
TOUCHPOINT™
BETTER LIVING THROUGH NEUROSCIENCE

RESEARCH REVIEW

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TouchPoints Offering

TouchPoints are twin neuroscientific wearables that are worn on either side of the body preventatively or for spot use for 15 minutes before, during or after a stressful situation to reduce stress in real time.

Using gentle, haptic microvibrations called BLAST (bilateral alternating stimulation tactile), TouchPoints affect the brain and alter the body's fight, flight or freeze response by turning off the stress switch to restore calm nervous system functioning.

This not only helps to reduce the amount of perceived stress experienced, but also the associated body sensation that comes with it (i.e. stomach butterflies or tightness in the chest).

Having the ability to think rationally without an associated body sensation helps the brain create new neural pathways that are net positive, and this has a lasting effect on your brain. Now the next time you experience stress, it doesn't feel so bad!

TouchPoints Products

TouchPoints for Calm

TouchPoints for Calm is a simplified version which is controlled manually and includes three pre-settings (sleep/meditation, calm/ focus, and anger/agitation). This model features sleek-looking wristbands for ease of access and so that users can wear around the wrist.

TouchPoints for Sleep

TouchPoints for Sleep is a simplified version which is controlled manually and includes three pre-settings (sleep/meditation, calm/ focus, and anger/agitation). This model includes zippered sweatbands to provide additional comfort, reduce the sound of the vibrations, and so that users can wear around arms or ankles.

TouchPoints for Kids

TouchPoints for Kids is a simplified version which is controlled manually and includes three pre-settings (sleep/meditation, calm/ focus, and anger/agitation). This model comes with cool-colored wristbands for extra customization, ease of access, and so that kids may wear around the wrist.

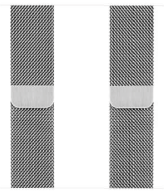
TouchPoints Pro (Coming Soon)

TouchPoints Pro is the first dual-screened wearable that includes six pre-settings (calm, focus, sleep, performance, anger, and cravings) as well as nearly 300 customizable settings with the ability to adjust the intensity, frequency, and overlap. It also tracks biometrics such as heart rate, oxygenation level, steps, and calories, and has environmental sensors to alert the user if he/she is in a high toxicity situation.

TouchPoints App

The TouchPoint app includes a Personalized Stress Profile (PSP) which gives users lifestyle tips and personalized suggestions for how to use TouchPoints based on how they manifest stress. Subscription to be released in 2019.

TouchPoint Accessories



Watchbands

Zippered Sweatbands

Clothing Clips

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Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

Regular Article

Psychotherapy and Psychosomatics

Psychother Psychosom 2006;75:290–297
DOI: 10.1159/000093950

Eye Movement Desensitization and Reprocessing for Posttraumatic Stress Disorder: A Pilot Blinded, Randomized Study of Stimulation Type

David Servan-Schreiber[b] Jonathan Schooler[a] Mary Amanda Dew[c]
Cameron Carter[d] Patricia Bartone[e]

[a]University of British Columbia, Vancouver, Canada; [b]University of Pittsburgh Medical Center, Center for Integrative Medicine, Pittsburgh, Pa., [c]University of Pittsburgh, and Western Psychiatric Institute and Clinic, Pittsburgh, Pa., [d]University of California at Davis, Davis, Calif., and [e]Jefferson Hospital, Pittsburgh, Pa., USA

Significant benefit of normal memory retrieval with eye movements and BLAST but not auditory

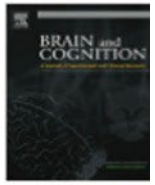
Significant benefit from alternating stimulation vs. simultaneous or continuous stimulation (auditory vs tactile)

