



# BLAST Technology Reduces Stress Response for Children and Adolescents

Emily Kade, M.A. and Amy Serin, Ph.D.



## Abstract

The following archival study examined whether bilateral alternating stimulation in tactile form (BLAST) technology utilizing TouchPoints prototypes reduces subjective units of distress (SUD) and body sensations (BS) in child and adolescents samples. Significant pre-and-post reductions in subjective stress levels and body sensations were found following delivery of BLAST for 30 seconds.

## Introduction

- BLAST is a somatosensory-based methodology found to reduce feelings of stress and physiological body sensations<sup>7</sup> by mediating sympathetic nervous system (SNS) arousal and de-potentiating amygdala activity<sup>2,5</sup>
- The amygdala is responsible for regulating fear and emotional responses to physical threats, and may be activated in individuals with anxiety when faced with neutral/harmless stimuli<sup>4</sup>
- Anxiety disorders are the most common form of mental illness in children and adolescents. Up to 41.2% of children<sup>3</sup> and 31.9% of adolescents have an anxiety disorder<sup>6</sup>

## Methods

- A non-clinical sample of child (ages 5-12; n=81) and adolescent (ages 13-17; n=83) responses from archival data of self-report ratings of SUD and BS with TouchPoints prototypes were collected via a mobile application
- Children and adolescents rated the intensity of the stress associated with a disturbing event and associated physiological body sensation on a scale of 0-10 with 10 being the worst possible level of stress/distress
- TouchPoints prototypes were activated for 30 seconds and respondents were prompted via the app to re-rate SUD and BS levels
- **Hypothesis:** Following 30 seconds of BLAST, both SUD and BS ratings would significantly decrease in both child and adolescent samples

## Results

### Children Pre and Post SUD and BS Ratings

	Start SUD	End SUD	Start BS	End BS
Mean	7.46	1.62	5.33	1.59
Standard Deviation	2.00	2.19	3.31	2.51

### Adolescent Pre and Post SUD and BS Ratings

	Start SUD	End SUD	Start BS	End BS
Mean	7.80	2.19	5.45	1.84
Standard Deviation	1.93	2.61	3.66	2.61

### Paired Sample Two-Tail t-Tests

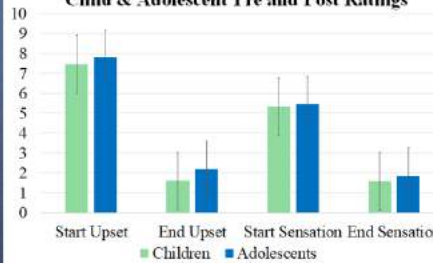
	Children	Adolescents
Subjective Unit of Disturbance	p < 0.001*	p < 0.001*
Body Sensation	p < 0.001*	p < 0.001*

Note: \*Significant at p<0.001

### Child & Adolescent SUD and BS Decreases

	Children	Adolescents
SUD	78%	72%
BS	70%	66%

### Child & Adolescent Pre and Post Ratings



## Discussion

- TouchPoints prototypes were found to significantly reduce subjective feelings of stress and associated physiological body sensations
- BLAST technology may offer an alternative adjunct to treatment for clinical pediatric populations that have high levels of SNS dysregulation such as GAD, PTSD, or disruptive mood dysregulation disorder (DMDD)
- Given that TouchPoints were found to be helpful in a non-clinical sample, this technology may also be beneficial for non-clinical children and adolescents who experience general stress

## Limitations

- Younger children may have more difficulty cognitively identifying internal levels of stress and self-monitoring changes in body sensations, which may affect the validity of responses
- Given responses via mobile application, it is unknown whether the ratings came from the individuals themselves or were reported by others (e.g., parents, family members) using the application
- Future research is needed to determine if BLAST is efficacious in reducing stress and anxiety levels in children and adolescents in larger clinical samples

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# Bilateral Alternating Stimulation in Tactile Form (BLAST) Significantly Reduces Stress Response in Males and Females

Emily Kade, M.A. and Amy Serin, Ph.D.

## Abstract

The purpose of this archival study was to examine whether TouchPoints prototypes, noninvasive devices that deliver BLAST technology, are effective in reducing perceived anxiety and physiological arousal in response to recall of a disturbing memory for adults. Significant pre-and-post differences were found for both males and females. There was a significant decrease in the ratings for subjective unit of disturbance (SUD) and body sensation (BS) pre and post BLAST for 30 seconds.

