new during the training session. Several engineers specifically noted that they did not know about presenting their research to a lay audience.

"In the training session we were told to use simple terms and explain things in a simple way... It's easy to forget the importance of this when you're used to speaking to other engineers." (Engineer, interview)

- From the observation during the event and the interviews with members of the audience it is evident that this use of simple terms and simple explanations was a pre-requisite for dialogue and discussion.

"They (the engineers) used simple language... It was easy to engage in discussion with them because they didn't use technical terms and complex examples." (Audience member, short interview)

The engineer communication workshop which formed part of the *Fine Tuning* series therefore provides a useful model for future events targeting scientists and engineers with little previous experience of public engagement activities. This is because the outcome of such workshops contributes to an enhanced level of dialogue and engagement between audience members and participating scientists.

3.3 AUDIENCE-LED CONSULTATION

- Audience-led work with the Black African and Caribbean community is ongoing and will result in an event each season at the Science Museum's Dana Centre. This relationship forms part of the Dana strategy to target under represented audiences e.g. BME groups.
- During September 2007 – July 2008 consultation with the Black African Caribbean community continued. The programmes team held focus group sessions to identify topics of interest to the group, how best to approach a specific topic and possible formats. These sessions also helped to generate an understanding of the needs, expectations, barriers and motivations of the group.

3.3.1 BLACK AFRICAN AND CARIBBEAN COMMUNITY CONSULTATION

- Four focus groups were conducted to develop 4 audience-led events for the African-Caribbean community in London. In addition, the *Scientific Racism* series involved a trip to Blythe house followed by discussion, and an online discussion forum in the form of a Google group.
- Events were delivered during Black History Month 2007, and again in March and July 2008 to fulfil a target of delivering one event per season with the group. This continued the relationship with this target audience.
- The events successfully attracted members of the African-Caribbean community to the Science Museum's Dana Centre (see Table 2) and has raised the profile of the Science Museum's Dana Centre within this community. In the words of one audience member:

"The Dana Centre is really a haven for diversity. I think we, the African Caribbean community, feel more welcome now." (Audience member, interview, *Intelligence* event)

Table 2: Ethnic profile of participants visiting Black African and Caribbean audience-led events 2007-8

Ethnicity	16 Oct 07 Scientific Racism: A history %	30 Oct 07 Is science colour blind? %	12 March 08 Melanin Effects: not so black and white? %	3 July 08 Intelligence %
Black	25	18	25	18
Other BME group	18	21	12	19
Mixed	-	3	-	4
White	38	48	50	59
Prefer not to say	19	9	13	-

Note: Percentage results are taken from self-complete audience profile forms after each event.

3.3.2 WHAT WE HAVE LEARNED ABOUT AUDIENCE-LED CONSULTATION PROCESSES

- The use of a respected and authoritative moderator from the community to lead an audience-led project in collaboration with the Museum remains crucial to the continuation of good relations between the group and the institution. This overcomes barriers of mistrust of the Science Museum as an institution which is seen to have neglected black history in both its collections and interpretation of its collections. In response to the facilitator explaining the background of the Science Museum's Dana Centre, a group member offered the following:

*"I take my faith in this institution from you."*¹

- Individuals value involvement in the audience-led projects because they can influence the process. Many in the group related that they felt the process of audience consultation to be empowering and that the Museum staff really took on board their recommendations. One said:

"It was a great empowering experience to have my experience valued."

- Continued consultation and opportunities to influence event development has worked well to create events for Black African and Caribbean target audiences (please see Table 2). The events have also attracted a substantial proportion of other BME groups to the events, resulting in audience comments including:

"It's great that the event was guided by the audience... you can see how the Dana Centre is encouraging many different people to join in." (Audience member, interview, *Intelligence* event)

- Focus group participants have continued to be keen to take part in this process. A sustained approach is necessary to avoid a relationship the focus group regard as tokenistic. The approach of one event per season for the community ensures the ongoing success of the relationship.
- Additional members of the focus group were successfully recruited after an audience-led event in the Science Museum's Dana Centre. Current focus group members were actively involved in talking to other audience members after the event to recruit new individuals.

¹ Foggett (April 2008): *Community consultation at the Dana Centre* report, p.8, available from the Visitor Research Group.

