Autism
Accessibility Guidelines research project

Final Report
for National Autistic Society

23rd September 2019

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access for
everyone

About this report

- This research project was carried out by Hassell Inclusion in response to a research brief from the National Autistic Society.

- If you reference this report, please reference National Autistic Society & Hassell Inclusion

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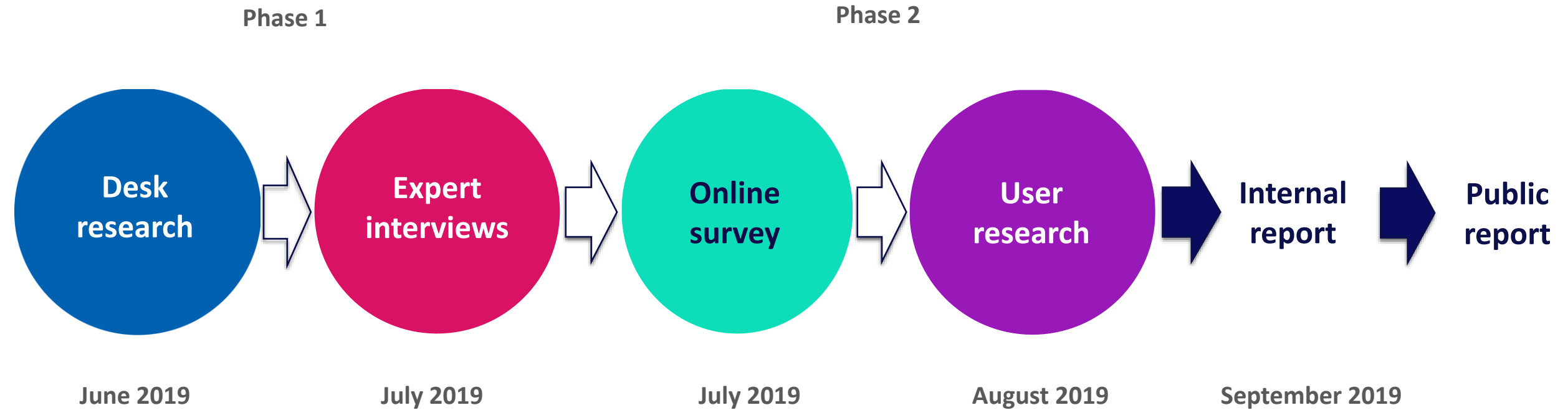 - Angela Collins-Rees

Executive summary - introduction

- **We propose a set of 49 web design guidelines, based on solid empirical evidence, and which if followed correctly and in conjunction with WCAG 2.1, will improve web accessibility for autistic people.**

- These guidelines were drawn up based on the findings from our extensive multi-method research project commissioned out by the National Autistic Society (NAS) in 2019, for use internally and sharing publicly.

- In this research, we integrated qualitative and quantitative methods that included a desk research and interviews with accessibility experts (Phase One), an online survey and user study with autistic people (Phase Two). We conducted the studies between 1st June – 28th August 2019.

- Whilst there has been some useful prior research done in this area, this research is unique in that it brings together evidence from multiple sources and verifies it in user research with autistic people.

- Our multi-method approach enabled us to uncover autistic people's real-world experiences and perspectives on what really matters to them about the accessibility of the web.

Executive summary - research methodologies

- **Phase One** consisted of **desk research & interviews with 3 experts in autism & accessibility:**

  - In the desk research, we identified and reviewed **13 sets of guidelines** for designing websites accessible to autistic people (published in the last 10 years). The review resulted in a list of **44 individual recommendations** and uncovered many **inconsistencies** and low agreement between the existing sets of guidelines.

  - The expert interviews added more **themes** to be explored in **Phase Two's online survey & user research**

- **Phase Two** consisted of **an online survey and user research:**

  - The online survey involved 398 autistic respondents including 110 autistic people with associated learning disabilities. The survey validated quantitatively the findings from Phase One and established the prevalence of access problems experienced by different groups of autistic web users.

  - The user research included a diary study and face-to-face focus groups with 17 autistic web users. These studies allowed us to explore in-depth the experiences of individual autistic web users and to identify the problems they currently encounter online.

- Through this research project, we gained a solid empirical understanding of the barriers people with autism experience while using the web and how the problems they currently find online can be overcome through design. This understanding is summarised in the **guidelines** the research delivered.

Executive summary – research diagram

Phase 1

Phase 2

Desk research → **Expert interviews** → **Online survey** → **User research** → **Internal report** → **Public report**

June 2019   July 2019   July 2019   August 2019   September 2019

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Introduction - quote

"Accessibility means more than putting things online.
It means making your content and design clear and simple enough
so that most people can use it without needing to adapt it,
while supporting those who do need to adapt things."

GOV.UK (2019) *Understanding new accessibility
requirements for public sector bodies - Guidance*

Contents

A. Autistic web users' shared & individual preferences

B. Autism Accessibility Guidelines

C. Appendices

      i.   User research participants' profiles

      ii.   List of websites used in the user research

A. Shared and Individual preferences - introduction

- Autism is a spectrum. Not everyone who is autistic prefers the same things.

- Many autistic people also have associated other conditions, like Dyslexia or Learning Difficulties that impact on their preferences. Many do not have other conditions.

- Other demographic factors can also impact people's preferences – such as male/female, children/adults, socio economic factors, and familiarity with technology.

- Other clear differences of preference stood out in our research – such as a preference for information to be conveyed through text or iconography/video, or preferences for particular colours.

- These differences can make it challenging to design for all autistic web users.

- So, before presenting the full Guidelines, in this section we've segmented some key learnings from the research into:
  - those preferences most Autistic people share
  - those preferences which are individual (splitting them into two categories where possible)

A. Autistic users' <u>shared</u> preferences - summary

- We uncovered a number of preferences shared by all or most autistic web users.
- These include preferences for:
  - Muted colours
  - Background images
  - Symmetry in design
  - Logical ordering of elements
  - Logical sizing of elements
  - No auto-playing movement
  - No surprises
  - Customisation

Impact on design

These shared preferences reveal autistic users' basic expectations regarding web design.

Addressing these shared preferences will improve web accessibility for all or most autistic people.