## Introduction

- Perceived high levels of stress can impact both physical and psychological health, with stress levels highest in adult men and women between the ages of 20 and 50<sup>4,6</sup>
- BLAST has been found to induce feelings of comfort/relaxation<sup>1,5</sup>
- BLAST is thought to mediate stress and anxiety by inhibiting the sympathetic nervous system (SNS), responsible for the body's "fight or flight" stress response<sup>2,3</sup>

## Methods

- Clinical archival data was collected on male (n=35) and female (n=47) respondents
- Respondents (ages 4-77) were asked to rate the intensity of a disturbing event, the SUD, and associated BS on a scale from 0-10 with 0 being no stress/BS and 10 being the worst level of stress or physical sensation. Responses were recorded manually.
- Respondents rated SUD/BS once before using the TouchPoints. Following approximately 30-seconds of BLAST respondents were prompted to re-rate SUD and BS
- Paired sample t-tests were conducted to assess for significant differences between pre-and-post SUD and BS ratings in male and female samples
- Hypothesis:** Both SUD and BS ratings would decrease significantly following approximately 30 seconds of BLAST in both male and female samples

## Results

### Male Pre and Post SUD and BS Ratings

	Start SUD	End SUD	Start BS	End BS
Mean	6.96	3.38	5.43	2.17
Standard Deviation	1.53	2.00	1.83	2.07

### Female Pre and Post SUD and BS Ratings

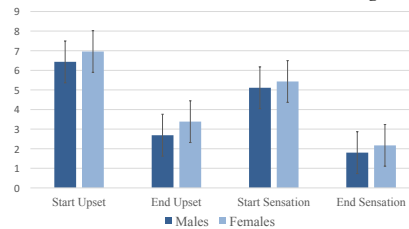
	Start SUD	End SUD	Start BS	End BS
Mean	6.43	2.69	5.11	1.80
Standard Deviation	1.53	1.66	1.79	1.69

### Paired Sample Two-Tail t-Tests

	Males	Females
Subjective Unit of Disturbance	$p < 0.001^*$	$p < 0.001^*$
Body Sensation	$p < 0.001^*$	$p < 0.001^*$

Note: \*Significant at  $p < 0.001$

### Male and Female Pre and Post Ratings



## Discussion

- SUD ratings significantly decreased by **65%** in males and by **60%** in females; and body sensation ratings significantly decreased by **58%** in males and by **51%** in females
- TouchPoints prototype technology was effective at significantly reducing subjective ratings of stress and body sensations in male and female samples
- This technology has potential application in numerous clinical and sub-clinical conditions that may be complicated by SNS arousal, often impairing cognitive and physiological symptoms
- Future research is needed to determine the efficacy of BLAST in reducing anxiety and psychological distress in clinical samples

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# The Effects of Bilateral Alternating Stimulation in Tactile Form (BLAST) on State Anxiety and Public Speaking



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## Abstract

The following study examined whether BLAST technology utilizing TouchPoints reduces state anxiety levels pre and post a public speaking task. Community college students in a public speaking course were assigned to either Group 1 or Group 2 conditions; where only Group 1 students wore TouchPoints during a public speech (Time 1). Conditions were switched during Time 2. Significant pre-and-post subjective stress levels and state anxiety ratings significantly reduced for Group 1 during Time 1 and both Group 1 and 2 during Time 2.

## Background

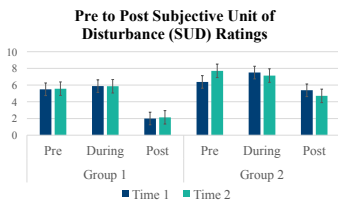
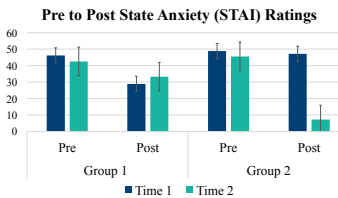
- BLAST technology has been found to significantly reduce subjective feelings of stress up to 62% and physiological body sensations up to 50% in 30 seconds<sup>9</sup>
- BLAST is believed to have this stress-reducing effect on anxiety by inhibiting amygdala activity.<sup>5</sup> This reduces fear-induced sympathetic nervous system (SNS) arousal associated with the body's "fight, flight, or freeze" stress response<sup>4</sup>
- The Yerkes-Dodson model explains that some arousal is optimal but increased levels negatively affect performance<sup>6</sup>
- Anxiety associated with public speaking is potentially caused by anticipatory arousal, associated with increased amygdala activity<sup>3</sup>, which subsequently elevates state anxiety<sup>2</sup>
- State anxiety may fluctuate before, during, and following public speaking<sup>7</sup>, with greater apprehension resulting in symptoms of dizziness, rapid heart rate, and trembling<sup>1</sup>

