

# Visual Attention to AAC Displays with a Main Visual Scene Display and Navigation Bar for Individuals with and without Developmental Disabilities

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## Rationale

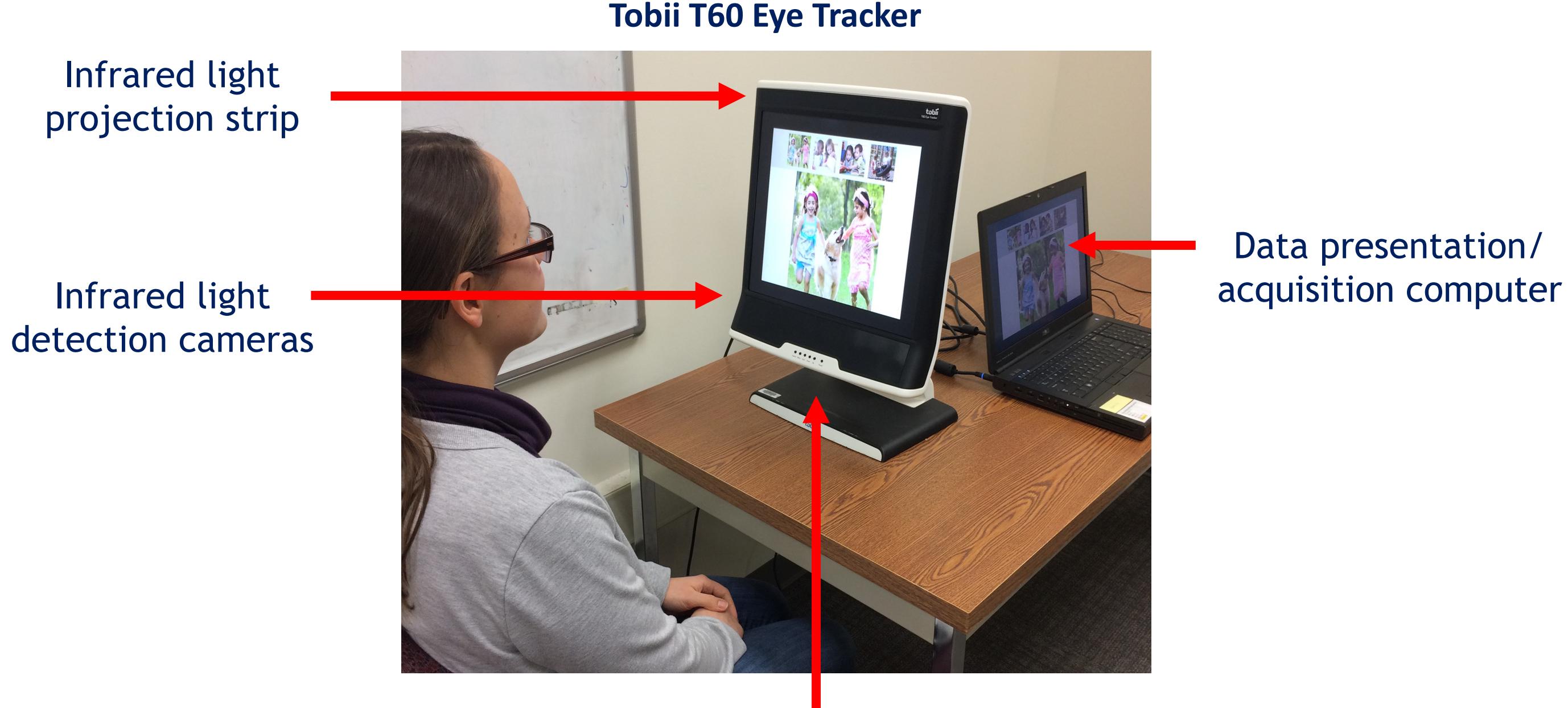
- Individuals who use augmentative and alternative communication (AAC) technologies must be able to attend to and extract visual information from displays
- Therefore, the design of AAC interfaces must be grounded in a theoretical understanding of visual cognitive processes
- A visual scene display (VSD) is one type of AAC display that depicts people engaged in activities within a photograph, with language concepts embedded as hotspots
- This investigation examined visual attention to AAC displays that included a main VSD and a navigation menu, in one of four locations (top, bottom, left, or right)