- The audience-led process helps the Science Museum's Dana Centre to explore controversial and sensitive topic areas such as race, effectively. It ensures that the events produced are successful in engaging diverse audiences and provides a thorough mix of speakers from multiple perspectives:

"You don't often hear about how science and culture across the world interlink and how the whole historical aspect links with this... it's interesting for the Dana Centre to tackle this." (Audience member, interview)

"It would be great to have more events on the controversial side of science. Race is a good one to use and I think it's interesting to learn about this... This is a topic that must be taken seriously." (Audience member, email questionnaire)

3.4 OUTREACH AND NEW AUDIENCES

As part of its key objectives, the Science Museum's Dana Centre aims to attract new and hard-to-reach audiences as part of its ongoing programme. Examples include efforts to reach BME audiences and LGBT audiences. This year the programmes team took an event that had previously happened within the Science Museum's Dana Centre out to another venue. The Science Museum's Dana Centre applied for a specific extension to a previous grant from the Wellcome Trust to re-run the LGB Healthy Sex (Feb 2007) event.

Whodunnit Whoknewit? took place as part of the London Pride festival in June 2008. It used the same event format as *LGB Healthy Sex* event, adapted to be site-specific to the new venue: Central Station, a gay bar and public sex bar in King's Cross. The target audience was LGBT members of the public who engaged in risky sexual behaviour.

Results from audience profile data suggest that the audience enjoyed the event, especially the use of Science Museum objects. The experts and role players involved in the event were keen to do the event again in a different venue. One audience member commented:

"It was fun & I actually learnt something. I felt a bit unsure as to the brief at first but it all came together in the end. I will definitely talk about this event to my friends & colleagues."

The success of this outreach event shows the potential for more Science Museum's Dana Centre events to act as 'taster' events that aim to encourage a new audience to come to the Science Museum's Dana Centre in the future.

The Science Museum's Dana Centre might consider hosting events in different locations that aim to attract new audiences. When planning outreach events in new venues, research into the best venue or way of engaging the particular target audience needs to be carried out so that events can attract audiences in the most successful way.

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APPENDIX

EVENTS EVALUATED SEPTEMBER 2007 - JULY 2008

Table 3. Events evaluated between September 2007 and July 2008, listing key findings and recommendations. Separate event evaluation reports are available from the Science Museum's Dana Programmes team.

	Date	Event	Series?	Methodology	Event evaluation aims/objectives	Key Findings / Lessons learnt
1	18 Sept	Sound	5 Senses series	Pre-event and post-event interviews Detailed observation Post-event paper and email survey with participants	In addition to series aims: Raise awareness of the role of engineering in modelling reality. Raise awareness of the nature of science/engineering. Raise awareness of the role of engineering in art.	<ul style="list-style-type: none"> The presentations included good quality and interesting information on the science of sound. However, most of the time in the sessions was spent listening to lectures: the presenters eagerly talked about their work and experiences with engineering such that they nearly eliminated the time allotted for dialogue and interacting with technologies. Effective modifications increased the accessibility of the event for participants who were visually impaired and blind. These modifications enhanced the experience or were neutral for sighted participants. Over-documentation of the event (evaluation and web/podcast preparations) disrupted the sessions and was off-putting to some participants.
2	25 Sept	Sight	5 Senses series	Pre-event and post-event interviews Detailed observation Post-event email survey with participants	In addition to series aims: Improve the event experience for those who are visually impaired or blind. Deliver an event that is directly relevant and interesting to people who are visually impaired or blind. Raise awareness of the nature of science/engineering.	<ul style="list-style-type: none"> The event organizers and facilitator incorporated lessons learned from the previous week in order to improve the Sight event. Effective modifications increased the accessibility of the event for participants who were visually impaired and blind. These modifications enhanced the experience or were neutral for sighted participants. This event was scheduled with too many interesting presenters and activities. For example, as interesting as the last speakers were, there was little time to wrap up or discuss. In addition, participants had been asked to use and provide input on tactile maps of the Dana Centre, yet no time was set aside during the event for participants to use the maps or give input.
3	2 Oct	Touch	5 Senses series	Pre-event and post-event interviews Detailed observation Post-event paper and email survey with participants	In addition to series aims: Raise awareness of haptic technology.	<ul style="list-style-type: none"> This event was highly effective in many ways. Strengths included that it provided a good mix of information and opportunities to discuss and interact, and it fulfilled participants' motivations for attending and facilitated meaningful interactions between people with diverse experiences and expertise. If participants are asked to contribute in a specific way, for example writing 'invention ideas', and told they will be shared later, then facilitators should follow up with a meaningful use or discussion of them. For events in which participants move through activities on their own, participants may need a specific motivation to stay until the end of the event. The fact that some left early did

not mean they weren't pleased with the event. Instead, it was easy to leave the fairground format when one had had 'enough of a good time' or 'learned enough to make the evening worthwhile.'