## Methods

- College students (n=16), ages 18-51 (M=24.6) enrolled in a community college public speaking course were recruited and randomly assigned to Group 1 or Group 2
- Students completed a public speech twice
- During Time 1, Group 1 wore TouchPoints while Group 2 did not; and vice versa during Time 2
- Students completed the State-Trait Anxiety Inventory (STAI) once before and after their public speech to measure state anxiety
- In addition, students also rated their subjective unit of distress (SUD) before and after the speech
- "On a scale from 0-10, how stressed are you at the moment with 10 being the worse possible stress/distress?"
- Paired one-tailed sample t-tests were conducted to assess for significant changes in pre-and-post ratings
- **Hypothesis:** It was hypothesized that state anxiety ratings would significantly decrease in Group 1 during Time 1 and in Group 2 during Time 2



## Results



**Paired Sample One-Tail t-Tests**

Time	Measure	Group 1	Group 2
Time 1	STAI	p < 0.001*	p = 0.34
	SUD	p < 0.05*	p = 0.14
Time 2	STAI	p < 0.05*	p < 0.05*
	SUD	p < 0.05*	p < 0.05*

Note: \*Significant at p<0.05

## Group 1 and 2 SUD Ratings and State Anxiety Scores from Time 1 to Time 2

	SUD Ratings		STAI Scores				
	Group 1	Group 2	Group 1		Group 2		
	M	SD	M	SD	M	SD	
Time 1	Pre	5.50	6.38	46.13	5.22	47.50	6.59
	During	5.88	7.50				
	Post	2.00	5.38	28.88	6.01	45.38	11.78
Time 2	Pre	5.57	7.71	42.50	8.04	45.57	7.21
	During	5.86	7.14				
	Post	2.14	4.71	33.25	10.01	39.93	8.73

Note: SUD=Subjective Unit of Disturbance; STAI=State Trait Anxiety Inventory; M=Mean, SD=Standard Deviation

## Group 1 and 2 SUD and State Anxiety Percentage Decreases From Time 1 to Time 2

Time	Measure	Group 1	Group 2
		37%	4%
Time 2	STAI	22%	13%
	SUD	62%	39%

Note: SUD=Subjective Unit of Disturbance; STAI=State Trait Anxiety Inventory

## Discussion

- BLAST technology in TouchPoints significantly reduced state anxiety and SUD stress ratings when worn during a public speaking task in Group 1 during Time 1 as compared to Group 2
- During Time 2, Group 2's state anxiety ratings/SUD ratings significantly decreased; however, this was also seen in Group 1
- It is suspected that BLAST may have a residual effect in reducing anxiety, therefore those in Group 1 may have become less anxious during their second public speech, which may be the reason for the continued decrease in SUD/state anxiety during Time 2
- Group 2 appeared more anxious given SUD ratings Time 1 and 2, which may have impacted results
- BLAST technology may offer a tool to reduce cognitive/physiological symptoms of SNS arousal for those with significant anxiety either during public speaking or in additional anxiety-provoking situations
- One limitation of this study is the small sample size, further replicated research is required to determine efficacy on a larger scale

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# Bilateral Alternating Stimulation in Tactile Form (BLAST) May Mediate Blood Pressure and Heart Rate

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## ABSTRACT

The purpose of this archival analysis was to assess for any differences in blood pressure and heart rate following 1-5 minutes of applied BLAST technology in TouchPoints (n=12). Blood pressure (BP) and heart rate (HR) measures had been taken before BLAST and following the application of BLAST. In addition to a statistically significant decrease in systolic BP, HR also reduced; however, HR reduction was not found to be significant. There was no found change in diastolic BP.

