Circus Starr: App for autistic audiences

Research & Development Report

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“Can a mobile app help improve arts experiences for children with an autism spectrum disorder and their families?”
Executive Summary

Background

The Show and Tell project arose from the desire to increase the accessibility of arts experiences for audiences who are frequently excluded from many cultural opportunities due to their specific needs. The project partners on Show and Tell were Circus Starr, Therapy Box and Dr Tracy Piper-Wright.

The aim of the project was to discover whether a preparatory visual story, delivered via a mobile app, could encourage children on the autistic spectrum to attend the circus and thereby experience a brand new art event with their family. It was anticipated that this would give a child more confidence and inclination to explore other arts and cultural opportunities such as museums, theatre and galleries.

The project addressed two key trends in the digital market: the explosion in popularity of mobile apps and the growing use of smart devices. It also recognised that encouraging disabled and child audiences to explore and engage with the arts is a key concern for arts organisations as these sectors form a valuable part of the search for new audiences for the arts.

The Project

The app took the form of a visual story, a short narrative containing all pertinent information about a situation or event. This story could be reviewed by the autistic child to assuage anxiety about an unknown situation and to develop coping strategies. The app was designed to be compatible with iDevice platforms as these were commonly held to be the preferred option for autistic children and their families.

The research used qualitative and quantitative methods to obtain data from parents and children on their experience of the circus and using the Show and Tell app. Research on the project took place during Circus Starr’s 2014 autumn tour and focused on locations in the North West of the UK. Participants downloaded and used the app to prepare for their forthcoming circus trip for which tickets were provided.

The project found that an engaging preparatory visual story, delivered via an interactive technological interface, had a measurable impact in encouraging
an autistic child to attend an arts event which they may have previously avoided. The visual story provided familiarisation with the event and gave advanced warning of particular sensory features of the environment. This reduction of the ‘unknown’ had a significant impact on autistic children’s engagement with and enjoyment of the circus.

Research

According to users the most valuable feature of the app was the detailed content of the visual story which used real photographs, video and audio to aid familiarisation with all aspects of the circus environment and performance. Users also highlighted the effectiveness of the app in promoting recall and speech for their autistic child, and the potential usefulness of the app format to other leisure and everyday situations.

The least successful aspect of the app was the perceived lack of interactive and fun features which would enhance its repeat use and desirability to an extended range of users on the autistic spectrum. In addition, the iOS format restricted the accessibility of the app on platforms more widely available to the target audience.

Future

During the project several arts organisations expressed an interest in working with Circus Starr to develop the Show and Tell app for their own specific art form, organisation or service. The Show and Tell app recently won the National Autistic Society’s ‘Best New Technological Innovation Award’ at the 2015 Autism Professional Awards, offering credibility and endorsement to the concept whilst promoting the idea directly to its target audience.
Background

The aim of the Show and Tell project was to enable a child with autism to enjoy a supported, positive experience at the circus, which in turn would give him or her more confidence and inclination to explore other arts and cultural opportunities such as museums, theatre and galleries.

Circus Starr was already aware of the positive impact its show had on children with autism. Time and again parents reported that their autistic child, who could not usually cope with unknown situations, had engaged with Circus Starr’s show like nothing before and sat mesmerised to the end of the performance for the first time ever. The highly accessible nature of a Big Top environment alongside the friendly, interactive and ‘relaxed’ character of the show meant that – once inside the Big Top – children with autism felt comfortable. However, whilst the show itself was ‘autism-friendly’ it was still necessary to find a way to prepare those children who were still too anxious to make it inside the Big Top. A project was therefore conceived with this in mind.

The project was led by Circus Starr, an independent, charitable organisation that supports disabled and vulnerable children across the UK through a 75 venue tour held 3 times a year.

The technology partner within the project was Therapy Box, an award winning app developer in special needs and education sector.

Dr Tracy Piper-Wright’s research is focused on Audience Engagement and Digital Technologies and the Arts. She worked as the academic research partner to the project.

Audience reach and use of technology

The project emerged from the desire to increase the accessibility and enjoyment of arts experiences for audiences who are frequently excluded from many cultural opportunities due to their specific needs.

The report Audience building and the Future Creative Europe Program\(^1\) found that within Europe audience numbers for arts events are decreasing.

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The report observed that the most effective strategies for increasing audience numbers were those that developed specific outreach programs for underrepresented audience groups and engaged their audience through technology.

According to the National Autistic Society there are 700,000 people with autism in the UK and 2.8 million (wider families) directly affected.² Despite this, the number of artistic programmes catering specifically to an autistic audience is low. Whilst some theatres host ‘relaxed performances’ (e.g. The Lion King and Spot’s Birthday Party, Oxford Playhouse) and Odeon and Cineworld hold ‘autism-friendly’ screenings, this is not commonplace.

The use of technology amongst children and adults with autism is widespread. Technological interfaces are visual, consistent and predictable and therefore circumvent the complexities of social interaction and communication that those on the autistic spectrum find difficult. Visualisations in the form of story narratives are commonly used to impart information about a new event or experience and to provide reassurance and fore-knowledge, which in turn alleviates anxiety. Technology provides interfaces which are stable and attuned to repetition which makes computers and tablets ideal formats for the delivery of a visual story.³

Show and Tell focused on facilitating a leisure time activity that others might take for granted. In worlds which are heavily scheduled and monitored, entertainment, play and relaxation are often not factored in, but they are equally important.⁴ The project supports autistic children and their families in the context of entertainment, beyond the clinical or educative settings in which support for autism is often placed.

The project concentrated on the needs of a differently-abled audience at the outset, and hence the ethos of the project started with an audience sector who are often excluded not only from arts events but also from the research and design thinking that surrounds arts and audience engagement initiatives. The project aimed to integrate a brand new arts audience into an

existing one; creating a more inclusive society and providing the public with a better understanding of the needs of autistic children.

**Advance thinking and practice: research**

Show and Tell combined the visual story format with cutting edge technology for use within an arts and cultural context. At the outset of the project there was no evidence of technology being used in this way for autistic children or disabled audiences for the arts.

Much existing research into autism and technology is focused on social skills development or tasks which are designed to improve or modify some behaviour. Much of this research is carried out on a small scale (2-3 participants) and in a clinical or educative context. While the Show and Tell visual story could also be seen as engaged in modifying behaviour (in this case anxiety behaviours) it was primarily envisaged as a way to get children to engage with an exciting and unpredictable art form. As the research took place outside of traditional autism research contexts the project contributes to an ongoing questioning of how autism research is carried out:

> By investigating behaviour ‘in the wild’ we offer a genuine alternative to traditional paradigms in understanding ASD.

The scale of the project made a significant contribution to the existing published research in relation to how autistic children make use of technologies designed for them, and it therefore offers new insights which have genuine application in future cultural, medical and technology contexts.

