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Attention

Hey you, look here!

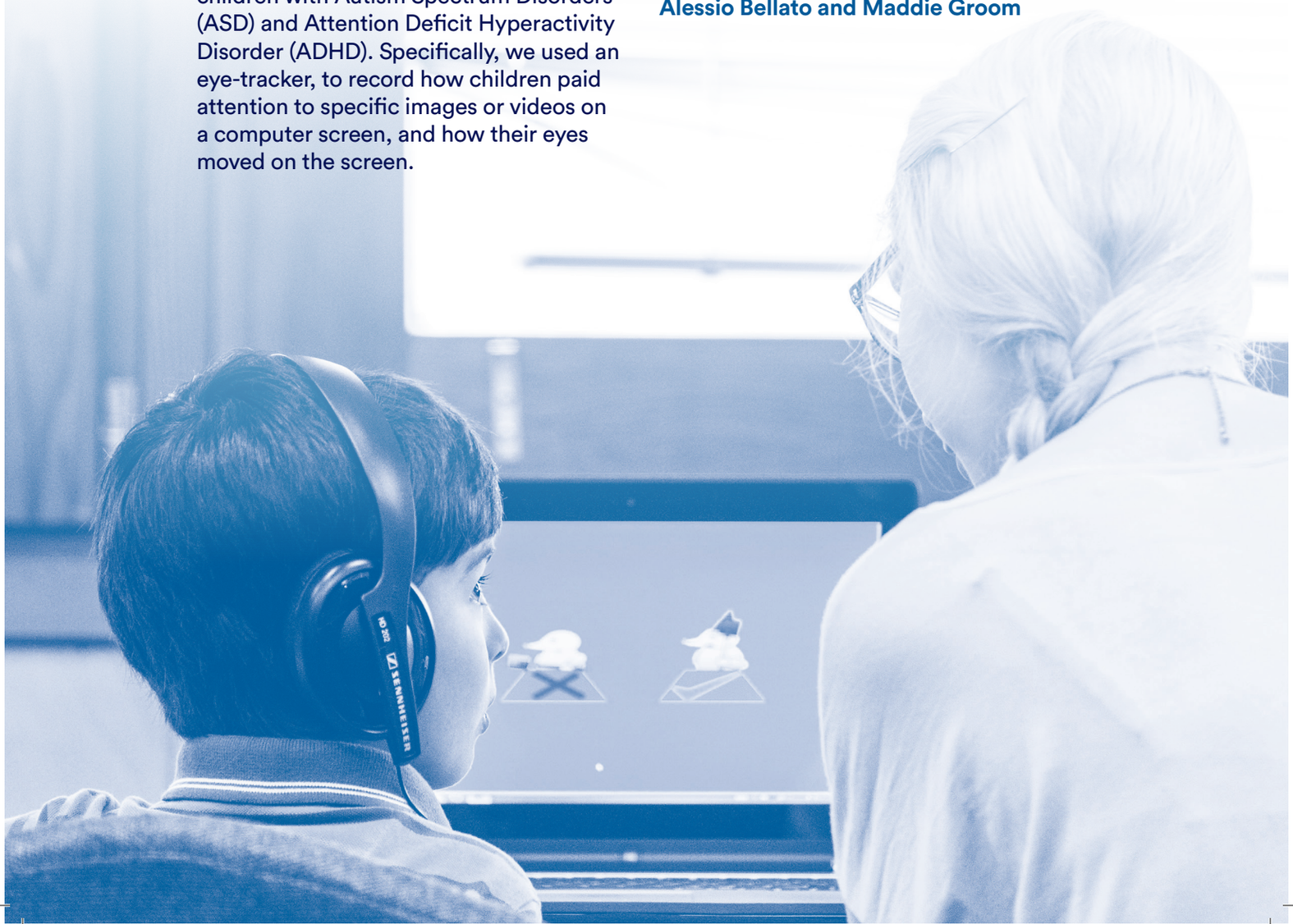
We live in a world where information changes very quickly around us, and different things grab our attention at the same time, such as people trying to call us, a mobile phone ringing, or horns of cars coming our way when we are crossing a road. Therefore, it is interesting to understand why some people have more difficulties in paying attention to the external world.

During the Summer Scientist Week 2017, we measured attentional mechanisms in children, through a task which has been tested for the first time, and to check that it was the right task for future use with children with Autism Spectrum Disorders (ASD) and Attention Deficit Hyperactivity Disorder (ADHD). Specifically, we used an eye-tracker, to record how children paid attention to specific images or videos on a computer screen, and how their eyes moved on the screen.