## Research Questions

- When the AAC display included both a main VSD and a navigation bar with thumbnail sized VSDs, what proportion of attention was allocated to those two areas?
- Within the main VSD, what proportion of attention was allocated to the children and the shared activity, compared to the background elements?
- Were gaze patterns to the meaningful elements of the display influenced by the location of the bar (i.e., top, bottom, left, or right)?

## Methods

**Tobii T60 Eye Tracker**



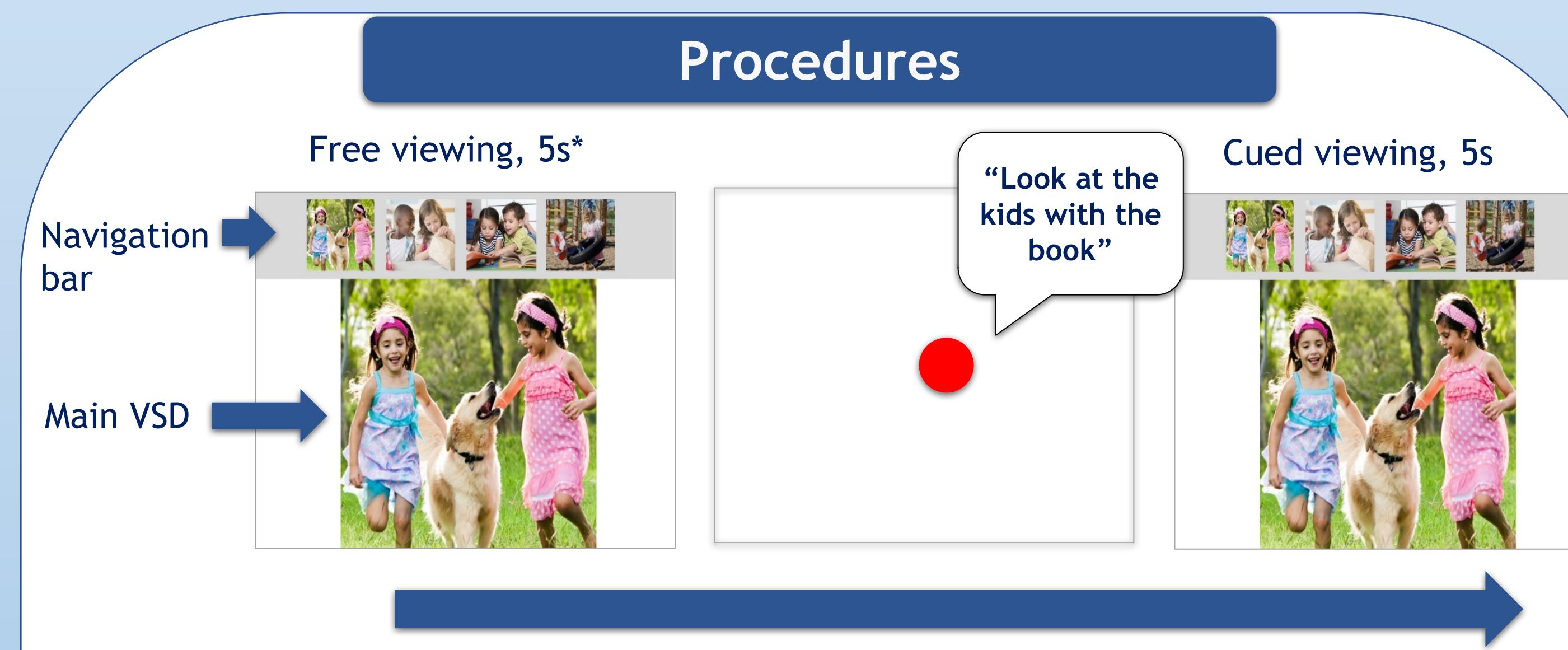
Infrared light projection strip  
Infrared light detection cameras  
Stimulus presentation monitor  
Data presentation/acquisition computer

