

Introduction



The A3i: Accessible Audio for Autistic Individuals project has been investigating the accessibility needs of autistic individuals for television, film and broadcast as well as radio and other audio formats like podcasts. This project has been funded by the Screen Industries Growth Network (SIGN). My name is Dr Lauren Ward and I've been leading this project with a team of wonderful humans who I will introduce to you shortly.

Why?



Why are we doing this project?

It grew out of a conversation after a conference in 2020 where I was presenting some of my previous work on accessible television audio for hard of hearing individuals. I had a question from the audience about whether what I had talked about would work for autistic individuals and whether I could make any recommendations about making a podcast optimally accessible for autistic individuals. I didn't know the answer to that question but chatting to Samera, who asked the question, it became clear very quickly that we were both very keen on finding out the answer.

The Team



We have a big team with a lot of different expertise they bring to the project.

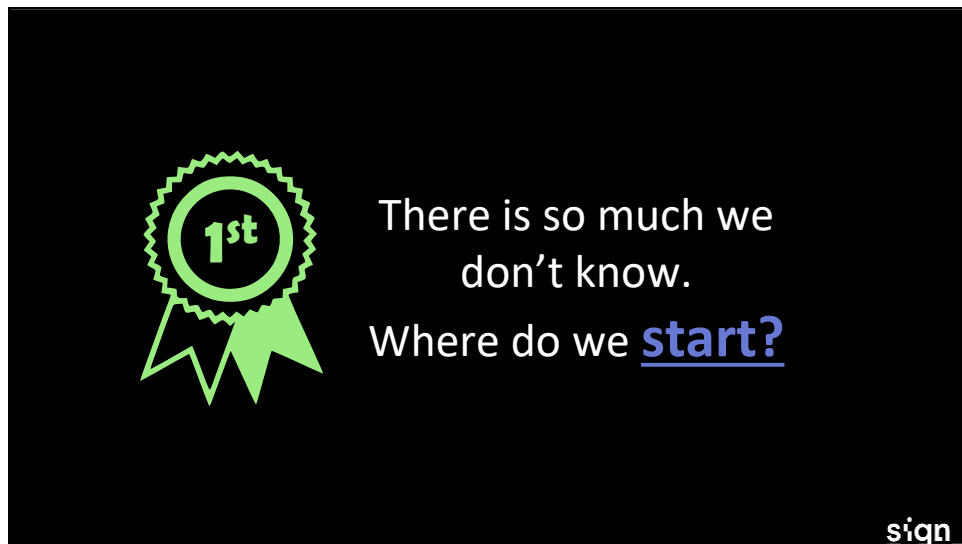
The team members are:

- **University of York AudiLab** which works on a variety of accessible audio technologies for hard of hearing, visually impaired and autistic individuals.
 - o Dr Lauren Ward (top left)
 - o Dr Gavin Kearney (top right)
- **University of Sheffield Autism Research Lab (ShARL)** which conducts a range of autism research and has a focus on applied studies which improve the lived experience of autistic individuals.
 - o Dr Megan Freeth (middle left)
 - o Dr Daniel Poole (centre)
 - o Dr Emma Morgan (middle right)
- **Samera Haynes-Khan** (bottom left) works with the Greater Manchester Autism Consortium, is mother to an autistic young adult and is producing a podcast on autism and parenting.

In addition to the core research team, we also had:

- A co-production panel made up for four autistic adults with a variety of lived experiences who we met with regularly throughout the project and who co-produced the survey used in the study.
- BBC Research and Development's Audio Team who are supporting the transfer of the projects results into practical guidance and recommendations for content creators and production staff.
- Ken Brown who spent three months collaborating with us and BBC Research and Development, experimenting with their podcasting app to see how it could be used to make more accessible podcasts.
- Jonathon Cooke, an intern over summer who helped us kick started the project by reviewing the literature on autism and accessibility.

Where do we start?

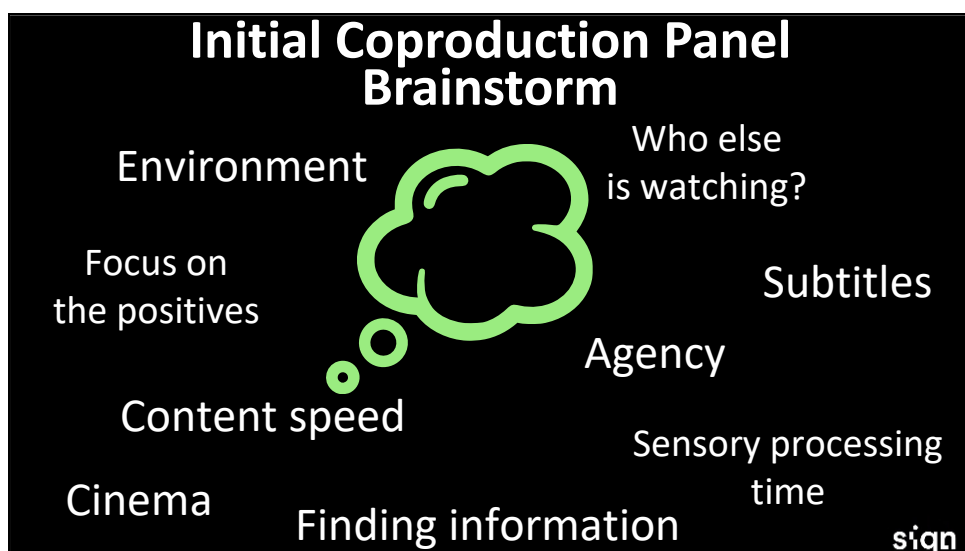


Quite a lot is known about the media accessibility needs of visually impaired, hard of hearing and d/Deaf individuals, as it has been widely studied over many decades. As a result, in the UK we have mandated levels of access services like Sign interpretation, Audio Description and Subtitles which are enforced by OFCOM.

Once we started looking in depth about what was known about the media accessibility needs of neurodiverse individuals we found... basically nothing. We know almost nothing about how neurodiverse individuals use broadcast and streamed media, whether or not it works in its current form and if not, what the challenges are.

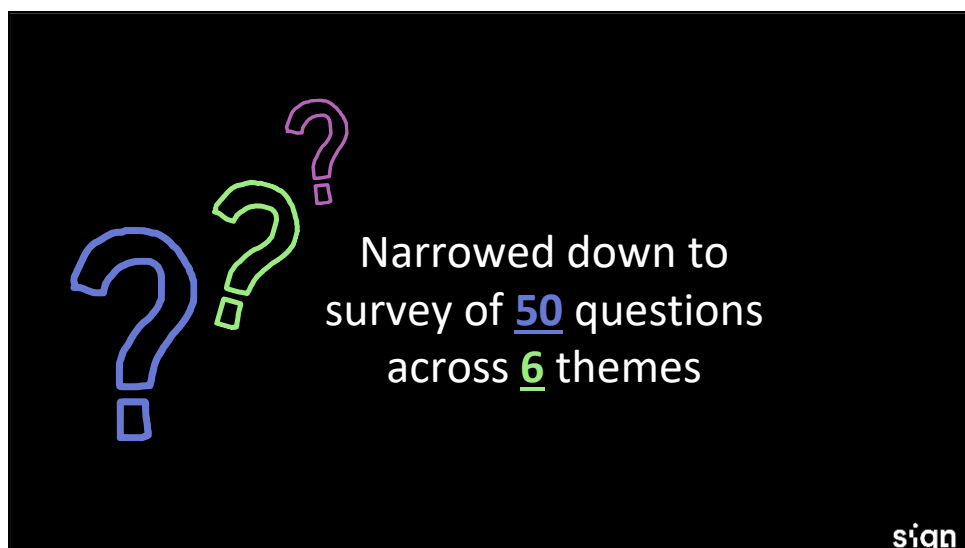
With so much we don't know, where do we start our research?