ELSEVIER

Contents lists available at SciVerse ScienceDirect

Brain and Cognition

journal homepage: www.elsevier.com/locate/b&c

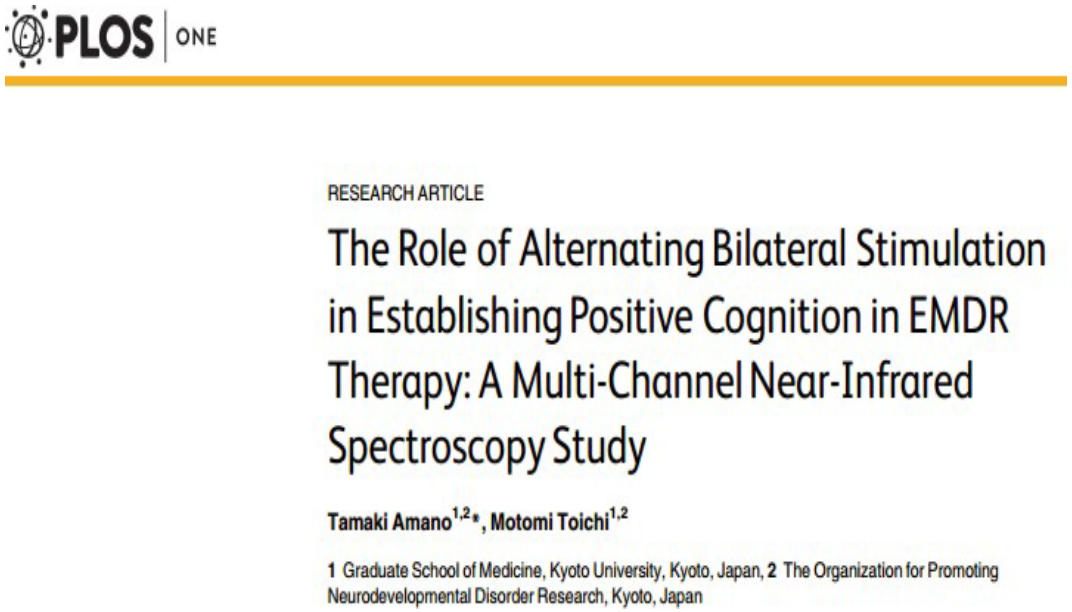


Bilateral saccadic eye movements and tactile stimulation, but not auditory stimulation, enhance memory retrieval

Sander Nieuwenhuis[a,*], Bernet M. Elzinga[a], Priscilla H. Ras[a], Floris Berends[a], Peter Duijs[a], Zoe Samara[b], Heleen A. Slagter[c]

[a] Institute of Psychology, Leiden University, The Netherlands
[b] Department of Neuropsychology and Psychopharmacology, Maastricht University, The Netherlands
[c] Department of Psychology, University of Amsterdam, The Netherlands

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)



PLOS ONE

RESEARCH ARTICLE

The Role of Alternating Bilateral Stimulation in Establishing Positive Cognition in EMDR Therapy: A Multi-Channel Near-Infrared Spectroscopy Study

Tamaki Amano[1,2]*, Motomi Toichi[1,2]

1 Graduate School of Medicine, Kyoto University, Kyoto, Japan, 2 The Organization for Promoting Neurodevelopmental Disorder Research, Kyoto, Japan

Multi-channel near-infrared spectroscopy during memory recall with/without BLAST. Increase in oxy-Hb in right STS, decrease in wide bilateral areas of PFC in BLAST condition. BLAST "may help recall of more representative pleasant memories," create emotional regulation, and induce comfortable feelings and pleasant memories. BLAST "warranted in some clinical situations."

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

Traumatology
Volume 15 Number 2
June 2009 81-95
© 2009 The Author(s)
10.1177/1534765609338498
http://tmt.sagepub.com

On the Neural Basis of EMDR Therapy: Insights From qEEG Studies

Melvin L. Harper, Tasha Rasolkhani-Kalhorn, and John F. Drozd

Eye movement desensitization and reprocessing (EMDR) therapy has been shown by empirical studies to be effective in relief from psychological traumas including posttraumatic stress disorder (PTSD). Several logical concepts regarding the origin of the EMDR effect have been presented, but no detailed neural

wave sleep. These studies suggest that brain stimulation during EMDR significantly increases the power of a naturally occurring low-frequency rhythm in memory areas of the brain, binding these areas together and causing receptors on the synapses of fear memory traces to be disabled. This mechanical change in the

