Did We Catch Your Eye? Using Eye Tracking to Inform Survey Design

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Eye Tracking

- Non-invasive technology to track and record eye movements
- Allows for qualitative and quantitative analysis of what users look at on a screen
- Common in human factors, usability, marketing
- Survey designers can use it to inform form and question design





Advantages of Eye Tracking

- Removes reliance on participant self-report
- Can directly observe where a participant looks and for how long
- Known patterns (e.g., reading vs. scanning) provide insight into how participants interact with the material
- Valuable in combination with other participant feedback



Eye Tracking Data

12 Date

- Captures each eye movement by time and coordinate
- If two movements are in the same location for more than a set threshold, identifies a 'fixation'
- Fixations then used for analysis and visualizations

16	17	1	-1024	-768	0.686	0.364	-1.000	-1.6	800	4	-1024	-768	0.391	0.375	-1.000	-1.000	4	
17	36	2	-1024	-768	-1.000	-1.000	-1.000	-1.6	666	4	-1024	-768	-1.000	-1.000	-1.000	-1.000	4	
18	56	3	-1024	-768	-1.000	-1.000	-1.000	-1.6	006	4	-1024	-768	-1.000	-1.000	-1.000	-1.000	4	
19	77	4	-1024	-768	0.685	0.365	-1.000	-1.6	666	4	-1024	-768	0.390	0.376	-1.000	-1.000	4	
20	97	5	716 613	0.683	0.367	637.570	5.529	0	726	571	0.389	0.379	642.266	4.890	0			
21	117	6	712 623	0.680	0.370	623.295	5,408	0	721	578	0.388	0.381	634.657	4.833	8			
22	137	7	845 738	0.680	0.370	623.295	5.354	0	835	702	0.387	0.381	634.657	4.753	0			
23	157	8	874 731	0.681	0.369	623.295	5.381	0	847	715	0.387	0.381	634.657	4.789	0			
24	176	9	876 730	0.681	0.369	623,295	5.491	0	839	724	0.387	0.380	634.657	4.801	0			
25	196	10	868 736	0.681	0.369	623.295	5.404	0	844	723	0.387	0.380	634.657	4.874	0			
26	216	11	868 733	0.682	0.369	623.720	5.452	0	840	723	0.388	0.380	634.513	4.904	0			
27	236	12	869 724	0.682	0.369	623.720	5.352	0	842	712	0.388	0.380	634.513	4.955	0			
28	256	13	868 744	0.683	0.369	623.720	5.357	0	843	716	0.389	0.381	634.513	4.908	0			
29	276	14	860 720	0.684	0.370	623.720	5.509	0	846	727	0.389	0.381	634.513	4.914	0			
30	296	15	856 732	0.684	0.370	623.720	5.406	0	836	746	0.390	0.381	634.513	5.001	0			
31			854 737		0.370	625.318	5.465	0	835	755	0.391	0.381	635.039	4.986	0			
32	336	17	840 741	0.686	0.371	625.318	5.521	0	805	748	0.392	0.381	635.039	5.115	0			
33	356	18	845 752	0.686	0.371	625.318	5.417	0	815	740	0.392	0.381	635.039	4.936	8			
34	376	19	844 752	0.687	0.371	625.318	5.415	0	809	739	0.393	0.381	635.039	4.994	0			
35	396	20	838 755	0.688	0.371	625.318	5.460	0			0.393	0.381	635.039	4.919	0			
36	416	21	841 755	0.688	0.370	627.653	5.422	0	812	718	0.394	0.381	636.796	4.946	0			
37	436		843 746		0.370	627.653	5.557	0	797	744	0.394	0.381	636.796	4.976	0			
38	456	23	832 744		0.370	627.653	5.521	0			0.394	0.380	636.796		0			
39	475				0.370	627.653	5,522	0	818	741	0.394	0.380	636.796	5.014	0			
40	495	25	832 749	0.688	0.370	627.653	5.654	0	803	738	0.394	0.381	636.796	4.943	0			
41	515	26	825 749	0.688	0.370	625.994	5.630	0	807	739	0.394	0.381	636.477	4.976	0			
42	535	27	841 766	0.688	0.370	625.994	5.633	0	812	739	0.393	0.381	636.477	5.005	8			

Figure 7. Exported gaze file from Tobii Studio.