We found that children were faster to orient their attention to smiling faces, compared to other non-social objects. We also found that some children, who were less attentive and more hyperactive, were likely to pay attention to the pictures in different ways.

Overall, we think this task will be suitable for future use with children with developmental conditions, such as ASD and ADHD. We hope to use it next to measure attention in children, and how it is specifically weakened in children with these conditions.

Researchers:
Alessio Bellato and Maddie Groom



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Attention

Colour confusion

In everyday life we often need to focus on one sense whilst ignoring another. For example, whilst reading in a coffee shop we need to focus on the words written in front of us whilst ignoring background chatter. Conversely sometimes we want to focus on what we hear whilst ignoring distracting sights! In this game we investigated whether children were more distracted by sounds when focusing on vision or vision whilst focusing on sounds (or if distraction was similar in both directions!)

Children identified either the colour of a rectangle or a spoken colour word. Sometimes the word they heard and the colour they were shown conflicted. For example they might see a red rectangle but hear the word “Blue”, thus one sense distracted from the other. This distraction was expected to slow down response times and make children more likely to make a mistake. We were interested in whether distraction was greater with auditory or visual distractors or whether distraction was similar from both.

Both auditory and visual distractions equally slowed response times, and this pattern was similar in children and adults (although children were more distracted!). Interestingly, children made more mistakes when distractions were auditory compared to when distractions were visual. This was the opposite pattern to that seen in adults. This is important as it might mean children are more distracted by auditory information whilst adults are more distracted by visual information.

These findings are important because they suggest that children could be more distracted by auditory information in real world environments such as the classroom. The next step we are taking is to test this effect in older adults. From this we should be able to see how distraction in multisensory environments might change across the lifespan!

Researchers:
Rebecca Hirst, Harriet Allen and Lucy Cragg

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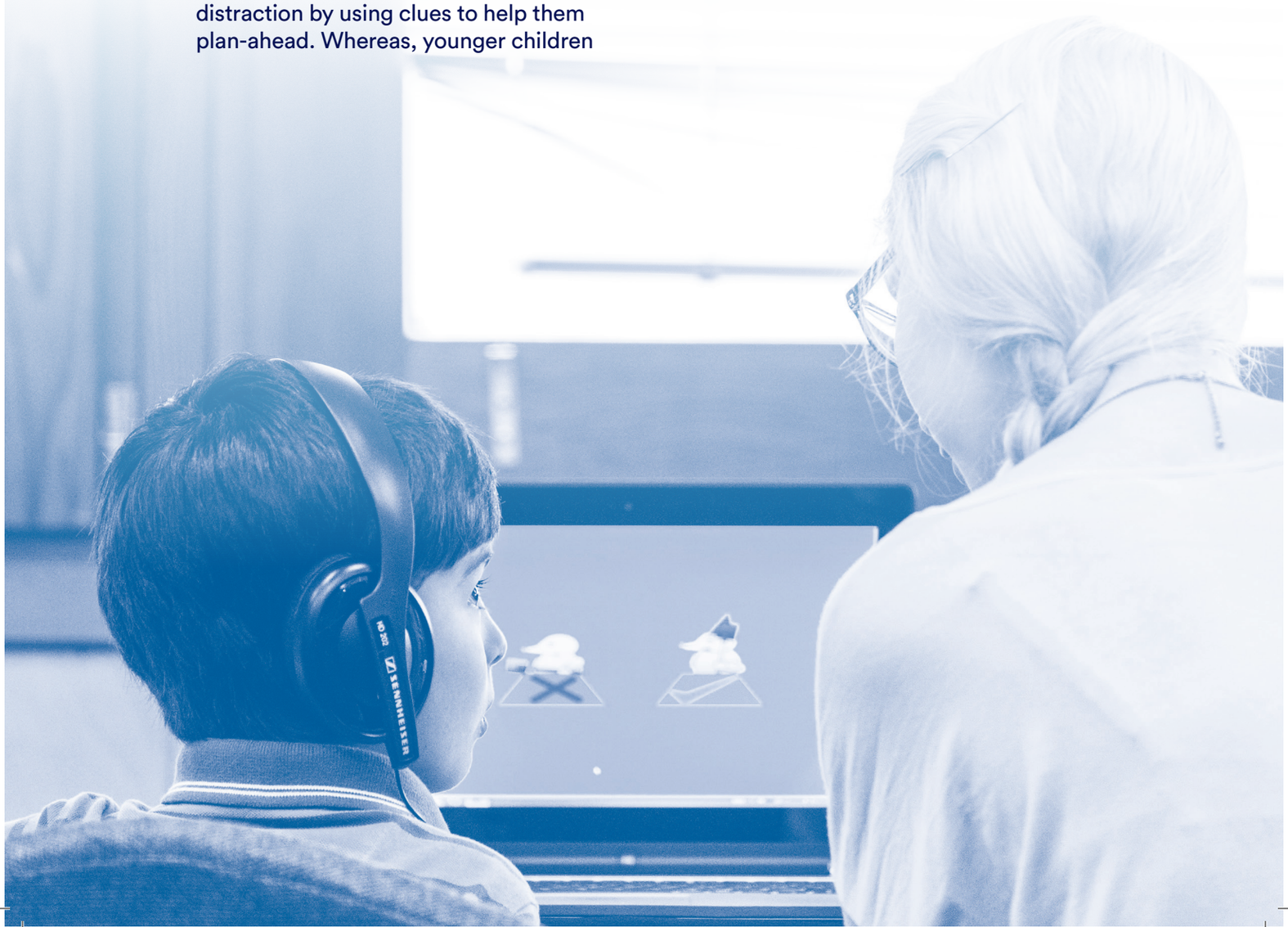
Let's find Dory