Brainstorming themes



This is where our coproduction panel came in to help us narrow down all the possible topics. Whilst the panel is still only a small group of individuals, bringing together their lived experience and our research experience helped us to brainstorm some key themes and ideas for the survey to focus on. These can be seen in the slide.

Narrowing it down

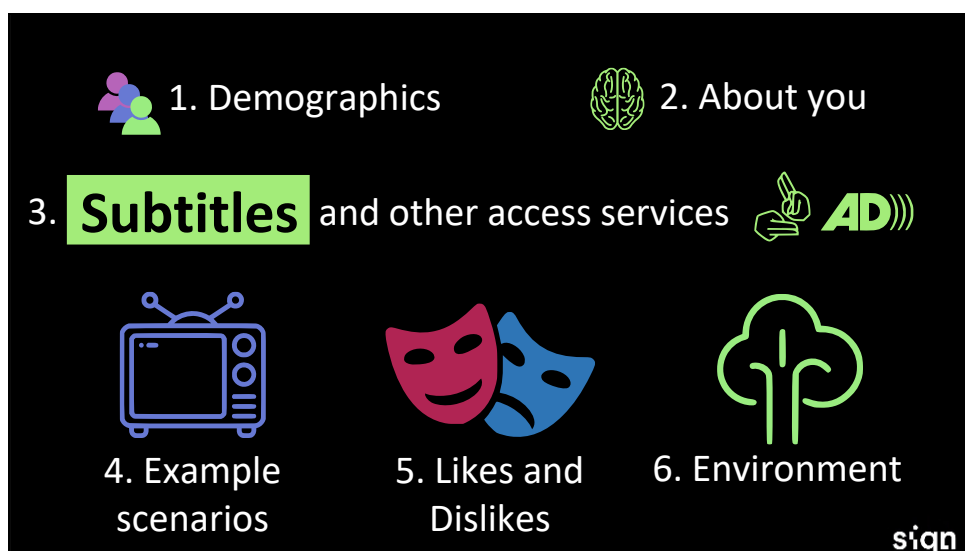


Over four meetings we workshopped these themes and questions designed to elicit information about these themes with the panel. Some of the questions were easy – e.g. ‘How often do you use subtitles?’ whilst others were harder, like finding out about whether they had challenges with multisensory integration without using complicated terms or leading them (we settled on the question: Do you feel you process audio and visual information differently (such as at different speeds, or intensities)?)

The format of questions and responses were also worked through with the panel, with a particular focus on free text responses to allow participants to share as much or as little information as they wanted.

The final version of the survey was fifty questions over six key themes.

Final themes



These six themes were:

Demographics which included question about ethnicity and gender and were primarily designed to allow us to understand the diversity of our participant pool and how representative they were likely to be of the autistic population more broadly.

About you which included questions about factors which might influence or contextualise an individuals media access needs like how much of different kinds of content they consume (TV, Radio, Podcasts, Cinema), whether they identify as blind/partially sighted or d/Deaf or hard of hearing, as well as whether there are any other neurotypes they identify with in addition to being autistic (e.g. Dyslexic, Dyspraxic, ADHD or ADD).

Subtitles and other access services asked participants about which of the current set of access services they use, how often and whether they meet their needs.

Example scenarios asked participants to think of different situations they might have experienced with TV and rate how difficulty they found the situation – for example:

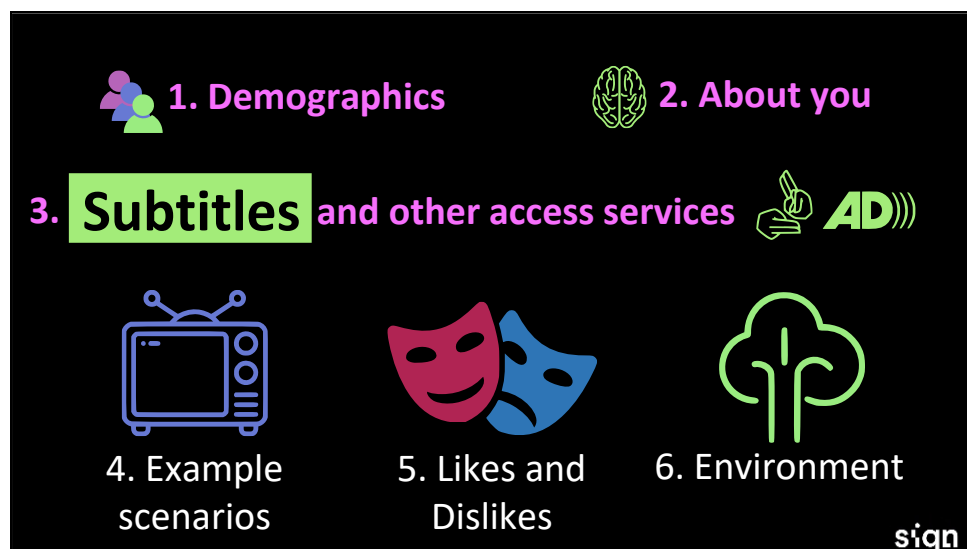
This question is about a television scene where a character might be speaking to someone in another room or on the phone.

How easy is it for you to understand the speech of the offscreen character without seeing the character's face and without subtitles?

Likes and Dislikes broadly covered audio-visual sensory experiences they seek or avoid, as well as multi-sensory integration and whether sufficient information is provided by broadcasters about content to allow informed choice.

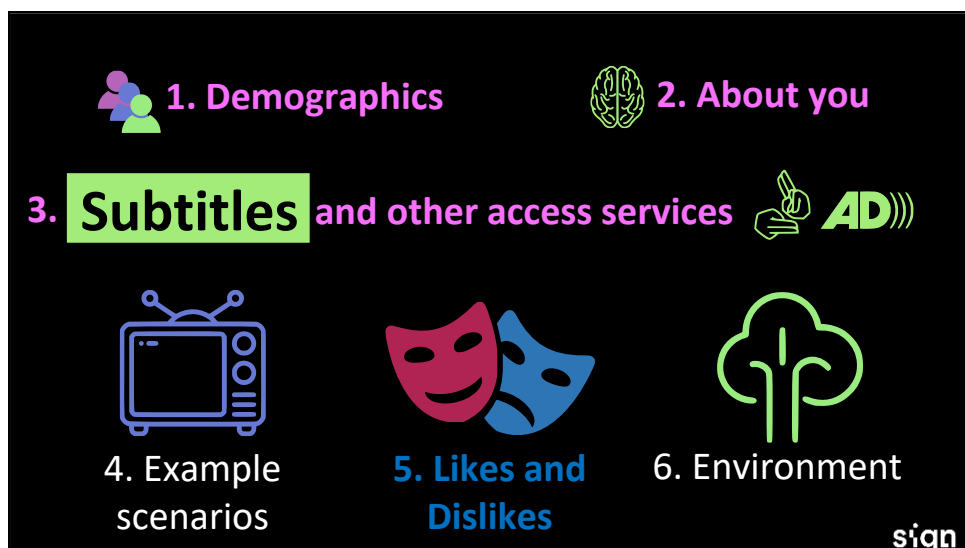
Environment covered the situation and spaces which people preferred to consume content in, whether this was alone or with people, and what their ideal environment for consuming content is.