A. Autistic users' <u>shared</u> preferences - detail

- Muted colours (Guideline 3.1)
  - All users expressed a preference for muted, soft colours on web pages, while large areas of bright colours were considered distracting.
  - "I found my attention drawn to the bright yellow image and found that distracting. Fortunately, there isn't much text there to read." P6
  - "I'd love to be able to mute all colours." P8

- Background images (Guidelines: 7.5; 13.1)
  - Background images have to have a purpose. Geometric shapes in muted colours worked well but image collages were considered distracting.
  - For autistic web users everything is equally important and they struggled to distinguish between foreground and background.

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A. Autistic users' <u>shared</u> preferences - detail

- Symmetry in design (Guidelines 1.3; 1.5; 1.8)
    - There was a general preference for symmetry in design and for clearly defined sections including images having clear boarders.
    - Symmetrically designed webpages were considered "neat", "easy to use" and "easy to look at" (e.g. gov.au), while web pages that used design elements inconsistently (e.g. large boxes and small boxes not lined up symmetrically) were immediately noticed by participants and considered more difficult to process visually.

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A. Autistic users' <u>shared</u> preferences - detail

- Logical ordering (Guideline 1.3)
  - All users expected some logical ordering of information on webpages – for example, by importance (where the most important information is on top), alphabetical (lists), or chronological (in forums).

- Logical sizing of elements (Guideline 1.5)
  - Generally, participants associated the size of design elements (e.g. boxes) with the importance of information/content presented in those areas.
  - "The smaller box and the bigger box – it makes a hierarchy." P4
  - "Is the information in larger boxes more important?" P8

A. Autistic users' <u>shared</u> preferences - detail

- No auto-playing content/movement (Guidelines 8.1; 9.1; 9.2; 13.1)
  - Moving adverts in banners and pop-ups, auto-playing videos make websites inaccessible to most autistic web users.
    - "I've stopped using my local paper site because of the [moving] adverts." P1
    - "If there are lots of ads or pop-ups or videos (especially auto-play videos) then this gets annoying (…) so I click straight off of them." P6
    - "Moving adverts are distracting in your peripheral vision. It's annoying even without the sound. I don't know what to pay attention to." P13
  - 2 participants said that they liked automatic sliders (carousels) that showed more content related to the website, as long as their movement was slow.
  - However, there were also 2 participants who were sensitive even to the smallest movement. They considered it an access issue if they could not (or did not know how to) control it/stop it.
    - On one of the websites, P9 commented on the gentle movement in the background: "This makes me feel seasick."

A. Autistic users' <u>shared</u> preferences - detail

- No surprises (Guidelines 15.1; 1.7; 8.4)
  - Generally, participants expressed (in one way or another) their dislike of unpredictable situations and changes. This includes changing designs of websites that they used.
    - "I don't like surprises." P9 "Facebook keeps changing layout, options, especially on the mobile app and so I hate using it." P6
    - "I stick with what I know, as I know how it is laid out." P1
    - "I like things that don't change. I lost my bank app when they went to "Pride" month." P17
  - Further, participants did not want to feel like they were lost in something that had no end. They wanted to know what pages, sections and videos were about before reading/watching them. They wanted to know the length of videos.

A. Autistic users' <u>shared</u> preferences - detail

- Customisation (Guideline 13.1)
    - All users wanted to be able to tailor their web experience to their needs.
    - "The idea of being able to control your own experience is really good." P1
    - "I'd love to be able to mute all colours." P8
    - "I'd want sites in my colours." P1
    - P17 used open dyslexic font on e-readers – "I'd want to be able to do this on websites."
    - "If turning off auto-play would be available on everything, I'd do that." P1

A. Autistic users' <u>individual</u> preferences - summary

- We uncovered a number of preferences related to autistic web users' personal characteristics.
- These include preferences for:
  - text vs. non-textual information
  - dark vs. light background colours
  - sans-serif vs. serif fonts
  - real-time communication vs. e-mail communication, and
  - preferences related to the web-savviness of the user

Impact on design

These individual preferences reveal conflicting expectations of users regarding web design. A design solution that could improve accessibility for one group of autistic people, could become a barrier for other autistic users.

Addressing and/or prioritising any of these preferences will require making well-thought through, explainable design decisions.

These decisions must be set out in an Accessibility Statement with a plan for future improvements.

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A. Autistic users' <u>individual</u> preferences - detail
Preference for textual cf. non-textual information

Text-first users

- These users take in information best from text. They find that visual design and information in formats other than text slow them down.

- They want images that add value to the text, e.g. infographics. If images of people are used, the people must be relevant to the story.

  "I read the text because I generally hate watching videos. I can read way faster than people talk, and I find it hard to understand speech in videos without subtitles." P4

  "When I look for information, I don't really care about the visual" P8

  "My brain doesn't work well to look through images to find what I want." P16

Visual users

- These users rely on visual design to be able to find information, e.g. images, icons. They take in information best from video or audio.

- They have a preference for images that are meaningful, relatable and calming, ideally, images that include a single object in focus.

  "I can listen to very complicated scientific articles but I cannot focus on text so easily." P10

  "[Watching video is] easier than reading for me" P11

  "Some viewers though may prefer to read, I prefer visual content personally." P5

  "Easy. Short videos and to the point. Ideal for good retention of information." P15

Guideline: 13.1

A. Autistic users' <u>individual</u> preferences - detail
Preference for light background cf. dark background

Light background & dark text colour

- 4 users said they liked white background and black text. 8 users showed a preference for an off-white, grey, blue and other light pastel colour background with dark text colour.

- 1 user preferred orange background and had orange glasses prescribed for reading off the screen.

Dark background & low contrast text colour

- 4 users had a strong preference for dark background & low contrast text colour, e.g. grey

- P17 preferred a dark blue background with black text in the diary study

While people had different preferences, those who wanted something different from a white background wanted the ability to choose background and text colours to suit their exact preference. Autistic people have very clear preferences in colour.

Guideline: 10.1

A. Autistic users' <u>individual</u> preferences - detail Preference for serif cf. sans serif fonts

Most participants said that they preferred sans serif fonts for reading on the screen, however, a few participants said they preferred serif fonts.

1 participant said he used open dyslexic font on his e-reader (P17).

"I prefer the font that The Guardian use."
P1

"I like that it uses serif font, it's easier to read." P12 (autistic user with dyslexia)

Guidelines: 4.2; 4.3; 13.1

A. Autistic users' <u>individual</u> preferences - detail
"Techy" users cf. less "web savvy" users

Techy autistic web users

- Users who are involved in web design demonstrated a good understanding of how websites are built and how to use in-browser accessibility settings and plug-ins to adjust websites to their individual needs on a variety of devices.