BLAST created significant depotentiation of fear memory synapses in the amygdala. (Used eye movements and BLAST)

Amygdala appears to have intrinsic connectivity to key brain structures that integrate sensory inputs, fear response, and can modulate or extinct fear

Neuron
Review

Amygdala Inhibitory Circuits and the Control of Fear Memory

Ingrid Ehrlich,[1,4] Yann Humeau,[2] François Grenier,[1] Stephane Ciocchi,[1] Cyril Herry,[1,3] and Andreas Lüthi[1,*]
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[2]Institut des Neurosciences Cellulaires et Intégratives, Université Louis Pasteur and CNRS, UMR7168, F-67084 Strasbourg, France
[3]Present address: INSERM U862, Neurocentre Magendie, 146 Rue Léo-Saignat, 33077 Bordeaux, France
[4]Present address: Hertie Institute for Clinical Brain Research, 72076 Tübingen, Germany
*Correspondence: andreas.luthi@fmi.ch
DOI 10.1016/j.neuron.2009.05.026

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

Tactile Stimulation Affects Amygdala in Rats (Adolphs *et al.*, 2000)

- In rats, both somatosensory and auditory stimulation activated the dorsal amygdala
- ONLY somatosensory stimulation activated the ventrolateral amygdala
- Ventromedial amygdala did not respond to either
- The lateral nucleus is essential in auditory fear conditioning
- Conclusion: different stimulation can effect different parts of the amygdala in rats, with tactile stimulation affecting a discrete part that auditory stimulation does not affect

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

What Does The Fear System Have To Do With Memory?

Research

Impaired Emotional Declarative Memory Following Unilateral Amygdala Damage

Ralph Adolphs,[1] Daniel Tranel, and Natalie Denburg
Department of Neurology, Division of Cognitive Neuroscience, University of Iowa College of Medicine, Iowa City, Iowa 52242 USA

◆ Human Brain Mapping 29:51

Enhanced Amygdala and Medial Prefrontal Activation During Nonconscious Processing of Fear in Posttraumatic Stress Disorder: An fMRI Study

Richard A. Bryant,[1,2*] Andrew H. Kemp,[1,3] Kim L. Felmingham,[1,3] Belinda Liddell,[1,3] Gloria Olivieri,[1,4] Anthony Peduto,[1,4] Evian Gordon,[1,5,6] and Leanne M. Williams[1,3]

[1]Brain Dynamics Centre, Westmead Hospital, Sydeny, New South Wales, Australia
[2]School of Psychology, University of NSW, Sydeny, New South Wales, Australia
[3]Department of Psychology, University of Sydney, Sydeny, New South Wales, Australia
[4]MRI Unit, Department of Radiology, Westmead Hospital, Sydeny, New South Wales, Austra
[5]Division of Psychological Medicine, University of Sydney, Sydeny, New South Wales, Austra
[6]Brain Resource International Database, Brain Resource Company, Sydeny, New South Wales, Au

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

Can't We Just Tap Ourselves? NOT AS GOOD

NeuroImage 10, 448–459 (1999)
Article ID nimg.1999.0478, available online at http://www.idealibrary.com on IDEAL®

The Cerebellum Contributes to Somatosensory Cortical Activity during Self-Produced Tactile Stimulation

Sarah-J. Blakemore,* Daniel M. Wolpert,† and Chris D. Frith*

*Wellcome Department of Cognitive Neurology, 12 Queen Square, London WC1N 3BG, United Kingdom; and †Sobell Department of Neurophysiology, Institute of Neurology, London WC1N 3BG, United Kingdom

Received February 16, 1999

We used fMRI to examine neural responses when

central monitor (Frith, 1992) or internal "forward model" (Wolpert *et al.*, 1995; Wolpert, 1997) has been postu-

What Does This Have To Do With Empthy?

