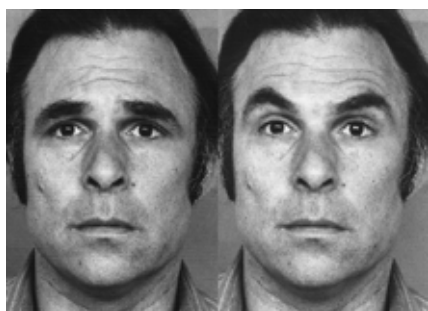


Facial expressions are behaviors which are very difficult to measure objectively. Ekman and Friesen [1] have developed the Facial Action Coding System for exactly this purpose. The FACS is based on action units, roughly to be interpreted as the smallest visible units of muscular activity in the face, which produce changes in the facial appearance. By concentrating completely on muscular activity and relinquish from interpretation, the FACS produces a purely descriptive account of facial expressions. Therefore, the FACS is one of the most widely used and comprehensive coding systems for facial expression analysis.



Example of person with activated action unit 1 (left) and unit 2 (right). Copyright [1]

Extensive research shows that certain combinations of action units are linked to the six 'universal' facial patterns of the emotions anger, disgust, fear, sadness, surprise, and happiness [1]. Interpretation of the reported activated units, however, isn't covered in the FACS, but in separate systems, such as EMFACS [2] or FACS-AID [3]. These are methods for objectively scoring and interpreting emotional or affective expressions.

MANAGE THE FACS

With The Observer® XT it is possible to manage the whole FACS or parts of it, allowing comprehensive coding when needed. There are dozens of muscles in the face. These are represented in the FACS (version 2002) with 44 action units of facial muscles, and 14 action units of muscles in the head (of the eye and neck for instance). Since the activation of one action unit can co-exist with as many as ten other units, the coding scheme can become very large: more than seven thousand combinations of action units have been identified [4]. Use The Observer XT

to manage such a large coding scheme. Working with The Observer XT will save you valuable time and energy.

COLLECT YOUR DATA

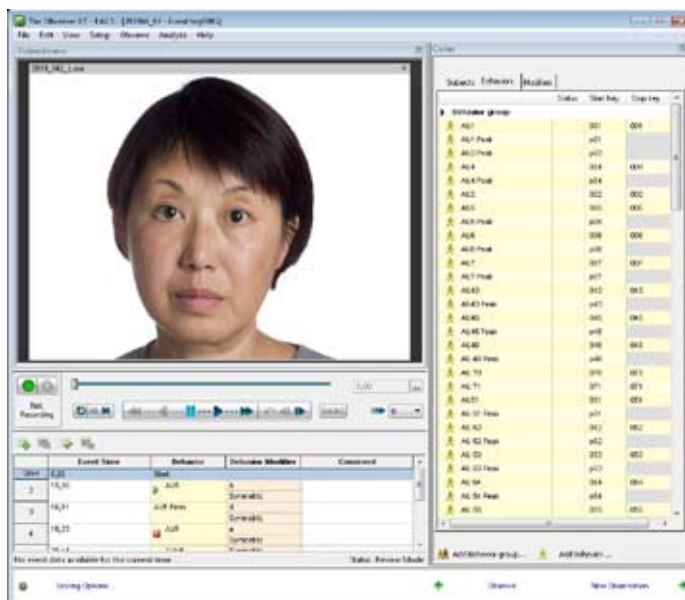
To start your data collection, connect the video camera and other equipment to a computer that runs The Observer XT. In general, the FACS-coding scheme will be set up next; elements regarding other behavior and events can be included directly or added later.

Set up a coding scheme

All relevant behaviors and modifiers are specified in a coding scheme before or during observing. Behaviors within the framework of the FACS are the activation of one or more action units. Behavioral classes don't need to be mutually exclusive, thus allowing you to record the activation of all action units as start-stop behaviors for exact time references. This will enable you to score all activated action units at the same time as 'on' or 'off'. Modifiers describe additional features of behavior, such as the five steps of activation intensity and possible symmetry of activation across the face. This will help you to answer research questions about subjective experience.