What this presentation will focus on



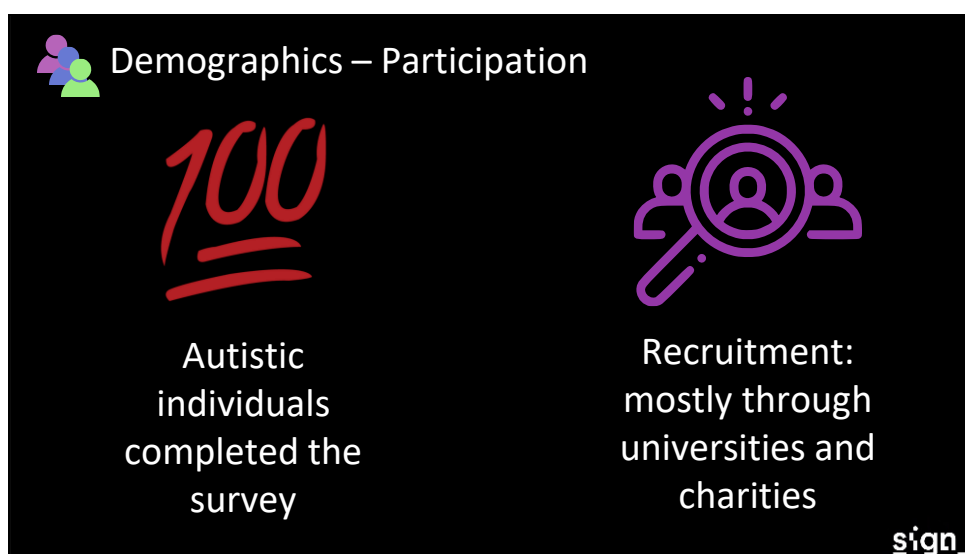
We are at the early stages of analysing the data so we are just going to focus on a few themes today, which are themes 1-3 (highlighted in pink)

What this presentation will focus on (cont)



We will also briefly touch on some themes that have come out of theme 5 around auditory sensory experiences which participants sought and avoided (highlighted in blue).

Participation

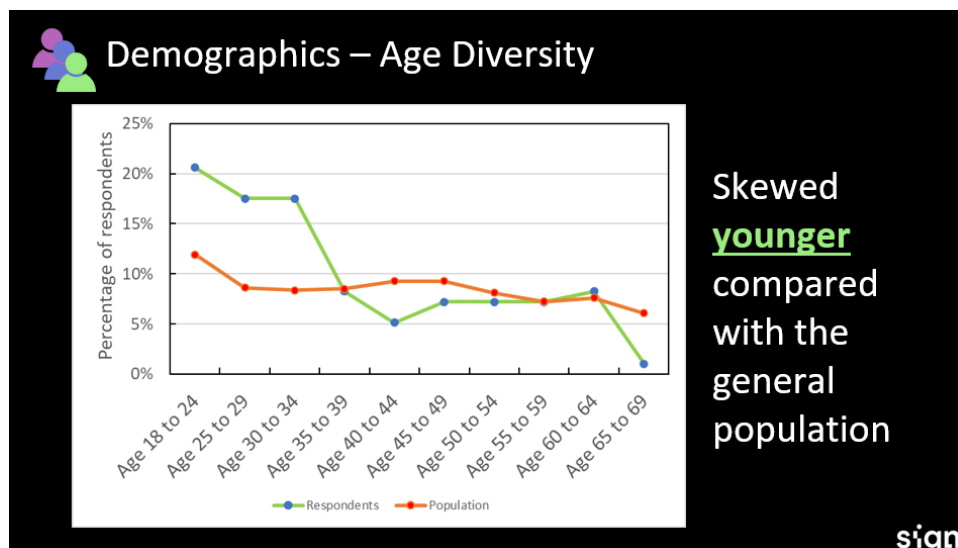


We recruited participants through a variety of sources. These included existing research participant mailing lists across the University of Manchester, Sheffield, and York as well as charities like greater Manchester Autism consortium. We also recruited through social media, but after an initial influx of bots trying to complete the survey for the Amazon voucher, we scaled this back to closed social media groups.

Including our pilot participants we reached our target of 100 respondents!

So what are the results?

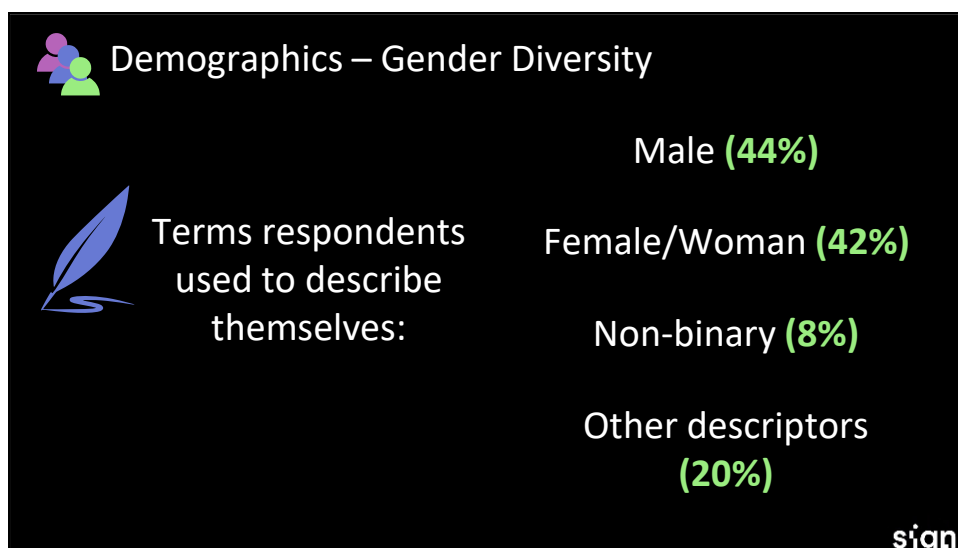
Age diversity



First, we looked at the age of our participants, which ranged between 18 and 67 years old with a median age of 33. Three participants declined to share their age.

On the slide there is different age bands on the x axis and on the y axis the percentage of respondents and in green and blue the participants of our survey and in orange and red, the percentage of the general population that falls into those age bands (as a percentage of those over 18 – data is from the ONS 2020 census). We can see our participants skew younger than the general population. This likely reflects both changing patterns of autism diagnosis and awareness over the years as well as our University recruitment network skewing younger and conducting the study online potentially not reaching some older groups.

Gender Diversity



This slide shows the terms participants most commonly used to describe their gender identity. Historically there has been many more men who received autism diagnoses than women (at least 3:1, though many studies give estimates much higher than this). Given this, the roughly balanced amounts of participants using 'male' and 'female' descriptors, as well as non-binary and other descriptors (such as gender non-conforming, gender apathetic and trans) is great.