Less web savvy autistic web users

- These users have had to develop more coping techniques to be able to find the information they need on the web, e.g. avoiding certain websites, using different devices for different purpose etc.

- These users will most benefit from onsite customisation.

Guideline: 13.1

A. Autistic users' <u>individual</u> preferences - detail
Preference for real-time communication cf. e-mail & FAQs

Users communicating with confidence in real-time

- These users had a strong preference for accessing help via phone or live chat.

  "Chat is helpful, but I'd like to call a person to ask – I get annoyed if there is no phone number." P3

Guideline: 10.1

Users with phone anxiety

- These users had a strong preference for accessing help on the website via email or on the site, e.g. using FAQs, "how to do" videos

  "If I have to make a phone appointment, I need someone to do it for me, the anxiety of what I need to say?" P1

  "I'm rubbish when I'm on the phone "scared of what they would say, and what I'll say" P2

B. Autism Accessibility Guidelines – key

High, Medium and Low are indications of the importance of each Guidelines, based on the severity of how failures to follow it impacted participants in our research:

- **HIGH:** issues critical to accessibility prevent users from using the site or part of the site, users cannot complete their core task because the problem they encountered on the web causes physical pain, leads to dizziness or fatigue and/or a sensation of blurry vision

- **MEDIUM:** issues cause frustration but do not prevent users from using the site, or completing their core task. Users may find completing the task slow and feel frustrated, annoyed and nervous.

- **LOW:** when minor or cosmetic issues are encountered, something is officially 'wrong' but it won't affect users too much. These issues may relate to users' personal aesthetic preferences.

Each Guideline notes whether the Guideline applies to all Autistic users, or just those with a particular preference (see Section A for background on this).

Each Guideline also notes the Evidence sources behind it:

- **U = User research**

- **S = Survey**

- **E = Experts**

B. Autism Accessibility Guidelines - categories

We propose 49 autism accessibility guidelines grouped in **16 categories**:

1. Page layout
2. Navigation
3. Colours
4. Fonts
5. Text
6. Non-textual formats
7. Images
8. Video content
9. Movement
10. Help page
11. Forms
12. The use of language
13. Customisation
14. Sharing content
15. Re-learnability
16. User research

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1. Page Layout

HIGH   1.1 Design clear, clutter-free pages

HIGH   1.2 Set page lengths appropriately to the page type & function

HIGH   1.3 Clearly separate design elements & sections that do not belong together

MED   1.4 Place important information on top of the page and above the fold

MED   1.5 Use the size of design elements to communicate the importance of information

MED   1.6 Avoid large images above the fold

MED   1.7 For each page, provide a summary of the page & its purpose

LOW   1.8 Ensure the consistency of page layout using symmetry

LOW   1.9 Maintain a visual consistency of design elements within a single section of the page

1. Page layout

1.1 Design clear, clutter-free pages

Guideline: Build simple pages that include only elements relevant to the current user task

Description: Cluttered, busy layouts make finding information difficult and do not allow users to focus on their core tasks. 63% of survey respondents agreed that they like simple websites and 62% find too many choices on webpages confusing.

In users' words:

*"A lot going on, so many tabs and pictures. **It is shoving so many things down your throat**." P3 (on a news service homepage)*

*"Too many elements. So much going on, look at this, look at that. **It's too busy!**" P3 (on a news service homepage)*

*"The way this website is – the video playing and things on the side and along the top – it feels **haphazard** and shouty – it is **intimidating** as it is throwing a lot at you at a time… **it puts me on edge**." P1 (on a news service homepage)*

1. Page layout

1.2 Set page lengths appropriately to the page type & function

Guideline: Make decisions about the length of the page appropriately to its purpose. For example, make your homepage short and ensure that important information & sections are available with minimum scrolling. Content pages, e.g. article pages may be longer to facilitate uninterrupted reading.

Description: Homepages that are too long do not allow users to focus on their core tasks and make finding information difficult. Too much scrolling makes autistic users feel 'dizzy' and 'overwhelmed'. On long pages, participants feel like they are lost in "something" that has no end.

In users' words:

*"[A lot of] Scrolling makes me **dizzy**" P7, P9*

*"I find the scrolling experience **overwhelming**."*
P9 (on a news service homepage)

*"There is so much… **scroll down and there is still more**. I would go past the homepage directly with Google." P16 (on a news service homepage)*

1. Page layout

1.3 Clearly separate design elements & sections that do not belong together

Guideline: Clearly separate different sections and items on the page by using white space (i.e. space without text or graphics), outlines, boarders and dividers (i.e. lines) to help users visually discern which elements are (or are not) part of the same section

Description: Users wanted all design elements to have clearly defined outlines and boarders to be able to focus on them, as well as to move between the different sections within the page. Lack of clear outlines made their vision to blur.

In users' words:

*"The dividers between the columns are good. Later in the day, things can **blend together**." P15*

*"It'd be nice though if there was **a line between these sections**." P1*

*"The lack of clear outline **makes my vision to blur**." P13*

*"Images without outlines were very difficult to look at. **My eyes really struggle to focus on the images and it makes my eyes and head hurt**." P13*

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1. Page layout

1.4 Place important information on top of the page and above the fold

Guideline: Whenever possible, establish a high-to-low hierarchy of importance of items on the page. Place the information that is most important for users on top of the page above the fold. For items of equal importance, use alphabetical listing, or chronological ordering (e.g. forum threads, event timelines).

Description: Users look for the most important information on top of the page above the fold.

In users' words:

*"This is the section I'd come for to this site. I imagine these [sections] would be of interest to most autistic people but **they are so low on the page**, too low (…) **They need to be the first thing I see when I open this site**." P10*

*"[This is] Well laid out. Prominent news and campaigns kept **above the fold**." P15*

1. Page layout

1.5 Use the size of design elements to communicate the importance of information that they carry

Guideline: Use the size of design elements (e.g. larger boxes) to help users find important information easily.

Description: Users judge the importance of information by the size of the boxes that carry the information, i.e. the content in larger boxes is more important than information in smaller boxes.

In users' words:

*"It might be slightly more helpful to **have these sections** slightly **larger,** as they are probably **the most important** bits." P16*

*"**The smaller box and the bigger box** – it makes a hierarchy." P4*

*"Is the information in **larger boxes more important**?" P8*

*"Why are some of these boxes **bigger** than the others? … I guess [the information in the bigger sections] is **more important**." P9*

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1. Page layout

1.6 Avoid large images above the fold

Guideline: Avoid large images that would cover the entire space above the fold, if there is more information below the fold.

