Neural correlates of Emotion Regulation In Syrian Refugee Children: An ERP Study

Hana Mohamad, Brian Biekman, Xinge Li, Nesreen Mattar, Rebecca Lipschutz, Johanna Bick
University of Houston, Houston, TX

UNIVERSITY of HOUSTON

Introduction

Since the outbreak of the Syrian Civil War, roughly 13 million Syrians have been displaced around the world. Building off decades of knowledge gained from child clinical and developmental science, chronic stressors, in combination with the trauma and hardship experienced in their country of origin, are expected to challenge the normative development and general well-being, placing these refugee children at risk for long term mental and physical health problems.

Emotion Regulation in these youth is important in identifying how childhood trauma can help detect signs of psychological difficulties or illnesses. Specific to the refugee population, the war and threat-related adversities as well as traumatic stressors experienced can impact their ability to regulate emotions and creates challenges for their psychological status.

Present Study: For this study, we are focusing on the Syrian children who were born during the crisis in Syria, born in refugee camps, or were young in the events leading up to resettling in the US.

Research Questions:
- #1: How are symptoms of trauma associated with emotional regulation as measured by ERPs and subjective reports of arousal?
- #2: How is resilience associated with emotion regulation as measured by ERPs?

Hypotheses:
- #1: Those who display symptoms of trauma, will present greater ability to regulate emotions.
- #2: Resilience will act as a buffer and will aid in regulation of emotions.

Methodology

Participants: Participants in this study (N= 8) consisted of Syrian refugee children, seven to eighteen years of age and their primary caregivers from the local Houston area.

COVID Protocol: All participants were encouraged to always wear a mask during the duration of the visit. A minimal distance of 6 ft is ensured between participant and experimenter during data collection. A contact tracing log was kept up to date, and discarded after 2 weeks of visit.

Measures:
- Child Post Traumatic Stress Questionnaire: We assessed the severity of childhood post-traumatic stress using the Child Revised Impact of Events Scale-13 item version (CRIES-13; Horowitz et al., 1979), a self-report measure of PTSD.
- Child and Youth Resilience Measure: To assess the participants' resilience or ability to overcome childhood adversity, we used the Child and Youth Resilience Measure (CYRM; Jefferies et al., 2018). It is a self-report measure for children ages five to nine years, and youth ages ten to twenty-three years.
- Emotion Regulation (ERP) Task: We measured ERP/EEG recordings to emotional (negative) and neutral images. Child was instructed to look at an image normally or use a cognitive reappraisal strategy to decrease their emotional response to the picture. EEG will be acquired using an Ag/AgCl cap consisting of 64 electrodes, placed according to the International 10-20 system. The continuous EEG was recorded using BrainVision Recorder, at 1000 samples per second.

Each block of images will consist of [instruction-image valence]
1. 10 Look Neutral
2. 10 Look Negative
3. 10 Decrease Negative

A 1-5 rating scale will be used to measure level of arousal after each image.

We pre-process, process, trim, and analyze data using MATLAB, and HAPPE software.

Findings

Description of findings: Table 1. below shows the channels, and trials that have passes quality check. At this stage of the analysis, we are ensuring the data is correct and can be used to find what we are searching for. Figures 1-3 show the ERP results.

Subject ID	% of Good Channels Selected	Conditions	Trials Passed QC Check (out of 30)
SRS_004	85.9%	"Look Neutral"	29
		"Look Negative"	28
		"Decrease Negative"	30
SRS_006	76.5%	"Look Neutral"	24
		"Look Negative"	23
		"Decrease Negative"	24
SRS_009	76.5%	"Look Neutral"	19
		"Look Negative"	11
		"Decrease Negative"	17
SRS_014	76.5%	"Look Neutral"	25
		"Look Negative"	24
		"Decrease Negative"	30
SRS_015	82.8%	"Look Neutral"	28
		"Look Negative"	25
		"Decrease Negative"	29
SRS_020	68.7%	"Look Neutral"	30
		"Look Negative"	30
		"Decrease Negative"	30
SRS_021	64.06%	"Look Neutral"	9
		"Look Negative"	7
		"Decrease Negative"	10
SRS_022	71.8%	"Look Neutral"	22
		"Look Negative"	22
		"Decrease Negative"	23

Table 1. Quality check results for each participant, and the corresponding conditions

ERP Results: Pz waveforms for each condition, per participant.

