Measuring Affect in the Wild:

Challenges and Opportunities of Measuring Ambulatory EDA

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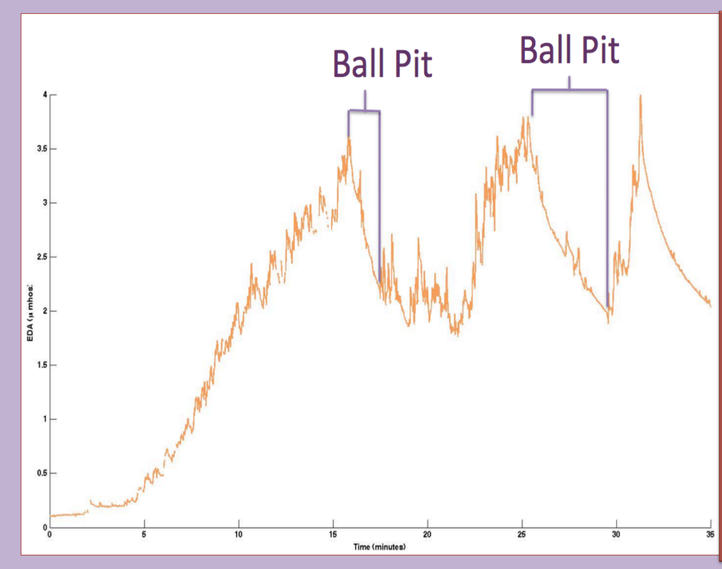
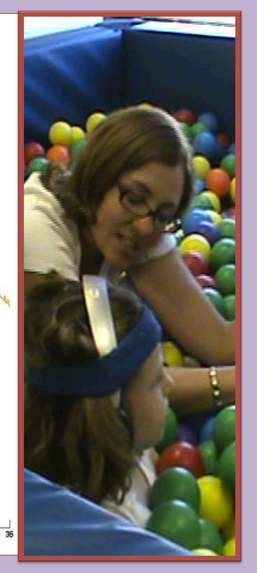
Overview

More and more, emotion research is being pushed to be explorative. While social scientists often can explore the real working world, psychophysiologists are often restrained to a small number of samples in an artificial lab.

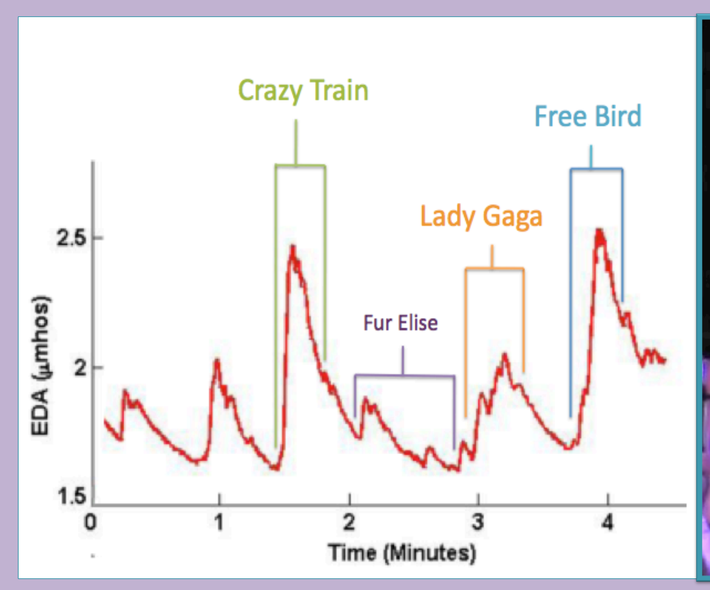
We have produced a tool that can measure Electrodermal Activity (EDA) comfortably, in real world settings. With this tool, psychologists can better understand the relationship of EDA, emotions, and behavior by looking at how EDA changes in the real world. We present a few projects and a brief summary of the opportunities and challenges of measuring EDA in the wild.





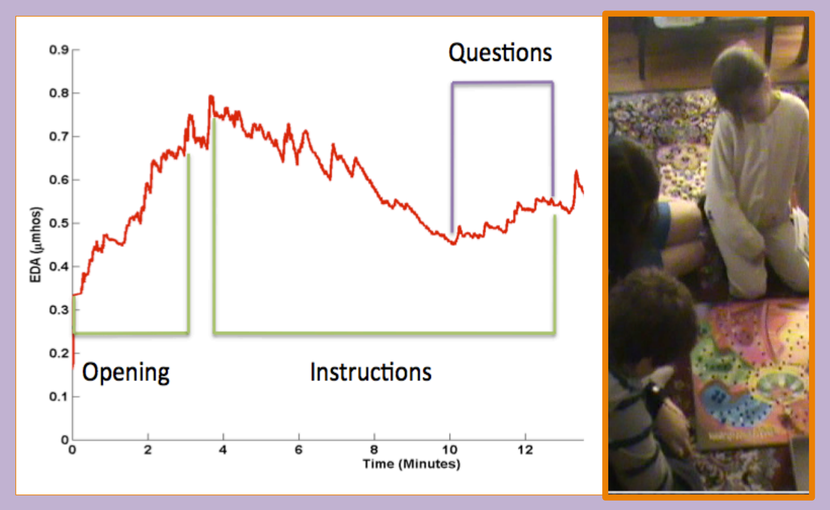
The Arousal of a Child with Autism During Therapy