Description: Users were overwhelmed by large banners that covered most of the space above the fold blocking their way to information below it.

In users' words:

*"The first thing I see filling my screen looks **overwhelming** and like it is **jumping out at me**." P6*

"… So I scroll past it. Then, I get to the boxes which aren't the kinds of information I visit the site for." P6

*"**Huge distracting images** – it takes too much of the screen and it is wider than the text." P12*

*"**Too big, over-imposing**!" P5*

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1. Page layout

1.7 For each page, provide a summary of the page & its purpose

Guideline: Provide a short descriptive summary of the page to help users to understand the topic and purpose of this page. This includes the homepage.

Description: Users want to know what pages and sections of the website they are on and often the page titles are not descriptive enough to provide this information. Autistic users feel disorientated when this information is not available and are likely to leave the site.

In users' words:

*"My ideal world would be that every page has at the top what would be on that page. They only have the headlines, **a one-line summary underneath would be good**… Sometimes the headings don't tell you what you are going to get. I want more information."* P1

*"**There isn't enough information**. It doesn't tell me what it does."* P9

*"Well, it tells me **what it is NOT** but does not say **what it IS**. So, why should I use it?"* P10

1. Page layout

1.8 Ensure the consistency of page layout using symmetry

Guideline: Ensure that design elements are aligned and laid out symmetrically on the page. Whenever possible, maintain an equal number of columns on the page.

Description: Autistic users have a strong preference for symmetrically designed pages. They prefer pages where visual elements (e.g. boxes or images) are aligned, and there are an equal number of columns in sections across the page. There's a clear preference for a grid layout on homepages and single-column layout on content pages.

In users' words:

*"I'd like the boxes to be **lined up**, the two long boxes on the left and the four short boxes on the right." P2 & P4*

*"Images that are **not aligned** are **disrupting**." P4*

"It doesn't look like even columns." P13

*"The layout is not very logical to me. I like **symmetry** in terms of layout." P9*

*"2 columns, 3 columns, now 4 columns – it's going **out-in, out-in**. You're scanning left and right – **I don't like that**". P17*

1. Page layout

1.9 Maintain a visual consistency of design elements within a single section of the page

Guideline: Ensure that the shape of design elements within a single section of the page are visually consistent.

Description: Users expressed a preference for a consistent visual design of elements grouped together in a container element, e.g. only boxes with rounded corners, or only boxes with square corners, but not both in the same section of the page.

In users' words:

*"All rounded boxes would be better – **consistent**
too – it's the flow, the rounded corners; and
shows stuff **belonging together** in that 'advice
and support' bit." P4*

2. Navigation

MED   2.1 Design consistent & simple navigation across the site

MED   2.2 Ensure that all links and buttons are visibly clickable

MED   2.3 Ensure that users understand how to navigate carousels

MED   2.4 Use sequential menus with fewer items to select

LOW   2.5 Use a "sticky" main menu

2. Navigation

2.1 Design consistent & simple navigation across the site

Guideline: Ensure that the navigation across the site is consistent and allows users to understand how they can navigate to different pages & sections on the site.

Description: Websites with complex and inconsistent navigation make people use Google and deep-link directly to the content. It also leads people away from the website as there may be other websites with similar content listed higher on the search pages. In the survey, confusing navigation was one of the main problems experienced online by autistic respondents.

In users' words:

*"I wouldn't immediately know how to find what I'm looking for. I'd use the search box at the top, or more likely, **I would "google"** what I'm looking for, rather than **hunt** on the site ."* P6

*"I have **no idea** where to start."* P9

*"I find it difficult to navigate the menus and would probably want to change them to make them **simpler** and **more intuitive**. (...) I would probably have **to use Google** to find all these pages."* P6

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2. Navigation

2.2 Ensure that all links and buttons are visibly clickable

Guideline: Ensure that links are clearly visible and distinct from other text and non-clickable elements, by using colour and underlining. Apply the design consistently across the site.

Description: Autistic users expect links (including visited links) to be both underlined and differ in colour from other text & non-clickable elements.

In users' words:

*"It's obvious what you can click on, the **underlines** tells you." P13*

*"The **red links** are clearly **visible**." P6, P7 (The Guardian)*

*"I didn't realise there were **links** on this page until you actually changed the background colour." P6*

2. Navigation

2.3 Ensure that users understand how to navigate carousels

Guideline: Ensure that users understand which element on the page is a carousel and how they can access the multiple carousel panels. Make the navigation *arrows* clearly visible and provide information about the number of panels in the carousel

Description: Some of the less web-savvy users missed the arrows on the carousel, until prompted to look for them. Some people did not want to interact with the carousel until they had information about the number of available panels.

In users' words:

*"I don't like these at all. I don't use them.
I don't know **how long this will go for**. It could **go
on forever** to show me everything that is
available, and **I don't have time for this**."* P9

2. Navigation

2.4 Use sequential menus with fewer items to select

Guideline: Design menus with fewer options that enable users to easily make selection

Description: On-hover menus, as well as menus that include too many items discourage autistic people from using the site. Sequential menus with fewer options that allow "pointing and clicking" rather than "mousing-over" work better for autistic users.

In users' words:

*"I don't like **multiple toolbars**." P17*

*"I think there are **too many tabs** at the top of the screen and when you hover your mouse over them there are **too many options** to chose from and it is quite **overwhelming**."P2*

*"**Annoying menus** on mouse-over."P17's one of the top access issues*

*"I don't like the **mouseover menus** which **disappear** when you mouse off." P12*

2. Navigation

2.5 Use a sticky main menu

Guideline: Use a sticky main menu on the top of the page, to enable users to easily navigate to any other section of the website. Avoid other sticky design elements on the site, e.g. adverts

Description: Autistic users said that they liked to always have access to other sections of the site and a sticky main menu facilitated this. They found other sticky design elements on the page distracting, e.g. sticky advert banners, sticky side nav with links to related content, or icons for content sharing

In users' words:

*"I like the **banner bar** [main menu] **staying** at the top." P17*

*"Maintaining **access to the main menu** whilst you scroll down the page would be **useful**." P5*

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3. Colours

HIGH   3.1 Avoid using lots of bright colours on the website

HIGH /MED   3.2 Set page lengths appropriately to the page type & function

3. Colours – Brightness

3.1 Avoid using lots of bright colours on the website

Guideline: Use simple, soft colours and colour combinations for the background, logo, images and text across the website. Autistic users prefer low-contrast colour schemes.

