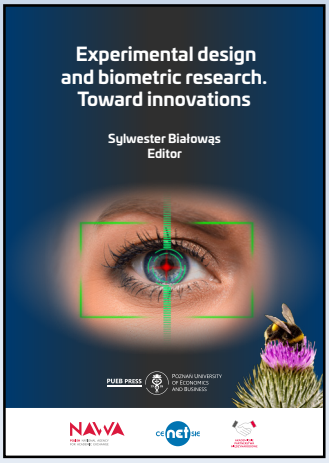

Experimental design and biometric research. Toward innovations

Sylwester Białowąs
Editor

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eISBN 978-83-8211-079-1

https://doi.org/10.18559/978-83-8211-079-1

PUEB PRESS
POZNAŃ UNIVERSITY
OF ECONOMICS
AND BUSINESS

Experimental design and biometric research. Toward innovations, pp. 39-60
https://doi.org/10.18559/978-83-8211-079-1/ll1

1.

EYE-TRACKING RESEARCH

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Abstract: Eye movements provide information on subconscious reactions in response to stimuli and are a reflection of attention and focus. With regard to visual activity, four types of eye movements—fixations, saccades, smooth pursuits and blinks—can be distinguished. Fixations—the number and distribution, total fixation time or average fixation duration are among the most common measures. The capabilities of this research method also allow the determination of scanpaths that track gaze on the image as well as heat- and focus maps, which visually represent points of gaze focus. A key concept in eye-tracking that allows for more in-depth analysis is areas of interest (AOI)—measures can then be taken for selected parts of the visual stimulus. On the other hand, the area of gaze outside the scope of analysis is called white space. The software allows for comparisons of static and non-static stimuli and provides a choice of template, dataset, metrics or data format.

In conducting eye-tracking research, proper calibration is crucial, which means that the participant's gaze should be adjusted to the internal model of the eye-tracking software. In addition, attention should be paid to such aspects as time and spatial control. The exposure time for each participant should be identical. The testing space should be well-lit and at a comfortable temperature.

Keywords: areas of interest, calibration, eye-tracking, visual attention.

1.1. Eye-tracking—what it is and how it works

Neuromarketing methods may help obtain a deeper understanding of consumer cognitive processes such as attention and perception. This, of course, enables marketing activities to be addressed in the most efficient manner possible. The subconscious responses to stimuli can be measured using neuromarketing techniques, providing insight into decision-making processes, customer preferences and motivations. One of the most widely used methods of this type is eye-tracking. In recent years, there has been a notable rise in the popularity of using this technique because it offers useful knowledge on how stimuli are processed visually. The need to learn more about the relationship between the brain and the visual system prompted the need to monitor eye movements (Białowąs & Szyszka, 2019; Schall & Bergstrom, 2014).

The eye-tracking system, which tracks the movement of the subject's eyeballs, allows for a thorough examination of the subject's vision direction, as well as the path of attention. As a result, it is possible to isolate the focus areas of the participant's vision, providing an overview of what the subject finds interesting or what has drawn attention. Thanks to this type of information, the researcher may examine how an individual perceives the viewed content (Białowąs & Szyszka, 2019; Duchowski, 2007).

The subject of scientific inquiry has long been how the brain responds to stimuli. Eye-tracking allows to learn more about how the human visual system functions and how the mind works while being exposed to visual content (Schall & Bergstrom, 2014). According to some theories, both attention and eye movements are mediated by the same neural pathways. This means that shifts in attention rely on the stimulation of brain structures involved in eye movement (Hoffman & Subramaniam, 1995).

Eye-tracking is a set of research techniques and methods used to measure, analyse and interpret data on:

- the position and movement of eyeballs (Rojna, 2003);
- where the subject's eyesight falls at a given moment;
- how long the eyesight focuses on a particular point;
- what path it follows (Schall & Bergstrom, 2014);
- pupil size (Bojko, 2013).

Louis E. Javal recorded eye movements using an apparatus mounted on the patient's eye surface in one of the first experiments regarding this field of the 19th century (Wawer & Pakuła, 2012). Eye-tracking has been used in a variety of areas of research, including psychology, medicine, ergonomics and marketing research as well (Białowąs & Szyszka, 2019; Wąsikowska, 2016).

The visual activity consists of four event types:

- fixations—brief pauses in the movement of the eye when the retina stabilizes at a particular point in the field of vision. It means that fixations occur when

the gaze is maintained on a single location. Fixations (visual intake) range in length from 150 to 600 ms (account for 90% of the looking time). They involve the tiniest eye movements such as tremor, drift or microsaccades. As part of visual activity, fixation is a measure of location which reflects the position of the eyes captured in a given time. However, even though the fixation is registered, it does not imply that the subject processed the picture (Duchowski, 2007; Schall & Bergstrom, 2014);

- saccades—rapid eye movements that occur between fixations when the sight shifts from one location to another. Saccades are thought to be an effect of an intention to voluntary change in attention. The duration of saccades is from 10 to 100 ms. Saccades occur when an individual searches different parts of the visual field in a sequential manner. They are not in the main focus of attention research because the visual information is not processed;
- smooth pursuits—movements that allow to track moving objects (Duchowski, 2007);
- blinks.

1.2. What can be examined using eye-tracking

For fixations and saccades, a variety of indicators can be measured.

Fixation measurement indicators include:

- the number and distribution of fixations (which could represent the individual's engagement with the stimuli);
- total fixation time in a specific area and the fixation time per unit area of the visual object (Bylinskii & Borkin, 2015);
- first fixation duration and time to the first fixation (which help determine how long it takes the consumer to recognise a specific element);
- average fixation duration (calculated as the total time divided by the number of fixations);
- revisits—they are observed when the gaze returns to the location where the fixation previously occurred (Garczarek-Bąk & Disterheft, 2018; Tullis & Albert, 2013);
- diversity of fixations—the number of points for which the fixation was observed;
- inter-element fixations—the number of instances when fixations are attributed to various elements (Bylinskii & Borkin, 2015);
- dwell time—the total time of all fixations and saccades (Garczarek-Bąk & Disterheft, 2018).

Saccade measurement indicators include:

- number of saccades;
- saccade duration.

Furthermore, there are measurements of both fixation and saccades as well as some combinations of these eye movements, such as scanpath and heat map.

The order of guiding sight for each space is reflected in the scanpath. Also, it aids the identification of places where the focus is diverted away from the message's vital material during the study. Circles reflect specific points that the subject looks at, with numbers showing the order of perception and lines representing the movement of sight from one point to the next. The following are some of the most commonly used measurements based on the scanpath:

- scanpath length;
- spatial density;
- transition matrix;
- scanpath regularity;
- scanpath direction (Borys & Plechawska-Wójcik, 2017).

The heat map helps participants see which areas earned the most attention and which were missed. Warm colours are used to indicate areas of longer concentration, while cool-toned colours are used to indicate areas of shorter concentration. The items that the subject does not look at, on the other hand, are not coloured. The heat map may also be shown as inverted, displaying the areas of the presented content where the subject focused his or her gaze. Areas of interest, which provide details about the degree to which a given image drew the subject's attention, are another way to view the effects of measuring eye movements (Garczarek-Bąk, 2016; Wąsikowska, 2016).