Code behaviors and log comments

You can code your observations by means of self-defined keystrokes or mouse clicks, which are automatically

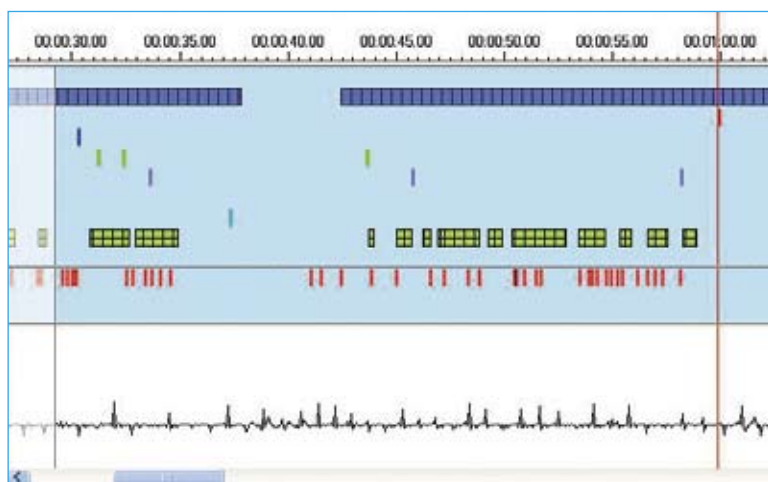


Screenshot of The Observer XT with the FACS.

assigned to a timestamp. You can also log comments to qualitatively classify your results.

Video recordings

To facilitate coding the video images, detailed time settings are offered. Typically with facial expression analysis, the face of the subject is recorded on video from close-by and coded afterwards in slow motion. The Observer XT will help you to simplify this process; video images can be displayed frame-by-frame in full resolution to enable detailed logging. Coding can be refined as many times as you like, without losing previously coded measurements. You can also select time segments of the video recording for coding, for example select time segments of 5 seconds after a certain stimulus has been applied.



Visualize your data.

Import external data

After observing your test participant, import any other external data you would like to use into The Observer XT, such as EMG or ECG data. Facial EMG data, of for example the muscles concerned with smiling and frowning, can provide (additional) evidence of the impact of a positive or negative stimulus. For example, you could use EMG in combination with behavioral data to measure pain intensity [5].

SELECT AND ANALYZE YOUR DATA

After coding your observations and importing external data, you can start to analyze your results.

Explore your results

The Observer XT provides detailed visualizations which helps you to explore the results. Customized charts and

statistics are accessible in a few mouse clicks and ample search options give access to the video images you require. With the advanced find functionality you can find relevant data very quickly. Search for instance 'AU45' and find all events coded as such (blinking of the eye). These search results can easily be exported to a program of your choice.

Select and analyze data

Specify the parts which are relevant for analysis by filtering or nesting the appropriate independent variables, behaviors, and modifiers. For example, determine if the subject raises the upper lip more frequently in conversation with a same-sex person than with an opposite-sex person. Peak events of specific

action unit activation can be put against one another to assess facial response to a certain stimulus.

Additional calculations

For additional calculations and analysis, The Observer XT contains the possibility to export data to a CD or DVD, or to programs such as spreadsheets, databases, or statistical packages.

Pattern detection

More complicated patterns in behavior can be detected by exporting your data to Theme™ for structural analysis. Theme

detects complex patterns of events in raw behavioral data which are difficult, if not impossible, to find with standard statistical methods.

Present your data

A wide range of presentation options is offered as well, to facilitate communicating your results to others. Select important video fragments and create your own Highlights Video Clip to illustrate your outcomes.

Feel free to contact us or one of our local representatives for more references, clients lists, or more detailed information about The Observer XT and Theme.

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