Research projects which explored connections between autism and technology such as *Imagining Autism* (Shaughnessy, 2013), *ReactTickles* (Keay-Bright, 2007), *Somantics* (Walker, DJ, Keay-Bright, W, and Cobner, D, 2012), and the Click East project *Find Me* (Fletcher-Watson, 2013) informed the approach taken in the development of Show and Tell. These projects validated the use of app technology with autistic children for creative and

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social benefit. Show and Tell differs from these projects firstly because it casts the autistic child as an audience member rather than participant and secondly because it employs a visual story delivery mechanism. Investigating visual story and technology use by autistic audiences in relation to the arts and arts engagement was entirely new. The project therefore contributes to the conversation that these research projects have begun about the combined value of creativity and technology for autistic children.

**Advance thinking and practice: organisations and markets**

The project addressed two key trends in the digital market: the explosion in popularity of mobile apps and the growing use of smart devices. Smart devices and apps in particular have triggered revolutionary change in this market. There are two major benefits of the iDevice; affordability and social acceptance. iDevices are commonplace within Special Educational Needs learning communities and there is a growing awareness of this user sector from the app development community and technology companies.

Being an emerging market, there was no existing app that delivers the same result and part of the project plan was to ensure easy customisation of the app for other arts organisations. The project contributes to the increasing interest in adaptable and tailored performance and presentation which increases accessibility and take up by differently-abled audiences.

The research outcomes from the Show and Tell project can be extrapolated to other audiences who might also be excluded from arts and cultural events due to social background or disability and therefore provide solutions that other arts organisations could use to engage these audiences.

Encouraging disabled and child audiences to explore and engage with the arts is a key concern for arts organisations as these sectors form a valuable part of the search for new audiences. Experiencing the arts in childhood has the potential to create life-long patrons and practitioners. Our project recognised that autistic children come with families and that targeting them also brings along the rest of the family.7

Project partner perspectives on the work

Researcher
The Lead Researcher’s research is grounded in the belief that experiencing art is of fundamental value to our well-being and that opportunities to encounter art in any form develops our sensory and imaginative faculties to our continuing benefit. She was drawn to this research project because it offered a chance to develop a tool through which more people could experience an arts event that had the potential to create lasting change. The focus on a marginalised audience sector extended the challenge of finding a way that this audience could be drawn into a new experience.

Arts Organisation
Circus Starr pioneers the provision of accessible entertainment for all its audiences and endeavours to accommodate the different needs of its audience members.

Whilst the evidence of need and positive impact of Circus Starr’s work was clearly illustrated through a Social Value Report comprised of feedback, testimonials and case studies (see Further Reading), the evidence was mostly anecdotal. The Show and Tell project allowed Circus Starr to improve the experience of its autistic audience members by providing practical, tangible support, whilst participating in a wider research project that would uncover potentially ground breaking findings about the impact of attending a live performance.

Technology Developer
Therapy Box create apps for people with a range of abilities, but particularly look at ways to use technology for people with cognitive and communication disabilities. This project was therefore an opportunity to look at how technology could provide a bridge for people with disabilities to access the arts. Going into partnership with Circus Starr seemed to be an effective way for both parties to focus on new challenges, drawing on the expertise of each organisation.
The Project

Research Aims and Objectives

The aim of the project was to discover whether a preparatory visual story, delivered via a mobile app, could encourage children on the autistic spectrum to attend the circus and thereby experience a brand new art event with their family. To do this an app was designed that would be appealing and suitable for an autistic audience, and a research strategy devised to measure its effectiveness. The key research questions used to guide the project were as follows:

Key research questions:

- How useful is the app in preparing an autistic child for an unknown event?
- How effective is the app in preventing or assuaging feelings of anxiety in new situations for a child on the autistic spectrum?
- Does the circus create a positive effect on children on the autistic spectrum?
- Could the app be useful in preparing autistic children for other arts events?
- Does the availability of a preparatory tool (visual story/app) lead to greater engagement and satisfaction with an arts event?
- How beneficial is an app as the interface for a visual story?

The Show and Tell app

The Show and Tell app contains three main features: two customisable visual stories and a repository of images, videos and audio tracks which evoke the sights and sounds of Circus Starr. Each feature of the app is distinguished on the homepage by a clearly recognisable icon.

The first visual story ‘Plan My Visit’ is designed to be used as a preparatory tool to familiarise the child with all aspects of their circus visit. Early slides in the story prompt the user for content which personalises the story for them and adds realistic detail such as the date of the circus trip. Further slides
familiarise the child with aspects of the circus which might require
preparation, such as noise, queuing to get in, waiting times, using images,
audio spoken by the ringmaster and simple text captions. Latter slides
preview the circus acts and link to video clips of the acts.

The second visual story ‘After My Visit’ is designed to create a record of the
experience for the child and is a shorter fully customisable story. Five slides
prompt the child to recount their visit and to record which acts they enjoyed
by inserting either their own picture or a picture from the app’s image bank.

‘Welcome to The Circus’ is a repository of images, video clips and audio files
which can be accessed independently of the visual stories. This feature
enables users to enjoy highlights of the circus performances and to view this
material separately if additional familiarisation is required.

*Image 1: Show and Tell app homepage*
App Design

A before/during/after format for the app had been discussed at the initial introductory meeting between Circus Starr and Therapy Box at a Digital R&D Fund collaborative workshop event, drawing on Therapy Box’s experience in working with creating tools for children with autism. This tripartite format was envisaged as a way to provide a preparatory story, an opportunity for sharing recollections of the event and activities to be used during the interval which was sometimes a difficult point for autistic children.

The content of the app followed the existing form of a visual story, a short narrative containing all pertinent information about a situation or event which can be revised by the autistic child in order to assuage feeling of anxiety about an unknown situation and to develop coping strategies before the event. Building on this concept, which is widely used with autistic children and has proved effective, and taking on board insights from the Prince’s Foundation for Children and the Arts’ Relaxed Performance Project, the project team developed an interactive, personalised story app that children and carers could author and customise for themselves.

The app was designed to be compatible with iDevice platforms (iPad, iPhone and iPod) as iDevices were commonly held to be by the preferred option for autistic children and their families (anecdotally and also in research evidence (de Rochas Rosa 2014). It also enabled a more straightforward development route which was pertinent within the timescales of the project. Developing on iOS for a restricted project was more viable than developing for Android, given the larger number of form-factors, screen sizes and handsets running the Android operating system. Given Therapy Box’s track record of app development in this field, their own sales/download patterns for previous apps also supported the plan to develop on iOS for iDevices.

The project team were informed and guided through the design process by the National Autistic Society Consultant on the project. She advised a clear, simplified design with minimal animation with language and images kept as literal and simple as possible.

Details about the circus location, show schedule and queuing times were included as part of the preparatory information for the user. Photographs of the circus environment and acts were taken during prior Circus Starr tours
for inclusion in the app, which meant that content was clear and reflected the show accurately.