Everybody gets distracted sometimes, especially by things that are particularly eye-catching, such as someone making silly faces in the classroom.

The aim of this study was to see if encouraging children to plan-ahead can help them to ignore eye-catching distractions. In this game, children were asked to find Dory the fish by looking for a tilted line to follow her trail, whilst ignoring a black diamond trying to distract them. Clues were presented which either helped children plan-ahead or act in the moment.

The findings show that it was not until age 10, when children were able to ignore the distraction by using clues to help them plan-ahead. Whereas, younger children aged 5 to 6 years may have found it easier to ignore the distraction when they acted in the moment. As young children's brains are still developing, this might mean that planning-ahead is too difficult for them at this age. Further research is being done currently, to understand the potential this has for developing strategies to help children stay on-task in the classroom.

Researchers:
Ruman Hayre, Lucy Cragg and Harriet Allen



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Attention

Pirate party!

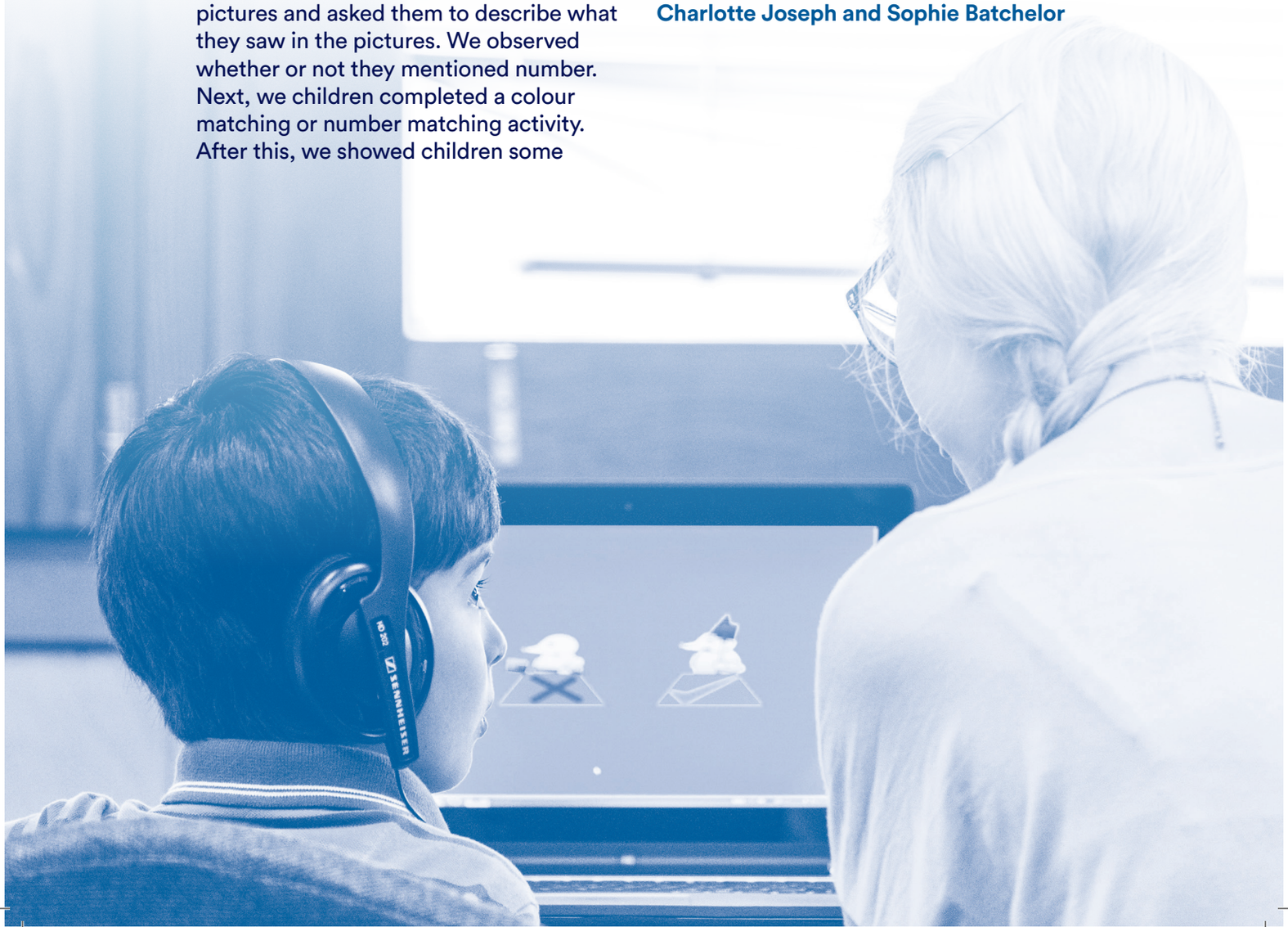
In a busy world, with so many people, so much noise, and so many different coloured, shaped and sized objects - what do you pay attention to?