Description: Bright contrasting colours are commonly known to be visually overstimulating. 64% of survey respondents agreed that they got distracted by bright colours. 69% of respondents find bright images distracting. (See also Guideline 3.2.)

In users' words:

"It is calm so better than the others" P3

"There is this imbalance, some [images] are really bright." P17

*"It is **physically painful** to read [black on white]." Expert 3*

"I'd like a button to tone down colours and images" P10

*"The blue in the navigation is **too bright**" P2*

*"It's just **so much bright colour**. (…) I found my attention drawn to the bright yellow image and found that **distracting**. Fortunately, there isn't much text to have to read."P6*

"I'd love to be able to mute all colours." P8

3. Colours – Brightness

3.2 Allow users to customise the background & text colours

Guideline: Allow users to choose the background and text colours that suit their needs.

Description: "*There is no standard autistic colour preference*" (Expert 3). Autistic users' needs regarding colours differ. A colour scheme that works for one autistic person does not work for another user. However, they all agree that being able to choose their colours on the web would significantly improve their experience on the web.

18% of the survey respondents already change text & background colours, and 44.7% would like to be able to do this but don't know how to.

In users' words:

"*I like the neatness of black and white, but when I* **read** *I prefer like this,* **off-white***.*" P6

"*I would change the background colour to* **blue***, would make it* **easier for me to read***.*" P10

"*I'd like to be able to change it to a* **cooler colour scheme***.*" P10

"*I like that they give you a choice of colours. I have a dyslexia so the* **overlay colours** *are* **helpful** *to me.*" P2

"*Oh, that's great! absolutely fantastic!* **I want it on every website***… That light blue*" P16

"*Facebook messenger is bad, I* **can't change** *the background colours.*" P17

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4. Fonts

MED   4.1 Use at least 12pt font across the website

MED   4.2 Choose a typeface for your website and use it consistently

MED/LOW   4.3 Allow users to customise the font type & size to suit their needs

4. Fonts

4.1 Use at least 12pt font across the website

Guideline: To ensure readability of text on the site, use a font size not smaller than 12 pt.

Description: Generally, users preferred larger size fonts, at least 12 pt. Smaller than this was considered too small for comfortable reading by users in focus groups.

In users' words:

*"I need decent size text – **larger text** is good for me because of my ADHD." P15*

*"The "welcome to our community" paragraph is a bit **smaller text** than elsewhere and thus a bit **more challenging to take in** for me." P15*

4. Fonts

4.2 Choose a typeface for your website and use it consistently.
Avoid using serif & sans-serif fonts on the same page

Guideline: Avoid using too many typefaces on the site. Use consistently either a serif or a sans-serif font across your website. Avoid using both a serif font & a sans-serif font on the same page.

Description: Some autistic users prefer sans-serif fonts, while others read better in serif fonts. Autistic users feel distracted when both type of fonts are used on the same page.

In users' words:

*"I like that is uses a **serif font** – that's **easier to read**." P12, autistic user with dyslexia*

*"**Three fonts** is already **too many,** it's distracting. I don't like serif and sans-serif on the same page." P15*

4. Fonts

4.3 Allow users to customise the font type & size to suit their needs

Guideline: Allow users to choose the font type & size that best suit their needs, in order to make reading easier for them

Description: Autistic users have different preferences regarding the use of serif and sans-serif fonts, and font sizes.

In users' words:

*"I use **open dyslexic font** on my e-reader. I'd like to be able to use this on all websites." P17*

*"I **changed the font** on my mobile but I wouldn't know how to do this on websites on my laptop." P8*

*"I use **18pt** on all websites." P12*

*"I want things to be **bigger**... I can change the size of text on my phone with **zoom**, but not on desktop." P1*

5. Text

HIGH 5.1 Ensure sufficient spacing between paragraphs and between lines of text

MED 5.2 Organise text into short paragraphs and use short lines

MED 5.3 Do not interrupt the flow of text with other design elements

MED 5.4 Avoid using bold text style for large amounts of text and in combination with other styles

LOW 5.5 Bold the keywords to facilitate rapid scanning of text for important information

5. Text

5.1 Ensure sufficient spacing between paragraphs and between lines of text

Guideline: Use white space (areas not filled with text or graphics) consistently to separate paragraphs and lines of text

Description: All users but particularly users with associated learning disabilities (those with "eye-tracking" issues). People with ADHD found densely spaced text difficult to read

In users' words:

*"This is far **too dense** for me to read. I have eye-tracking issues. My eyes skip lines and [dense] text like this is even more difficult to focus on." P5*

5. Text

5.2 Organise text into short paragraphs and use short lines

Guideline: Use short paragraphs and short lines to organise the text for easier reading

Description: Users found long paragraphs and long lines difficult to read.

In users' words:

*"I like that they are all **short paragraphs.**" P1*

*"I find all texts difficult to understand but this text is nicely put into **short equally sized paragraphs**." P2*

"A 'good' paragraph should not be longer than 6 sentences." P4

*"I was able to read the text, but I would have preferred it to be slightly bigger and occupy a narrower band of screen estate. Really **wide lines** of text on a screen are **hard to read**."P12*

5. Text

5.3 Do not interrupt the flow of text with images or other design elements

Guideline: Avoid splitting the text with elements that may interrupt the flow of reading. Avoid scroll-stoppers that may mislead users into thinking that they have reached the end of the text when they have not.

Description: Users want to be able to read the text without interruption. Large images or video content placed in the text interrupt users' thought process. It is worse when the design element fills up a large part of the screen.

In users' words:

*"The videos are **breaking up the text**, which is **annoying**." P4*

"I like text well-presented and spaced but all together rather than little bits of text between videos."P6

"This is the end… Oh, no, it isn't!" P8

"The pictures are so big that it feels like they are the end of the article." P1

5. Text

5.4 Avoid using bold text style for large amounts of text and in combination with other text styles

Guideline: Limit the use of bold text to highlight keywords or important phrases in the text to make them stand out to readers

Description: Applying bolding to a large amount of text confuses users and makes them feel agitated.