Looking at gender along with age, there is a slight skew towards those using 'male' descriptors being older but it is not a significant difference.

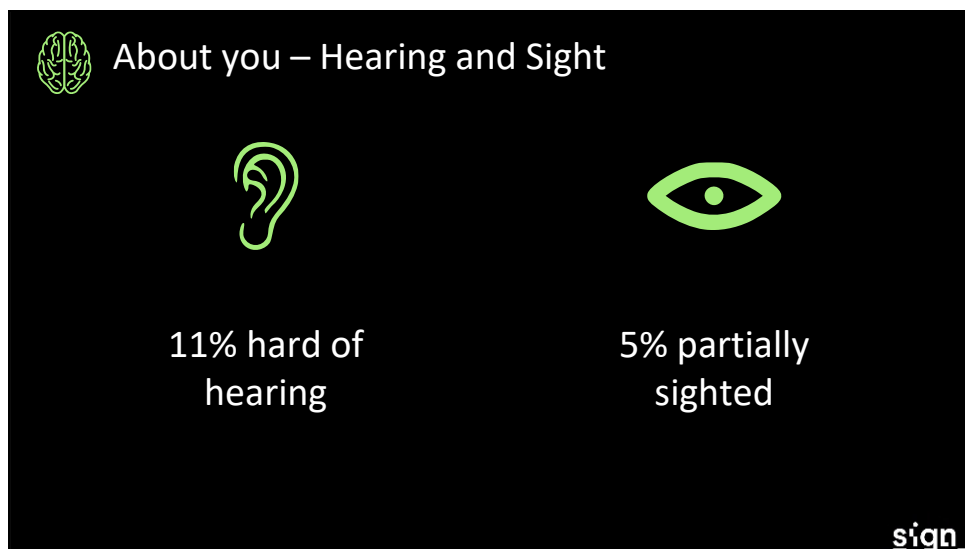
Ethnic Diversity



96 participants shared information about their ethnic identity. The vast majority of these used the term 'white' to describe themselves and the majority also used 'British' or a related term (e.g. English).

Minority ethnicities were very underrepresented. This again may be in part due to the networks through which we recruited as well as being reflective of the patterns of autism diagnosis in different communities.

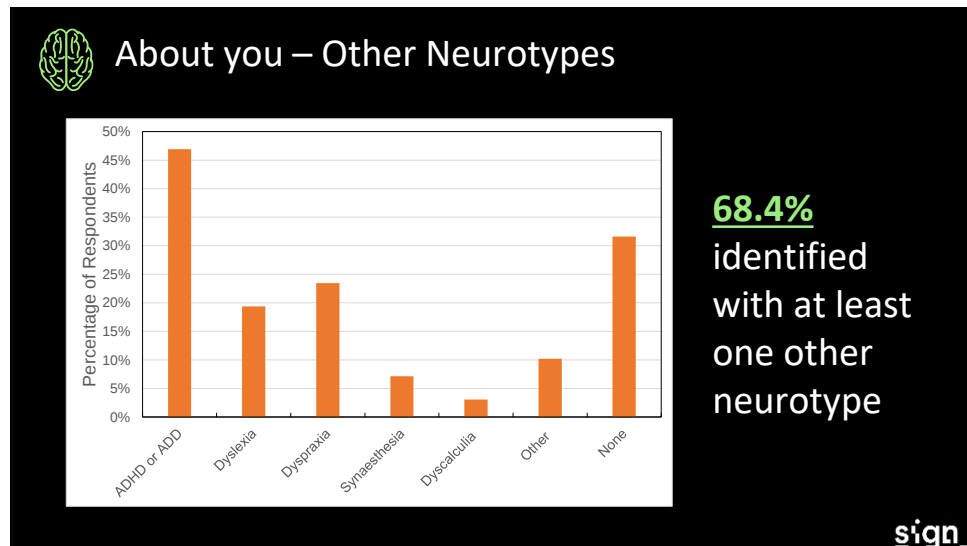
Hearing and Sight



11% of respondents identified as hard of hearing, which is slightly less than would be expected in the general population (17% of the population had some hearing loss in 2015 estimates from RNID). This may be due to the respondent pool skewing younger.

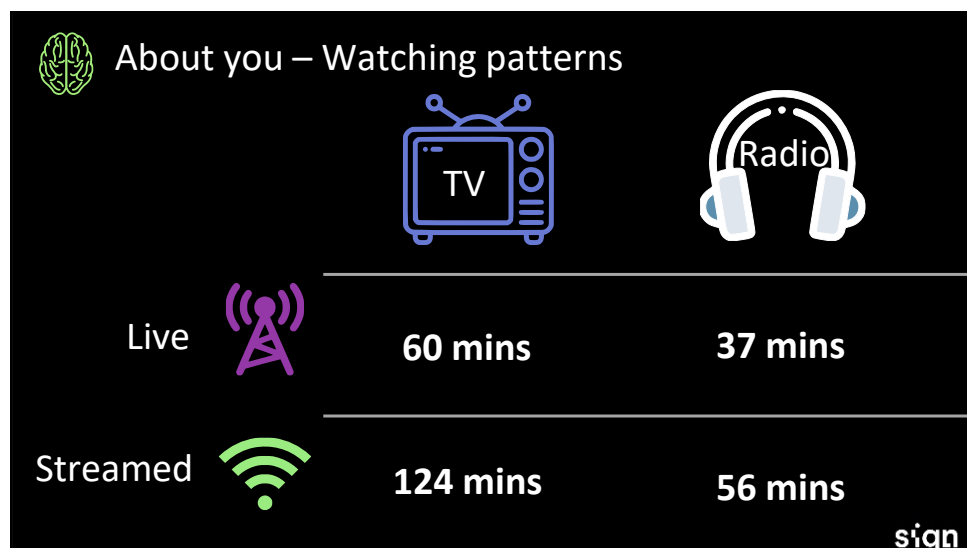
Conversely, 5% of the respondents identified as partially sighted which is higher than the population average (3% in 2013, estimates from RNIB).

Other Neurotypes



98 participants responded to the question about whether they identified with any other neurotypes. The slide shows the percentage of respondents which identified with each neurotype. Of those who answered, 68.4% identified with at least one other neurotype. The most common was ADHD/ADD which 47% of respondents identified with, followed by dyspraxia and dyslexia. 10% included their own terms including 'Personality disorder', 'Plural (DID)', 'Asperger Syndrome', 'Auditory Processing Disorder', 'Hyperacusis', 'OCD', 'Anxiety', 'Dysfunctional perfectionism' and 'Prosopagnosia'.