1.3. How eye-tracking research is prepared

Eye-tracker

An eye-tracker is a device that allows the researcher to get a precise representation and interpretation of how the eyes move. The corneal reflection method is used by most modern eye-trackers to track the location and movements of the eye. This method is based on the use of infrared light sources guided into the eye, accompanied by high-resolution camera reflection. The camera captures an image that can be used. An eye-tracker is a tool that enables obtaining an accurate representation and understanding of eye motion. Most modern eye-trackers follow the position and movements of the eye using the corneal reflection method. The technique is based on the use of light sources (infrared) directed into the eye, followed by a reflection from a camera with high resolution. The image is used to locate the source of light reflection on the cornea, allowing the direction of the subject's sight to be located (Garczarek-Bąk, 2016; Schall & Bergstrom, 2014). In the analysis of visual activity, while using the eye tracker, three main attributes can be distinguished, i.e. the location, duration and movement.

Equipment

1. Smart Recorder—a SmartPhone (based on Samsung Galaxy Note 4) with iViewETG 2.1 Mobile software that is used to create and run experiments.
2. Eye-Tracking Glasses—a mobile eye-tracking device which captures a participant's eye movements. It uses two small cameras on the bottom rim of the glasses and infra-red filtering lenses. The device enables registration of the eye's movements from different distances as well as outdoor (*BeGaze Manual. Version 3.7*, 2017).

   To start the gear, connect part 1 and 2, then power on the recorder.

Figure 1. Eye-tracking equipment

Source: Own elaboration.

Participants

The number of participants included in the study depends on the method of data analysis. For the heat map, the desired number of participants is 39. In qualitative research, it is enough to have at least 6 participants (Pernice & Nielsen, 2009).

The sample should be large enough to maximise the statistical power of analysis and not include too many participants due to study tractability (Duchowski, 2017).

When recruiting people for an eye-tracking study, general information needs to be gathered about the eyes and sight. We should know whether the participant is wearing contact lenses or eyeglasses and/or has any issues with the eyes (e.g. cataracts). The sample should include the participants of the target audience. For

instance, selecting only students for the study may not enable generalisation of the results (Duchowski, 2017).

Before proceeding with the study, participants should be warned that it will take place using technology that tracks eye movements—but the researcher must be careful not to reveal too many details about the procedure, as this may have a negative effect on the obtained results (Pernice & Nielsen, 2009).

1.4. Visual activity testing rules

Conducting the experiment

When carrying out a test using an eye tracker, it is worth remembering a few fundamental principles that will ensure reliability of the obtained results. It must be borne in mind that the exposure time needs to be controlled for each participant—it should be made equal for all the subjects. Furthermore, when controlling the exposure duration is not possible, the solution may be to express the dwell time in percentages instead of absolute values—depending on its duration, other eye movements and other amounts of time spent on watching each element are observed. Time control should only take place when the participant is involved in the study—the time that the respondent spends reporting his/her experience should not be recorded. During the test, the subjects' eye movements should be monitored in real-time, and they should be observed for correct posture. The use of a trigger—the point on which the participants focus their attention at the beginning of the experiment—should be considered. This allows control of the place from which all subjects begin the experiment (Tullis & Albert, 2013).

Space

It is worth remembering that the results obtained through registering eye movements depend on the environment in which the test is performed. When planning an experiment related to tracking the subjects' eyesight, it is worth considering the context in which it is conducted. For example, instead of using an eye tracker in a store space, for reasons of cost and flexibility, researchers decide to use projectors to create a virtual environment. It is worth bearing in mind that the most realistic environment is a real, physical store—the results of the test may be different depending on whether the eye movement is measured in a natural or artificial environment. In the study by Tonkin, Ouzts and Duchowski (2011), it was proved that visual search is faster in a physical environment compared to virtual image—although the perceived difference may not be significant. In turn, if the test is carried out in laboratory conditions, proper lighting should be ensured in the room in which it takes place. It is not recommended to conduct the test in very bright rooms—too much light may affect the device for recording eye movements (Pernice & Nielsen, 2009).

1.5. Before the experiment (proper usage of the equipment, calibration, recording)

Proper usage of the equipment

The glasses should be properly set by adjusting the strip. The position of the glasses should be stable, and the participant is not allowed to change the position of the glasses during the experiment. After turning on the device, the range of the participant's view and the dot showing where the participant is looking at can be seen.

The proper positioning of the glasses is indicated by a green dot on the screen of the recorder (1). If the colour of the dot is not green (yellow or red), the position of the glasses has to be adjusted.

Figure 2. Positioning of the glasses

Source: Own elaboration.

After turning the device on, in the panel on the right, click on the 'NEW EXPERIMENT' button.

After that, you will be asked to name your experiment.

In the next step, a new participant can be added to the experiment. It should be ensured that the participant is added to the experiment. New experiments for new participants of the existing experiment are not to be created. Each new participant should be recorded separately (added as a new participant).

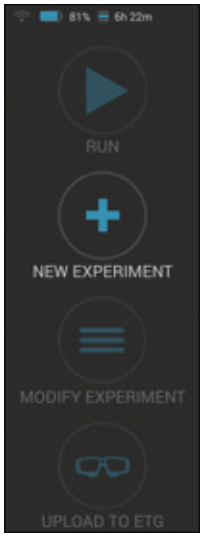


Figure 3. Creating a new experiment on the device

Source: Own elaboration.

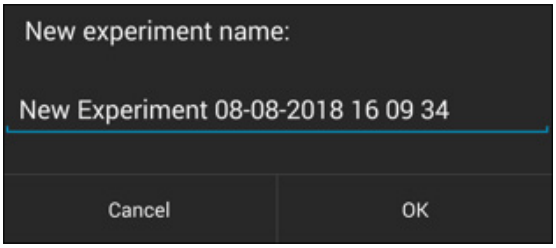


Figure 4. Naming the experiment

Source: Own elaboration.

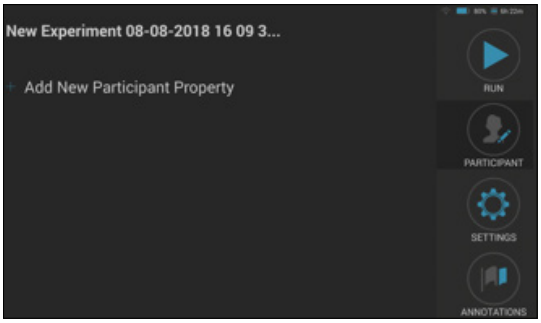


Figure 5. Adding a new participant—part 1

Source: Own elaboration.

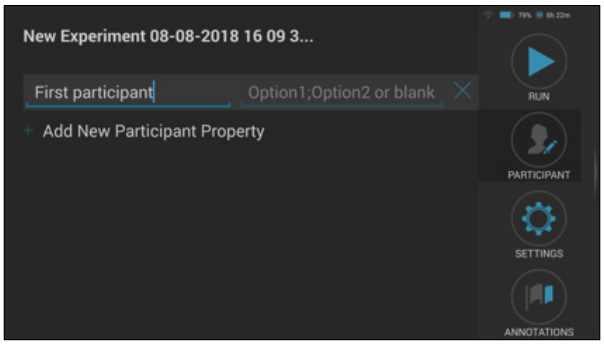


Figure 6. Adding a new participant—part 2

Source: Own elaboration.

