

Commentary: Using Electroencephalography Measurements and High-quality Video Recording for Analyzing Visual Perception of Media Content

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Media perception is commonly analyzed in different research areas such as communication sciences, psychology, and sociology. In the past few years, scientists have started using neuroscience for analyzing the perception of media content. In this regard, we think that the use of a neuroscientific tool, electroencephalography, when combined with a high-quality video recording of participants' faces, can give a good insight into viewers' brain activity and even eye-blink behavior while viewers watch media content.

According to previous studies, eye blinks have physiological^{1,2} and psychological^{3,4} functions, and can be analyzed as attentional markers⁴⁻⁶. While protecting the cornea from mechanical and chemical threats and wetting it, eye blinks hide visual contents for 150-400 ms^{7,8}; however viewers of media content do not report having lost that information. Although viewers somehow have the cognitive impression that they still see what they are looking at, this is impossible because the pupil is covered by the lids for the mentioned period of time. We are so used to blinking that it seems not to have an important role in the perception of media content, and yet it has. For example, viewers' eye-blink rate depends on their media experience and on the style of edition of the audiovisual content^{9,10}.

In a recent article¹¹, we proposed the use of a dual protocol for detecting eye blinks, with the aim of analyzing viewers' visual perception of media content. The dual protocol consisted in monitoring the electroencephalographic/electromyographic (EEG/EMG) activity of participants and recording their visual behavior with an HD video system while they were watching media stimuli. With a rigorous system where presentation of video content is synchronized with the EEG/EMG device used for recording brain activity and with the HD video camera, we can obtain viewers' eye blinks at the specific moments when they took place. With a detailed list, data analysis can be done using professional statistical tools.

The basic steps to be accomplished are as follows:

1. The creation and presentation of visual stimuli. Stimuli should be designed, created, and presented according to the specific interest of the investigation. They are going to control the variables of analysis, so special attention should be paid to this step.

2. Selection of participants. As in many investigations, making two or more groups of analysis can bring out differences between populations.
3. Set-up preparation. Since this is a dual protocol, the preparation of the session has to be focused on managing the acquisition of both data acquisition system proposed. A correct management of both data sources will make a triangulation of results possible.
4. Data acquisition. As mentioned, each system used for acquiring data (EEG and HD video) should be synchronized and properly connected to the following steps.
5. Post-experimental session. After each session of EEG/EMG, specific cleaning protocols have to be carried out with regard to both participant and recording devices.
6. Data analysis. After carefully analyzing data from both sources—EEG/EMG and HD video—a final list of each participant's eye blinks should be obtained. A proper statistical analysis should be performed, depending on the variables used.

The explained protocol¹¹ allows researchers to study viewers' perception of media content without asking their opinion or thoughts. The purpose is to determine differences in eye-blink rates of viewers watching media content. Eye blinks can be treated as markers of levels of attention, and although no specific questionnaire or interview is necessary, it is always desirable to complete results from as many sources as possible. The paper entitled "Using Electroencephalography Measurements and High-quality Video Recording for Analyzing Visual Perception of Media Content" includes an explanatory video with the following chapters:

1. Title, with a brief introduction to the eye blink, the proposed technique, and the media content studies.
2. Set-up design, with a practical demonstration of how to prepare an experimental session.
3. Analysis of collected data, including the statistical approach.
4. Representative examples of collected results.
5. Conclusions.

The advantage of using EEG/EMG analysis for detecting eye blinks is the high temporal resolution (of the order of milliseconds) and the possibility of, in necessary cases, adjusting the algorithm to automatically detect

participants' eye blinks. The advantage of using a dual protocol is to match results from the EEG acquired data: recording viewers' faces with an HD video camera allows researchers to manually count blinks and contrast results. Thus, we double-check each eyeblink. As a result of using both systems, a very accurate matrix is obtained, on which posterior statistical analysis can easily be performed.

With the use of EEG/EMG procedures, we also have access to analyzing brain activity at different frequencies during the watching of media content. The main advantage of this method is to have a highly synchronized response of the electrical brain activity to the presentation of the selected stimuli.

Conflict of interest statement

The authors declare that no competing interests exist.

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