In this game, we looked at children's attention to number. Research suggests that attention to number is linked to counting and arithmetic skills, but it's not yet clear where a child's tendency to focus on numbers comes from. Why do some children focus on numbers, while others focus more on the colours, shapes, and emotions of the objects and people around them?

We showed children some cartoon pictures and asked them to describe what they saw in the pictures. We observed whether or not they mentioned number. Next, we children completed a colour matching or number matching activity. After this, we showed children some more cartoon pictures and asked them to describe them. Again, we observed whether or not they mentioned number.

We are looking to see whether children paid more attention to number after completing the number matching activity compared to the colour matching activity. If the type of activity altered what children focused on, then this would suggest that attention is influenced by the environment. Once we have analysed our results, the next step will be to see whether children's attention is influenced by factors in their more natural everyday surroundings.

Researchers:
Charlotte Joseph and Sophie Batchelor



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Attention

My icy gaze

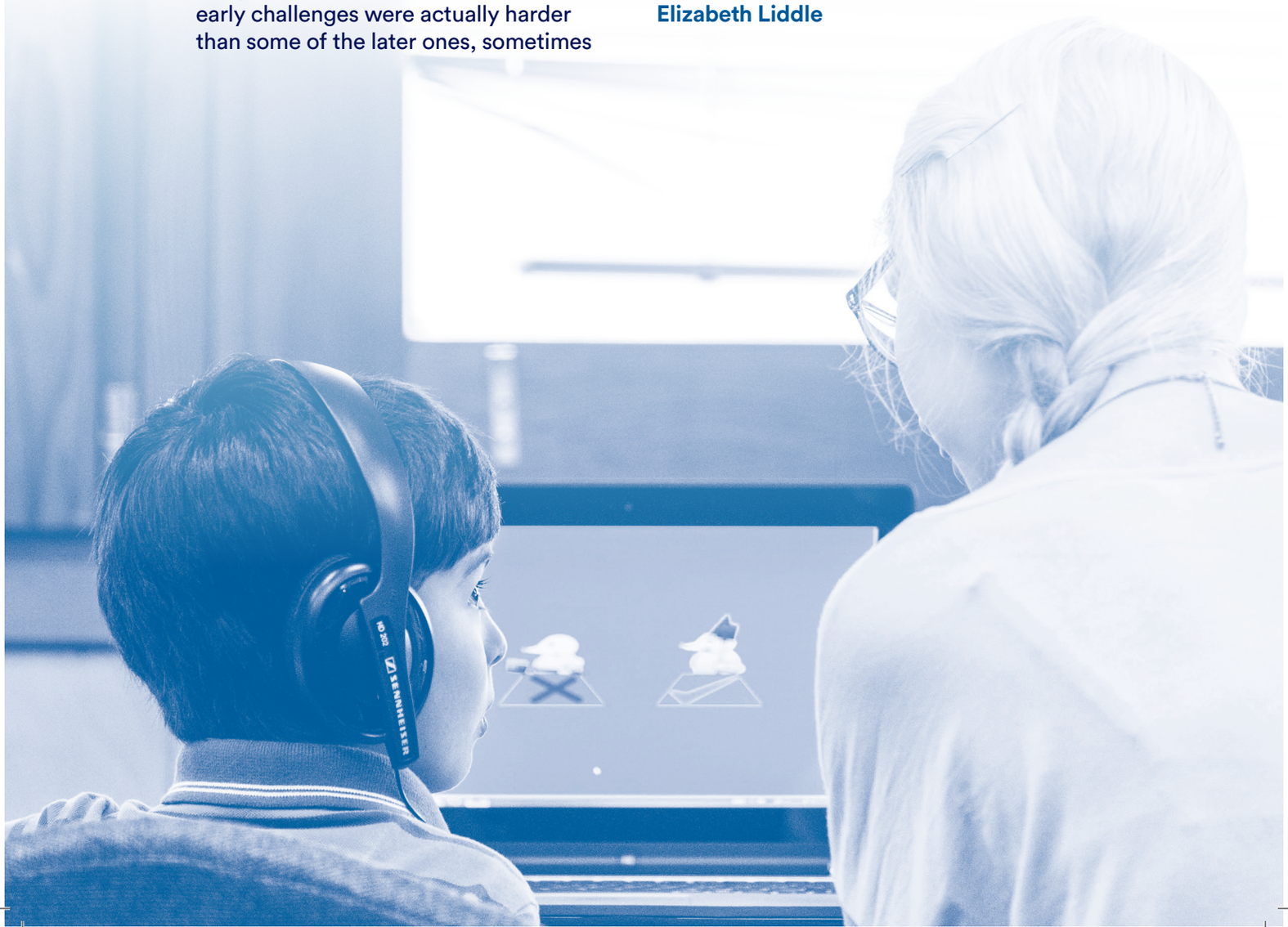
We have been developing a computer game to help people with ADHD learn better control over their attention.

A small eyetracker plugged into the computer lets you use your own eyes as the game controller. We called the game My Icy Gaze. The challenge is to protect the magical ice fish from fire, just by using your eyes. As you progress in the game, new challenges are set. Because we simply wanted to know how much children would like the game, we set up My Icy Gaze as a "fun" activity in the main concourse.

Many children seemed to really enjoy the game. However, we found that the early challenges were actually harder than some of the later ones, sometimes discouragingly hard. The good news was that children who managed to get past those early challenges would often keep playing – and even return to play some more.

This experience helped us to re-order the activities in the game and it now works much better. The new version is now being tried out in Spain with children with ADHD, and we are also doing a study with students in Nottingham to find out whether playing the game changes the brain networks we use to control our attention.