4	9 Oct	Smell	5 Senses series	<p>Pre-event and post-event interviews</p> <p>Detailed observation</p> <p>Post-event paper and email survey with participants</p>	<p>In addition to series aims:</p> <p>Raise awareness of the presence of engineering in retail industries.</p> <p>Provide an enjoyable evening.</p>	<ul style="list-style-type: none"> This event, with exception of the end discussion, was a model event in terms of balancing the presentation of information, dialogue, and interactives. The sessions weren't rushed. The engineers/presenters were strong communicators.
5	11 Oct	Taste	5 Senses series	<p>Pre-event and post-event interviews</p> <p>Detailed observation</p> <p>Post-event paper and email survey with participants</p>	<p>In addition to series aims:</p> <p>Create a space for discussion and dialogue about nanotechnology.</p>	<ul style="list-style-type: none"> The format, organization, and management of the event fostered dialogue. The facilitator worked closely with the presenters prior to and during the event such that they created a welcoming, interesting environment for asking questions and discussing ideas. Having two presenters with very different perspectives and knowledge – not oppositional, but from different fields - made for mutual learning between the presenters. This also seemed to encourage participants to share their knowledge, which made for a more equitable dialogue all around. The engineers/presenters were good science communicators. The time and effort invested in finding them was well-spent and crucial to the success of this event.
6	16 Oct	Scientific Racism: A History	<p>African-Caribbean audience-led Scientific Racism series</p> <p>Mixture of talks, object-based discussion and small group discussions</p>	<p>Detailed observation</p> <p>Focus group</p> <p>Post-event interviews</p> <p>Post-event email survey with speakers and participants</p>	<p>In addition to series aims:</p>	<ul style="list-style-type: none"> Visitors greatly value the Science Museum's Dana Centre hosting an event dedicated to scientific racism because this demonstrates that the Dana Centre / Science Museum is open to critical reflection on the history of science and the collection of the Science Museum. The event attracted new visitors to the Science Museum's Dana Centre because of its specific focus on Black History. The presentation of objects related to scientific racism from the Science Museum's collection increased visitors' engagement because it provided a focus for questions and comments. An African-Caribbean woman facilitating the event was successful because visitors identified with her and therefore perceived the event as being aimed at them. There is clear evidence for various types of learning from the event: The post-event discussion was a success: about one third of all visitors remained in the Science Museum's Dana Centre following the end of the event. Many of these visitors spoke to the panellists or the facilitator.

- The Dana café and the open-plan upstairs area of the Science Museum's Dana Centre were too noisy to be used for the group discussions. This posed a barrier to learning since it made it difficult for visitors to hear panellists and other visitors' comments and questions.

7	30 Oct	Is science colour blind?	African-Caribbean audience-led Scientific Racism series Mixture of talks and small group discussions	Detailed observation Post-event interviews Post-event email survey with speakers and participants	<ul style="list-style-type: none"> • Overall the event was a great success in engaging visitors with the subject of 'scientific racism'. This was achieved by the facilitator providing a clear introduction to the event, by the excellence of the speakers and by the successful facilitation of group discussions. • Clear facilitation of the audience-led context of the event contributes to the success of the event • The representation of a diverse range of opinions and backgrounds amongst the speakers enabled the audience to identify more with them, enhancing dialogue at the event. • The facilitation of group discussions by Science Museum's Dana Centre staff worked well by steering the discussion towards the objectives of the event. This encouraged some visitors to speak about their experiences and actively contribute to the group discussions. • There was clear evidence for various kinds of learning at the event: • 1) Visitors perceived the event to be very current and controversial because it linked to racist comments made by James Watson and the implementation of the Mental Health Act in 2006. • 2) Visitors noted the importance of the Science Museum's Dana Centre hosting events on current and controversial topics because this encourages debate and allows visitors to contribute to discussions by expressing their personal views and experiences.
8 and 9	16 Jan & 12 Feb	The Rubbish Game and The Rubbish Game Too	Event in association with Coney Interactive game format	Examining online dialogue before and after events Detailed observation during events Post-event email interview with participants	<ul style="list-style-type: none"> • Establish levels of participation, interaction and dialogue prior to the events. • Investigate whether or not the online interaction encouraged event attendance. • Determine levels of participation and <ul style="list-style-type: none"> • Use of the online forum was relatively successful with 1744 unique IP address visits to the Rubbish Game website and 33 postings to the question 'what stops you recycling?' • The game had an impact on the attitudes of 2/3 of participants. Those not feeling any impact professed to already be keen recyclers who didn't learn anything new. Many of those