## Participants

	TD (n=20)	DS (n= 13)	ASD (n= 13)	IDD (n= 9)
<b>Chronological age</b>	4.1 (0.7)	16.5 (6.1)	15.7 (3.4)	15.5 (4.4)
<b>PPVT standard score</b>	114 (14)	46 (14)	29.5 (18)	40 (20)
<b>PPVT age equivalent</b>	5.1 (1.5)	5.8 (2.0)	3.5 (1.9)	4.8 (1.8)

Note. Ages and age equivalents are represented in years. ASD= autism spectrum disorder, DS= Down syndrome, IDD= intellectual/developmental disability of other origin than DS or ASD, TD= typically developing

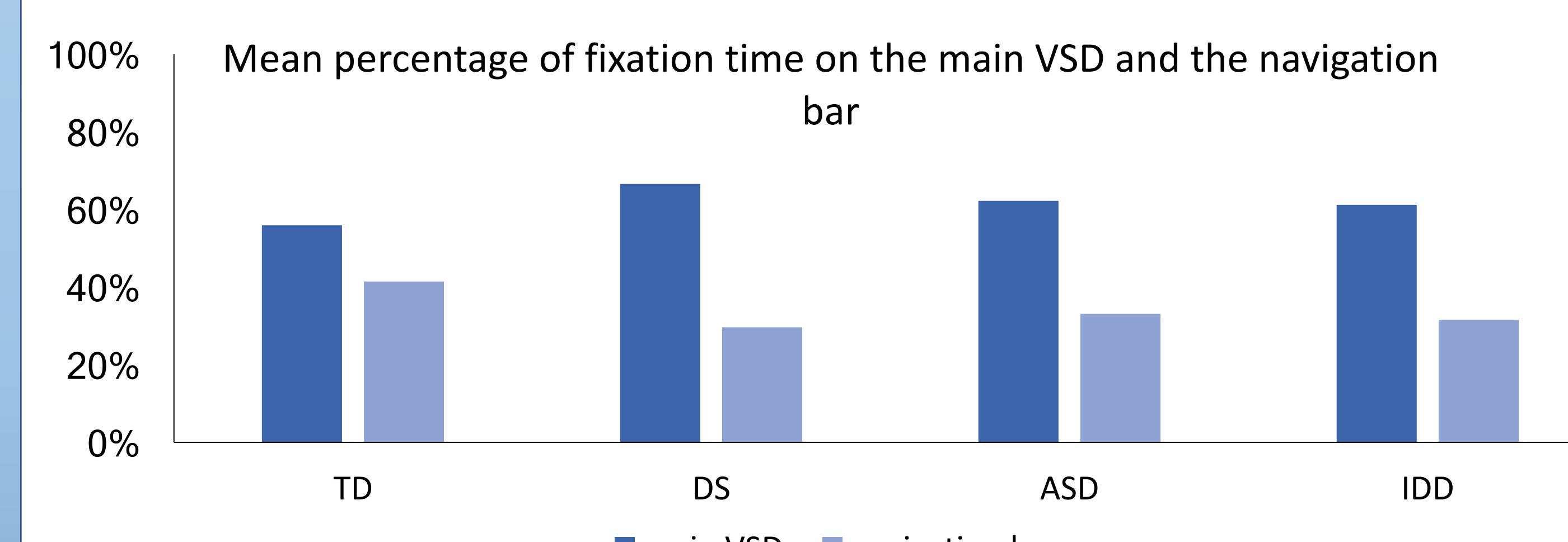
## Procedures



\*The free viewing phase is the focus of the analyses presented here.