Calibration

Calibration enables adjustment of the participant's gaze to the internal model of the eye-tracking software. It is a crucial step in conducting eye-tracking analysis because it helps in precisely tracking the movement of participant's eyes during the experiment (*BeGaze Manual. Version 3.7*, 2017).

In order to calibrate, the CALIBRATE icon on the right panel is to be selected. Before the calibration, the calibration type needs to be chosen (for 1 or 3 points). In this case, calibration will be presented with one point (landmark) that is marked as X.

Calibration should be arranged in the environment similar to real experimental conditions (position of the participant and distance from the object). It must be noted that the calibration should not be conducted with the visible scene of the planned experiment that could bias the experiment results. One or three landmarks (area that we can easily assess the gaze point) are required.

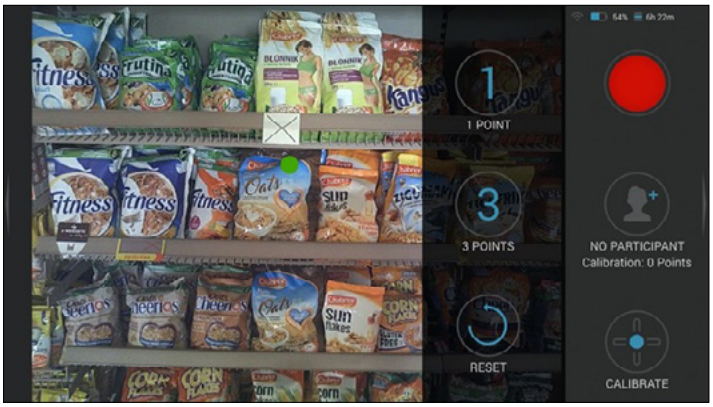


Figure 7. Calibration—step 1

Source: Own elaboration.

On the right panel, the instructions for calibration can be seen. The participant should look at the landmark (X). While the participant confirms gazing at the landmark, even if the dot is not exactly in the place of the landmark, the researcher should tap the screen of the recorder, freezing the image.

Figure 8. Calibration—step 2

Source: Own elaboration.

If the green dot is not exactly on the landmark, the researcher should move the '+' cursor to the landmark, using the touch-screen of the recorder.

Figure 9. Calibration—step 3

Source: Own elaboration.

After positioning the '+' cursor on the landmark, the researcher should click the 'ACCEPT' button.

Figure 10. Calibration—step 4

Source: Own elaboration.

After calibration, it needs to be checked if the position of the dot shows exactly the point at which the participant is looking.

Recording

In order to prevent losing the proper settings, immediately after calibration, the experiment should be conducted. The glasses may not be touched, moved or repositioned.

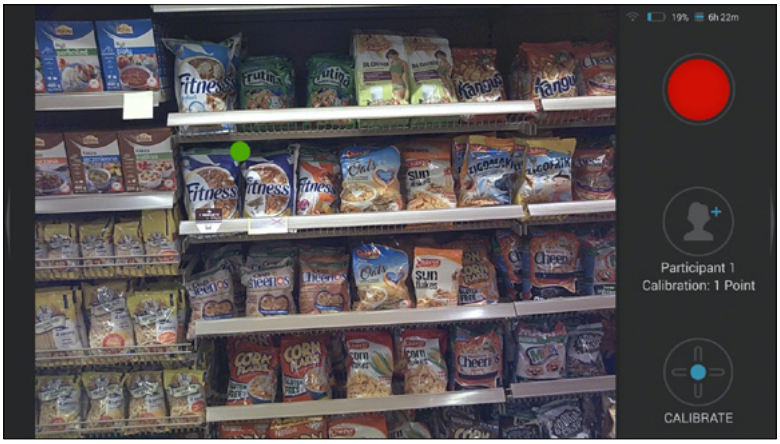


Figure 11. Recording

Source: Own elaboration.

To start the experiment, you should click the 'RED BUTTON' on the right panel (circle-shaped button turns into squared-shaped button, which confirms recording).

It must be remembered to record the whole exposition to the stimulus (full time of the experiment). Recording can be started a few seconds before beginning the experiment.

To end the recording, please click on the same 'RED BUTTON' (squared-shaped button turns into a circle-shaped button, which confirms the end of recording).

Data transfer

After recording chosen participants, the data can be exported to the computer with the BeGaze software. Connect the device to the USB port of the computer. It will appear as a mobile device. You will find the experiment folder in: Card-SMI-A.

Copy the folder of your experiment and save it to the hard drive.

Creating a new experiment in the software

1. Open BeGaze software.
2. Path: File – New experiment from folder – Choose saved folder.

1.6. Data preparation (adding reference image, adjusting gaze points, adding areas of interests, dividing videos, groups)

Preparing experiment analysis

The whole analysis will be conducted on the reference view showing the full visible range of the experiment and allows to set the position of all the fixations. The reference view may be the screenshot from the recorded experiment or a separate image (as in the following example).

1. Adding reference view and selecting fixations for the chosen stimulus. (Path: Change mode – Semantic gaze maping – Confirming it as the default option).
2. Open 'Semantic Gaze Mapping' by clicking on the icon indicated by a red arrow. In order to add a reference view from the folder, click on the icon shown by a green arrow.

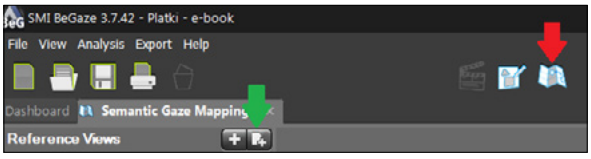


Figure 12. Semantic Gaze Mapping

Source: Own elaboration.

The reference view will be displayed on the left panel. On the right panel, there is a recording of the chosen participant with all the fixations. The allocation of fixations should be conducted for each participant separately. In order to choose the participant, the 'CHANGE STIMULUS' button must be clicked.

The exact length of the experiment can be adjusted by right clicking on the film stripe and setting the starting and ending position of the chosen stimulus.

The first fixation is visible in the right window (displayed as a circle). Please, find and click corresponding position on the reference view. Then, the next fixation will appear in the right window. Please, allocate the fixation to the reference view and repeat the procedure until the final fixation. The allocations are automatically saved and the next participant can be chosen.

