

Event-related Psychophysiology

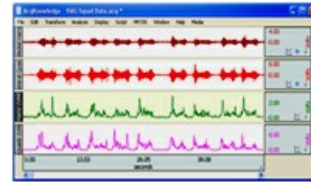
Electrodermal activity (EDA) is the umbrella term used for defining autonomic changes in the electrical conductance of the skin.

The EDA complex includes both background tonic (skin conductance level: SCL) and rapid phasic components (Skin Conductance Responses: SCRs) that result from sympathetic neuronal activity. EDA is arguably the most useful index of changes in sympathetic arousal that are tractable to emotional and cognitive states as it is the only autonomic psychophysiological variable that is not contaminated by parasympathetic activity. EDA has been closely linked to autonomic emotional and cognitive processing. This coupling between cognitive states, arousal, emotion and attention enables EDA to be examined as an objective index of cognitive processing in emotional states. Examining EDA can also inform implicit emotional responses that may occur without conscious awareness or are beyond cognitive intent (i.e., threat, salience, novelty).

Recent research has shown that EDA is also a useful indicator of attentional processing per-se, where salient stimuli and resource demanding tasks evoke increased EDA responses. Investigations of EDA have also been used to illuminate wider areas of enquiry such as emotional-processing and arousal in; psychopathological disorders, personality disorders, psychoses, conditioning, and neuropsychology.

Recent improvements in technology, hardware, software and developments in methodology / analyses have led to the emergence of a new, more precise and improved form of event-related psychophysiology. New protocols for measuring a host of factors (i.e., electrodermal activity and skin conductance responses / facial EMG) have also been developed. The net impact of these improvements has led to a resurgence of interest in event-related psychophysiology and with integrating such measures to modern brain-imaging methods.

In our lab we are principally interested in psychophysiological factors associated with emotional processing, increased anxiety and arousal. Examples include (though are not restricted to) Electrodermal activity (EDA), facial electromyography (fEMG), and body-temperature.



Advances in research on Electrodermal activity

Improvements in analogue-to-digital conversion have led to improved signal quality for research on electrodermal activity (EDA). The existence of increased sample rates and low noise have facilitated greater utility to research on EDA as well improvements in automated computer signal analysis routines. Complex algorithms developed from modern brain-imaging are now being applied to improve the temporal precision of SCRs and help delineate SCRs that occur in close temporal proximity under faster stimuli presentation conditions (i.e., convolution / deconvolution methods).

All of these advances mean that recruiting EDA / SCR methods can greatly inform and extend our current understanding of brain function and the processing of emotional / aversive stimuli in way manner that many other methods cannot do.