## BACKGROUND

- BLAST technology is embedded in a pair of devices, one placed on either side of the body which alternates haptic microvibrations at a specified frequency and intensity
- EMDR therapy has utilized BLAST for the past 30 years as part of treatment for de-escalating arousal for PTSD
- In other studies, BLAST has been found to reduce subjective feelings of stress up to 62% and physiological body sensations up to 50% in 30 seconds<sup>4</sup>
- One hypothesis is that BLAST may assist in returning the body to homeostatic functioning by reducing sympathetic nervous system (SNS) arousal and returning the body to a calm parasympathetic nervous system (PNS) state<sup>1</sup>
- High levels of work-related stress is associated with increased heart rate reactivity, systolic blood pressure, and lower 24-hr vagal tone (the cranial nerve associated with the PNS's calming response)<sup>5</sup>
- Increased work stress has been associated with hypertension and increased risk for cardiovascular disease<sup>2</sup>
- While BLAST has been found to reduce subjective feelings of distress, research utilizing objective cardiovascular parameters indicative of physical functioning have yet to be examined

## METHODS

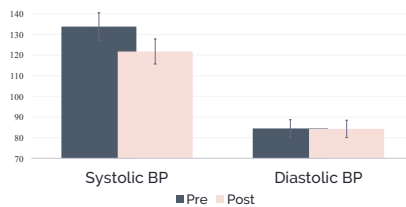
- Data was assessed utilizing an archival sample of individuals who's blood pressure and heart rate were taken before and after BLAST technology was applied
- Paired one-tailed sample t-tests were conducted to assess for significant changes in pre and post BP and HR

## HYPOTHESIS

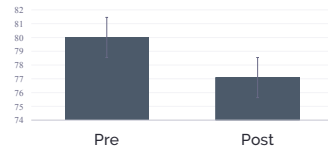
It was hypothesized that both systolic and diastolic blood pressure and heart rate would significantly decrease following delivery of BLAST

## RESULTS

Pre and Post Systolic and Diastolic Blood Pressure (BP) Ratings in mmHg



Pre and Post Heart Rate in Beats Per Minute (BPM)



Paired Sample One Tail t-Tests

Systolic Blood Pressure	$p = 0.002^*$
Diastolic Blood Pressure	$p = 0.47$
Heart Rate	$p = 0.06$
Subjective Unit of Disturbance	$p = 0.000^{**}$
Body Sensation	$p = 0.000^{**}$

Note: \*Significant at  $p < 0.05$ ; \*\*Significant at  $p < 0.001$

Percentage of Pre to Post Decreases

Systolic Blood Pressure	9%
Diastolic Blood Pressure	0%
Heart Rate	4%



## DISCUSSION

- Our hypothesis was partly supported as systolic BP significantly decreased by 9% and HR decreased by 4% following BLAST, although HR was not significant
- There is a potential for a Type II Error regarding our heart rate finding, it is suspected with a larger sample size, there may be a significant effect in the reduction of HR
- Due to a lack of control group, it cannot be determined whether this decrease was due to BLAST alone or additional confounding variables
- The lack of change in diastolic BP may be explained by the fact that diastolic BP tends to fluctuate less than systolic BP<sup>3</sup>
- BLAST via TouchPoints technology may offer a daily tool to de-stress and remain in a calm PNS state
- By potentially reducing the daily frequency of SNS arousal, TouchPoints technology could potentially aid in the decrease of risk for hypertension or cardiovascular disease and this is an area for further research
- Follow-up research assessing long-term physical and health outcomes with a larger sample and randomized controlled trial may be helpful to determine the various potential benefits of BLAST

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# Preliminary Evidence for Stress-Reducing Effects of BLAST Following Significant qEEG Reduction in Beta Wave Activity

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## ABSTRACT

In this archival preliminary analysis of 21 subjects, quantitative electroencephalogram (qEEG) was utilized to assess for changes in brain electrical activity following use of bilateral alternating stimulation tactile (BLAST) technology in response to thinking of a stressful event. Significant reductions in Beta and Gamma wave activity were found.