In users' words:

*"It's bold and underlined. It's **aggressive**." P12*

*"I find text **hard to focus** on anyway but I found it hard to read on
[this] website because there is one sentence **in bold** and some of the words at the end of the text are **in purple** writing." P2*

*"I like the bullets, but I don't like that they've **bolded the bullet points** after the bold headline, makes things run on into other – it **makes me feel agitated** not calm." P1*

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5. Text

5.5 Bold the keywords to facilitate rapid scanning of text for important information

Guideline: Use bold text to draw user's attention to keywords or important phrases in the text

Description: Bold text helps readers to scan text for important information.

In users' words:

*"There is so much text (...) I tried to **scan** the text for **keywords** but couldn't find any." P11*

*"The **keywords** could be **in bold**."P9*

6. Non-textual formats

LOW   6.1 Consider providing information in video format

LOW   6.2 Use visuals with the text to facilitate understanding

LOW   6.3 Use icons to help users locate information faster

6. Non-textual formats

6.1 Consider providing information in video format

Guideline: Consider providing information in video format with captions & transcripts

Description: Visual users said that it was easier for them to process and remember information from video than from text only. Most users also found captions and transcripts for videos useful. In the survey, 36% of respondents agreed that they preferred getting information from video not text.

In users' words:

*"I can listen to very complicated scientific articles but I **cannot focus on text** so easily."* P10

*"I think websites should **speak** to us."* P10

*"[Video] **easier than reading** for me"* P11

*"Some users though may prefer to read, I **prefer visual** content personally."* P5

*"Easy. Short videos and to the point. Ideal for **good retention of information**."* P15

6. Non-textual formats

6.2 Use visuals with the text to facilitate understanding

Guideline: Use visuals to facilitate understanding of textual information and to help users locate required information on the page.

Description: 50% of survey respondents agreed that they needed pictures or icons along the text to help them understand information.

In users' words:

*"Images **help me understand** better if they relate to the text."P9*

*"Symbols [referring to icons] can **clarify**, if they mean something." P12*

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6. Non-textual formats

6.3 Use icons to help users locate information faster

Guideline: Use meaningful & memorable icons to help users find information on the page

Description: Autistic users found icons helpful when scanning web pages for information, especially on busy text-heavy pages where there were many visually similar sections, e.g. laid-out in a grid.

In users' words:

*"I like the **little icons**. It can **cut down the amount of reading** you have to do to find what you need."*
P15

*"When you go back to the page, **you know where to click** [the icons help to locate information]."*
P13

7. Images

MED 7.1 Use simple images that can be easily understood

MED 7.2 Use meaningful, relatable images that add value & clarity to the information on the page

MED 7.3 Limit the use of background images and decorative graphics

LOW 7.4 Use photographs of people only if depicted people are relevant to the information

LOW 7.5 Provide the ability to turn off decorative graphics & all images

7. Images

7.1 Use simple images that can be easily understood

Guideline: Use simple images that can be understood at "a glance", without a need for a deep visual analysis

Description: Users want images that are simple and easy to understand. Users found images showing a single object in focus easier to process.

In users' words:

*"This photo is nice because the woman is in focus and the trees behind her are not in focus. I find this good because it's **obvious where the focus is**. In this photo, there are 8 people in the foreground, and it is less obvious where you are supposed to be looking." P2*

*"I think there is **too much happening** in this: I find it quite **overwhelming** to look at because there is so much happening. There are 8 shoes and 4 animals: lion, elephant, monkey and giraffe." P2*

7. Images

7.2 Use meaningful, relatable images that add value & clarity to the information on the page

Guideline: Make sure your images are meaningful and add value & clarity to the text information on the page

Description: Autistic users wanted images to be meaningful and congruent with the story on the page. Images must add value, provide more information or clarification to the text, represent information visually (e.g. infographics).

In users' words:

*"I don't like images that don't add anything, I'd prefer **just text,** no images… there is no need for them."* P12

*"Only if there is point to them. Images must be **meaningful**."* P9

*"It's all about shopping! Do they want to sell me something? I know the words explain the image but **my mind reads images first of all**."* P10

*"Images must be **obviously connected** to what the category is."* P13

7. Images

7.3 Limit the use of background images and decorative graphics

Guideline: Use background images sparingly, especially if they are overlaid with text. If you use decorative graphics, ensure they do not distract the users from reading text.
Use non-patterned backgrounds on content pages to facilitate uninterrupted reading.

Description: Autistic users found background images and decorative graphics distracting, They preferred plain background, especially on content pages where there is much textual information to read through.

In users' words:

*"I like that there is **nothing** going on in the background."* P1

*"The coloured background is too **distracting.**"* P2

*"I like that they've stuck with their colours… but the textured background is **distracting**."* P12

*"The pastel background is good, but the images over it are too **distracting**."* P13

*"The background image is **OK** because it's **abstract**."* P15

*"I get very curious about what the pictures relate to…I tend to get **distracted** by them, **figuring out what they are**, I would be thinking how they are related… and **go off on a mad tangent**… the background on the cricket is logical, I find that less irritating as it links to what the articles are."* P13

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7. Images

7.4 Use photographs of people only if depicted people are relevant to the information

Guideline: Use photographs of people only if these people are relevant to the story

Description: Text-first autistic users found generic photos of people irritating and irrelevant

In users' words:

*"I always find **pictures of people odd if they are not what the text is about** (…) we know what people look like, we don't need you to remind us [instead of the photograph of people] it could be a graph showing how many people you helped." P4*

7. Images

7.5 Provide the ability to turn off decorative graphics & all images

Guideline: Allow users to turn off decorative graphics & all images on the website to enable them to focus on textual information.

Description: Text-first users find all images distracting and would benefit from an ability to turn all graphics off or on.

16% of respondents already use text-only, and 20% would like to learn how to do this.

In users' words:

*"When I look for information, I **don't really care about the visual**." P8*

*"If there was a **turn-off images** button, I'd press it and that would be better." P12*

8. Video and audio

HIGH 8.1 Disable auto-play

HIGH 8.2 Provide captions for videos and transcripts for all video & audio content

MED 8.3 Allow users to turn off captions for videos

MED 8.4 Provide text-based introductory information for videos on pages

LOW 8.5 Use video content when it adds value or increases clarity of textual information on the site

8. Video Content

8.1 Disable auto-play

Guideline: Do not make video content to auto-play on pages, even if the sound is off. Users prefer control over what content is playing and when it is playing. If you include auto-play there was must be an option to turn it off.

Description: Auto-playing videos made users feel "nervous" and "out of control" over their online experience. They wanted to be able to decide what and when they want to watch or listen to.

