Session 1 – Introduction

Recommended schedule:

1) **Introduction meeting (*approx. 1 hour)***
   - discuss the research aims, experiment
   - discuss goals for learning and expected outcomes
   - outline sessions and structure of training
   - if applicable – trainee takes part in a related experiment as a participant to gain initial hands-on knowledge of the procedure.

Introduction

- Introductions – discuss the desired research including aims, experimental design and expected outcomes
- Research aims / goals for learning
- Outline sessions and structure of placement

Why use Psychophysiology (EDA) measures?

- Reliable, inexpensive, and non-invasive
- Not contaminated by parasympathetic activity, i.e., rest state
- Provides a true reflection of sympathetic neuronal arousal
- EDA provides an objective measure of psychological processing and emotional states
- Can examine implicit emotional responses that may occur without the individual's conscious awareness or beyond cognitive intent (i.e., threat or anticipation).

Brief introduction to EDA/SCRs:

- Electrodermal Activity (EDA) complex used for defining autonomic changes in the electrical properties of the skin
- Driven by the Sympathetic Nervous System of the Autonomic Nervous System (like the fight or flight state). It is linked to emotional and cognitive states
- Conductance measured by passing a small electrical charge (potential) between two electrodes / two contact points of the skin.
- With increased psychological arousal e.g., strong emotion / startling event, the skin (sweat glands) becomes a slightly better conductor of electricity (passing current), hence an increase in psychological arousal and EDA.
- Units are in Microsiemens (μS) or Micromho (μΩ) = equivalent

The EDA complex includes:

1. Skin conductance responses (SCRs) – which are the rapid '*phasic*' components
   - They are the most widely studied property of the EDA.
   - Faster changing elements of the signal (usually as a reaction to presented stimuli or a change in the environment)

- An SCR is a significant deviation that crosses a threshold from the background signal (the tonic signal, see point 2). This threshold is set by the experimenter, but it's typically between 0.01µS- 0.05µS microsiemens.
- These SCRs can be called stimulus specific (or event-related [ERSCR]) = i.e., those that occur as a reaction to stimuli
- Or non-specific SCRs (NSSCR) = i.e., those that occur in the absence of any stimuli.

2. Skin conductance level (SCL) – which is the background '*tonic*' level
- The individuals' overall level of arousal / EDA
- Slow climbing, constantly moving and variable across individuals
- Some difficulties in measuring this (most don't!). You can obtain SCL values or for the entire signal, or at certain time points e.g., during a baseline / control condition, or some look at the values or frequency or NSSCRs as an indicator.

Other important definitions:

- Delta / Amplitude / Peak / SCR = this is the main SCR value most commonly reported. It is the size or value of the SCR. Typically measured from the start of the peak – i.e., when it crosses a certain threshold – to the highest / maximum point. In AcqKnowledge this is from the open bracket "(" to the centre of the water droplet – i.e., the middle of the peak.
- Latency = the value (in seconds) after a stimulus presentation to the start of the peak SCR (i.e., to the open bracket). Typically, an SCR is classified as stimulus-specific, or tied to an event if the latency period is 1-3 secs after stimulus onset (i.e., from stimulus onset to the start of the open bracket).
- Delta T / Rise Time = duration (in milliseconds / seconds) from the start of the SCR to the maximum / peak (i.e., open bracket to the water droplet)
- Size SCR = this is the value at the peak / water droplet. However, note this also includes the background tonic level too.

Experimental set up

- Depends on research aims!
- Stimuli: e.g., visually irritating or aversive, emotional, or something like the rubber hand illusion.
- Hardware: Biopac unit MP36R, EDA amplifier module, LEAD110A leads and EL507 electrodes.
- Software: Acqknowledge 4.1
- If you accidentally open Acqknowledge before switching unit on – warning message. Cancel and start again. Don't click 'Do not show this message again'
- First, open a new graph window and set up your preferences:
  - Analysis → Electrodermal activity → Preferences
  - Channels = i.e., what you're measuring / the amplifier modules used, e.g., EDA or EEG etc.
  - Acquisition and sampling rates depend on research aims / experiment and the equipment. Prior recommendations used to be in 200-400Hz range (minimum), more recently, with newer technologies a sample between 1000-2000Hz a second is common.

    - Set SCR threshold level (.05 or .01 are common)
- Save this as a 'template' (.gtl) file.
- Important: if you have saved the template file correctly, when you press 'start' in AcqKnowledge, it should first ask you for a name to save the signal as a new (participant) file, which is a .acq file. If not, you will override the template file (same signal) each time you test someone.