10	5 Mar	Babies' best start	<p>Mixed Messages and Healthy Choices series</p> <p>Format used a mixture of talks, small group discussions and talkaoke sessions</p>	<p>Detailed observation</p> <p>Short face-to-face interviews</p> <p>Post-event email survey with speakers and participants</p>	<p>In addition to series aims:</p> <ul style="list-style-type: none"> • Investigate the impact (as perceived by attendees) that the event has had on their attitudes towards reducing, reusing and recycling. • Increased understanding for audience of impact of mother's choices on the foetus; before and after birth. • Generated dialogue about wider social factors influencing mothers' choices. • Increased understanding of limitations of parents' ability to shape a child by looking at nature/nurture interplay, genetic predisposition to ADHD, autism, etc. (Plomin) • Greater confidence in making and greater understanding of the choices that are best for a baby e.g. mother's diet, alcohol intake, breastfeeding and immunization. 	<p>reporting that it did have an impact felt that it 'brought issues to the forefront of their mind/made them think'.</p> <ul style="list-style-type: none"> • The Game has had a positive effect on participant's behaviour, with a large number talking about it / thinking about issues raised since the event. Close to 2 in 10 report to be making changes with regards to the management of their waste since attending. • The 'fun', 'entertaining' element was the Game's greatest strength, followed by the 'meaningful/ thought-provoking message'. • The perception that the Game didn't have enough 'information/ solutions/ science' was the most frequently reported dislike. • 90% of respondents were satisfied with the Rubbish Game, giving it a positive rating of 'Good' or 'Very good'. • There was discussion throughout the event, both between members of the audience and the speakers, and amongst the audience members. This discussion was encouraged by the mother and baby profiles, dividing the audience into small groups, selecting appropriate speakers and selecting appropriate topics. • There is strong evidence for learning at the event. • The use of the video on the Science Museum's Dana Centre website worked well in generating interest and encouraging participation in the event because it was professionally made and because it featured a pregnant woman who was not a scientist or overly health-conscious. • Several members of the audience expected the event to include more discussion about the role of men in babies' best start. The absence of more discussion involving the role of men was perceived by several audience members to portray too conventional gender roles.
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11	19 Mar	Cancer: In the genes?	<p>Mixed Messages and Healthy Choices series</p> <p>Format used a mixture of short talks, small group discussions and talkaoke sessions</p>	<p>Detailed observation</p> <p>Short face-to-face interviews</p> <p>Post-event email survey with speakers and participants</p>	<p>In addition to series aims:</p> <ul style="list-style-type: none"> Increased knowledge about the effect of healthy dietary choices on cancer risk. Improved understanding of the interplay between nature/nurture in cancer. 	<ul style="list-style-type: none"> The topics introduced during the event were interesting to the audience because the audience had some personal exposure to them. Furthermore, the topics introduced during the event were detailed enough to ensure that the audience could acquire new information. The selection of experts worked well because of their different areas of expertise and because they were approachable. This allowed the audience to consider cancer from a number of perspectives, and gave the audience confidence to approach other experts in the future. The framing of the event around Guy worked well because it created a trusting and unthreatening environment. This encouraged members of the audience to talk about their personal experiences, thus facilitating learning. Providing the audience with a choice of which discussion groups to attend worked well in ensuring that individual preferences were taken into account. Science Museum's Dana Centre facilitators who took part in the group discussion promoted debate by encouraging all audience members to join in the discussion and reflect on the views of the experts. The use of the talkaoke worked well in encouraging participants to talk to each other and thus setting the scene for an event based on discussion. In addition, the talkaoke encouraged the audience to ask the experts questions in an informal way, thus facilitating learning. <i>Concern was voiced from two speakers that the facilitation of the talkaoke did not adequately distinguish between scientific evidence and everyday hearsay.</i> <i>Learning is a key outcome of the event.</i>
12	25 Mar	Keeping Your Marbles	<p>Mixed Messages and Healthy Choices series</p> <p>Format used a mixture of short talks, small group discussions and</p>	<p>Detailed observation</p> <p>Short face-to-face interviews</p> <p>Post-event email survey with participants</p>	<p>In addition to series aims:</p> <ul style="list-style-type: none"> Increased understanding of uncertainty in science – what we don't know yet, with regard to Alzheimer's research. Confidence – feeling that they are making informed choices in diet, exercise – and 	<ul style="list-style-type: none"> The audience perceived the overall event as very positive because the topics discussed during the event took their personal experiences with Alzheimer's into account. The speakers worked well because they kept jargon to a minimum, they had different areas of expertise and they provided expert advice. This allowed for all audience members to gain an overview of the issues surrounding Alzheimer's, and take part

