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Autism in the air: using Point of View Video Priming and Natural Environment Teaching to help children with autism travel by plane

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Editorial comment

This paper describes a study that used video materials and visits to an airport to prepare children on the autism spectrum for travel by plane. Twenty parents and carers took part in the study with children aged from 3 to 16 years. The authors explain that the methods they used were based on Applied Behaviour Analysis (ABA) research; a video modelling technique called Point of View (POV) Video Priming and during visits to an airport they used procedures known as Natural Environment Teaching. The findings suggest that using video and preparing children by taking them through what is likely to happen in the real environment when they travel by plane is effective and the authors suggest these strategies could be used to support children with autism with other experiences they need or would like to engage in such as visits to the dentist or hairdressers and access to leisure centres and other public spaces.

Introduction

Autism affects each child differently, but the two key elements in the recently revised diagnostic criteria (Diagnostic and Statistical Manual of Mental Disorders 5) focus on social communication and restricted, repetitive behaviours (American Psychiatric Association, 2013). Sensory over-sensitivity or under-sensitivity is very common and auditory and kinaesthetic (touch) perception are most frequently affected. This can lead to stimulation-seeking or sensory-avoidance behaviours of the child that can be challenging for parents and caregivers who may then avoid visiting public places and engaging in leisure activities (Nawijn, 2010; Pagán, 2013). Some families restrict family activities including holidays (Larson, 2006) due to lack of adequate finances, their worries about the public’s perception, or previous negative experience while travelling.

There is much evidence that parental stress is significantly higher for parents of a child with autism than for parents of children with other disabilities or typically developing children (Dillenburger et al, 2010; Gray, 2006). Consequently, parents of children on the autism spectrum are more likely to have reduced marital quality (Harper et al, 2013) and poorer mental and physical health (Myers et al, 2009). Family holidays and breaks from day-to-day routines offer respite from work, school, and the usual responsibilities and are therefore particularly important for families with a child on the autism spectrum.
The main reasons a family may avoid going on holiday are related to their child's preference for familiar routines and the unpredictability of situations encountered when travelling, such as noisy airports, crowded places and queues, and unreliable schedules. These can lead to difficulties due to sensory overload or anxiety and children may find it difficult to cope in these situations. Recommendations for improving the holiday experience include the creation of autism friendly environments with well-trained staff and clear guidance regarding strategies to support the child with autism (Amet, 2013). Most children with autism can be taught through adequate preparation to enjoy the experience of travelling.

Materials to prepare children with autism for flying and air travel exist in various forms, such as books and Social Stories (Gray, 1998). The book series, *Off We Go* was especially created to prepare children with special needs for new experiences of travel (Webster, 2015). Downloadable cartoon-like apps (eg *Luca Lashes and his first airplane ride*, 2014) can also be used to prepare children for going on the plane. Short guide books exist to educate parents and airport staff on how to meet the needs of children with autism (eg *Autism Speaks*, 2014; *CARD*, 2014).

Increasingly, airports offer both hard copy and online guides for families travelling with a child with autism. For example, Dublin Airport in Ireland offers tips, advice, a visual guide to the airport, and instructions for parents and carers on how to make their own visual guide for the child, using symbols for the journey. These visual guides commonly include a series of photographic images with a short paragraph of text that explains what is going on in the corresponding photo. Some airports are making use of videos. For example, Manchester airport in conjunction with the National Autistic Society (2014), provides three downloadable booklets that explain the different parts of the journey when travelling by plane and offers three short introductory videos, narrated by a celebrity. In the USA, 15 airports offer the *Wings for Autism* programme, which invites parents and children with autism to come to the airport for preparatory visits and some videos of these events are available (Schectman, 2014). While parents may welcome these guides, videos, and visits, these have generally not been evaluated (Skillicorn, 2013).

The Autism in the Air project described in this paper used two well-evidenced behaviour analytic methods (ie Point Of View video-priming and Natural Environment Teaching) (Autism in the Air, 2014). Point Of View (POV) video-priming has a number of distinct advantages over the third-person perspective that is usually used in video-modelling (Lindsay, Moore, Anderson, and Dillenburger, 2013; Nikopoulos and Keenan, 2004; Sancho, Sidener and Reeve, 2010). A POV video is recorded from the eye-level view of the individual completing the activity. It does not show the actor, instead it focuses only on the task being completed (Tetreault and Lerman, 2010). As such, POV videos have fewer distractions and allow for more direct identification with the model. Natural Environment Teaching (NET) involves teaching new skills in the actual situation in which the new behaviour is needed (Jahr and Eldevik, 2002). In the context of learning about travelling by plane, this involves visits to the airport and might include access to a stationary plane, as opposed to viewing material online or from leaflets. NET incorporates a range of teaching opportunities including modelling and imitation, for example, in the security area the parent or caregiver may take off their shoes and coat or empty the content of the rucksack onto the conveyer belt and the child can imitate these behaviours, or in the check-in area, the parent can reinforce appropriate queuing behaviour.