Image 2: The Big Top
© Paul Briscoe
In the early stages of development it was envisaged that children might capture footage and images for their own visual stories during the show, and that this could be used to provide us with real time feedback on their experience. However, the project team concluded that encouraging in-event interaction with the app would distract from the circus experience and it would be impossible to measure whether interaction was occurring for positive or negative reasons. Therefore these elements were omitted from the app design at an early stage.

**The Research Methodology**

The research questions used in the project required a multi-modal methodology which could capture qualitative and quantitative data from parents and children regarding their experience of the circus and the Show and Tell app. The methodology therefore focused on how multiple strands of information could be best captured in light of the particular requirements of the target user group.

The app included additions which enabled the retrieval of passive quantitative data on its use during the main research phase (September-
November 2014). This data recorded how much the visual story was used, which particular slides in the story had the most views and how many times particular audio and video clips were viewed. Passive data capture was used to gauge how useful or interesting particular images and content was and enabled some extrapolation of which features were specifically useful and relevant and which were less so.

The app included a feedback activity to be used by the autistic child. This feature, called ‘Rate Your Experience’ was made available to research project participants only (it was passcode protected) and was included as way to address the lack of direct feedback from autistic children observed in other research projects. The activity sought feedback on how children felt about aspects of the circus that might cause the most difficulty or not be ‘autism friendly’, such as lights, sounds and music. A rating for ‘overall enjoyment’ captured the child’s overall impression of the experience including the circus performance itself. Rating was carried out by selecting between one to five stars for each feedback element.

Image 4: Rate Your Experience feature in the Show and Tell app
This feature went through some changes during development in order to simplify the format and to ensure the rating feature was user-appropriate and accurate.

Families who had used the app and been to the circus were asked to complete a questionnaire about their experience of going to the circus and their experience of using the app. The questionnaire blended quantitative questions framed using a Likert scale with opportunities for respondents to add further comments or to respond with a free written response only. This created a rich blend of quantitative and qualitative data which was further enhanced by follow up interviews carried out with individual parents either face to face or by telephone. The follow up interviews were used to draw out a more extended commentary on the circus experience and app use and also considered how the family used technology, how they prepared for new events and their attitudes to attending arts events. These additional questions were included in order to situate the Show and Tell research project within an existing landscape of family use and habits in order to draw out what was useful and adaptable about the technology being developed.

**App Testing and Development**

Development happened in sprints, or short bursts which allowed for taking on board feedback from the internal team at Therapy Box, the project team and users. In March 2014 the project partners were able to review and test a First Build version of the Show and Tell app. At this stage changes were made to the font size and layout of text to make the slides easier to read, and features were renamed to make them more personal and user friendly.

An audio option was added which enabled the text of each slide to be heard as spoken by Circus Starr’s Ringmaster. This feature was added for the benefit of children who couldn’t or preferred not to read the text, and increased the accessibility of the app.

A small focus group was recruited to test the First Release version of the app in May 2014. The focus group was formed of three parents and four children who had already attended a Circus Starr performance and who already had a relationship with the organisation.
The children found the app engaging and enjoyed creating their visual story. However, difficulties with the navigation, editing and content-adding functions were highlighted and the group felt that the app lacked the excitement and drama they associated with the circus and were expecting to see conveyed in the app through animation, sound or video. While video and audio had been included in the app, the focus group had found these features difficult to access and view.

Feedback from the focus group provided a key driver to the final development phase in which the parameters of the app were re-established and major revisions to content, layout, and navigation were made. The revised app opened with an animation which led the user to the homepage through a circus Big Top. Editing functions were made more seamless so that slides could be edited within the story as it was being viewed. A short video guide was included at the start of the app which ran through the main functions and could be hidden or replayed at will.

With some further adjustments to content and terminology used in the slides the final version of the Show and Tell App was released to the App Store on 15th August 2014. Following its launch to the AppStore, Therapy Box monitored the crash reports/data logs and there were no crashes to note.

**Recruitment of Participants**

Recruitment of participants for the main research phase took place from May to August 2014 and focused on locations where Circus Starr’s autumn tour would take place. Recruitment was based on a convenience sampling methodology through organisations such as autism support groups with which Circus Starr already had a connection. Using autism support organisations as ‘gatekeepers’ gave the research credibility for parents who might be unwilling to risk time and energy engaging in a new activity which could be potentially stressful for their child.

Details of the research were circulated to organisations with follow up visits to explain more about the research and to provide tickets to the upcoming Circus Starr performance. Informal drop-in sessions were scheduled to take place approximately one or two weeks before the circus came to town, where parents could look through the information on the project and ask questions about the research before deciding to participate.
In addition to direct communications with schools and autism support groups across the regions, the National Autistic Society featured the project in its magazines and website, and posted three separate recruitment ads on their own Facebook pages (200,000 followers). However, the recruitment process was slower than anticipated due to a number of factors. Firstly, many parents felt unable to guarantee attendance at the circus show in the first instance due to the nature of their child’s autism in which the additional pressure to attend and participate was potentially stressful. Secondly, whilst the project team had assumed support from a number of specialist autism schools who had already attended Circus Starr’s shows, in practice they were reluctant to introduce an unknown and untested resource into their curriculum.

Thirdly, research suggested that children with autism were very technology friendly and that most had access to an iPad. However, as many of Circus Starr’s audience groups live in some of the most deprived areas of the UK, in reality it was impossible for them to gain access to an iPad either at school or at home. The iOS platform was also restricting in this respect as some families informed us that they could access an Android smart phone or tablet but not an iDevice.
Circus Starr’s audience groups live in some of the most deprived areas of the UK, in reality it was impossible for them to gain access to an iPad either at school or at home.
The App Goes Live

The app was downloaded by research participants and used to prepare for shows taking place during September and October 2014. The Show and Tell Facebook and Twitter pages were used to create and maintain interest in the project and to gather informal feedback on the app and its use.

Questionnaires were sent out to participants and were returned during the following months and follow up interviews were carried out with participants during October and November. Passive data from the app and ‘Rate Your Experience’ feedback was returned up until the end of November which marked the end of the data collection period. Initial feedback from interviews and questionnaires indicated that the app had been greeted enthusiastically and had a positive impact on participants’ experience of the circus.

Feedback from research participants informed final changes to the app and further developments for future shows. At the time of writing, the app is due to be updated with new content for Circus Starr’s spring tour in April 2015 and remain in the App Store as a free resource for all those going to Circus Starr in the future.

With the constant support of the National Autistic Society and their media networks, the app’s launch enjoyed positive coverage across the national and regional media (including the Autism community press (Your Autism Magazine, Autism Daily Newscast), arts sector press (Native Magazine, Media Trust News), regional press (Daily Post North Wales, Congleton Chronicle) and was also featured in the Guardian Culture Professionals ‘App Stories’ series).

The Show and Tell website, which was set up at the outset of the project, proved a popular hub for accessing news, research outcomes, downloadable documents for participants as well as general information.