Cerebral Cortex November 2007;17:2553–2561
doi:10.1093/cercor/bhl161
Advance Access publication January 6, 2007

Empathy for Pain and Touch in the Human Somatosensory Cortex

Ilaria Bufalari[1,2], Taryn Aprile[1,2], Alessio Avenanti[1,2], Francesco Di Russo[2,3] and Salvatore Maria Aglioti[1,2]

[1]Dipartimento di Psicologia, Università degli studi di Roma "La Sapienza", I-00185 Rome, Italy, [2]Centro Ricerche Neuropsicologia, Istituto di Ricovero e Cura a Carattere Scientifico Fondazione Santa Lucia, I-00179 Rome, Italy and [3]Dipartimento di Scienze della Formazione per le Attività Motorie e dello Sport, Istituto Universitario di Scienze Motorie, I-00194 Rome, Italy

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

Implications for Pain

frontiers in Human Neuroscience

ORIGINAL RESEARCH
published: 02 July 2015
doi: 10.3389/fnhum.2015.00375

Top-down and bottom-up modulation of pain-induced oscillations

Michael Hauck[1,2], Claudia Domnick[1], Jürgen Lorenz[3], Christian Gerloff[2] and Andreas K. Engel[1]*

[1] Department of Neurophysiology and Pathophysiology, University Medical Center Hamburg-Eppendorf, Hamburg, Germany, [2] Department of Neurology, University Medical Center Hamburg-Eppendorf, Hamburg, Germany, [3] Faculty of Life Science, Laboratory of Human Biology and Physiology, Applied Science University, Hamburg, Germany

Attention is an important factor that is able to strongly modulate the experience of pain. In order to differentiate cortical mechanisms underlying subject-driven (i.e., top-down) and stimulus-driven (bottom-up) modes of attentional pain modulation, we recorded electric brain activity in healthy volunteers during painful laser stimulation while spatial attention and stimulus intensity were systematically varied. The subjects' task was to evaluate the pain intensity at the attended finger, while ignoring laser stimuli delivered to the other finger. Top-down (attention) and bottom up (intensity) influences differed in their effects on oscillatory response components. Attention towards pain induced a decrease in alpha and an increase in gamma band power, localized in the insula. Pain intensity modulated delta, alpha, beta and gamma band power. Source localization revealed stimulus driven modulation in the cingulate gyrus (CG) and