Media watching patterns

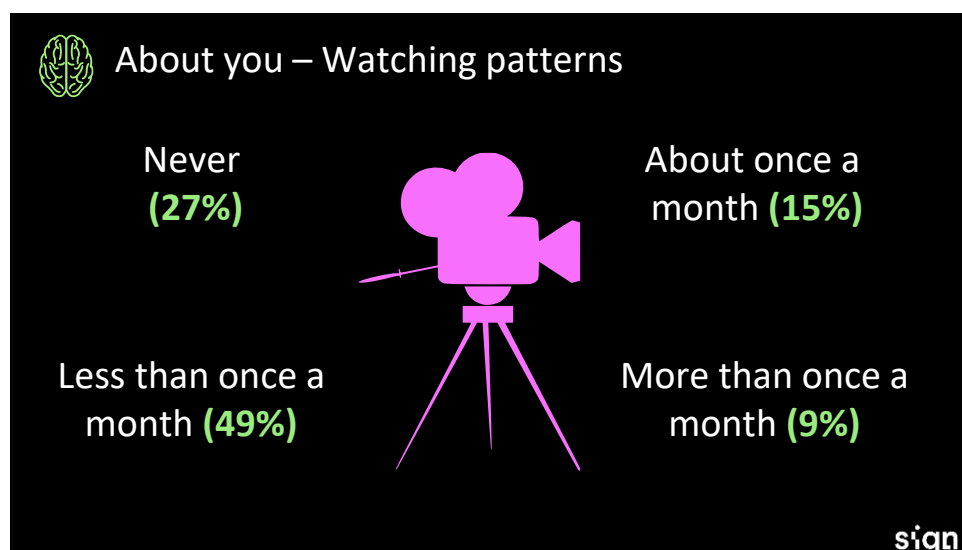


We asked participants to estimate how many hours a day they consumed

- Live broadcast television and/or films
- Streamed or on-demand television and/or film content (incl. platforms like Youtube and twitch)
- Live radio
- Podcasts or on-demand audio only programmes

Participants responded with a range (e.g. 1-2hrs) and from this we made some overall estimates of how long per day for each kind of content and whether it was live or streamed. This generally reflects broader trends in content consumption where streamed and on demand content is preferred (Ofcom's Media nations report 2021 indicates that less than half of average media consumption is live broadcast content, though the metrics used are not directly comparable).

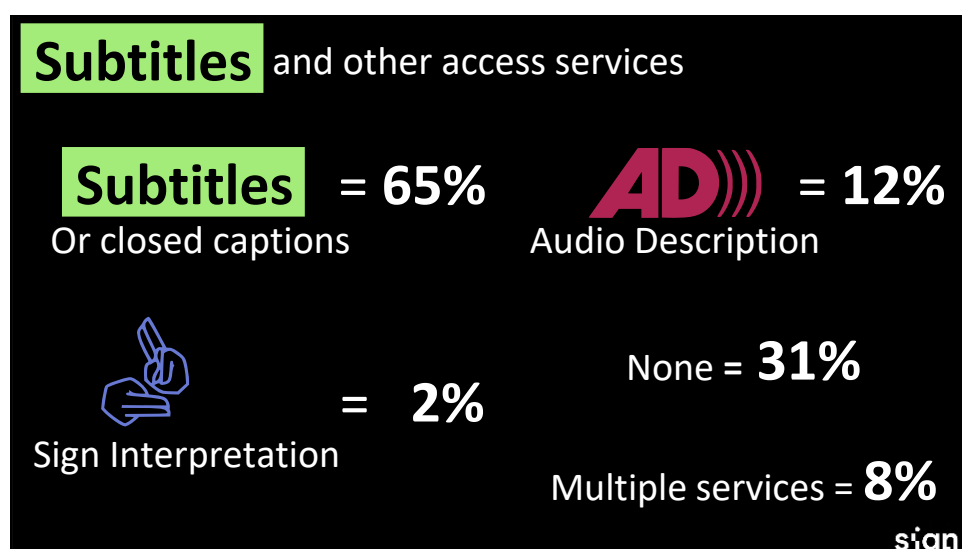
Media watching patterns – Cinema



Participants were asked how often they went to the cinema prior to the pandemic.

The majority indicated that they went less than once a month or never, with only 9% indicating that they would go to the cinema more than once a month. 2017 data from Attest, a consumer research company, indicates that the amount of casual cinema goers (less than once a month, but not never) is similar to the general population (49% vs. 48%) however the differences are at the extremes. Whilst only 3% of the general population reported never going to the cinema, nine times as many autistic individuals reported never going. Balancing this, a much smaller percentage of autistic individuals reported regularly going to the cinema, 9% going more than once a month compared with 27.5% of the general public.

Usage of access services

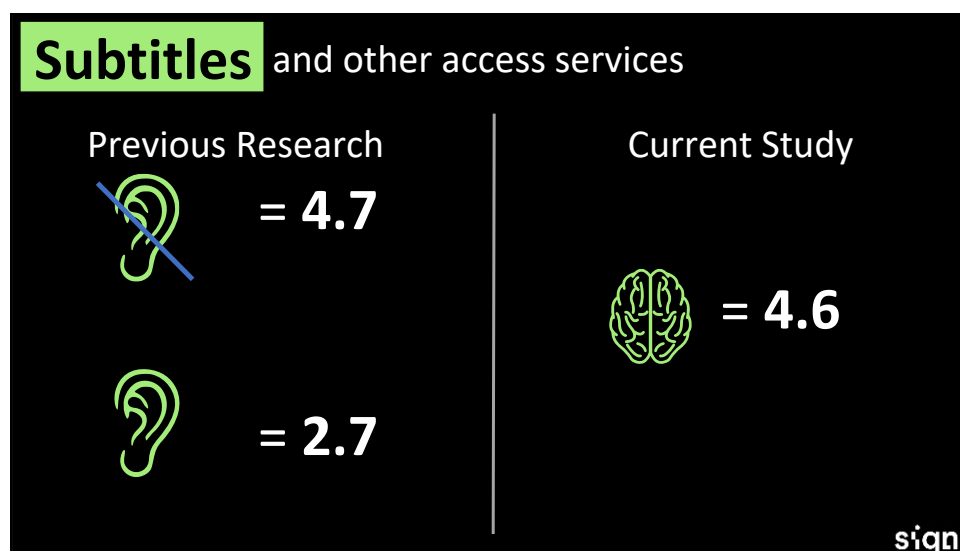


This section asked participants about their usage of existing access services like subtitles, audio description and sign interpretation. Percentages of the respondents who used each service can be seen on the slide.

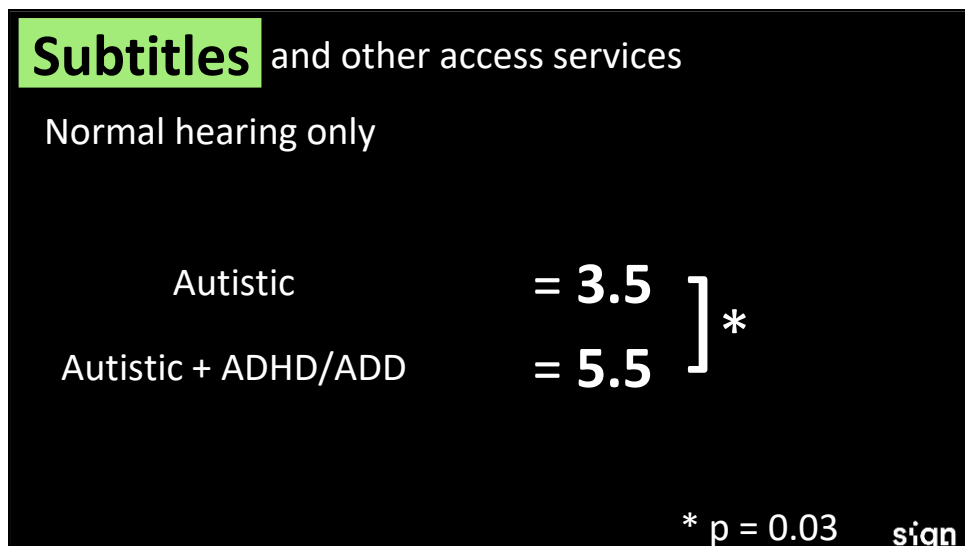
It is interesting to note that despite only 5% of participants indicating they are partially sighted, 12% of respondents indicated using audio description.