talkaoke sessions, with opportunities to contribute via speakolasc ope prior to, during and after the event

these may make a difference.

in discussion.

- *The audience perceived the event to be innovative because of the use of the speakolasc and talkaoke, which were both new and interesting to the audience. They engaged the audience and generated discussion.*
- The facilitation of the talkaoke worked well because the facilitator distinguished between opinions based on scientific evidence and opinions not based on scientific evidence. This ensured that the audience knew the origin of opinions, and were able to establish their own opinion taking this into account.
- There is clear evidence for learning at the event.
- The high level of noise in the Science Museum's Dana Centre created a barrier to learning since at times it was difficult for the audience to understand what was being said.
- *Several conversations during the group sessions occurred on a one-to-one basis, which may have excluded other members of the group.*

13

5 June

Sorted Sounds

Fine Tuning series

Format used a mixture of short talks, small group discussions and a live performance

Detailed observation

Short face-to-face interviews with speakers

Post-event email survey with participants

- Raise awareness of relevance of engineering to managing online music at present and in the near future – commercial implications.
- Live music sorting – audience interaction with engineered software to provide stimuli for dialogue, and an opportunity for direct consumer feedback to software engineers.
- To discuss impacts of these new tools on music business and future consumer trends from consumer and industry perspectives.

- The pre-series engineer training session was successful. It:
 - allowed engineers to practice their communication skills in a supportive and non-threatening environment.
 - allowed them to learn about the needs of a lay audience.
 - gave them the confidence to actively seek out the views of the audience, thus allowing for dialogue and discussion during the event.
 - Benefited their future career by allowing them to gain insights into how to engage with a lay audience and how to engage with the media.
- The audience rated the event as well-organised, and it seems that this is mainly due to the engineers being briefed about how to lead the group discussions.
- All engineers described the event as 'informative', 'interesting' and 'innovative' because it demonstrated the public's interest in their work. Feedback and questions from the audience gave the engineers a new perspective on their work from the users' perspective on their technology. This encouraged the engineers to consider the relevance of engineering for the music industry and other commercial settings.
- The engineers' experiences at the event were very different from the experiences gained at academic events because the research was discussed by a much wider range of individuals, because the Science Museum's Dana Centre café was perceived to be an innovative venue, and because the

engineers could speak to each other and the audience in an informal, non-academic way.

- The audience were intrigued by the technology and information presented during the event. This stimulated dialogue between the audience and the engineers, both in the group sessions and in the post-event discussion.
- Many members of the audience were specifically interested in technology associated with music. This indicates that using music as a means of exploring engineering worked well. It is evident that the audience had positive associations with music, and the event therefore also encouraged positive associations with engineering.
- The audience were intrigued by the presented technology and information because of the innovative and novel devices presented by the engineers, and this was a reason for them to engage in dialogue with the engineers.
- The group sessions were successful in allowing the audience to find out about each application and speak to the engineers about these applications. The group sessions worked well because they demonstrated that it is an interesting time for music engineers and for consumers of music, they allowed the engineers to demonstrate their work in progress and because the audience were able to feed back their views on the technology.
- The most successful dialogue occurred at the end of the event because there was enough time for the audience to speak to the engineers and because the music being played encouraged the audience to remain in the Science Museum's Dana Centre.
- There is clear evidence for learning during the event, both for engineers and for the audience. For the engineers this learning is linked to them gaining experiences of engaging with the public, which allowed them to learn the value of engaging with lay individuals. For the audience this learning is linked to the presence and relevance of engineering in their enjoyment of music. This allowed the audience to make a clear connection between music and engineering, and indicates that the audience's attitudes towards engineering have changed.