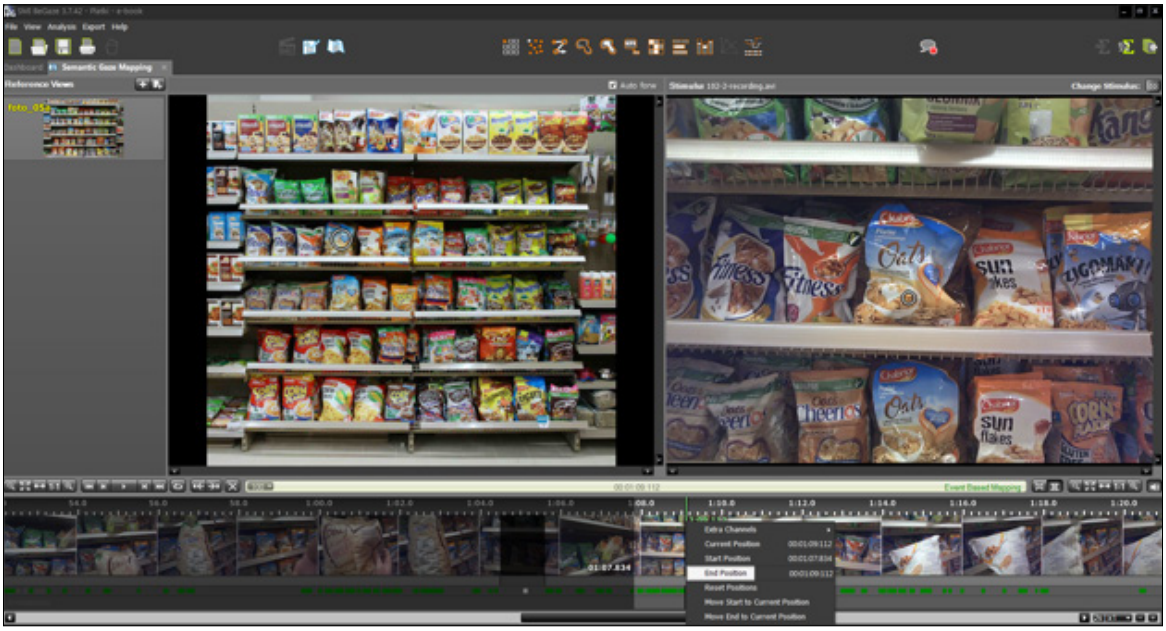


Figure 13. Detecting the fixations

Source: Own elaboration.

Creating AOI

The main analyses are conducted calculating the events within the areas of interest (AOI). Any number of AOI can be set, and results for the chosen areas may be obtained. To set the AOI, the area of our interest can be drawn covering the selected object (e.g. one product, group of products, face, logo, part of logo).

In order to define the AOI for the selected object(s), please click on the 'AOI Editor' indicated by a red arrow.

In the following example, the object is the upper shelf. Please note that on the following screen, AOI has been defined in the rectangle shape. In the AOI toolbar, there are other possible shapes such as those ellipsoidal or polygonal. We can create more AOIs, e.g. the lowest shelf, group of products or even a single product.

If the AOI needs to be deleted, please click on the 'X' in the toolbar (*BeGaze Manual. Version 3.7*, 2017).

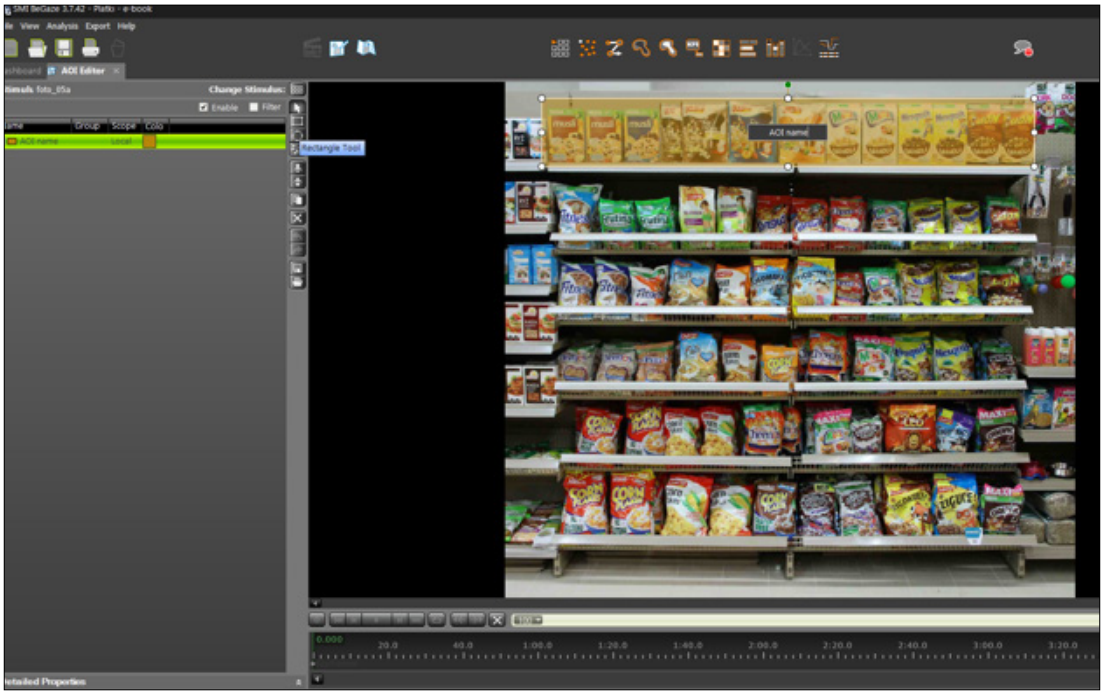


Figure 14. Creating AOI

Source: Own elaboration.

1.7. Analysis using default charts

Bee Swarm shows gaze positions on the reference image (as circles) for selected participant(s) in a given moment. For example, 10 participants have been chosen and their gaze position at the moment of 1:12:771 was checked. Four circles, colour-corresponding to the chosen participants, can be observed. The other six had no gaze positions recorded at that moment.

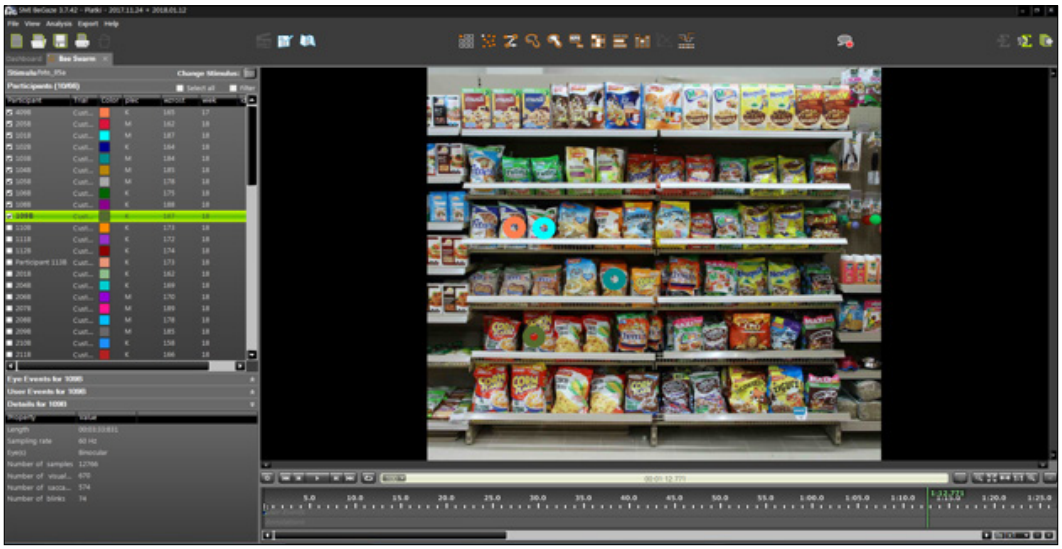


Figure 15. Bee Swarm

Source: Own elaboration.