Estimates of subtitle usage in the general population vary. A 2006 report by OFCOM estimated that 18% of the general public used subtitles with 2015 estimate by the BBC putting it at 10% of broadcast viewers. However, with changing media consumption patterns and the rise of captioned social media videos, subtitle usage seems to have dramatically increased by recent estimates. Netflix reported in 2019 that more than 80% of their use subtitles at least once a month. A study by live theatre subtitling company StageText in 2020 indicated that a similar number of young people (18-24) used subtitles regularly on a range of different platforms. Our study specifically asked about television and film usage, so comparisons are difficult but it appears to be generally similar to the general population. What is more telling is the regularity of usage between different viewer groups.

How regularly do different groups use subtitles



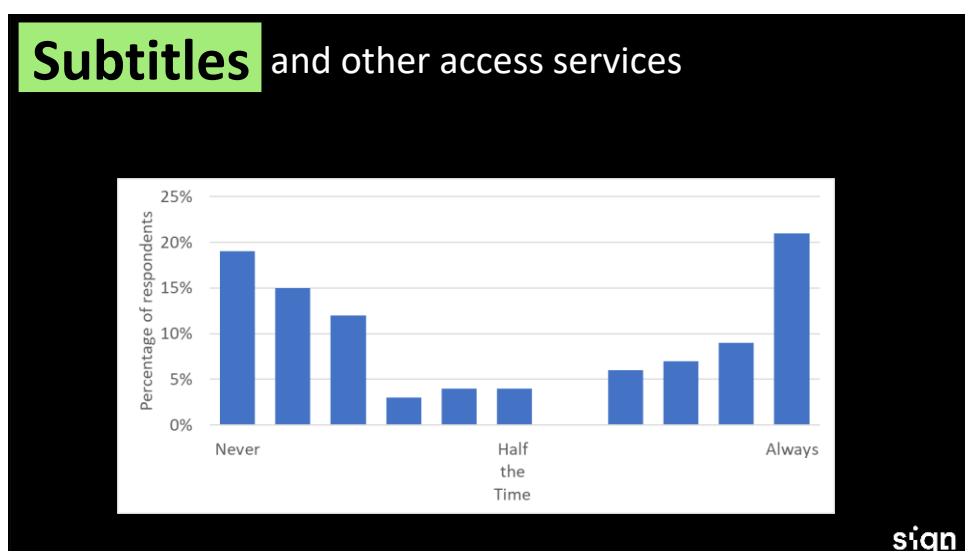
Participants were also asked to rate on a scale of 0 to 10, how often they used subtitles whilst watching content in their native language, with 0 being 'never' and 10 being 'always'. This question has been used in some of my previous research with hard of hearing and normal hearing listeners. The average score from respondents in different groups are shown above. In previous research hard of hearing individuals use subtitles significantly more regularly than normal hearing individuals. The results from the current study indicate that autistic individuals use subtitles about as regularly as hard of hearing individuals (despite only a small percentage of respondents identifying as hard of hearing). We investigated this further by looking at only those who identified as normal hearing, which reduced the average slightly to 4.4.



We also explored the results of the normal hearing respondents and whether there was any difference evident in subtitle usage by other neurotypes. Dyslexia and dyspraxia showed no real difference, but autistic individuals who identified as ADHD or ADD were significantly more likely to use subtitles and at a rate higher than hard of hearing individuals in the general population.

Whilst subtitle usage has been expanding, the guidelines for how they are presented are written based on the assumption of a neurotypical hard of hearing viewer. This confirms suspicions we had that actually there are a lot more varied groups using subtitles.

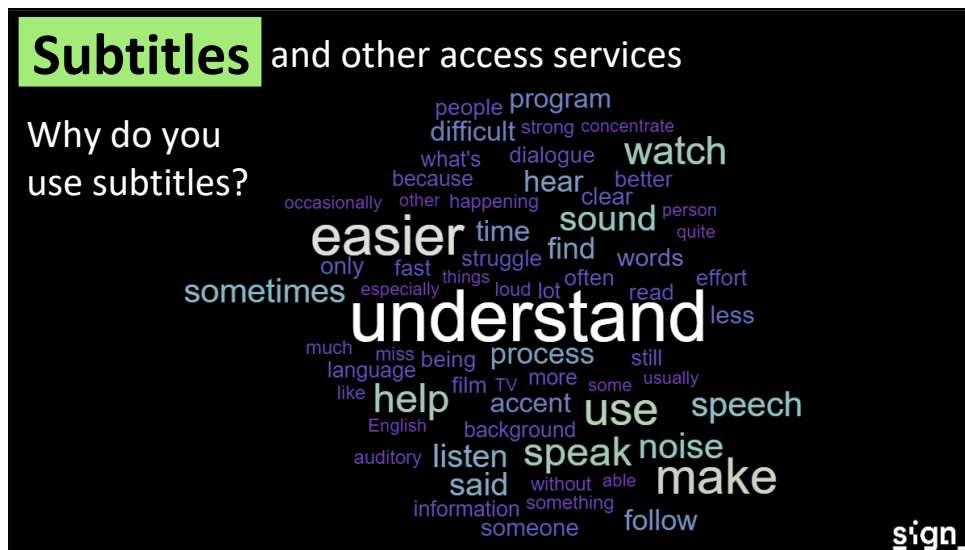
Subtitle usage



To explore this further we looked at the distribution of responses to the question about subtitle usage. From this we can see that there are two groups– those who use subtitles regularly and those who never or only occasionally use them, rather than all individuals using them a little bit.

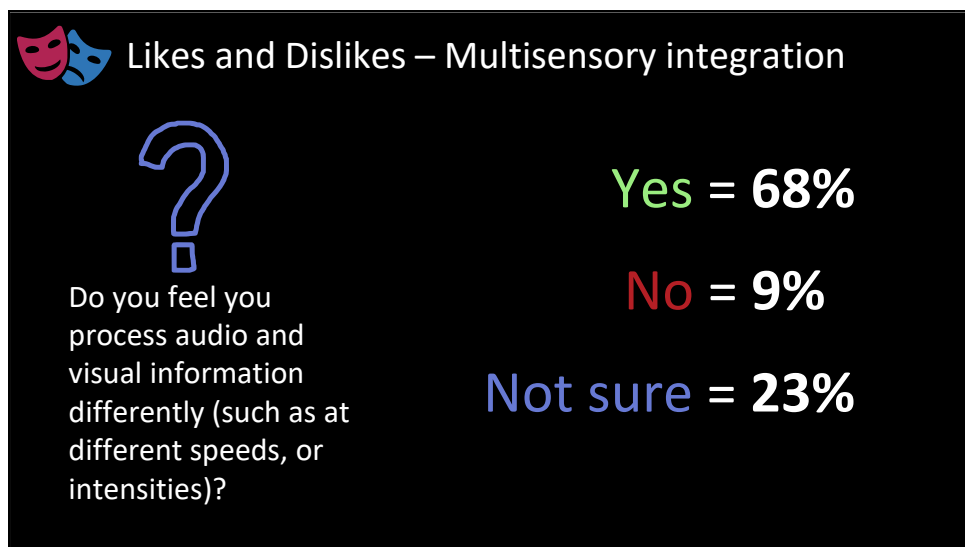
To further understand why this is, we ask participants to tell us why they use subtitles.