OPEN ACCESS

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

Memory System Involved in Emotion and Motivation

Annu. Rev. Psychol. 2000. 51:599–630

MEMORY SYSTEMS IN THE BRAIN

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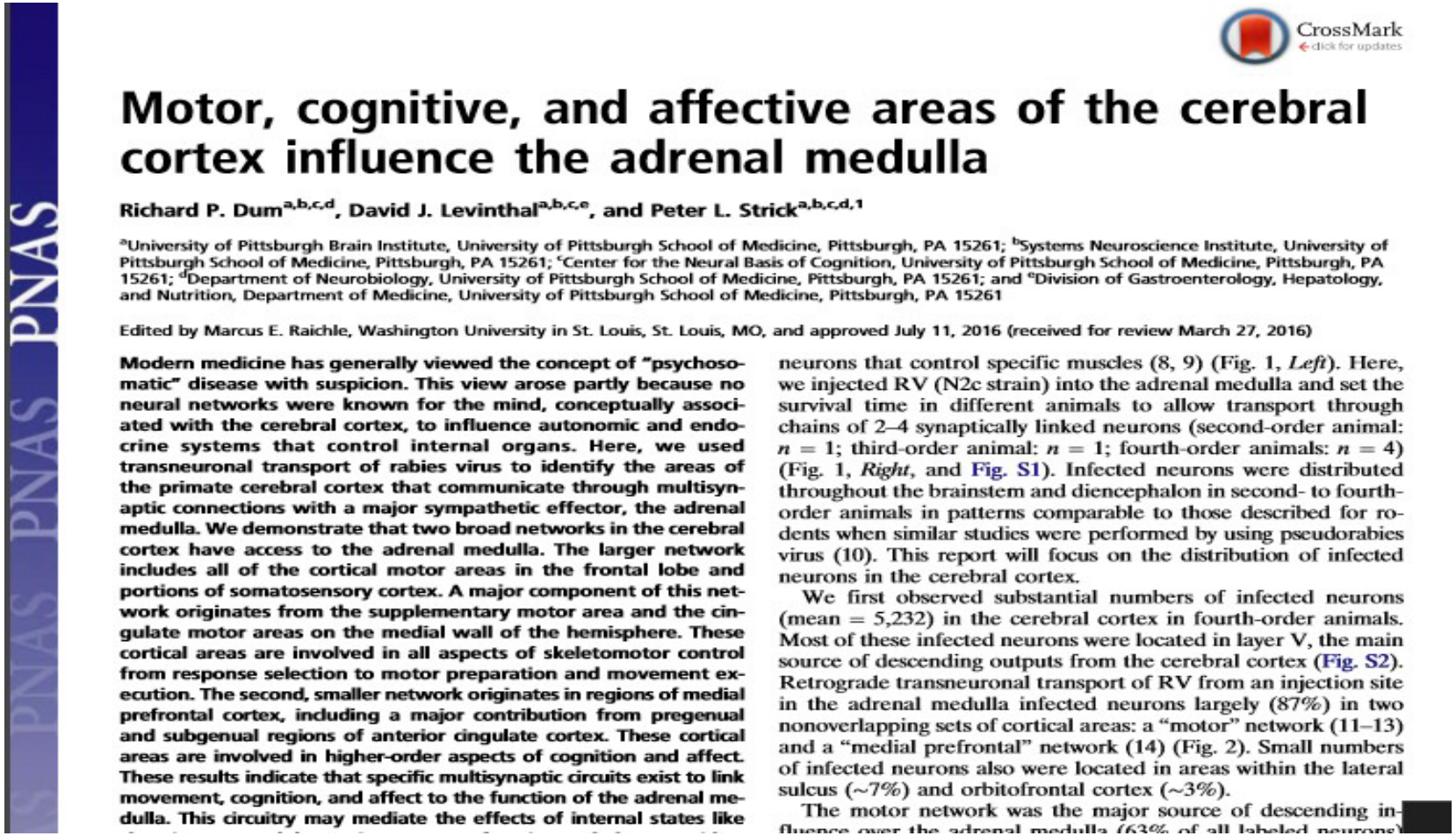
Key Words emotion, hunger, taste, orbitofrontal cortex, amygdala, dopamine, reward, punishment, object recognition, inferior temporal cortex, episodic memory, hippocampus, short term memory, prefrontal cortex

■ **Abstract** The operation of different brain systems involved in different types of memory is described. One is a system in the primate orbitofrontal cortex and amygdala involved in representing rewards and punishers, and in learning stimulus-reinforcer associations. This system is involved in emotion and motivation. A second system in the temporal cortical visual areas is involved in learning invariant representations of objects. A third system in the hippocampus is implicated in episodic memory and in spatial function. Fourth, brain systems in the frontal and temporal cortices involved in short term memory are described. The approach taken provides insight into the neuronal operations that take place in each of these brain systems, and has the aim of leading to quantitative biologically plausible neuronal network models of how each of these memory systems actually operates.

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

New Pathways to Adrenals Found



PNAS PNAS PNAS

CrossMark click for updates

Motor, cognitive, and affective areas of the cerebral cortex influence the adrenal medulla

Richard P. Dum[a,b,c,d], David J. Levinthal[a,b,c,e], and Peter L. Strick[a,b,c,d,1]

[a]University of Pittsburgh Brain Institute, University of Pittsburgh School of Medicine, Pittsburgh, PA 15261; [b]Systems Neuroscience Institute, University of Pittsburgh School of Medicine, Pittsburgh, PA 15261; [c]Center for the Neural Basis of Cognition, University of Pittsburgh School of Medicine, Pittsburgh, PA 15261; [d]Department of Neurobiology, University of Pittsburgh School of Medicine, Pittsburgh, PA 15261; and [e]Division of Gastroenterology, Hepatology, and Nutrition, Department of Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA 15261