14

17
June

**Virtuoso
Stress**

Fine Tuning series

Format used a mixture of short talks, audience voting and live performances

Detailed observation

Short face-to-face interviews with speakers

Post-event email survey with participants

- Raise awareness of relevance of bioengineering to understanding performance stress.
- Putting engineering in new contexts to make it accessible to wider audiences.
- Exploration of wider impact of the bioengineered

- Engineers valued participating in the event mainly because it contributed to their professional development. The event provided an opportunity for engineers to present their research to the public, allowing engineers to gain feedback on their work from the public, and encouraging discussion amongst engineers.
- The use of music during the event worked well because engineers and audience enjoyed listening to the music. This positioned the Science

technology, e.g. stress management, and the relationship between physical and mental anxiety.

Museum's Dana Centre as a venue for entertainment, as well as for learning. In addition, the use of music served well in breaking the event into chunks, which encouraged concentration.

- The integration of music and technology worked well because it demonstrated the wide use of engineering and presented a positive image of engineering as interesting and fascinating.
- The facilitator interviewing the musicians and the personal accounts from the musicians worked well because they showed the audience the kind of questions they could ask, and therefore encouraged the audience to ask questions themselves.
- The fifteen minute break in the middle of the event worked well in encouraging the audience to speak to each other, and for the audience to speak to the engineers. This is because at the time of the break the audience had been presented with enough information for them to speak to each other, while they were not inclined to leave the Science Museum's Dana Centre because the event had not yet finished.
- There is clear evidence for learning at the event, both for the engineers and for the audience. For the engineers this learning is associated with an increased understanding of how to interact with a lay audience, an increased understanding of how to present their work in an informal setting, and an increased understanding of the work of other engineers. This learning was fostered by the facilitator clearly stating that the engineers should engage with each other and learn from each other. For the audience learning was associated with an increased understanding of physiology, music, technology and engineering.
- The event attracted a diverse audience from different ethnic backgrounds, and with various levels of scientific knowledge. This was because the event focused on a range of topics associated with intelligence, because the event provided information that had personal relevance to the audience, and because the event considered how intelligence is used in every-day life.
- The topics discussed during the event were made accessible to the audience by the facilitator providing links between the content covered, between the different speakers, and between the content and the personal lives of the audience. The audience expected the speakers or the facilitator of the event to make these links.
- The audience were aware that the event was audience-led and appreciated this because it demonstrates that the Science Museum's Dana Centre is open to diverse views and encourages many

15	3 July	Intelligence	African-Caribbean audience-led Scientific Racism series	Detailed observation
			Panel debates	Post-event email survey with participants

different people to become involved.

- The use of two small group sessions worked well because this allowed the content to be guided by the audience. The content that the audience were most interested in was the different conceptualisation of intelligence in various parts of the world, and how intelligence is used in every-day life.
- The audience and the speakers acknowledged the special effort made by the Science Museum's Dana Centre to be inclusive towards different communities, and it was noted that the African-Caribbean community now feels more welcome at the Science Museum's Dana Centre.
- In one group session a member of the audience voiced a view that was different from that of the speaker. Several members of the audience noted that they were disappointed that the facilitator of this group session did not encourage the voicing of views that were different from those of the speaker. In order to ensure that diverse views are embraced and that critical reflection on all these views is encouraged it is important to ensure that audience members who have different views from the speakers are not excluded. This could be done by encouraging audience members to voice their views, even if these are different from those of the speakers.
- There is considerable evidence for learning from the event, with members of the audience engaging in discussion, asking questions and taking notes. This learning was mostly associated with the personal experiences of individuals in various parts of the world, the every-day lives of the audience, and how intelligence is associated with links between science, culture and history.

16 10 July

Making Music (evening event)

Fine Tuning series

Format used a mixture of brief talks, interaction with live installation, small group discussions and live performances

Detailed observation

Short face-to-face interviews with speakers

Post-event email survey with participants

- Dialogue through small group discussions after the performance and further interaction with the software.
- Introduction to contemporary music using microtones.
- Exploration of wider applications of music-oriented engineering.
- Raise awareness of how engineering facilitates music
- Improve the event experience for those who are visually impaired or blind.