In users' words:

*"**Playing it at me** (...) **I didn't choose any of it**. I don't know what to pay attention to. I do watch video but I want the choice to watch (...) if turning off auto-play was available on everything, I'd do that." P13*

*"On Facebook, I can read my feed and not be distracted, but **auto-play is a nightmare**." P1*

*"The video **auto-play** is making me **nervous** as I didn't ask it to play." P1*

8. Video Content

8.2 Provide captions for videos and transcripts for all video & audio content

Guideline: Provide captions for all videos. Provide transcripts for video and audio to enable text-first users to access the same information in text format.

Description: Captions help Text-first users to access information available in video format. 38.5% of all respondents need transcripts for audio content.

In users' words:

*"I find it **hard** to understand speech in videos **without subtitles**."P12*

*"I watch the videos, **no sound**, just read the **subtitles**." P17*

*"If I have to watch a video of someone just talking, I put on the **subtitles** and make the video run faster so that I can **obtain the information quicker**." P4*

*"**Transcripts** of the videos would be helpful if I wanted to **access a part of the videos** without re-watching them." P5*

8. Video Content

8.3 Allow users to turn off captions

Guideline: Allow users to switch captions off according to their preferences

Description: Some visual autistic users find captions distracting and would like to be able to turn them off (i.e. they prefer closed captions to open captions).

In users' words:

*"I find **subtitles distracting,** so an option to **turn on and off** would be ideal." P13*

8. Video Content

8.4 Provide text-based introductory information for videos on pages

Guideline: Provide text-based introductory information for videos so that users can read it before they play the content

Description: Before they decide to play video content, users wanted to know what the video was about and how long it was.

In users' words:

*"Some **intro** about them first. Otherwise, the videos look like they've been dumped there."* P13

*"I played the video just **to see how long** it was for. It wasn't too long so I watched it."* P14

*"I want to **know what I'm going to watch**. I don't like going into video blind."* P1

*"It was a little **intimidating** and **information-heavy** after having two videos with **little explanation** to start with."* P1

8. Video Content

8.5 Use video content when it adds value or increases clarity of textual information on the site

Guideline: Make sure video content adds value and increases clarity of textual information on the site

Description: Video content can be a distraction to users, including visual users, therefore, videos must add value to the site and focus on explaining information presented in the text.

In users' words:

*"It was easy to understand because of the subtitles. However, I **couldn't see that the value** of it being a video rather than just some text." P12*

9. Movement

HIGH 9.1 Disable auto-playing movement on pages. Provide a pause mechanism

HIGH 9.2 Avoid attention-attracting movement unless other methods of visual emphasis have failed

9. Movement

9.1 Disable auto-playing movement on pages. Provide a pause mechanism for moving & animated design elements (e.g. carousels)

Guideline: Avoid using pop-ups, moving or animated design elements. If eliminating movement is impossible, provide a pause mechanism to "return" control to users.

Description: Even the smallest movement can have negative impact on some autistic web users. Most autistic users said that moving adverts and pop-ups were the top issues that prevented them from using websites. They felt they lost control over their experience.

Auto-playing carousels were disliked by most users who found it difficult to read the text before the panels change. However, some autistic users liked auto-playing carousels.

In the survey, pop-ups and moving ads were the top problem that people found online.

The survey results show that 41% autistic users already turn off the ads, and another 41% would like to be able to.

In users' words:

*"**Moving adverts** are **distracting** in your peripheral vision. It's **annoying** even without the sound. I don't know what to pay attention to." P13*

*"Being **able to turn things off** to be less of an overwhelming experience would be great… **I hate moving images** – if I want it to move I'll click play." P1*

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9. Movement

9.2 Avoid attention-attracting movement unless other methods of visual emphasis have failed

Guideline: Small animated movement may be used to draw users' attention to information or to invite users to take action if all other methods of visual emphasis such as: size, colour, font style, have failed.

Description: Small animated movement of an arrow when moused-over, communicated to users that the section was clickable and more information was available. This movement was limited and explainable, and users did not find it disturbing.

In users' words:

*"This **small movement** is ok. It shows that there is more to read or see, if you click on it."P16*

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10. Help pages

HIGH 10.1 Provide help on the website in a range of formats

10. Help pages

10.1 Provide help on the website in a range of formats

Guideline: Ensure that all autistic users are effectively supported when problems occur on the site. Provide help for your website in a range of formats & channels, e.g. via phone or a live chat, as well as via email and on the site (via FAQ pages).

Description: Some autistic users prefer to use the phone or a live chat to access help on the site quickly. People with phone anxiety tend to look for answers on the site, e.g. FAQ pages, Google, or want to be able to send their queries via email.

In users' words:

*"Chat is helpful, but I'd like to **call a person** to ask – I get annoyed if there is no phone number." P3*

*"I'd like **a video** that I can pause when it's going too fast; I'm rubbish when I'm on the phone." P2*

*"I'm **scared of the telephone** (…) If I have to make a phone appointment, I need someone to do it for me, the anxiety of 'what I need to say?' (…) I like when sites have a **FAQ page** – is there an answer to my question there already?" P1*

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11. Forms

HIGH 11.1 Use clear, unique labels & instructions for each field

HIGH 11.2 Ensure reasonable time-outs

MED 11.3 Provide clear and timely feedback

11. Forms

11.1 Use clear, unique labels & instructions for each field

Guideline: When designing forms, use unique labels and clearly explain what information needs to be entered

Description: Autistic users struggled with labels that were ambiguous or similar to other labels. For example, they found "username" and "sign-in name" confusing, and were unsure about these different names would be used on a site.

In users' words:

*"When filling it in, I **didn't know** that **the sign-in name** was going to have to be **different to the user name**. This may have led me to choose a different sign-in name." P6*

*"I found it a bit **odd and confusing** to have a username and a 'forum' username as it can be confusing to have two different names." P13*

11. Forms

11.2 Ensure reasonable timeouts

Guideline: When using forms with an authentication timeout, ensure that the timeout is reasonable and sufficient for users to complete the form. Warn users about the expiring timeout and provide means to extend the session time limit.

Description: 76% of respondents agreed that they struggle with filling in forms with time-outs.

In users' words:

*"**Time-outs** on forms cause **melt downs**." Expert 2*

11. Forms

11.3 Provide immediate feedback on errors

Guideline: Provide immediate feedback to allow users to quickly realise when they made an error when filling in the form

Description: Users expected to receive immediate feedback to be able to correct errors promptly when they've occurred.