## BACKGROUND

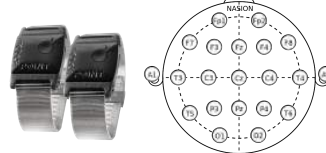
- BLAST technology is embedded in a pair of devices, one placed on either side of the body, alternating haptic microvibrations at a specified frequency and intensity
- BLAST has been found to reduce subjective feelings of stress up to 62% and physiological body sensations up to 50% in 30 seconds<sup>6</sup>
- BLAST is hypothesized to return the body to homeostatic functioning by reducing sympathetic nervous system (SNS) arousal and returning the body to a calm parasympathetic nervous system (PNS) state<sup>1,2,3</sup>
- Beta EEG rhythm has been correlated with high situational stress and personal anxiety<sup>4</sup> while prefrontal cortex gamma power (>30Hz) has been associated with increased stress<sup>4</sup> and may be seen in ruminative or worried individuals
- Hypothesis:** EEG beta-wave activity would increase in frontal regions when thinking of a stressful event and decrease in the same locations following BLAST

## METHODS

- 21 participants (9 male, 12 female) ages 7-63 (M age=27.8; SD=16.5), 14 with heterogeneous diagnoses of anxiety, major depressive disorder, and attention deficit hyperactivity disorder were included
- Data was collected utilizing a NeuroField Q20 amplifier and was stored using NeuroGuide software
- Participants underwent a 5-minute 19-channel baseline recording followed by an instruction to think about a stressful event. Participants then held BLAST devices and 5-minute qEEG recordings were taken while thinking about the stressful event, during the delivery of BLAST, a second baseline was taken again upon removal of BLAST

## RESULTS

- Hz band definitions: Delta (1-4Hz), Theta (4-8Hz), Alpha 1 (8-10Hz), Alpha 2 (10-12Hz), Beta 1 (12-15Hz), Beta 2 (15-18Hz), Beta 3 (18-25Hz), High Beta (25-30Hz), Gamma 1 (30-35Hz), Gamma 2 (35-40Hz)
- Preliminary EEG recordings comparing the stress condition to the BLAST condition exhibited significantly reduced activity in frontal Theta, specifically in 5Hz at Fp2 and F4 sites and reduced activity in Beta 1 at 12-14Hz in the frontal channel locations (Fp1, Fp2, Fp3, Fz, F4)
- Significant right frontal decreases are shown in Beta 2 (16-18Hz), Beta 3 (19, 23Hz), and Gamma 1 (30-35 Hz) with activity decreasing along the midline at Beta 3 (19Hz, 23Hz), and Gamma 1 (30Hz)



FFT Absolute Power Group Paired t-Test (P-Value)

Intrahemispheric: LEFT

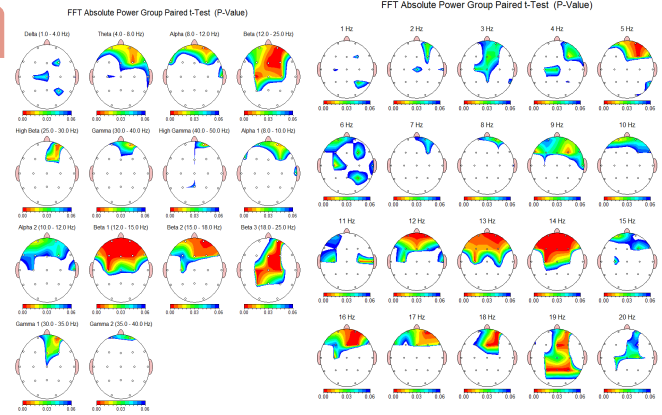
	DELTA	THETA	ALPHA	BETA	HIGH BETA	BETA 1	BETA 2	BETA 3
FP1-LE	0.148	0.019	0.019	0.025	0.164	0.001	0.012	0.124
F3-LE	0.200	0.116	0.131	0.024	0.325	0.002	0.057	0.089
C3-LE	0.042	0.052	0.084	0.000	0.108	0.000	0.059	0.051
P3-LE	0.141	0.145	0.359	0.032	0.069	0.143	0.163	0.004
O1-LE	0.395	0.215	0.898	0.567	0.864	0.656	0.899	0.298
F7-LE	0.101	0.064	0.022	0.073	0.046	0.016	0.045	0.168
T3-LE	0.221	0.386	0.219	0.564	0.770	0.166	0.953	0.638
T5-LE	0.341	0.613	0.915	0.530	0.866	0.419	0.913	0.614