Figure 1. "Look Neutral"

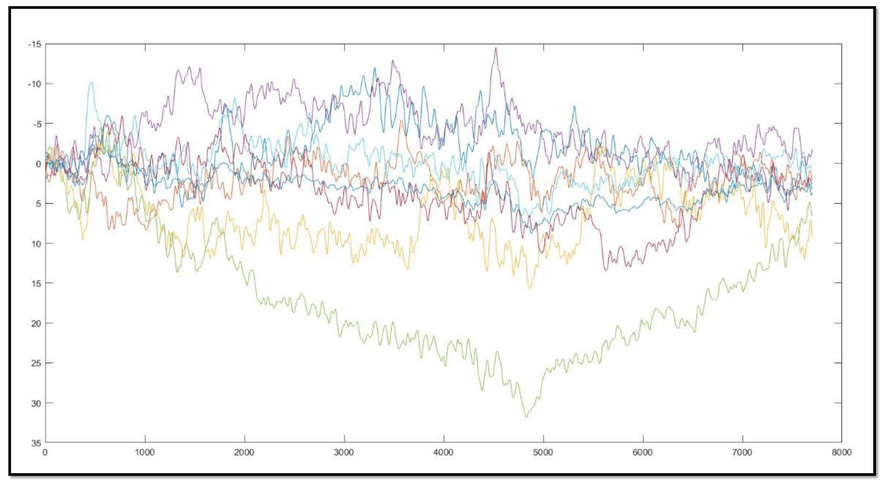


Figure 2. "Look Negative"

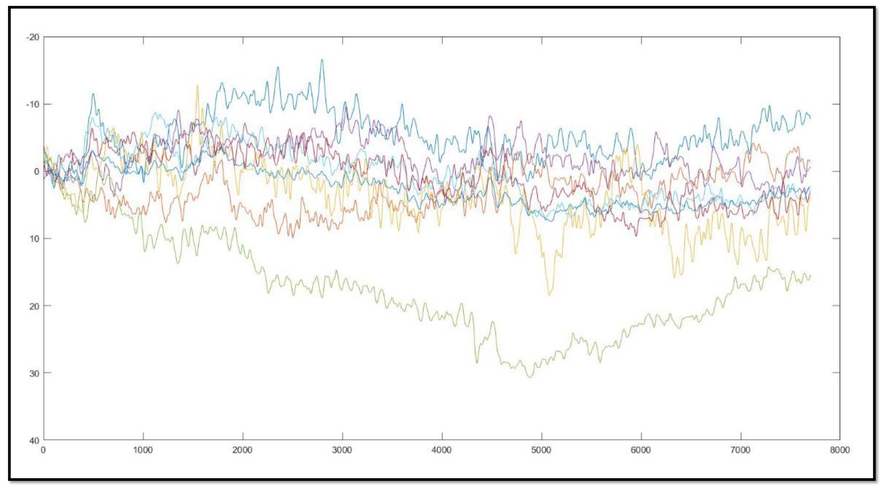
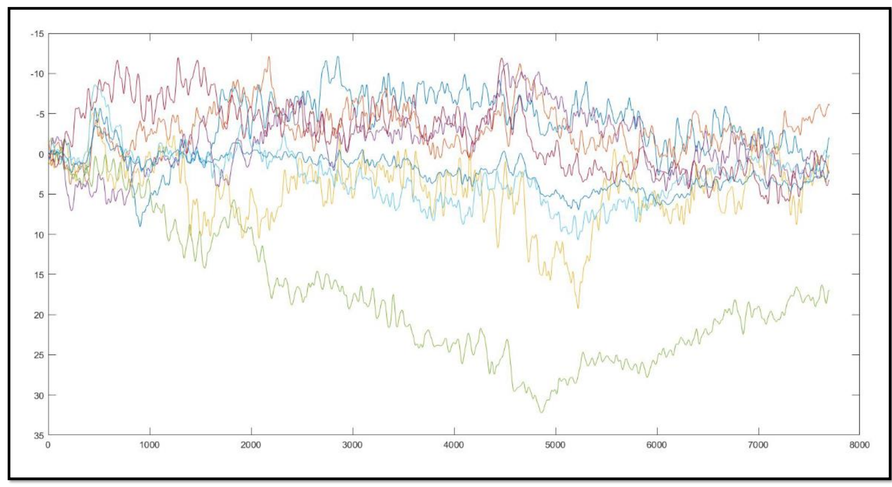


Figure 3. "Decrease Negative"



Next Steps

We hope to extrapolate this ERP data (with averages), compare to the controls, and draw conclusions about the ability to regulate their emotions. We will also look at the questionnaires and their correlation with the ERP data.