In users' words:

*"I want to **be told** if I put the password in right." P1*

*"**Not very clear** if username was available." P14*

"When I typed in my name as a possible username it said it was available even though I used a space and it says not to." P2

12. Use of language

HIGH 12.1 Use clear, concise language and avoid metaphors & ambiguity

HIGH 12.2 Avoid jargon, abbreviations, acronyms, idioms & colloquialisms

12. Use of language

12.1 Use clear, concise language and avoid metaphors & ambiguity

Guideline: Use clear, precise language and avoid metaphors & ambiguous terms

Description: 53.3% of survey respondents agree that it is difficult for them to understand when people do not say what they mean and when people use metaphors. Autistic users want information to be delivered in concise and "to the point" manner.

In users' words:

*"I would prefer the text to **actually say** the information than to allude to the information." P9*

*"The language is easy to understand, but the text uses **a lot of words to say little information**." P12*

*"I had to **keep reading over bits to try to understand** what it was saying. I wouldn't be able to tell you what the specifics are of what it is trying to convey. There was a lot of **vague language** in what was said, so I don't know if I understood it all." P6*

12. Use of language

12.2 Avoid jargon, abbreviations, acronyms, idioms & colloquialisms

Guideline: Avoid using specialist niche terminology or colloquial language on the site.
Use clear and concise language that is familiar to users

Description: Users struggle with understanding specialist terminology or colloquial language.

In users' words:

*"I wanted to apply for [...]. The application was full of **difficult words** I didn't understand. I asked my sister [to help with the application]." P10*

*"This video was a bit **difficult** for me especially when he started **talking about numbers**." P10*

"Cookies on a computer aren't the same as the ones you eat and it can be difficult for autistic people to understand the same word can be used in different ways and for different things." P2

13. Customisation

<mark>MED</mark> 13.1 Allow users to customise the website & make customisation clearly available

13. Customisation

13.1 Allow users to customise the website & make customisation clearly available

Guideline: Allow users to tailor their experience on the website to their needs & preferences. Essential customisation must include tools to change font type & size, text & background colours, an ability to turn off decorative graphics, an ability to turn off captions for video content. Available accessibility tools must be clearly visible & easy to use.

Description: Autistic web users must be able to tailor their web experience to their needs. While some users could change in-browser accessibility settings, others did not know where to look for accessibility tools.

In users' words:

*"The idea of being **able to control your own experience** is really good."* P1

*"I'd want sites in **my colours**."* P1

*"I wouldn't know **where to look** for them [accessibility settings]"* P9 & P10

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14. Sharing content

LOW 14.1 Allow users to share content via e-mail & platforms that they use

14. Sharing content

14.1 Allow users to share content via e-mail & platforms that they use

Guideline: Allow users to share content from the website via social media platforms that they use, and enable them to e-mail content to others and to themselves for 'slow' reading.

Description: Autistic web users wanted to be able to share content from websites on social media platforms that they used. Participants said they most often shared content on Facebook, Twitter & Instagram. Some participants wanted to be able to e-mail content to other people or to themselves to read 'later' in their time when they concentrate better.

In users' words:

*"Sometimes I find something on my phone and it's interesting but I can't concentrate at this moment. I'd normally **e-mail it to myself** and then, read it later, when I have time, when I can focus better, or I want to read it on a bigger screen. (...) I then read at my own slow pace." P10*

15. Re-learnability

HIGH 15.1 Communicate your plans about changes on the website clearly & in advance

15. Re-learnability

15.1 Communicate your plans about changes on the website clearly and in advance

Guideline: Announce any planned changes on your website in advance, inform the users about what is going to change and when the changes are going to be implemented.

Description: Change disorientates users. Users feel lost and frustrated when the websites that they like and use change frequently or unexpectedly. 32% of survey respondents do not learn new websites easily.

In users' words:

*"Facebook **keeps changing layout**, options, especially on the mobile app and so **I hate using it**."* P6

*"I like things that don't change. **I lost my bank app when they went to "Pride" month.**"* P17

16. User research

HIGH 16.1 Conduct user research to inform design decisions

16. User research

16.1 Conduct user research to inform design decisions

Guideline: Conduct research with autistic web users (including users with associated learning disabilities) to make sure updates to websites meet their needs & preferences

Description: Autistic web users feel disorientated when websites that they frequently use change and the information that was available on the site before the changes is not easy to find.

Conducting user research with autistic web users before and after re-design work will ensure that users are able to complete user journeys and accomplish core tasks on the site without needing to adapt it.

In users' words:

*"Web designers would need to **think more about how people use sites**, not just making it look good – finding pages, sensible navigation." P12*

Questions

Should you have any questions about these Guidelines
or the research behind them, please contact us at:

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Appendix i
Participants' profiles from user research

No.	Gender	Age group	Location: London (Y/N)	Autistic	Associated disability	Main device(s)
P1	F	25 - 30	N	Y	No	Smartphone
P2	F	19 - 24	N	Y	Dyslexia	Laptop
P3	M	19 - 24	N	Y	No	Smartphone
P4	M	16 - 18	N	AS	Hypermobility	PC & smartphone
P5	F	31 - 40	N	Y	Eye-tracking	Laptop & smartphone
P6	M	41 - 50	N	Y	No	Laptop & smartphone
P7	M	41 - 50	Y	Y	No	Laptop
P8	F	51 - 60	N	Y	No	Laptop & smartphone
P9	M	51 - 60	N	Y	No	Laptop
P10	F	51 - 60	Y	Y	Dyslexia	Laptop & tablet
P11	F	41 - 50	Y	Y	Yes	Smartphone
P12	F	31 - 40	N	Y	Dyslexia	PC & tablet
P13	F	31 - 40	N	Y	No	Smartphone
P14	M	51 - 60	Y	Y	Yes	Laptop & smartphone
P15	M	31 - 40	N	Y	ADHD	Laptop & smartphone
P16	F	31 - 40	N	Y	No	Laptop
P17	M	51 - 60	N	AS	Dyslexia	Smartphone

Appendix ii
List of sites used in the user research (August 2019)

1. www.gov.uk

2. www.gov.au

3. www.bbc.co.uk

4. www.autismsociety.com

5. www.Iplayer.co.uk

6. www.dailymail.co.uk

7. A news article in Daily mail

8. A news article in The Guardian

9. A news article on the BBC homepage

10. www.autscape.org

11. https://discordapp.com/

12. www.stanstedexpress.com

13. www.autism.org.uk