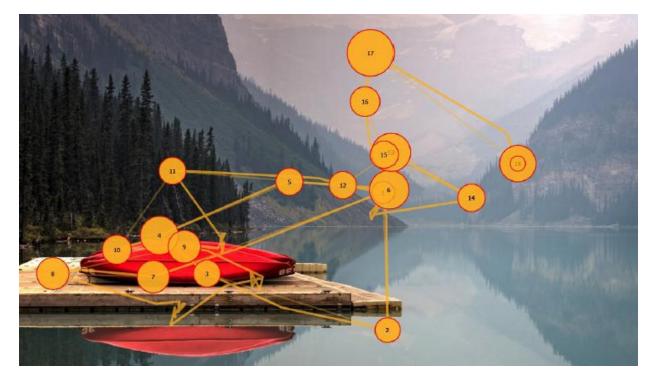
Source:

http://www.psychology.nottingham.ac.uk/staff/wvh/eou/Eyetracker%20Output%20Utility%20Manual.pdf



Eye Tracking Metrics: Fixations & Gaze Plots

- Track fixation order and duration in gaze plots
- Longer fixations (illustrated by bigger circles) and/or more fixations show more time spent in that area

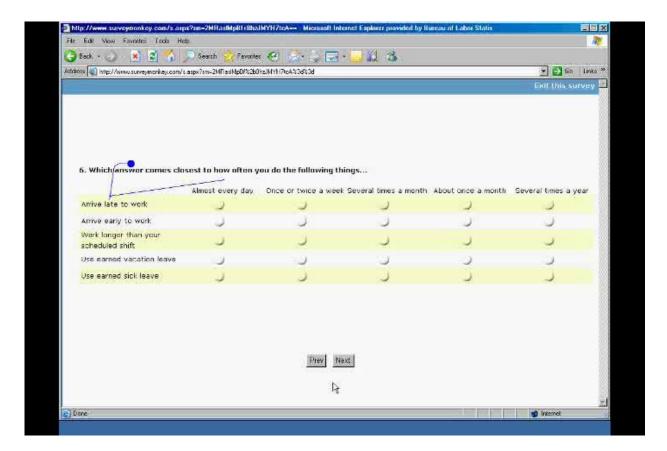


Source: https://imotions.com/blog/7-terms-metrics-eye-tracking/



Gaze Replay

Replay session with the eye tracking results overlaid on the content



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Areas of Interest (AOI)

- Define the target areas and the analyze software will calculate the amount of time spent (total & fixating) in that area
- Useful for analyzing how much time was spent on specific features (e.g., instructions or help screens)
- Can also show the order in which participants looked at AOIs

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Areas of Interest (AOI): Limitation

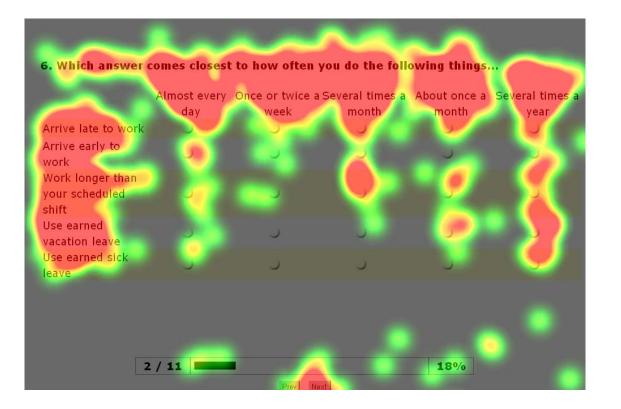
- Have to be careful about overlapping or adjacent AOIs
- While calibration ensures the participants' eye movements are tracked in generally the right area, there is always some error (sometimes these errors are systematic)
- Designing layouts to allow for separated AOIs is ideal but not always practical

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Heat Maps

- Visualization of the gaze points
- Indicates amount of time fixated in a given area
- Powerful illustration of what the participant did and did not look at





Eye Tracking Limitations







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