**Project risks**

There were a number of risks associated with the project.

There was a risk that a disparity between the circus acts depicted in the app and the actual show the child would see, due to the requirement to prepare the app content with the previous season’s performers, would perhaps partly cancel out the preparatory benefits of the app in terms of accuracy. However by referring to broad examples of acts e.g., ‘A Clown’, ‘A Trapeze Artist’ in the app design, feedback from users indicated that the app gave sufficient overview of the event while still creating excitement and expectation about the content of the actual performance.
There was a risk that the app design and content could have become ‘niche’ bearing in mind the focus on circus as an art form and the specific requirements of autistic children in technology design. To increase transferability of the app to other arts organisations broad reference to key activities was favoured over specific detail (e.g., ‘Planning My Visit’ rather than ‘My Visit to the Circus’) and steps were taken to design the app as a framework for other content. Focus group feedback demonstrated that the app had to address a wide range of users of different ages and abilities and so design took a middle line in order to appeal to as many users as possible while recognising the need for differentiation in future app development.

There was a risk that poor recruitment would limit the scale of the project and undermine the validity and reliability of the research findings. While under-recruitment was an issue, the project has demonstrated the challenges of recruiting ‘hard to reach’ audiences for arts research projects, and findings from the project can support other organisations in future endeavours.

**Project Roles and Responsibilities**

Cath Logan, former Community Engagement Manager at Circus Starr, was the Project Manager for Show and Tell. She managed the project on a day to day basis including managing communication between all partners and keeping the project on track with deadlines, milestones and communication with funders.

Sophie Bee and Jazmin Riddell were Project Assistants at Circus Starr and supported the initial participant research and recruitment processes.

Heather Wildsmith is Cultural Engagement Manager for the National Autistic Society. Heather was a Consultant on the project and worked closely with the project partners during the initial design, testing and development phases of the app.

Rebecca Bright is a Director at Therapy Box and was instrumental in envisioning the first outline design of the Show and Tell App. Rebecca designed the bare bones structure of the App which held the ideas of before/during/after using a simple interface and predominantly visual content.
Swapnil Gadgil is a Director at Therapy Box and worked on the initial development stages of the app and First Release, which included designing the passive and active data capture features included in the app.

Ewelina Wisnieska was a Developer at Therapy Box who worked closely with the project team to finalise the app development between the First and Final Releases.

Daniel Aldridge was a Developer at Therapy Box who took over from Ewelina during the final build.

Dr Tracy Piper-Wright was based at Glyndwr University at the start of the project and now works for the University of Chester. Tracy was the Lead Researcher on the project and formulated the research strategy and managed the research activities that occurred throughout the project.

Megan Wyatt was a Research Assistant on the project based at Glyndwr University during the project. She worked on the literature review and data analysis aspects of the research.

**Outputs**

The following outputs were created throughout the lifespan of the project:

- Show and Tell App available in the App Store
- Show and Tell video, publicity, social media, national media (Guardian Professionals)

Winner of Best Technological Innovation at the National Autistic Society Professional Awards 2015
### Key Project Costs:

<table>
<thead>
<tr>
<th>Key Project Costs</th>
<th>Detail of activities</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>App Design</td>
<td>Conceptual storyboarding, wireframe, interface and navigation design</td>
<td>10,600</td>
</tr>
<tr>
<td>App Development</td>
<td>Project team meetings, planning and creating app content, testing app during development phase</td>
<td>24,500</td>
</tr>
<tr>
<td>App Testing and launch</td>
<td>Focus group testing, revisions to interface, navigation, design after feedback</td>
<td>7,200</td>
</tr>
<tr>
<td>Development of research strategy and literature review</td>
<td>Designing strategies appropriate to project and participant requirements, contextualising the research</td>
<td>4,900</td>
</tr>
<tr>
<td>Creating and testing research tools</td>
<td>Questionnaires for focus group and main research phase, interview questions, in-app feedback</td>
<td>4,300</td>
</tr>
<tr>
<td>Collection and analysis of data, reporting</td>
<td>Analysis of data from questionnaires and app, conducting interviews, analysing interview data</td>
<td>10,400</td>
</tr>
<tr>
<td>Recruitment of research participants</td>
<td>Liaison with gatekeeper organisations, creation of information letters and leaflets</td>
<td>9,600</td>
</tr>
<tr>
<td>Marketing</td>
<td>Local and national press coverage, updating social media and project website</td>
<td>4,200</td>
</tr>
</tbody>
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*Table 1: Key project costs*
Results

Can a mobile app help improve arts experiences for children with an autism spectrum disorder and their families?

The research found that an engaging preparatory visual story, delivered via an interactive technological interface, had a measurable impact in encouraging an autistic child to attend an arts event which they may have previously avoided. The visual story provided familiarisation with the event and gave advanced warning of particular sensory features of the environment, enabling users to devise coping strategies. This reduction of the ‘unknown’ had a significant impact on autistic children’s engagement with and enjoyment of the circus.

Project participants

The project was specifically targeted at autistic children who would be attending a Circus Starr performance. The participants for the research project were drawn from families in the North West region of the UK and specifically locations in which Circus Starr would be performing during their autumn 2014 tour: Wrexham, Chester, Liverpool, Wigan, Warrington and Oldham. In order to counteract lower participation in the targeted locations the range of locations was extended to include shows taking place at Luton, Derby and Macclesfield, which brought the final number of research participants to 136.

<table>
<thead>
<tr>
<th>Locations</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool</td>
<td>43</td>
</tr>
<tr>
<td>Oldham</td>
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</tr>
<tr>
<td>Warrington</td>
<td>23</td>
</tr>
<tr>
<td>Chester</td>
<td>17</td>
</tr>
<tr>
<td>Wrexham</td>
<td>16</td>
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<tr>
<td>Wigan</td>
<td>5</td>
</tr>
<tr>
<td>Derby</td>
<td>5</td>
</tr>
</tbody>
</table>
Table 2: Number of participants by location

While official research participants were slightly lower than hoped for, the presence of the Show and Tell app as a free download on the App Store meant that the app was distributed to a wider audience and therefore reached a greater number of families attending Circus Starr performances during the September–November 2014 period. At the time of the tour there had been 550 downloads.

The majority of child participants in the study were male, aged between five and seven and had been diagnosed with an Autistic Spectrum disorder.

Figure 1: Age Range of child research participants
Participant’s experience of the project

Participants were asked to download the Show and Tell App and use it with their child before attending the Circus Starr performance for which they had been given tickets (the distribution of tickets sponsored by local businesses and hence free to families is part of Circus Starr’s existing method of ticket allocation). Shortly after their trip to the circus participants were sent a short questionnaire and were asked to make sure their child had completed the ‘Rate Your Experience’ activity in the app. Those participants who had indicated an interest on their consent form were approached for a follow up interview a few weeks after their circus trip. In total nine follow up interviews were completed, slightly below the projected target of 12.