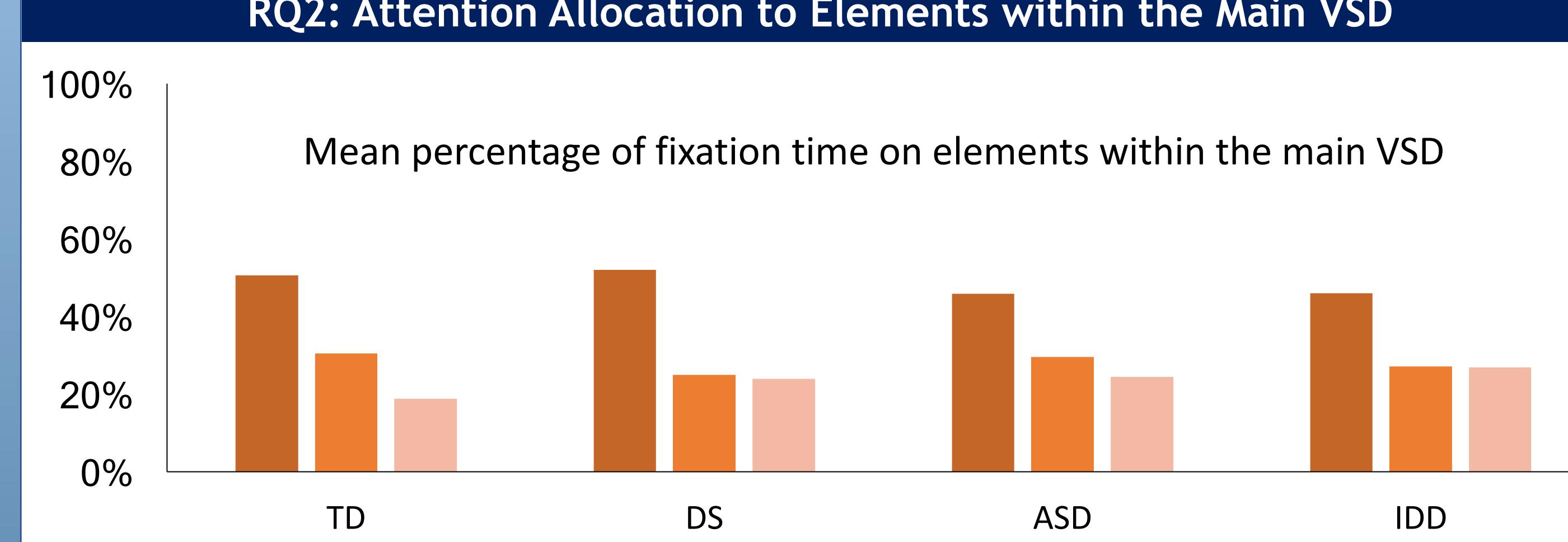
## Results

### RQ1: Attention Allocation to Main VSD and Navigation Bar



Group	Main VSD (%)	Navigation Bar (%)
TD	~65	~40
DS	~70	~30
ASD	~65	~35
IDD	~65	~30

