

Estimating physiological arousal with pupil size and skin conductance
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In the fields of behavioural and psychological research, pupil size and skin conductance are two variables that provide useful information about a participant's state of mind at a given moment. Both variables are involuntary indicators of psychophysiological responses such as alertness, arousal, or focus. Pupil size is commonly measured with a video-based eye tracker, and skin conductance is measured using data collection systems for psychophysiological responses. One difference between the two variables is that changes in pupil size in response to external stimuli are relatively fast (300 ms), while those in skin are considerably slower. In fact, skin conductance responses to external stimuli have a latency of two to three seconds and the response itself has a duration of several seconds as well.

Since pupil size and skin conductance are similar in their interpretation but at the same time two radically different kinds of variables, we used a series of parallel measurements of these two signals to investigate how they are related. In this series, participants are exposed to visual (images, words) as well as auditory stimuli (sounds) while both their skin conductance and their pupil size are being co-registered. The systems used for the measurements are the BioPac MP150 with a GSR100C component for skin conductance and a Tobii Pro Spectrum for pupil size.

We will present the experimental setup for this data collection, the challenges it posed, the stimuli we used, and, naturally, the results of the measurements. We will conclude with a discussion of the implications of the findings, which hopefully are useful for researchers who want to measure these variables in future studies.