29 questionnaires were returned – a response rate of 21%. 55 children in total completed the ‘Rate Your Experience’ feedback activity in the Show and Tell app.

Despite recruiting participants from organisations who had previous contact with Circus Starr it was gratifying to find that 86% of those who responded to the questionnaire were first time circus goers. This was particularly useful because their feedback reflected the use of the app in relation to a brand new experience, thereby enhancing the external validity of the findings.
Some key findings:

- 100% of respondents understood the purpose of the Show and Tell app.
- 93% found it easy to navigate, and agreed that they were able to find images and videos on the app easily and found it easy to edit the visual story.
- 85% found it easy to add their own images and videos to the slide content.
- 85% of respondents told us that their child enjoyed using the app and found it easy to use unaided.
- 89% of respondents were ‘satisfied’ or ‘very satisfied’ with the Show and Tell App.

The following section expands on the findings in relation to the research questions.

How useful is the app in preparing an autistic child for a new event? 85% of respondents felt that using the app beforehand helped prepare their child ‘well’ or ‘very well’ for the experience of going to the circus. This was supported by free commentary in the questionnaire and interview responses which were highly positive about the usefulness of the Show and Tell app to prepare their child for the circus. This usefulness was indicated as being the provision of a comprehensive and accurate pre-visualization of the circus including clear information about ancillary environmental factors such as queuing, toilets, lighting, clapping and the inclusion of an interval. Parents told us that the accurate preparatory visualisation of the circus environment lent their trip an air of familiarity and therefore gave their child confidence in entering a partially recognisable situation.

“When we drove in and he saw the big top he said ‘I know that!’ as he recognised it from the app.” - Participant

The Show and Tell app used a preparatory design which is familiar to parents of autistic children who use or make their own visual stories. However, what was commended by parents was the accuracy of the images used in
the Show and Tell app which created a strong link in their child’s mind between what they expected and what they actually saw.

“The pictures conveyed what was there, unlike some social stories where the images are a bit vague and don’t really match up to the reality.” – Participant

This accuracy was prized because autistic children tend to be highly literal and a mismatch between expectations created by the visual story and the real experience could be problematic.

100% of respondents who had previously attended a Circus Starr performance found that their child had a more enjoyable and positive experience by using the app on this occasion. In one case this was because the functionality of the app (to take and upload pictures) was used as a distraction but in most cases it was because of the reassurance created by being able to pre-visualize the circus acts, the sequence of events and timing of the performance.

“Definitely more relaxed, knowing what to expect and how long it was going to be on.” – Participant

There were a few cases in which the app was not successful in preparing a child for the event. Feedback suggested that further information on particular issues encountered in the circus environment and performance would have been beneficial for the individuals concerned. These issues were those that would be problematic for some autistic children: crowds at busy performances, volume levels and seating in the Big Top, and lowering of lights at the start of the performance. These environmental changes triggered sensory disruption for the children in question and are details which should be included in future versions of the app.

**How effective is the app in preventing or assuaging feelings of anxiety in new situations for a child on the autistic spectrum?**

As well as providing a preparatory insight to the circus, the app was designed to also help assuage feelings of anxiety during the circus visit itself. 63% of those whose child used the app during their visit indicated that this use was prior to the event and that the reason for using the app was to remind their child of what was to come.
“He was very anxious when we got out the car so I used my phone to show him and he was a lot more settled.” - Participant

While anxiety at the prospect of going to the circus was not indicated particularly highly in the questionnaire responses (57% of respondents indicated no anxiety in their child) parents reported that they used the app at critical points such as queuing to get into the Big Top in order to avoid potential ‘melt down’ situations. Accordingly, respondents felt that the app had had a positive impact on their child’s mood, understanding and enjoyment of the whole experience. In cases where the app had been used during the show, 50% of parents felt that using the app during the visit helped reduce their child’s anxiety.

The benefit of the app as a tool to circumvent anxiety at or during the event is not conclusive, as many respondents stated that their child was not anxious at any stage of their visit. It is perhaps the case that genuine anxiety is avoided by not attending the event in the first place, particularly when that event is a leisure activity.

**Does the circus create a positive effect on children on the autistic spectrum?**

Circus Starr already knew that the circus had a particular appeal for their autistic audiences, however the research also set out to explore why this might be the case. 86% of respondents said that they and their child had enjoyed the circus and when asked to describe their child’s feelings while at the circus 83% agreed that their child felt ‘happy’, along with other positive emotions of being entertained and engaged by the experience.

“I haven’t seen him smile like that for a long time he was really engrossed in it and really enjoyed it.” – Participant
Figure 3: Impact of the app on child’s feelings

From written questionnaire responses and interviews it was clear that the relaxed environment of the circus plays a contributory part in the experience, with the ability to choose where to sit, vocalise or move around during the performance being valued aspects of the circus experience. The informality of the circus made it something that people would like to return to. Because the circus kept their autistic child engaged, families were able to enjoy the activity together.

When asked about positive or negative factors which might have affected their child’s experience of the circus, there was an equal division between positive and negative responses which reflects the highly individualized nature of each child’s specific needs. Positive aspects of the circus were the low lighting, relaxed seating arrangements, the ability to take photographs and move around during the show and being in a friendly and welcoming environment.

Negative responses were based on sensory issues which many autistic children find difficult, with loudness of the music/PA being the main concern, and difficulties encountered during queuing for entry or waiting for the show to start. It was clear that difficulties with noise and lighting were highly individualised, for while some children found this too much, others had no problem at all. This mix of positive and negative responses demonstrates the individuality of the children and families involved, and also the transitory and sometimes unpredictable feelings of autistic children in
response to their environment, which are difficult to plan for. All respondents were clear that their child had loved the show, despite other difficulties or upsets before the show started.

**Could the app be useful in preparing autistic children for other arts events?**

89% of questionnaire respondents felt that an app like Show and Tell would be ‘useful’ or ‘very useful’ on a future occasion when preparing their child for a new experience.

All parents asked the same question during interview felt that there were numerous other situations where an app like Show and Tell could be useful.

> “The app is good, and it would be good in other situations, because it’s really handy to be able to say ‘have a look at this’ rather than to talk through situations or do something new every time.” - Participant

Some stated that going on holiday was a situation in which the break from routine needed to be prepared for, and that an app could help with this. Other uses suggested were in healthcare appointments or supermarket shopping. Some parents felt that some of the transitional situations their child encountered, such as going up to the next class in school, could be assisted with a preparatory app using a similar format. Interestingly, relatively few parents mentioned using the app for other arts events. Their focus was on the day to day activities or family events which cause stress, which would suggest that the usefulness of the preparatory tool is more keenly felt in those situations where participation is necessary or mandatory, rather than those which are optional.