Comparisons of video-modelling and in-vivo modelling in NET demonstrate that both procedures result in the acquisition of new skills in children with autism (Ergenekon, Tekin-Iftar, Kapan and Ackmanoglu, 2014; Charlop-Christy, Le and Freeman, 2000). We explored the effect of a combination of these procedures.

**Participants**

A total of 20 parent/carer-child dyads took part in the study, including 14 boys and six girls diagnosed on the autism spectrum. They were mainly aged between 3 and 12 years of age, but one of the boys was 16 years old. The parent/family carers were between 30 and 70 years of age and included 14 mothers, two fathers, and four other close relatives of the child (eg grandmother, uncle).
Research tools

Four short (less than five minutes each) POV video vignettes were recorded by Queen’s University Belfast audio-visual department with faculty staff and students acting in the roles of parent and airport customers. Airport staff were available to act in their own roles (i.e., security staff, check-in desk staff, and flight attendant). A small professional digital video camera and a professional sound system were used to record scenes from a specially designed storyboard.

The camera was held at approximately 1.20m (the average height of a 5 to 8 year old child) throughout the filming for shots when the child was standing or walking. When seated (e.g., in the waiting area or on the plane) the camera man was holding the camera at approximately chest level pointing away from himself. A deliberate roaming movement was used to give the impression of a child’s eye movements and frequent shift in focus. The mother of a child with autism, who is a student at QUB, provided a child-friendly voice over for all four vignettes.

The scenes portrayed in the vignettes followed the storyboard of the usual procedure necessary when travelling by plane, i.e., putting suitcases into the car at home and driving to the airport, arriving at the airport and checking in, going through the security system (due to airport regulations, filming in the security area was not permitted, therefore this footage was captured in an alternative security area), waiting in the lounge, going through the gate and entering into the plane, sitting in the plane and listening to the security announcements, using the toilets in the plane, leaving the plane and finally, collecting the luggage of the carousel and leaving the airport.

A pre-intervention parent/family carer questionnaire was developed to assess the need for the Autism in the Air procedure (see Appendix 1). The questions sought parental views on their experiences of flying with their child and what kind of intervention they would consider helpful. Questions explored if plane travel was something the family wished to experience in the future and examined the factors that had prevented the family from travelling by plane before. The questionnaire was sent to all families who were members of the Parents’ Education as Autism Therapists (PEAT) charity at that time (n=220).

A post-intervention parent questionnaire was used to assess the experience of the project. This questionnaire sought parental views and explored their feelings about the impact the experience had on their child (see Appendix 2).

Research procedure

Pre-intervention questionnaires were distributed by email to all members of the parent-led PEAT charity. Paper copies of the questionnaire were handed out to parents at one of the monthly parent training sessions, organised by this charity. Participation in the study was based on a first come/first served basis, as places were restricted to ten parent/child dyads per visit to the airport.

For the POV video-priming part of the study, parents/family carers were instructed to show the video vignettes to their child in their own home, using their own computers or other devices and to follow the storyboard available on the webpage. The children were encouraged to view the videos multiple times and to discuss the videos with their parents/family carers.

The Natural Environment Teaching (NET) aspect of the study took place in a relatively small local airport, including a grounded plane. The airport was made available during a ‘quiet period’ on a Sunday morning, when few customers were using the airport. Members of airport staff were on hand to go through a mock routine procedure with the families at the check-in desk, the security checks and on the plane. A Board Certified Behaviour Analyst (BACB, 2015) and a post-graduate student with extensive experience in autism and ABA were available to support parents and children throughout the procedure. The procedure was carried out on two occasions (i.e., ten parent-child pairs participated each time). Post-intervention questionnaires were sent to the 20 parents/carers who had taken part in the study.
Findings
The results of the project showed overwhelming parental support and success of the procedure. Prior to the event, parents clearly identified that such a programme would be appreciated and pointed out specific issues that would make it difficult to take a plane to go on holiday:

"With a sunshine holiday planned this year I was anxious and nervous about how Noel would cope with the airport. Noise, lights, smells, queuing, unfamiliar instructions - all challenges for him."