Scan path shows gaze tracking on the reference image (circles connected by lines) for the selected participant(s). In this example, the scan path for one participant can be seen (matching the colours is the same as in Bee Swarm).

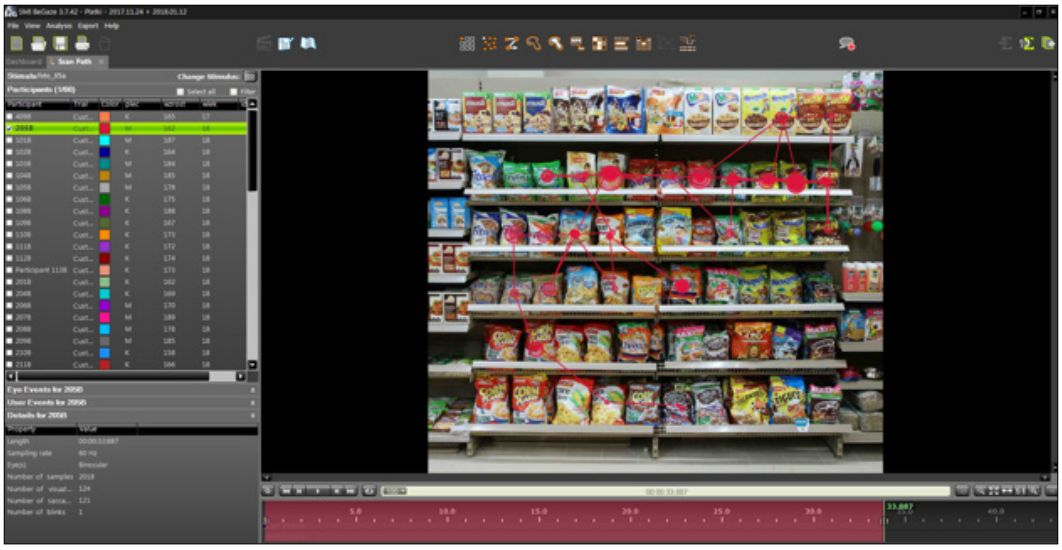


Figure 16. Scan path

Source: Own elaboration.

Heat map allows us to visualise the attention level (number of fixations) of chosen participant(s) by using corresponding colours. From green (lower attention), through yellow (medium attention) to red (higher attention).

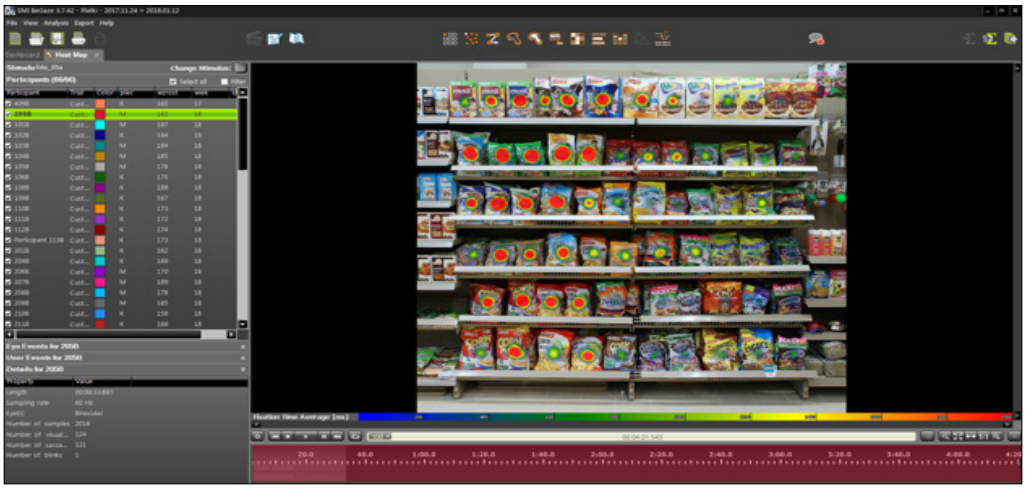


Figure 17. Heat map

Source: Own elaboration.

The focus map is somehow an inversed heat map. It allows to visualise the level of attention by showing the places receiving more fixations.

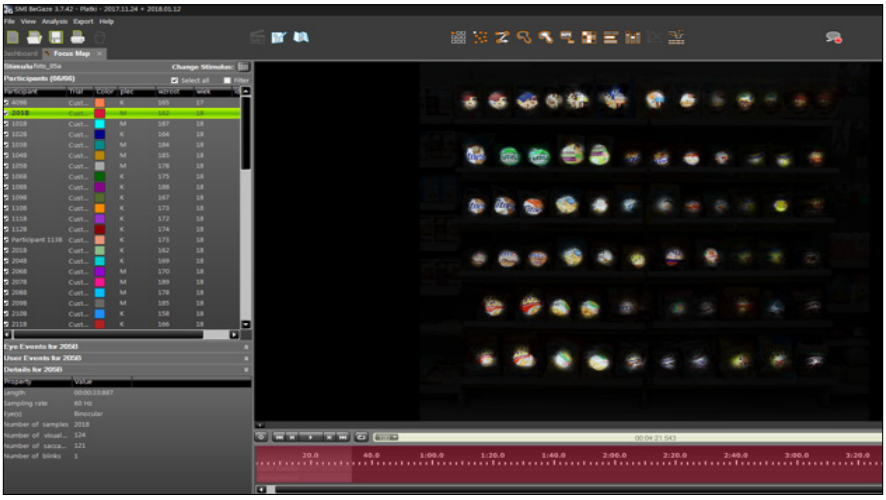


Figure 18. Focus map

Source: Own elaboration.

Key Performance Indicators display the set of the indicators for each AOI of the chosen participant(s). The area that is not covered by the AOI is called White Space, and all the events outside the AOI are summarised in White Space.

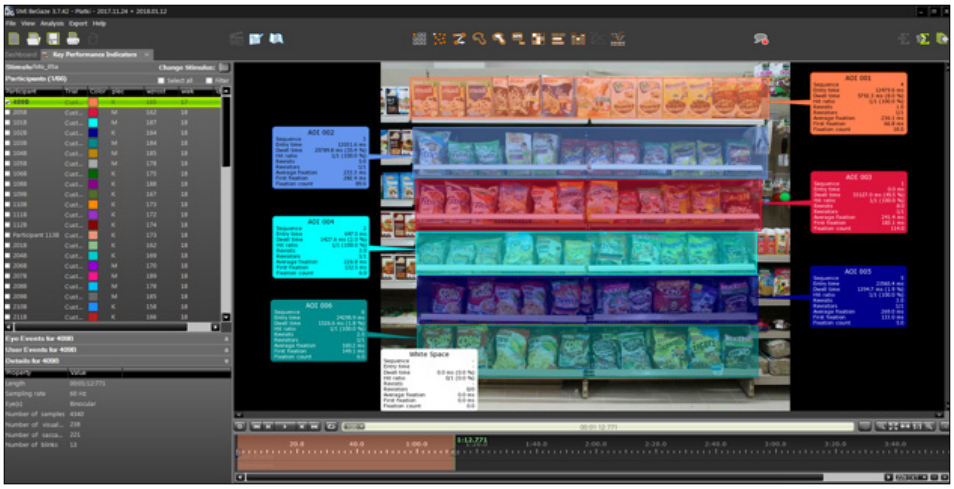


Figure 19. Key Performance Indicators

Source: Own elaboration.