Why do you use subtitles?



We asked participants to share why they use subtitles and this slide shows a word cloud of the most common terms used in their responses. These responses were cleaned, with spelling errors corrected, stop words removed and some common terms stemmed (e.g. easy and easier all counted as occurrences of the word 'easier'). The larger the font the more common the term was use, with 'understand' being the most common followed by 'easier'. This isn't a full analysis of these responses, but gives an idea of some the key factors in participants subtitle usage

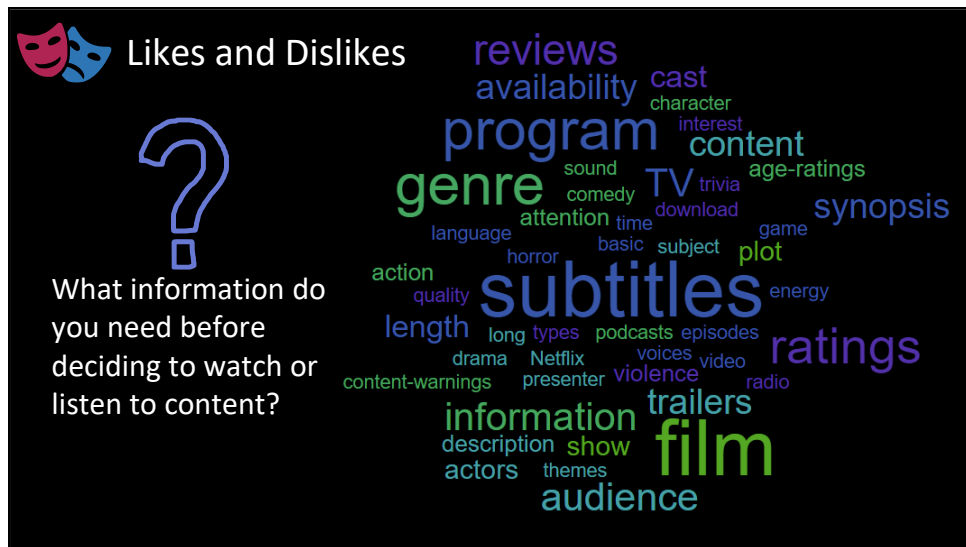
Multisensory integration



One of the themes which arose in initial brainstorm was that some panels members felt that they could process visual information more quickly (or differently) to audio information and that in particular, subtitles can help with this, reducing the amount of auditory information required.

Most participants reflected this idea of feeling as if they processed auditory information different to visual information.

Informed choice



One of the themes which came up in discussions with the co-production panel early on what having sufficient information available about a programme to make an informed choice about what content to watch. As with the previous word cloud, those terms with larger font occurred more commonly in responses and the data was cleaned before being put into a word cloud. Additionally with this data any terms which related to types of information that could be found, rather than describing how they found it.

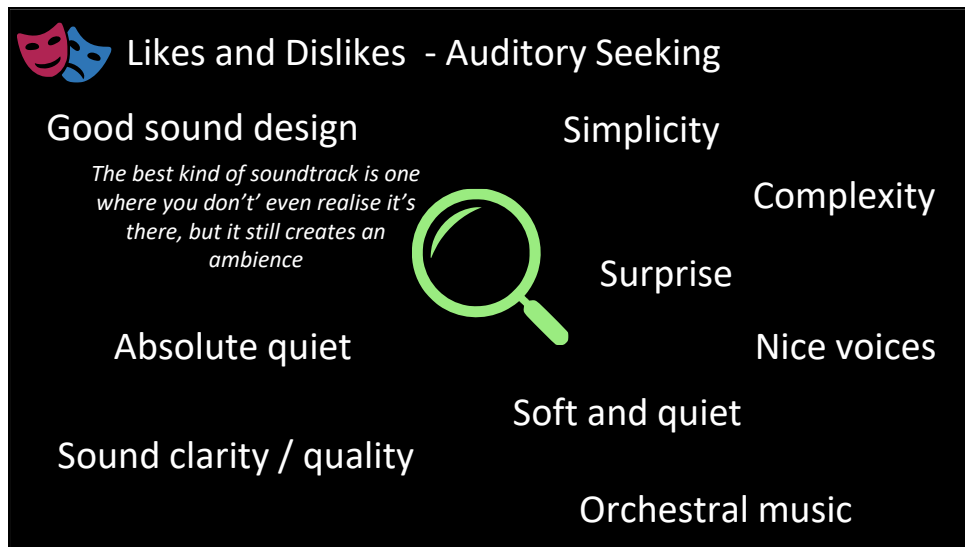
These responses are dominated by subtitles, genre and different types of ratings (age, content, audience and critics ratings). Respondents indicated that in general, they feel that on demand platforms sometimes have enough information available (rating it 6.2 out of 10 on average).

Auditory seeking

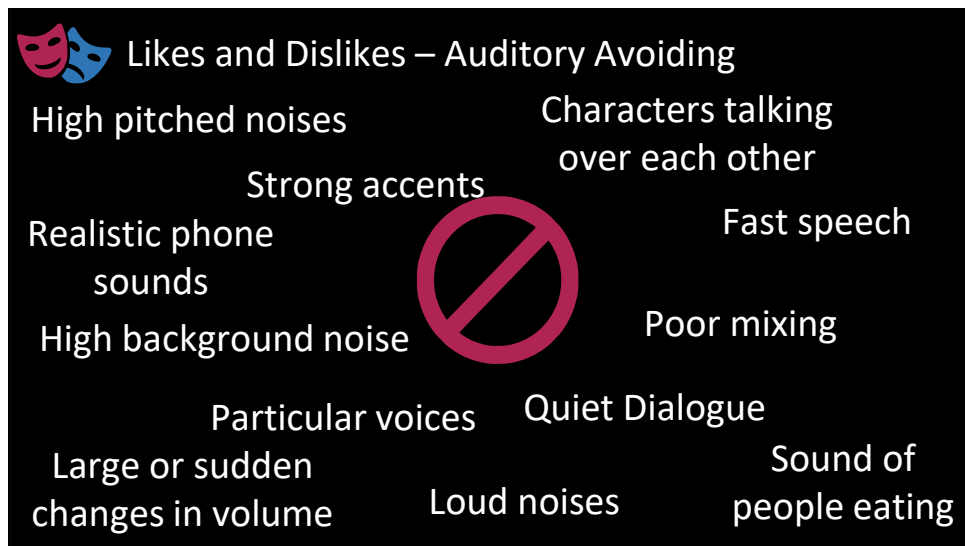


90 participants responded to the question about what auditory sensory experience they seek out in relation to media, with 23 of those indicating that there wasn't anything in particular they sought out. Some interesting topics from the remaining respondents are presented here and on the next slide – they don't represent all the views or the more common but are designed to give a flavour of the variety of responses. Quotes from participants are given on the slide in italics.