Intrahemispheric: RIGHT

	DELTA	THETA	ALPHA	BETA	HIGH BETA	BETA 1	BETA 2	BETA 3
FP2-LE	0.142	0.014	0.008	0.000	0.005	0.000	0.003	0.002
F4-LE	0.024	0.004	0.022	0.001	0.020	0.002	0.007	0.002
O4-LE	0.172	0.139	0.165	0.009	0.109	0.024	0.220	0.022
P4-LE	0.030	0.075	0.078	0.142	0.148	0.178	0.457	0.063
O2-LE	0.111	0.097	0.820	0.984	0.593	0.807	0.893	0.636
F8-LE	0.260	0.037	0.072	0.096	0.607	0.072	0.012	0.899
T4-LE	0.050	0.052	0.050	0.171	0.223	0.141	0.891	0.220
T6-LE	0.097	0.061	0.418	0.177	0.145	0.272	0.415	0.077

Intrahemispheric: CENTER

	DELTA	THETA	ALPHA	BETA	HIGH BETA	BETA 1	BETA 2	BETA 3
Fz-LE	0.082	0.049	0.088	0.000	0.004	0.003	0.009	0.000
Cz-LE	0.039	0.066	0.675	0.016	0.427	0.047	0.141	0.007
Pz-LE	0.096	0.214	0.929	0.106	0.307	0.109	0.429	0.032



## DISCUSSION

- Significant reduction in beta activity in frontal regions provides preliminary evidence BLAST may have a therapeutic effect on reducing cortex activity associated with anxiety and stress
- Our results are consistent with studies<sup>4,5</sup> suggesting beta and gamma wave activity may be correlated with increased stress
- This preliminary data implicates the potential efficacy of BLAST as a mediator of SNS arousal and stress through beta-activity reduction in both clinical and non-clinical samples
- Follow-up research is required utilizing a comparison control group with a larger sample to assess for qEEG differences in electrical activity following use of BLAST as a tool to reduce anxiety and stress responses

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# QEEG Evidence for Stress-Reducing Effects of BLAST Technology in Hispanic Individuals

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## Abstract

The aim of this archival study was to utilize quantitative electroencephalography (qEEG) recordings to explore the effects of Bilateral Alternating Stimulation Tactile (BLAST) technology on Hispanic individuals after thinking of a stressful event. It was hypothesized that significant changes in the participants' qEEG recordings would occur following the delivery of BLAST that would represent decreases in anxiety. Significant reductions in Delta, Theta, and Beta activity were found.

## Background

- BLAST was administered via a pair of devices that participants held in the palms of their hands. These devices administered quick alternating rhythmic vibrations.
- Bilateral stimulation has been previously found to reduce Subjective Units of Distress (SUD).<sup>2</sup> The tactile form has been found to reduce SUDs up to 62% in 30 seconds.<sup>4</sup>
- Beta 1 and Beta 2 EEG rhythms, especially in the right hemisphere, have been found to positively correlate with anxiety and can be considered an electrographic correlate of high situative and personal anxieties. A negative correlation with anxiety and Alpha rhythm was also found.<sup>3</sup>
- Studies examining the efficacy of bilateral stimulation in EEG profiles have focused primarily on populations consisting of Caucasian individuals.<sup>3,4</sup> Thus, further research is needed examining the efficacy in Hispanic individuals.
- Hypothesis: Significant changes in the participants' qEEG recordings would occur mainly in right frontal channels following the BLAST condition.

## Methodology

- Archival 19-channel qEEG recordings including a 15-minute "stress test," taken as the clinic's typical intake protocol, were analyzed. Data was collected utilizing a NeuroField Q20 amplifier and was stored using NeuroGuide software.
- The selected sample consisted of 6 participants (3 male, 3 female) ages 6 - 51 (M age= 23.3, SD= 19.39). Reported ethnicity: Nicaraguan (n=3) and Hispanic/BI-Racial (n=3).
- Participants had heterogeneous diagnoses of ADHD, Specific Learning Disability, and Generalized Anxiety Disorder.
- During the stress test, individuals were instructed to continuously think about a stressful event. QEEG stress test recordings were divided into 3, 5-minute increments: 1) an initial baseline recording 2) a recording while holding wireless electronic devices that delivered BLAST, and 3) a final baseline recording following BLAST removal.