Gridded AOI are default ones proposed by the software as regular squares in the reference image. The Gridded AOI gaze patterns and parameters are visualised by altering the colour of a square based on the level of received attention.

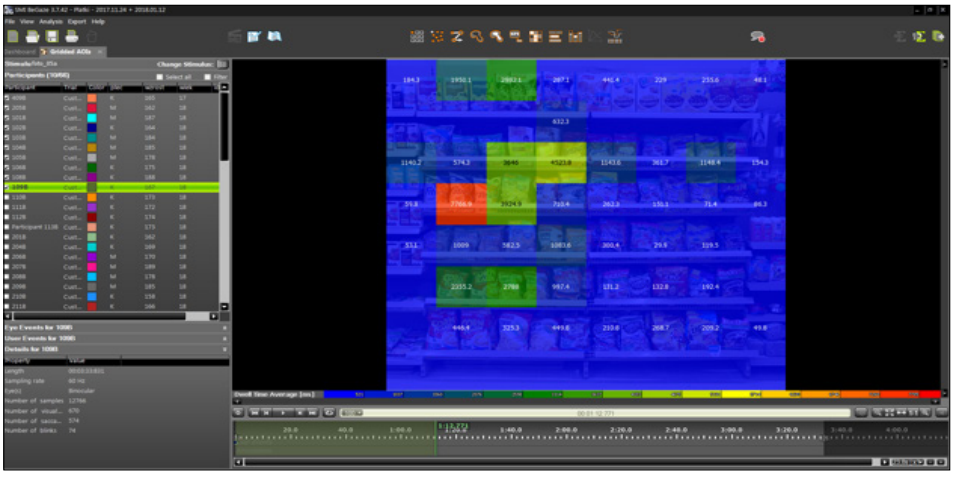


Figure 20. Gridded AOI

Source: Own elaboration.

The AOI Sequence Chart shows the temporal order in which AOI were hit by chosen participant(s). In this example, participant 409B focused gaze for the first 12 000 ms on the red AOI, then onto the blue AOI, and shifted gaze to the orange AOI (for about 5 000 ms), etc.

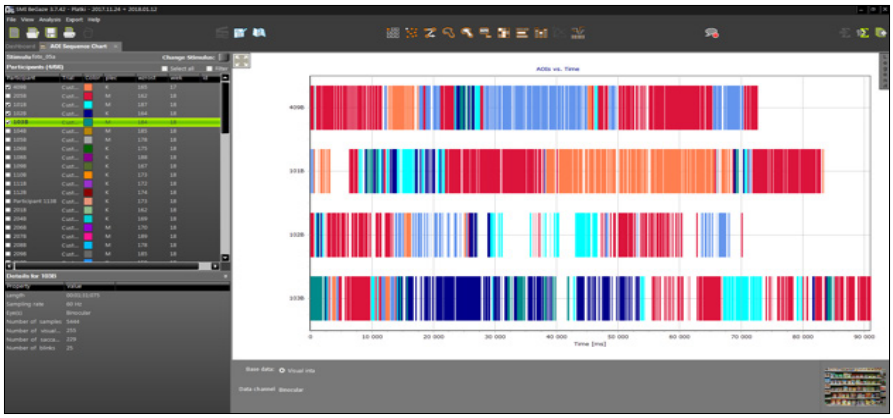


Figure 21. AOI Sequence Chart

Source: Own elaboration.

The Binning Chart shows percentages of AOI dwell time in every time unit.

A value of 100% means that for the whole time of the time bin, for all selected trials, one more AOI was always hit. The time unit of the bins can be adjusted using the 'Bins integration time [ms]' option. In this example, participant 409B in the first second focused gaze for 14% of the time on the blue AOI, for 65% on the red AOI and for 21%, beyond the drawn AOI (White Space).

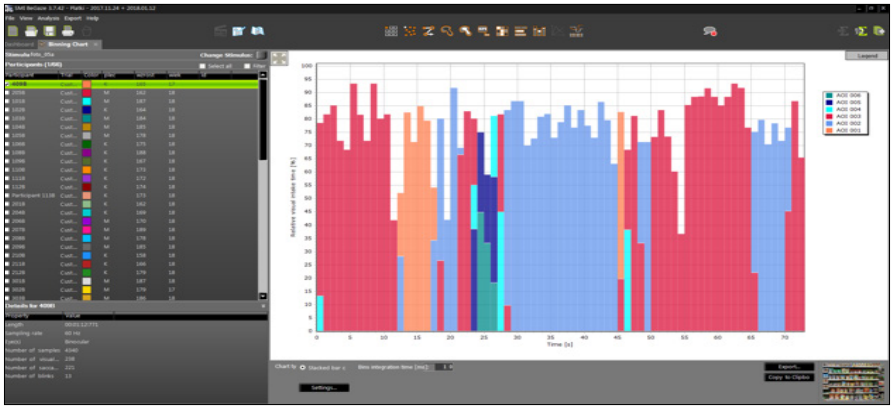


Figure 22. Binning Chart

Source: Own elaboration.

The Line Graph shows a variety of indicators.

In the Line Graph main view, the following gaze data are visualised over the timeline:

- Gaze parameters: the Y-axis on the left displays the gaze position in the stimulus (x- and y-direction) as well as angular velocity and acceleration of the eye.
- Pupil diameter: the Y-axis on the right displays the pupil diameter.
- Time [ms]: the X-axis at the bottom displays fixations, saccades, blinking and user events.

The exact measurements for a chosen time (shown as a red line on time axis) are displayed in the table below. In this example, the diameter increased approximately 28 000 ms, which may indicate higher attention of the participant.

In the presented instance, the diameter of the right pupil with the corresponding events were explored.