Auditory Seeking (cont)

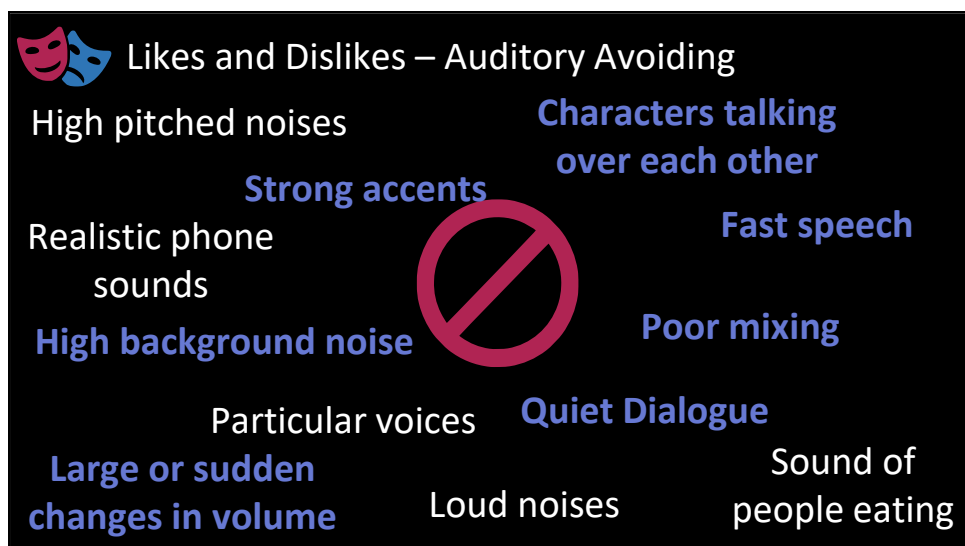


Auditory Avoiding



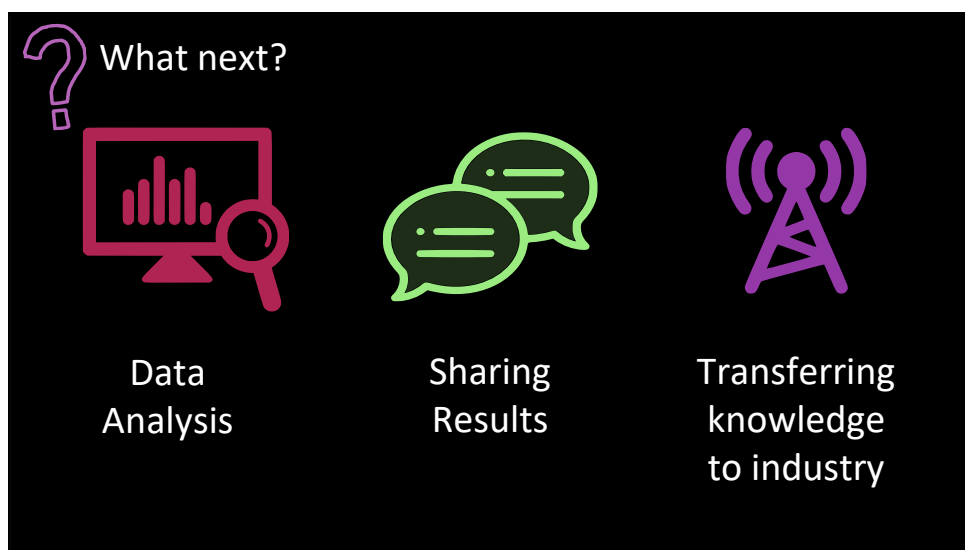
This slide shows responses to auditory sensory experiences respondents indicated they avoided in media. As before, they are to give a sense of the variety of responses.

Auditory Avoiding (cont)



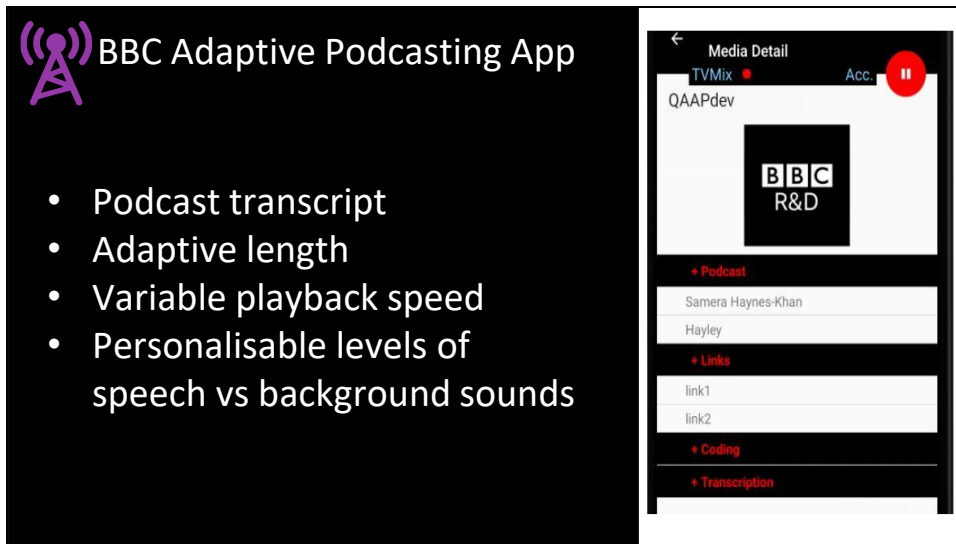
What is particularly interesting about most of the responses is that what autistic individuals seem to avoid in media is largely the same previous research into normal hearing individuals. The topics highlighted in purple are topics which have been previously identified in my research as being problematic or unpleasant for normal hearing viewers. Many of these problems aren't accessibility issues per se but just plain problems for everyone that the industry needs to address.

What next?



This has been just a brief tour of some of the first results from the A3i project. There is still a lot of data analysis for us to do, which will happen over the coming months. We plan to share these results not only with other academics, but to the autistic community and the broadcast industry. The latter is also where Ken, our post doc, did a lot of work specifically on the Adaptive Podcasting app by the BBC.

BBC Adaptive Podcasting App



This app is a prototype platform for trying out new podcasting technologies. You can see an example on the right of the slide. We have been working with BBC R&D to add accessibility features to this based on both existing knowledge and feedback from the co-production panel and respondents.

In particular, we implemented the ability to change the length of the podcast (from highlights only to shortened and then full) as well as changing the playback speed as possible in other podcasting apps. Based on my previous research, the ability to change the balance of speech and background was also added.

This leads us full circle back to...

Quirky and Autistic Parenting



Samera's podcast – Quirky and Autistic Parenting – will be launched September this year.

In addition to the usual podcasting platforms, it will be released on the Adaptive Podcasting app to allow listeners to personalise the content for their accessibility needs. Keep an eye out for it and if you want to find out more, there are the podcasts' Instagram and Twitter handles on the slide.

Thank you

Thank you

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sign_



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