"Lara has not been on a flight since she was 18 months old and back then we weren’t aware of any issues, plus she slept all the way! However, in the last year, Lara has become very aware of her environment. Loud noises, especially mechanical noises such as hand dryers, lawnmowers etc. can cause her great distress."

"The event couldn’t have been better for us as there was a dramatic change in Jake’s feelings about going to the airport and getting on a plane, from being totally reluctant and defiant that he was never going on a plane, to him becoming enthusiastic and excited about going away, all within the space of an hour and a half. What a result!"

POV video-priming was thought to be very useful and the children had watched the videos repeatedly. One parent said:

"As a result (of watching the videos) Noel coped brilliantly, waiting in line, taking off his shoes and even standing happily with arms outstretched to be searched. I didn’t know whether to laugh or cry. Having time on the plane was great as he could walk about and check out everything. Being able to visit the cockpit was an added bonus! When noise levels proved a bit much outside someone was at my side in minutes with ear protectors. As we watched a plane take off and disappear into the clouds I thought - Yeah, we can do this! - I’m so grateful to PEAT for giving us this opportunity. The difference it will make to Noel’s anxiety levels (and mine) when we’re doing it for real is immeasurable. I’d encourage anyone who thinks airline travel is too challenging for their child to attend an event like this if they have the opportunity."

We watched the videos together before the event and I’d really recommend doing so to anyone. Watching the videos highlighted the areas that Noel was concerned about. For example, when he saw people taking off their shoes and putting them in the tray he was shouting, “I don’t want to give them my shoes”. We were able to watch the video further so he could see that you got your shoes back. This meant that on the day he wasn’t concerned at all. He also recognised the airport as soon as we got there because he’d seen the video so it immediately seemed a bit familiar."

With regards to the in-vivo exposure during the Natural Environment Teaching aspect of the study parents thought this had been very worthwhile and really helped their child to learn to relax in the airport.

"To get the chance to have a practice run was amazing! Watching the videos together beforehand meant I knew the things he was anxious about and could reassure him. On the day everything was so well organised and positive with everybody involved keen to make it a fun experience for all the children. It was just a great to see how much effort everyone concerned put into it.

We found the event on Sunday really beneficial. As you know we are planning on taking Noel on his first trip abroad later this year so to have the opportunity to go through all the airport procedures was brilliant.

I would definitely recommend the event to other families. It takes the fear out of it and also highlights any areas of concern so they can be worked on before the journey."

"Lara and I found the event extremely beneficial. Lara has been talking about it ever since! Every Monday morning at school, Lara has to talk about what she did over the weekend and she was very pleased telling her classmates about the event. We didn’t view any videos but we found a social story online and were able to print this out and show it to Lara the night before the event."
Parents said that they would most definitely recommend the event to other families.

“As a family we would love to have a trip abroad (we also have a 2 year old son) and being able to have a holiday away would be brilliant. We were apprehensive about booking the trip but now we are more confident that Lara will be OK. Lara has a great memory, once she's experienced something she'll know it's OK the next time. We are now very excited about our trip and summer can’t come soon enough!”

“After the event, David talked a lot about getting on more planes. I feel this event has given me and David the confidence to try a short flight later this year.”

Two of families reported that they had gone on holiday within a month of the intervention having taken place and said that the children had travelled well and enjoyed their holiday. Airport managers and staff feedback was also very positive and they expressed that they would welcome the ABA based charity to organise the further practice days.

Discussion

In preparation for plane travel, the POV video-priming element of the project allowed parents and children to view the videos before they attended the real life experience of visiting an airport. The videos were hosted on-line and available 24/7. The ease of accessibility to the videos meant that the children could watch these vignettes repeatedly, with their parents and on their own, before visiting the airport. The parents appreciated the fact that the videos were available at no cost. Parents reported that the vignettes increased their confidence in approaching a family holiday. In line with previous research on POV video-priming, the children were able to view events from their perspective, as they would occur. Feedback showed that the children enjoyed the videos, in that they voluntarily watched them repeatedly, and were able to engage in the new skills during the Natural Environment Teaching aspect of the study (Tetreault and Lerman, 2010).

The Natural Environment Teaching opportunities during visit to the airport and on the plane gave the children the opportunity to experience the unusual smells, sounds and routines and rehearse skills that prepared them for real-life travel. Instead of reading a story about going on a plane, the experience exposed the children to real life, natural contingencies (Ospina et al, 2008). The presence of professionals with extensive experience in ABA and autism meant that the target behaviours (e.g., queueing, waiting, taking off shoes and coat in the security area, tolerating unusual routines, noises, and smells) were directly reinforced in the natural environmental context, thus ensuring that the behaviours were learnt and could generalise to other situations. Reinforcers that were used had been individually assessed for each child in their ABA-based home programmes (e.g., verbal or tangible reinforcers, or activity reinforcers).