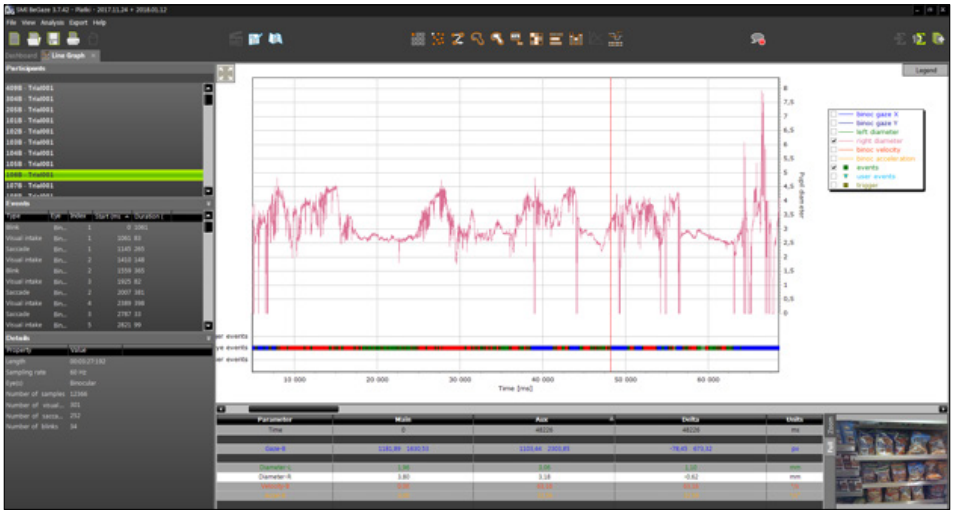


Figure 23. Line Graph

Source: Own elaboration.

1.8. Exporting data for advanced analysis

For more advance analysis, the gathered data regarding the experiment can be downloaded. There is a variety of export settings—template, dataset, metrics or data format can be chosen. It is demonstrated how to export a useful set of data, including the indicators for every fixation in each AOI.

Path: Export – Metrics Export

Select Template – AOI Statistics – Single (fixations only)

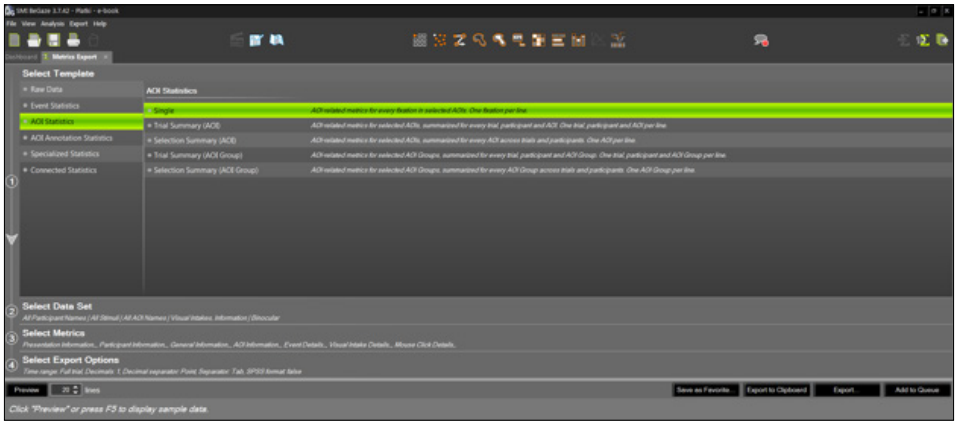
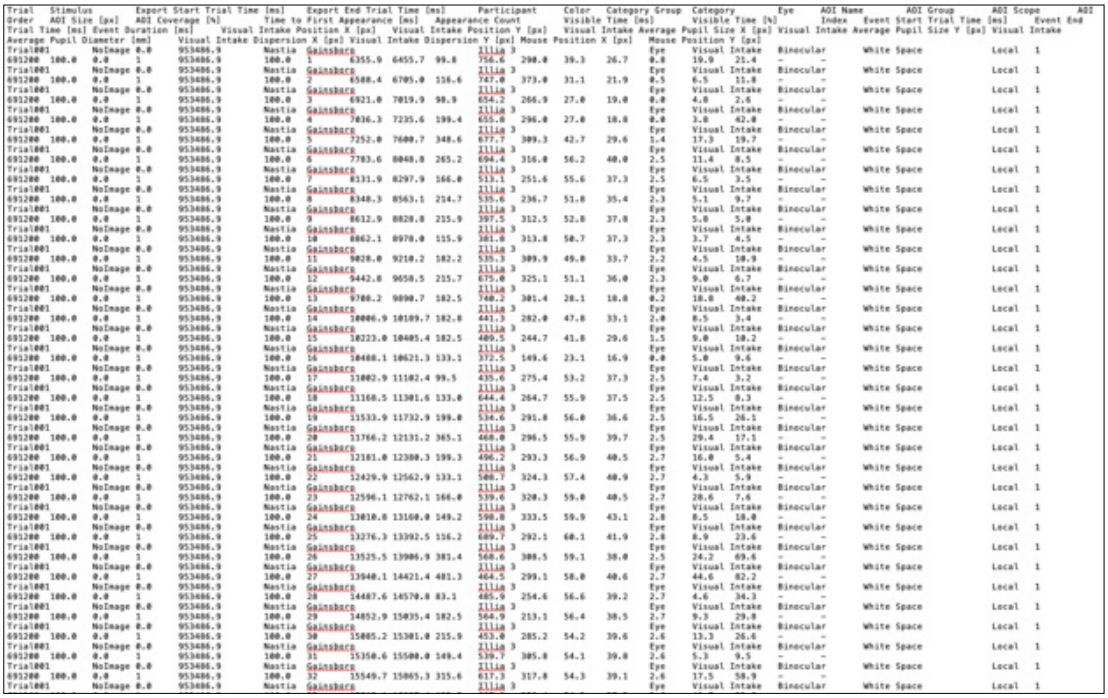


Figure 24. Metrics Export

Source: Own elaboration.

Data are in a .txt format (see Figure 25). Then it can be read in other applications such as Excel or SPSS (Figure 26 and Figure 27).