- The engineers were engaged throughout the event, talking to each other and to members of the audience. This interaction was particularly pronounced during the activity sessions because these sessions allowed the engineers to demonstrate their work and receive immediate feedback on it.
- The engineers valued receiving feedback from individuals who are not engineers and who they can interact with in an informal setting. This allowed the engineers to gain innovative ideas regarding their work.
- The engineers valued the opportunity to demonstrate the link between music and technology because this link is frequently neglected in public debate and discussion about music.
- The introduction to the event worked well because the facilitator clearly stated that the event is part of a series of events, what the aims of the event are, and asked the members of the audience why they are at the event and

what they aim to gain from the event. This demonstrated that the Science Museum's Dana Centre is interested in a two-way communication with the audience, setting the tone for an audience-focused event.

- The activity sessions worked well in making science and technology accessible to the audience because they allowed the audience to directly use and interact with music technology and because the engineers spoke about their personal experiences of music and technology.
- The demonstration and discussion of technology that increases access to music for individuals with disabilities worked well in demonstrating the inclusiveness of the Science Museum's Dana Centre and the Science Museum.
- The performance of the musicians using traditional instruments and technology worked well in demonstrating how music and technology can interact in many ways.
- The engineers would have appreciated receiving more information about the issues discussed in the other activity sessions to find out about the work of the other engineers. It may therefore be worth considering having a longer general discussion at the end of the event, during which engineers are encouraged to interact and demonstrate their technology to the other engineers.
- Some of the engineers noted that it would be beneficial for their preparation of the event to know more about the audience in order to allow them to consider the knowledge, skills and expectations of the audience.
- Some members of the audience did not know which of the speakers were engineers. In order for the audience to gain an even broader understanding of engineering it would be helpful to make it clear which speakers are engineers.
- The poor acoustics of the Science Museum's Dana Centre are a barrier to the appreciation of the event and the perception of the Science Museum's Dana Centre as a suitable venue. Increasing the acoustics of the Science Museum's Dana Centre, such as by adding carpeting, would increase the enjoyment of events, both for the audience and for the speakers.
- There is clear evidence for learning during the event, both for the engineers and for the audience. For the engineers this evidence includes engagement throughout the event, and an increased understanding of how to engage with a lay audience. For the audience this evidence includes asking questions and commenting, gaining a broader understanding of science and technology, and an increased appreciation that science and technology can be exciting and fun.

Funded Event series aims Sept 2007-July 2008

5 sense series Sept-Oct 2008

- Raise public awareness of the diversity, nature and impact of engineering on society.
- Encourage dialogue between society and engineers on engineering issues of public interest.
- Engage engineers in public engagement in order to look at their work in a wider societal context.
- Provide an interesting, enjoyable, interactive and informative experience for the public.

Mixed Messages and Healthy Choices March 2008

- Help public audience to separate out myths relating to healthy living/ageing from reality by talking directly to those working in relevant fields.
- Encourage dialogue about how individuals make decisions on healthy choices and what social factors influence these decisions.
- Enable dialogue on how nature/nurture works out through the ageing process, in areas including autism, cancer, Alzheimer's.
- Provide public engagement opportunities for MRC scientists.
- Provide media opportunities for MRC scientists.
- Spark increased interest in events through previously untested methods including event trailers available for Bluetooth download in the café, and on our website, linked series e-flyer and YouTube.
- Employ innovative techniques for lasting engagement through a variety of methods e.g. Bluetoothed event adverts available in Dana café, event formats, speakoloscope, poetry by Science Museum's Dana Centre poet in residence Heidi Williamson, stimulating further online discussion around event topics (*Cancer* and *Keeping your marbles*), and short films of event themes available after events on Dana website.
- Raise awareness of ageing as a lifelong process.
- Increase awareness of link between MRC research and public health.

Fine Tuning June-July 2008

- Seek to encourage dialogue between engineers and non-specialists on the role of engineering in our understanding and enjoyment of music and the wider social impacts of engineered innovations.
- Raise public awareness of the diversity, nature and impact of engineering on society's understanding and enjoyment of music.
- Engage engineers in public engagement in order to look at their work in a wider social context.
- Provide an interesting, enjoyable, interactive and informative experience for audience members