Edited by Marcus E. Raichle, Washington University in St. Louis, St. Louis, MO, and approved July 11, 2016 (received for review March 27, 2016)

Modern medicine has generally viewed the concept of "psychosomatic" disease with suspicion. This view arose partly because no neural networks were known for the mind, conceptually associated with the cerebral cortex, to influence autonomic and endocrine systems that control internal organs. Here, we used transneuronal transport of rabies virus to identify the areas of the primate cerebral cortex that communicate through multisynaptic connections with a major sympathetic effector, the adrenal medulla. We demonstrate that two broad networks in the cerebral cortex have access to the adrenal medulla. The larger network includes all of the cortical motor areas in the frontal lobe and portions of somatosensory cortex. A major component of this network originates from the supplementary motor area and the cingulate motor areas on the medial wall of the hemisphere. These cortical areas are involved in all aspects of skeletomotor control from response selection to motor preparation and movement execution. The second, smaller network originates in regions of medial prefrontal cortex, including a major contribution from pregenual and subgenual regions of anterior cingulate cortex. These cortical areas are involved in higher-order aspects of cognition and affect. These results indicate that specific multisynaptic circuits exist to link movement, cognition, and affect to the function of the adrenal medulla. This circuitry may mediate the effects of internal states like

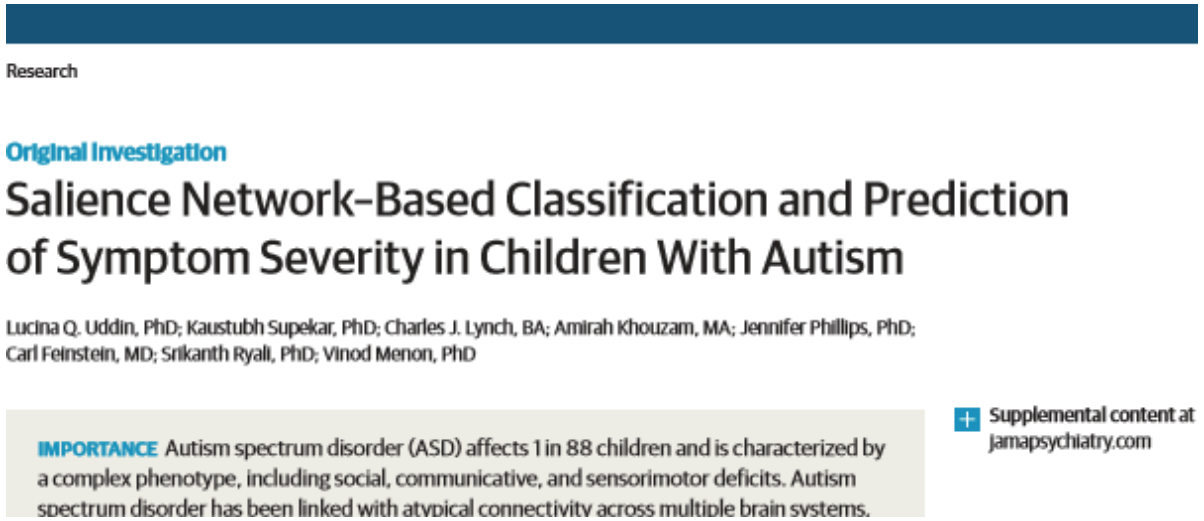
neurons that control specific muscles (8, 9) (Fig. 1, *Left*). Here, we injected RV (N2c strain) into the adrenal medulla and set the survival time in different animals to allow transport through chains of 2–4 synaptically linked neurons (second-order animal: $n = 1$; third-order animal: $n = 1$; fourth-order animals: $n = 4$) (Fig. 1, *Right*, and Fig. S1). Infected neurons were distributed throughout the brainstem and diencephalon in second- to fourth-order animals in patterns comparable to those described for rodents when similar studies were performed by using pseudorabies virus (10). This report will focus on the distribution of infected neurons in the cerebral cortex.