Trial Order	Stimulus	AOI Size [px]	Export Start Trial Time [ms]	Export End Trial Time [ms]	Participant	Color	Category Group	Category	Eye	AOI Name	AOI Group	AOI Scope	AOI Event End
Trial Time [ms]	Event Duration [ms]	AOI Coverage [%]	Time to First Appearance [ms]	Appearance Count	Visible Time [ms]	Visible Time [%]	Index	Event Start Trial Time [ms]					
Average Pupil Diameter [mm]	Visual Intake Position X [px]	Visual Intake Position Y [px]	Visual Intake Average Pupil Size X [px]	Visual Intake Average Pupil Size Y [px]	Visual Intake Dispersion X [px]	Visual Intake Dispersion Y [px]	Mouse Position X [px]	Mouse Position Y [px]					
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 1	6355.9 6455.7 99.8	756.6 290.0	39.3 26.7	0.0	19.9 21.4	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 2	6588.4 6705.0 116.6	747.0 373.0	33.1 21.9	0.5	6.5 11.8	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 3	6921.0 7019.9 98.9	654.2 266.9	27.0 19.0	0.0	4.8 2.6	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 4	7036.3 7235.6 199.4	655.8 296.0	27.0 18.0	0.0	3.8 42.0	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 5	7252.0 7600.7 348.6	677.7 309.3	42.7 29.6	1.5	1.4 17.3	19.7 - -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 6	7783.6 8048.8 265.2	694.4 316.0	56.2 40.0	2.5	11.4 8.5	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 7	8131.9 8297.9 166.0	513.1 251.6	55.6 37.3	2.5	6.5 3.5	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 8	8348.3 8563.1 214.7	535.6 236.7	51.8 35.4	2.3	5.1 9.7	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 9	8612.9 8828.8 215.9	397.5 312.5	52.8 37.8	2.3	5.8 5.0	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 10	8862.1 8978.0 115.9	381.8 313.8	50.7 37.3	2.3	3.7 4.5	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 11	9028.0 9210.2 182.2	535.3 309.9	49.0 33.7	2.2	4.5 10.9	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 12	9442.8 9650.5 215.7	675.0 325.1	51.1 36.0	2.3	5.0 6.7	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 13	9780.2 9890.7 182.5	740.2 301.4	28.1 18.8	0.2	18.8 40.2	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 14	10046.9 10189.7 182.8	441.3 282.0	47.8 33.1	2.0	8.5 3.4	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 15	10223.0 10405.4 182.5	489.5 244.7	41.8 29.6	1.5	9.0 10.2	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 16	10488.1 10621.3 133.1	372.5 149.6	23.1 16.9	0.0	5.0 9.6	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 17	11002.9 11102.4 99.5	435.6 275.4	53.2 37.3	2.5	7.4 3.2	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 18	11168.5 11301.6 133.0	644.4 264.7	55.9 37.5	2.5	12.5 8.3	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 19	11533.9 11732.9 199.0	536.6 291.8	56.0 36.6	2.5	16.5 26.1	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 20	11766.2 12131.2 365.1	468.0 296.5	55.9 39.7	2.5	29.4 17.1	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 21	12181.0 12380.3 199.3	496.2 293.3	56.9 40.5	2.7	16.0 5.4	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 22	12429.9 12562.9 133.1	580.2 324.3	57.4 40.9	2.7	4.3 5.8	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 23	12596.1 12762.1 166.0	539.6 320.3	59.0 40.5	2.7	28.6 7.6	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 24	13010.0 13160.0 149.2	590.8 333.5	59.9 43.1	2.8	8.5 18.0	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 25	13276.3 13392.5 116.2	689.7 292.1	60.1 41.9	2.8	8.9 23.6	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 26	13525.5 13906.9 381.4	568.6 388.5	59.1 38.0	2.5	24.2 69.6	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 27	13940.1 14421.4 481.3	464.5 299.1	58.0 40.6	2.7	44.6 82.2	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 28	14487.6 14570.8 83.1	485.9 254.6	56.6 39.2	2.7	4.6 34.3	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 29	14852.9 15035.4 182.5	564.9 213.1	56.4 38.5	2.7	9.3 29.8	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 30	15085.2 15301.0 215.9	453.0 285.2	54.2 39.6	2.6	13.3 26.6	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 31	15350.6 15500.0 149.4	539.7 305.8	54.1 39.8	2.6	5.3 9.5	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1
691200 100.0	0.0 1	953486.9	100.0 32	15549.7 15865.3 315.6	617.3 317.8	54.3 39.1	2.6	17.5 58.9	- -				
Trial001	NoImage 0.0	953486.9	Nastia Gainsbarre		Illia 3				Eye	Visual Intake	Binocular	White Space	Local 1

Figure 25. Data in .txt format

Source: Own elaboration.

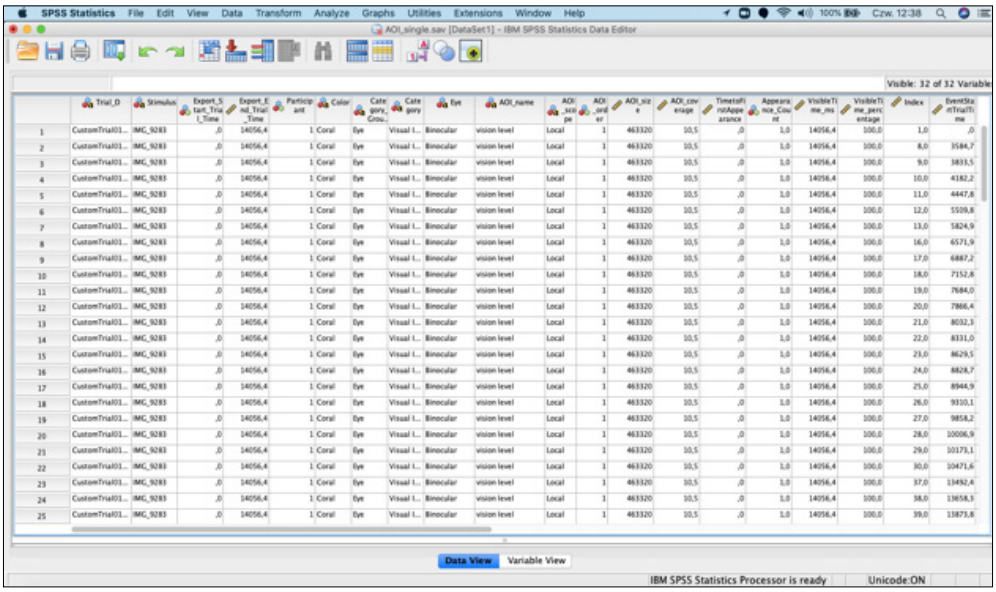


Figure 26. Data in SPSS—part 1

Source: Own elaboration.

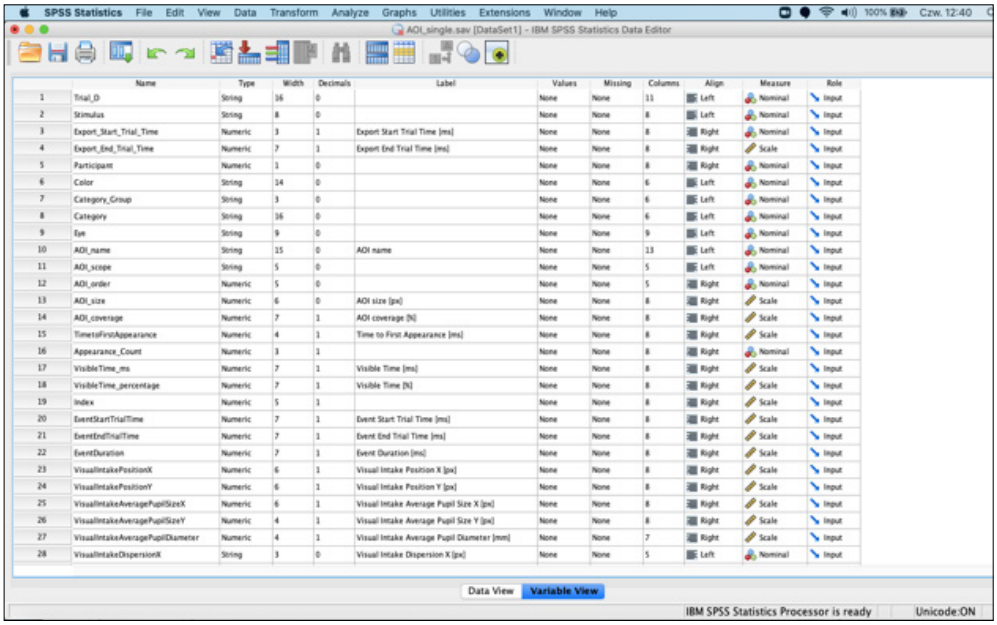


Figure 27. Data in SPSS—part 2

Source: Own elaboration.

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