**Does the availability of a preparatory tool (visual story/app) lead to greater engagement and satisfaction with an arts event?**

The Show and Tell App enabled the research participants to experience something very new and exciting with the reassurance of familiarity:

> “It was a brilliant way to introduce an activity that was new to him and ensured it was a date to look forward to rather than get anxious about.”
> – Participant

The app promoted engagement with the circus not simply as a situation of potential anxiety, but as an enjoyable and stimulating event to be looked
forward to. The app helped autistic children make sense of the concept of a ‘circus’ and to understand what could be interesting about it.

“The word ‘circus’ does not mean much to my son. Watching the app really helped him to understand what it is all about. He then remembered going last year. He understood where he was going and made him excited to go.” – Participant

The ‘After My Visit’ feature of the app was designed to capture the positive aspects of the child’s circus experience. 86% of those who gave written feedback on this feature were positive in their endorsement of it, in particular its usefulness as a way to encourage their child’s recall, and to stimulate conversation about experiences shared as a family.

The usefulness of the app was not simply in its preparatory qualities, but also because it provided a context in which a shared experience could be talked about and enjoyed again through recollection. It’s arguable that the value of an arts experience is not just in the experiencing of that event at the time, but also the ability to remember and reflect upon that experience. This is something that the Show and Tell app helps foster.

“We used the slides as a prompt for a conversation about where he’d been and what he’d done. Normally it’s all ‘I can’t remember’ if you ask him about something but the app helped him retell the story of going to the circus.” – Participant

The ‘Rate Your Experience’ feature of the app enabled children to give direct feedback on their experience of the circus. Using this feature they were able to demonstrate their feelings towards a number of aspects of their circus experience, from lighting and sound levels to their overall enjoyment. 55 responses were given, with questionnaire and interview responses confirming that most children used this feature themselves, with some guidance. 78% of children rated their overall experience of the circus positively (between 3-5 stars).
Figure 4: Feedback on the circus from the 'Rate Your Experience' feature
“For some autistic children information that is delivered in a technological format has a greater validity, and perhaps echoes the general population’s attitude to the ubiquity and availability of online/electronic information sources.”
How beneficial is an app as the interface for a Visual Story?

Autistic children tend to be high users of technology and technology played a large part in their child’s daily life amongst those interviewed. All respondents agreed that technology was not only beneficial but often vital in enabling their child to engage with new ideas in a form that best suited their needs. Concepts of trust, well-being, fun, ubiquity and comfort were all aspects of technology use described by the parents in relation to their children’s use of apps and devices.

“Apps for autistic children are absolutely priceless. We’ve never been to a circus before and rarely go out as a family. The app was crucial - as he trusts what he sees in an app.” – Participant

This suggests that for some autistic children information that is delivered in technological format has a greater validity, and perhaps echoes the general population’s attitude to the ubiquity and availability of online/electronic information sources.

The delivery of a preparatory visual story using software rather than traditional formats enabled content to be delivered in a seamless and interactive fashion which fits with the preferred 1:1 non-social engagement favoured by autistic children. The multimedia content included in the Show and Tell App had broad appeal across all aspects for most users, with videos and pictures being the most highly rated.

![Figure 5: Features of the app children found the most interesting](image-url)
Engagement with the material in technological rather than traditional form also encouraged engagement with something that appeared to be ‘fun’, through which tangible skills such as talking about the circus could occur, couched in a stimulating format:

“The app interface seemed to free up his response to the questions (in After My Visit) that he might not have engaged with normally.” – Participant

While most participants found the app innovative and engaging, technology was a problematic feature for some. The delivery of the app on iOS only excluded some from engaging with the project, or from engaging with the app as fully as they may have wished (for example by using it on their own, non-compatible device, rather than using an iDevice borrowed from the support group or friend). 93% of questionnaire respondents agreed that the app was easy to navigate, and found it straightforward to edit the visual story. However, in further interviews it transpired that some participants had not found or used key features of the app because they did not know they were there, e.g. video and audio functions embedded in the slides. Further changes to the layout and icons on the slides would make these features more prominent in future versions.

Some participants questioned the relative simplicity of the app content and features and expressed a desire for more interactivity and ‘fun’ content to be included. Feedback suggested that a more diverse range of activities or actions for the user would enhance the desirability of the app and promote repeated use, and would also better reflect the excitement and dynamism of the circus. It could be that the increasing use of apps by autistic children which are not designed for them has created a higher tolerance for features which designing for autism would normally resist. However, it is also the case that designing for ‘one size fits all’ is problematic, and a solution would be to create an adaptable app which would have features differentiated according to age and ability.
Summary of main findings:

The most valuable and engaging features of the app were:
The visual story was comprehensive and provided accurate examples of the circus environment and performance.

The ‘After My Visit’ feature was useful in promoting recall and speech for autistic children.

The app has high potential transferability to other art and everyday situations.

The most problematic aspects of the app were:
Some of the sensory issues of the circus were not fully described and so could not be prepared for.

The iOS format restricted the accessibility of the app on platforms more widely available to the target audience.

There was a perceived lack of interactive or extra ‘fun’ content in the app.

Impact

“A great idea that enabled us to try an activity as a family that we may have had second thoughts about doing. He has talked about it quite a bit after the event too, which has been lovely for us as he finds it difficult to communicate how he feels.” – Participant

When the idea of Show and Tell was presented at the National Autistic Society conference in March 2014 the response of autism professionals was very positive and individual families with autistic children appreciated and valued the focus on their particular needs that the project took.

Since Circus Starr began working on Show and Tell, it has been approached by a number of arts organisations who can see the potential of adapting the Show and Tell app to make their own arts offer more accessible (Eureka; Orchestra’s Live; The Roundhouse, London). The potential of the app in engaging a brand new, hard-to-reach audience is clear, and Circus Starr has been invited to share the project learning at the Future Everything Conference, and to present the app at a Kids in Museums Workshop and also at a Nesta Trustee event.
The Show and Tell app recently won the National Autistic Society’s Best New Technological Innovation Award at the 2015 Autism Professional Awards, offering credibility and endorsement to the concept whilst promoting the idea directly to its target audience. Carol Povey, Director of the National Autistic Society’s Centre for Autism, said:

“Autism is a specialist field which attracts many talented and dedicated individuals so it takes something extraordinary to stand out. The work of Circus Starr hasn’t just benefited the children and families its Show and Tell app supports, it also serves as a fantastic example to others working in the field of autism. Autism can have a profound effect on individuals and families but, as shown by the achievements of Circus Starr, the right support can make all the difference and help them live the fullest life possible.”
The Show and Tell app won the category of ‘Best New Technological Innovation’ at the 2015 Autism Professional Awards
Insights

Learning about Autism

The research team and the arts organisation did not come to the project with existing expertise in the field of autism and so recognised the importance of developing their knowledge during the project. Circus Starr already knew the positive impact of their performances on children with autism but was keen to find out what made the circus such a successful environment, despite the presence of many apparently autism-unfriendly aspects such as noise and lights.

Discussion with autism professionals highlighted several key factors which may contribute to the success of the circus:

- Children with autism don’t understand non-verbal cues, so the physical and visual nature of circus performance ‘talks their language’. There is no inference so they are not required to interpret emotion or read between the lines.