Researcher:
Elizabeth Liddle



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Attention

Laser vision: Do you see what I see?

Different people pay attention to the world in different ways and process information at different speeds. How we pay attention to the world influences how we learn. In our research, we are interested in how children with Autism Spectrum Disorder (ASD) and Attention-Deficit Hyperactivity Disorder (ADHD) might be different from typically developing children in how they pay attention to the world. During Summer Scientist week, we used a task which measures attention with typically developing children to make sure that the task measures what we are interested in, and that it is appropriate for use with children with ASD and/or ADHD.

We used an eye-tracker to record how children paid attention to videos on a screen. Two videos were presented side-by-side on the screen, with one video remaining the same and repeating over time, and the other video changing constantly. The videos consisted of dynamic moving shapes, clocks with moving arms or faces breaking into smiles.

We found that all the children were able to participate in this task easily, and did not find it difficult or boring to pay attention to the screen. We discovered that as expected, in the beginning of the task, children tended to pay attention to both the videos on the screen. However, as time progressed, most children shifted their attention to the video that changed, rather than the video that repeated itself. This is a good measure of 'habituation' and learning, wherein once we have learned what there is to learn about a stimulus, we stop paying attention to it and we tend to be more interested in new information. Interestingly, we found that when the videos were of faces, girls tended to pay more attention to the screen than the boys, and this was related to higher social skills as measured by the Social Aptitude Scale.

Overall, the task was validated for use with children with ASD and ADHD and it will play an important role in our research, in trying to enhance understanding of differences in attention and information processing in children with and without a developmental disability.

Researchers:
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