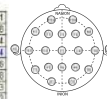
## Results

- Hz bands defined: Delta (1-4 Hz), Theta (4-8 Hz), Alpha 1 (8-10 Hz), Alpha 2 (10-12 Hz), Beta 1 (12-15 Hz), Beta 2 (15-18 Hz), Beta 3 (18-25 Hz), High Beta (25-30 Hz), Gamma 1 (30-35 Hz), Gamma 2 (35-40 Hz).
- A paired sample t-test analysis was utilized to compare stress test qEEG recordings of the initial baseline condition to the BLAST condition.
- Results of the analysis yielded significant reductions in the following areas: Theta activity in the right frontal channels (FP2, F4, C4), Beta 1 and Beta 2 in right hemispheric locations (FP2, P4), and Delta (C4, T3).

FFT Absolute Power Group Paired t-Test (P-value)

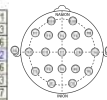
Intrahemispheric: LEFT

	DELTA	THETA	ALPHA	BETA	HIGH BETA	BETA 1	BETA 2	BETA 3
FP1-CSD	0.176	0.062	0.406	0.622	0.525	0.916	0.396	0.581
F3-CSD	0.221	0.129	0.066	0.663	0.403	0.364	0.821	0.456
C3-CSD	0.052	0.074	0.096	0.262	0.968	0.090	0.895	0.424
P3-CSD	0.370	0.265	0.412	0.268	0.021	0.022	0.597	0.384
O1-CSD	0.319	0.781	0.531	0.870	0.198	0.992	0.911	0.760
F7-CSD	0.342	0.385	0.740	0.576	0.305	0.912	0.790	0.660
T3-CSD	0.344	0.022	0.863	0.814	0.682	0.687	0.489	0.933
T5-CSD	0.257	0.114	0.978	0.287	0.640	0.335	0.245	0.343



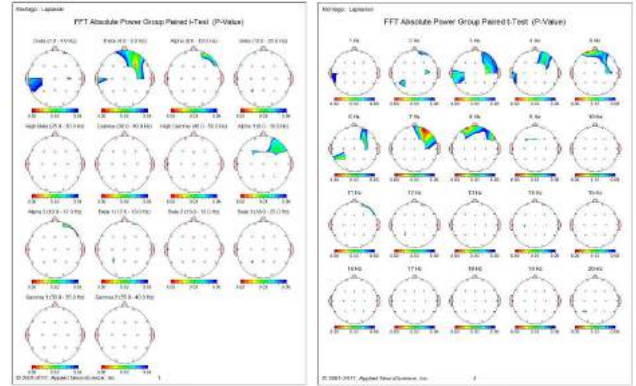
Intrahemispheric: RIGHT

	DELTA	THETA	ALPHA	BETA	HIGH BETA	BETA 1	BETA 2	BETA 3
FP2-CSD	0.053	0.030	0.012	0.876	0.360	0.022	0.678	0.621
F4-CSD	0.397	0.094	0.141	0.331	0.097	0.873	0.340	0.263
C4-CSD	0.020	0.027	0.198	0.357	0.976	0.212	0.741	0.496
P4-CSD	0.485	0.944	0.671	0.076	0.280	0.281	0.344	0.222
O2-CSD	0.685	0.699	0.406	0.917	0.519	0.641	0.840	0.756
F8-CSD	0.180	0.094	0.037	0.645	0.118	0.422	0.802	0.213
T4-CSD	0.156	0.080	0.658	0.618	0.207	0.754	0.466	0.427
T6-CSD	0.684	0.292	0.625	0.798	0.226	0.531	0.520	0.471



Intrahemispheric: CENTER

	DELTA	THETA	ALPHA	BETA	HIGH BETA	BETA 1	BETA 2	BETA 3
Fz-CSD	0.092	0.077	0.087	0.598	0.626	0.224	0.645	0.834
Cz-CSD	0.975	0.826	0.763	0.358	0.333	0.344	0.540	0.799
Pz-CSD	0.929	0.979	0.776	0.544	0.557	0.495	0.978	0.437



## Discussion

- Significant reduction in Beta 1 activity in the right frontal channels suggests that BLAST may be an effective means of reducing stress and anxiety. qEEG recording analyses suggest Beta 1 may be an electrographic correlate of personal anxiety in Hispanic individuals. Our results are consistent with previous research.<sup>3</sup>
- Theta activity in the anterior regions have been found to correlate to meditative states and increased internal attention.<sup>4</sup> The reduction of Theta in the frontal channels may suggest BLAST helps Hispanic individuals facilitate a more positive state of mind and increase external attention.
- Further research is warranted to examine whether these results withhold in a larger sample, and non-clinical group. Research utilizing a control group for comparative analysis is additionally warranted.

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