- Emotions are over exaggerated: facial expressions are either very sad or very happy and therefore easy for a child with autism to understand.

- Autistic children love slapstick (e.g. Mr Bean, Tom and Jerry) because it gives them information in a visual form which suits them best.

- The seating in the Big Top surrounds the circus ring making all aspects of the performance visible. This makes for fewer ‘unknowns’ during the performance which might cause anxiety.

- The ringmaster is there as a narrator to signpost all transitional moments, leaving nothing to guess-work or interpretation meaning the children can relax and enjoy the show with everyone else.

- A relaxed performance setting is crucial. Because many families who attend Circus Starr shows are attending with children with additional needs, no one bothers or stares if a child has a meltdown or needs to take ‘time out’ during the performance. This enables the whole family to relax knowing that any disruption is inconsequential to those around them.
By finding out from experts what was already successfully engaging autistic children with the circus encouraged the project team to value the unique perspective of the art form and to feel confident that the Show and Tell project could make a useful contribution to knowledge about autism. While only some aspects of the circus environment can be extrapolated to other arts organisations, some key factors such as the emphasis on visual communication methods, ‘signposting’, and a relaxed environment are pertinent to any organisation looking to adapt their own environments for autistic audiences.

**User Testing**

During the development phase the Show and Tell app was tested with a small focus group. It was a challenge to create a situation which balanced the requirement to gain sufficient feedback on the app with the necessity to minimise potential stress and anxiety for the autistic children taking part.

In order to do this the focus group was run as an ‘after school’ get together with parents and children at a family home. While this was good because it emulated a ‘real life’ environment, the level of relaxed familiarity meant there were many distractions which the app testing had to compete with, in addition to which the children were potentially tired after their school day. The focus group was run for two hours to militate against concentration and tiredness issues, however this was not long enough to explore all the features of the app in any depth.

Working with a small focus group meant that the spread of ages and abilities on the autistic spectrum was limited which had the potential to skew the feedback. The individual characteristics of the children and parents created distinct interpretations, use patterns and interactions with the app. Variations in parental input, technical difficulties and how individual children felt on the night all had an impact on their responses to the app.

Despite these issues the focus group provided a wealth of valuable feedback which was used in the next stage of app development. However, the project team learnt the requirement for breadth and depth in user testing situations and the necessity of multiple focus group sessions, with different participants, in order to create a rounded set of feedback. Working in app development with autistic users may require a different approach to the user testing process which enables participants to work with an app over time
rather than in a single session. While a longitudinal approach was not available to the team in this project, it may well present a more holistic and stress-free means of engaging autistic users in the design process.

**Collaborative Design Process**

The design, testing and development stages of the Show and Tell project were relatively condensed, due in part to the requirement to launch the app in time for it to be used during Circus Starr’s autumn tour schedule. This created pockets of intense activity on the project at key times, one of which was the final development stage.

There was a rapid turnaround between the focus group session, evaluating feedback and pushing ahead with the final development of the app for the projected release to the App Store in August. The members of the project team involved in the focus group wrote their feedback responses and shared these electronically with the rest of the team, channelling some of the negative feedback about the app into potential design changes.

During this time it became apparent that evaluating the responses to the app from the focus group and the project team needed to be given careful consideration and time so that the team could reflect effectively on what was being learnt and how this was best translated into design decisions. For example, a hasty decision almost lead to the removal of a key element of the app; a situation which was rescued by the quick thinking of another member of the team, but which could have had a negative impact on the final product.

While remote communication methods such as Skype, email and telephone were extremely useful during the project it was also apparent that times when the project team could meet face to face enabled better discussion and decision-making to take place. Opportunities for this were rare, but during the final design development the all-day meeting at the Technology partner’s offices resulted in some significant, transformative changes to the app interface and content.

What the project partners learnt was both the necessity to factor in pockets of reflection and time to digest feedback on an app design project such as this, and also the benefit of face to face meetings in order to progress significant decisions. Face to face meetings provided time for iterative
conversations between partners, in which ideas were tested, analyzed and refined in a short space of time, with all partners contributing in real time to the design process.

Barriers to participating in research

Recruiting parents and children to trial the Show and Tell app was a challenge. The research team were aware of the ‘hard to reach’ nature of the audience being targeted, and accommodated this in their recruitment plan and tools. However, the main barriers to participation were access to appropriate technology, particularly in low income areas, and reluctance to commit to new activities which in themselves could be a potential source of stress to the autistic child.

The complexity of the lives of parents with autistic children was brought home to the research team during the follow up interview stage. Parents discussed the extensive forward planning that needed to occur on a daily basis, and how unpredictable situations and events were best avoided. While there was a relatively good return on questionnaires and interviews, the project team worked hard to encourage the completion of, or participation in, these activities throughout the data collection period. In hindsight it was apparent that more opportunities for face to face interaction with parents and children, perhaps by dropping in on pre-existing community support group sessions, would make the activity of completing questionnaires or carrying out interviews more easily achievable.

While steps were taken to accommodate the research to the needs of the participants, the research team learnt that in future situations it would be important to go much further in order to facilitate engagement in the research, and that increasing opportunities for the researchers to enter the participants’ daily life (rather than the other way round) would be a more successful strategy to engage ‘hard to reach’ audiences.

Lessons Learned

- The existing knowledge of the organisation or project partners can be valuable even when working on a project which focuses on an apparently unrelated field. The insights brought to the subject from an outside perspective can often inform the direction of a project in an unexpected way, leading to new interpretations.
• Time is a valuable commodity, in particular during the development of an app or other digital project. Factoring in time for repeated engagement with the technology while it is under development enables richer feedback which is ultimately more useful. Time to think, time to reflect and time to act need sufficient distance in the design process.

• It is important to include as many opportunities as possible to gain feedback on the project from its eventual users. Incorporating the user into the design process can often provide valuable insight at an early stage which is just not available to the project team.

• Be mindful of the world outside the project for the participants. While the new product or idea may be beneficial, and people keen to help, their lives are full of other competing demands in which the research is simply one other job to complete. Finding ways to meet participants half or most of the way there makes their participation more likely.
Future

Next Steps

During the project several arts organisations have expressed an interest in working with Circus Starr to develop the Show and Tell app toward their own specific art form, organisation or service. These include: Kids in Museums, Eureka, The Lowry, The Roundhouse, Orchestras Live, The Postal Museum, a number of Primary Schools and more recently The National Trust.

Circus Starr have updated the Show and Tell app for their Spring 2015 tour including pictures and video footage of new acts joining the troupe for this season. The updates refresh the content of the app in preparation for the new season and retain the degree of connection between the preparatory story and the actual performance.

The research team will be sharing the project results in an article entitled “Show and Tell: Using mobile technology to increase engagement with the arts for children with autism” which will be published in the International Journal of Social, Political and Community Agendas in the Arts later in 2015.