A child with Autism attends occupational therapy for an hour. During the session, the child lies in a ball pit where the therapist intentionally attempts to calm her. As the child lies in the ball pit, her EDA correspondingly decreases. This response pattern is repeated a second time, later on in therapy.



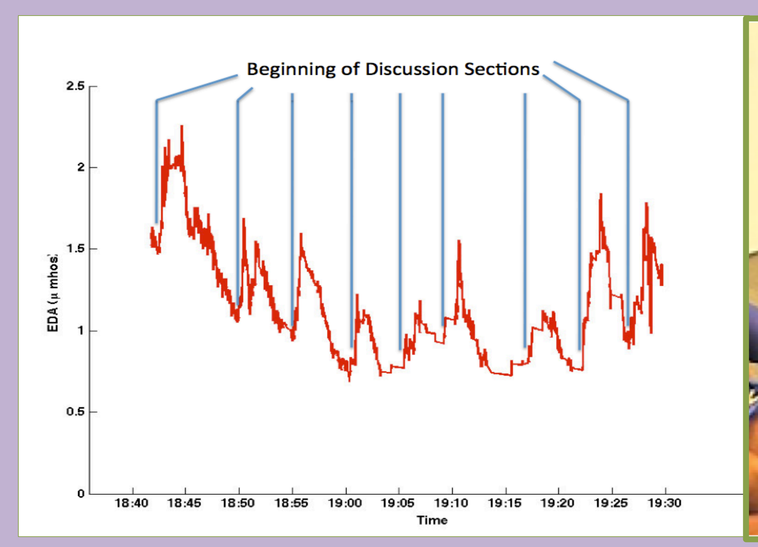
The Arousal from a Blue Man Group Performance

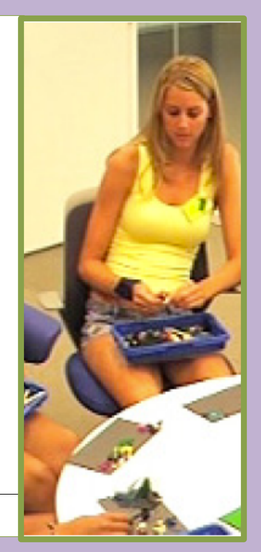
An audience member watches the blue man group perform four different songs on illuminated PCB pipe. For each song, the viewer's EDA increases, but some songs have larger increases in EDA, suggesting some songs may increase arousal and excitement more than other songs.



The Arousal of Learning to Play Board Games

A mother teaches her children to play a new board game. The mother's EDA increases during the time she is opening the game, but decreases while reading directions. As the children begin asking the mother questions, EDA correspondingly increases.





The Arousal of a Student Playing with LEGO Bricks

A high school student builds various brick models and shares her buildings with a group. As the discussion begins, but before she begins presenting, the woman's arousal increases. Afterwards, her arousal decreases as she begins speaking about her model. This pattern was repeated nine times.

Opportunities

Much more EDA data can be collected.
Over 77 hours of EDA data were collected from children during therapy. The sensor is small and comfortable, and can be worn on the ankle. With these changes, EDA can be worn throughout the day, making it ideal for long term data collection.

Changes in EDA can be observed out of the lab.
Emotion changes with what really matters to a participant. What matters to a mother in a lab is much different than what matters to a mother when playing a board game she chooses, with her family, on a Friday night in her living room.

Changes across time can help reveal causal mechanisms.
This student's EDA increases within one second of the discussion section beginning, nine times in a row. Her EDA then decreases when she begins to talk, across all nine repetitions. This pattern suggests that the anxiety of presenting increases this student's EDA.

Challenges

EDA increases with both physical and emotional arousal. When a person claps after a song, her EDA will increase. Determining whether this participant's EDA increased from excitement or from physical movement or a combination can be challenging.

Determining causal mechanisms is difficult.
This child's EDA decreases while in the ball pit, but it is unclear whether her body position, therapeutic activity, something else, or a combination of factors was the cause of the decrease in EDA.

Individual differences lead to different EDA responses.
While this student's EDA increased when anticipating presenting, not every students' EDA increased. This difference is due, in part, to some students not feeling anxious, as determined by their self reports.