The success of the combination of POV video-priming and Natural Environment Teaching (NET) in this study suggests that this combined procedure could be applied to other situations, not limited to airport travel. Future studies could explore methods to help children with autism use other modes of transport (e.g., bus, train, and ferry), to access leisure and public facilities (e.g., swimming pool, shopping centre), as well as attend to medical and health care facilities (e.g., dentist, optician, hospital). Including parents and carers is likely to enhance the generalisation of skills to home and other contexts.

Concluding comments

There were a number of limitations in this study. First, no objective behavioural baseline measures were taken before the introduction of the videos. This meant that it was not possible to assess with confidence the effect of the intervention. Parental reports in the pre and post intervention survey were the only indication against which the outcomes were assessed. In terms of qualitative feedback, parents were positive about the project and said the study helped them to plan a holiday. A more tangible and very encouraging finding was that two of the families who took part in the study and who had never been on holidays with their child before had used a plane to go on holidays within about a month of the intervention. It is likely that other families went on holidays later that summer. Since completion of this study, the Autism in the Air videos have been translated into Arabic (Kelly, 2015). This and further translations will allow for potential replication studies across cultures.
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Appendix 1:  **Pre-intervention questionnaire to parents/family carers**

Dear Parent/Carer,

PEAT in collaboration with the Centre for Behaviour Analysis at Queen’s University Belfast and George Best Belfast City Airport are planning to offer the *Autism in the Air* programme; a day at the airport preparing your child and family for air travel that you may want to undertake for your holidays.

Even if you are not interested in attending, we would appreciate a few moments of your time to respond to this brief questionnaire about air travel with your child with autism.

1. Age of child: ....................
2. Have you ever travelled through an airport with your child with autism?
   ☐ YES  ☐ NO
   *If, YES go directly to question 5, if NO, answer question 3.*
3. Would airplane travel be something you wish to do with your child with autism?
   ☐ YES  ☐ NO
4. What, apart from financial constraints, has prevented you from airport travel? *Tick all that apply:*
   ☐ My child does not cope well in new situations
   ☐ I am frightened as to how he/she will manage on the plane
   ☐ He/she does not like big crowds
   ☐ He/she does not like waiting
   ☐ I find airport travelling stressful and could not effectively manage a meltdown from my child
   ☐ He/she would not understand or like the security issues eg pat-downs, removing shoes etc.
   ☐ I’m not sure that other people would understand
   ☐ Other (please explain) .............................................................................
5. What have been the biggest problems that you have faced while travelling in an airport and also on the plane? *Tick all that apply:*
   ☐ Waiting in line at security
   ☐ Having to remove my child’s shoes
   ☐ Getting my child to put their belongings through the scanner
   ☐ Waiting in the departure lounge
   ☐ Queuing up to get on the plane
   ☐ Walking to the plane
   ☐ Going through the doors on to the plane
   ☐ Waiting appropriately in the seat while others board
   ☐ Paying attention to the flight staff
   ☐ Using the toilet
   ☐ The noises within the plane
   ☐ Other (please explain) .............................................................................
6. Are there other issues that are specific to your child?
   .............................................................................
7. Would you wish to avail of practical teaching lessons for helping children with autism experience the airport in a safe and structured manner?
   ☐ YES  ☐ NO
   *If yes, please give us your contact information:*
   .............................................................................

Please send your completed questionnaire via email to info@peatni.org

Many thanks,

Nichola
Appendix 2:  **Post-intervention questionnaire for parents/carers**

Dear Parent/Carer,

I really hope that you and your child enjoyed the event at the airport on Sunday; we at PEAT felt the day was a great success. In collaboration with the Centre for Behaviour Analysis at Queen’s University we are hoping to write a paper that could potentially help other families having difficulties travelling with children.

Would you be willing to provide me with some information that can help with this?

1. Did you and your child find the event beneficial?  
   □ YES  □ NO

2. Prior to attending the event did you watch the videos at home with your child?  
   □ YES  □ NO

3. If so did you find them useful and were there any aspects of the videos that were more beneficial for the event for your child?  
   □ YES  □ NO

4. Would you recommend the event to other families?  
   □ YES  □ NO

5. Can you please provide me with a short paragraph on how the event helped you and your family – you can be as emotional and descriptive as you like!

I appreciate you taking the time to answer this as it will help drive forward further programmes.

Many thanks,

Nichola