### RQ2: Attention Allocation to Elements within the Main VSD



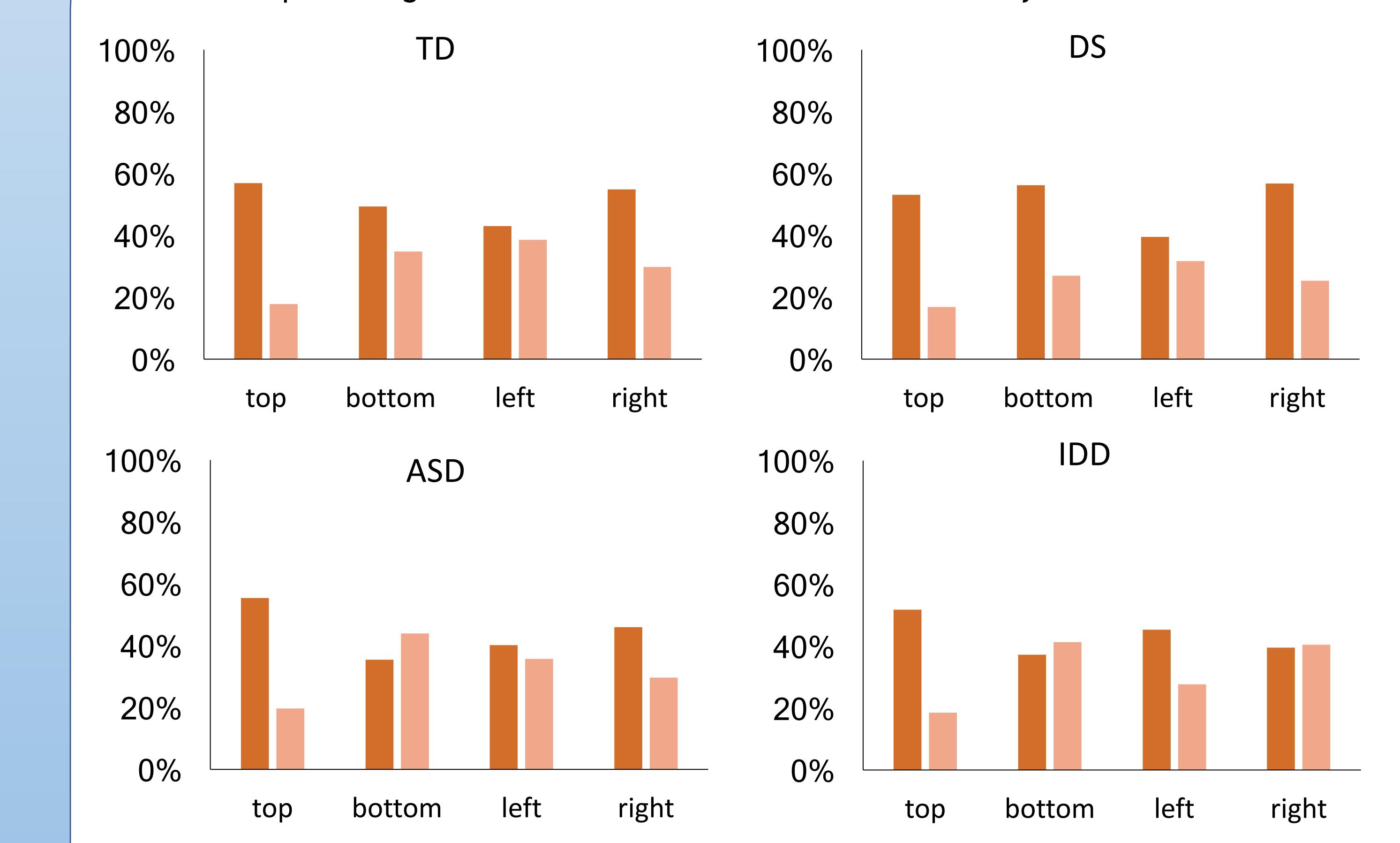
Group	Children (%)	Activity (%)	Background (%)
TD	~50	~30	~20
DS	~55	~25	~25
ASD	~50	~30	~25
IDD	~50	~25	~25



## Results

### RQ3: Influence of Bar Location on Gaze Patterns within the Main VSD

Mean percentage of fixation time on the children and activity within the main VSD



Group	Top (%)	Bottom (%)	Left (%)	Right (%)
TD	~55	~50	~45	~60
DS	~50	~55	~40	~35
ASD	~55	~40	~40	~45
IDD	~55	~40	~30	~40

## Discussion & Implications

- Participants across groups visually attended to both the main VSD and the navigation bar containing thumbnail sized images of VSDs, spending proportionally more time on the main VSD.
- Participants across groups attended to both the children and the shared activity within the VSD, with the children garnering the most attention across groups.
- Results suggested that the location of the navigation menu influenced visual attention to the elements within the main VSD (i.e., children and shared activity).
  - Participants generally spent more time on the shared activity in the bar bottom condition and more time on the children in the bar top condition.
- Human figures and a shared activity should be included as key elements within AAC VSDs.
- The location of the navigation menu within AAC displays is an important AAC system design factor that warrants future research and consideration.

## Acknowledgements

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