Therapy Box is sharing the project outcomes with its customer base in the UK and internationally through its social media outlets and events. Therapy Box is continuing to work on apps in this sector.

Application and development of project outputs

The research and findings from the project can be applied in several areas. Parents perceived the Show and Tell app as a useful transferable tool which could be adapted to assist with preparation in a range of everyday situations. The adoption of the Show and Tell app into a wider resource bank of tried and trusted autism apps is a possibility, and the contribution of the research to the existing knowledge base regarding the design and best use of such apps will be valuable.

The project enabled a large number of parents and children to contribute their voice to the debate on the importance of designing for autism and for considering the needs of autistic children in a range of art and non-art
situations. This research can reinforce both the necessity and the benefit of making adaptations for differently-abled audiences, and will hopefully contribute to the continued foregrounding of this in arts policy. It will also provide a useful touchstone for arts organisations considering their own strategies for audience engagement and inclusion.

The focus of the project on preparation for a fun, leisure time event highlighted the relative lack of opportunity to engage in such activities for autistic children and their families. By drawing attention to this it is hoped that the research can generate debate beyond the realms of the clinical and medical framework in which much autism research is situated, and contribute to debates which address the value of the arts for all regardless of ability.

**Transferability of the project**

Organisations wishing to carry out a similar project would first need to inventory the context of their arts experience, in terms of location and content, in order to map features which are likely to cause difficulties for an autistic audience. They would then need to capture sufficient material from their arts event in order to create a comprehensive preparatory story. Access to an existing audience population or autism support organisations would help them recruit sufficient numbers of participants to test out their preparatory story and the format of this as presented. They would also need to consider the requirement to obtain feedback from participants in an easy and stress-free way bearing in mind the existing demands on parents of autistic children.

Circus Starr is committed to securing the future and development of the app and is actively approaching other arts organisations to illustrate how the app might support a range of situations. Some adaptations would be a straightforward process of changing the brand and content whilst other organisations see the value in a more mainstream promotional app for their customers. For example the National Trust felt an app to show families where to go on arrival, where to park, where to eat, what to look out for and what visitor attractions were available (e.g. treasure hunts, workshops) would be extremely valuable for new members who were unfamiliar with the National Trust offer.
Key areas for future projects and research:

There are several key areas which could be explored in future projects and research; areas which were not addressed in this project due to the timescale or which have emerged subsequent to the research as further questions to explore. These are outlined below,

To test the app as a preparatory tool in a different arts context.
According to participants, extensive photographs and video of the circus performances was a valued aspect of the preparatory story for Show and Tell, and readily available to Circus Starr to create. Currently, it’s not clear what content would be required for a trip to another art event, and what material would be available when the art event is unavailable for preview, such as in a theatre performance or film screening.

To test an age/ability differentiated app so that the appeal could be broadened to older users.
Feedback received from older and more able children was that the app was too simple. In a future project it would be good to consider the autistic user in a more nuanced way and to include differentiated levels of complexity and content in the app for different users. The app could be designed with a greater level of interactivity, with the ability for complex features to be switched off for a user requiring a more simplified experience.

To explore different ways in which the creativity and input of the autistic user could be encouraged by the app design so that there is a greater level of interaction with the content.
The Show and Tell app is a tool which casts the autistic child as the audience of the arts experience. This could be seen as a passive role, reinforcing the distinction between observer and actor in the relationship between audience and art work. It could be interesting to recast the autistic child in a more active relationship and to consider how their creative response to what they are observing or engaging in can be encouraged. This would require a different type of approach in the app, but it is a potential development which expands the role of audience engagement for a disabled audience.
To find out in more detail how the app is used by individuals through observation in context.

The feedback process from participants was based on self-identified use through a questionnaire. It would be useful to carry out a greater level of observation of the app being used by parents and children in order to assess aspects of functionality and suitability of the app content in a more detailed way. This could also be incorporated into the design process.

To explore how the inclusion of autistic users in the design process would modify the outcome of the app.

The timescales for Show and Tell required the development of a fully functioning app in a short period of time which limited opportunities for user engagement in the design process. The incorporation of end users into the design process from the start of the project could have potentially led to a different approach and end product, and would be valuable to explore in a future project.
Further Resources

Further project information

Project website http://showandtell.circus-starr.org.uk/

Tools and guidance

National Autistic Society www.autism.org.uk

Network Autism is a portal to useful insight into current debates and research in the field www.network.autism.org.uk

Further reading


Other examples

The Prince’s Foundation for Children and the Arts Relaxed Performance Project 2012/3 developed inclusive performance practices for audiences with autism or learning disability

Imagining Autism is a related research project which focuses on the link between autism and the arts www.imaginingautism.org

DART (Development Autism Research Technology) is a project exploring technology use and autism www.dart.ed.ac.uk

Somantics: experimental software for autistic users developed by Wendy Keay-Bright in partnership with Hellicar & Lewis and Marek Bereza

http://somantics.org/about/

Reactickles: interactive software for autistic users developed by Wendy Keay-Bright http://reactickles.org/about/
Glossary & Abbreviations

Melt down

An involuntary and sometimes unpredictable increase in tantrum-like behaviours usually as a response to one or more stressors. For an autistic child, a meltdown occurs when they become over stimulated, for example by noise, or too much information, or due to anxiety. During a meltdown the inability to cope with any further incoming information results in behavioural outbursts or withdrawal.

Autism-friendly

Autism friendly adjustments take account of lighting, noise levels, crowds and waiting times which can be causes of stress for those with ASD. Autism-friendly environments are tolerant of movement in and out of seats and vocalisation. Closely related to ‘Relaxed performance’.

Relaxed performance

Relaxed performances are specifically designed to welcome people who might not otherwise be able to access the theatre such as those with ASD, sensory and communication disorders, or a learning disability. The term ‘relaxed performance’ references the Relaxed Performance Project carried out by the Prince’s Foundation for Children and the Arts. In a relaxed performance changes are often made to sound and lighting in the show to eliminate surprise and soften their impact. There is a relaxed attitude to noise and moving around the auditorium during the performance and a designated ‘chill-out’ area to use if the auditorium becomes overwhelming.

Social story

According to Gray (2010) ‘a Social Story™ describes a situation, skill, or concept in terms of relevant social cues, perspectives, and common responses in a specifically defined style and format. The goal of a Social Story is to share accurate social information in a patient and reassuring manner that is easily understood by its audience.’

Visual Story

Because the term Social Story™ is trademarked one of the outcomes of the recent Relaxed Performance Project is that the UK Arts / Theatre world renamed the concept for the UK as a ‘Visual Story’ which was considered more appropriate to an arts experience.

A social story™ is designed to help a child with their emotions through a social scenario whereas the visual story helps the child access an activity. The visual story then becomes an aid in remembering that experience and can encourage a second visit with real memories attached.
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artsdigitalrnd.org.uk