We first observed substantial numbers of infected neurons (mean = 5,232) in the cerebral cortex in fourth-order animals. Most of these infected neurons were located in layer V, the main source of descending outputs from the cerebral cortex (Fig. S2). Retrograde transneuronal transport of RV from an injection site in the adrenal medulla infected neurons largely (87%) in two nonoverlapping sets of cortical areas: a "motor" network (11–13) and a "medial prefrontal" network (14) (Fig. 2). Small numbers of infected neurons also were located in areas within the lateral sulcus (~7%) and orbitofrontal cortex (~3%).

The motor network was the major source of descending in-

Background Literature & Pre-Existing Research on Bilateral Alternating Stimulation in Tactile Form (BLAST)

Salience Network Hypothesis



Research

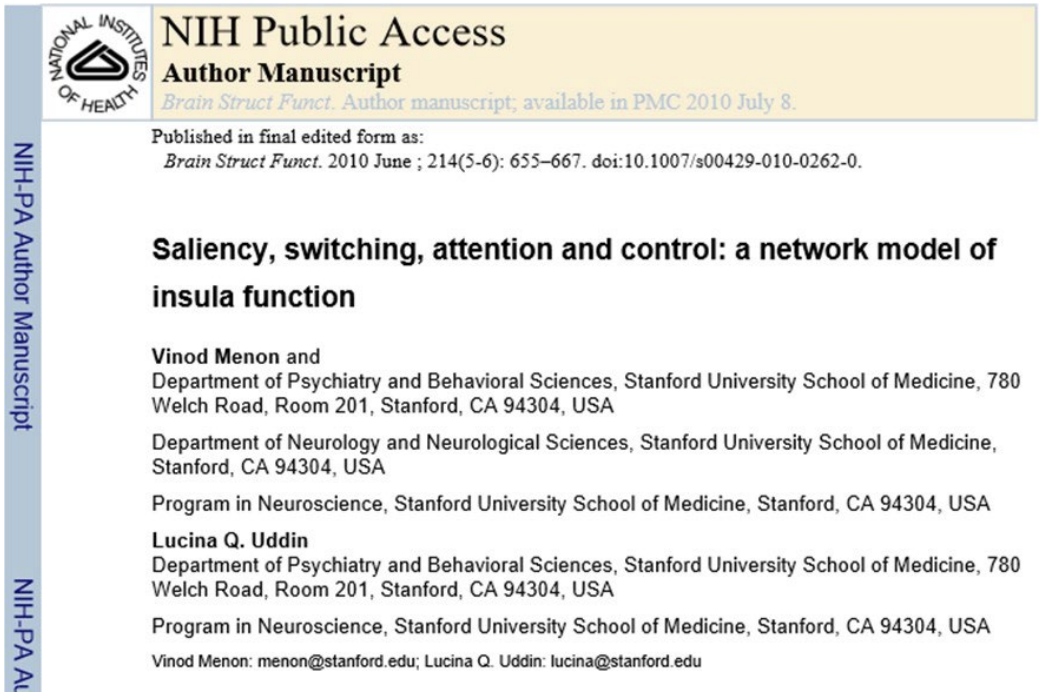
Original Investigation

Salience Network–Based Classification and Prediction of Symptom Severity in Children With Autism

Lucina Q. Uddin, PhD; Kaustubh Supekar, PhD; Charles J. Lynch, BA; Amirah Khouzam, MA; Jennifer Phillips, PhD; Carl Feinstein, MD; Srikanth Ryali, PhD; Vinod Menon, PhD

IMPORTANCE Autism spectrum disorder (ASD) affects 1 in 88 children and is characterized by a complex phenotype, including social, communicative, and sensorimotor deficits. Autism spectrum disorder has been linked with atypical connectivity across multiple brain systems.

Supplemental content at jamapsychiatry.com



Published in final edited form as:
Brain Struct Funct. 2010 June ; 214(5-6): 655–667. doi:10.1007/s00429-010-0262-0.

Saliency, switching, attention and control: a network model of insula function

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Published Research on TouchPoints

Published Research on TouchPoints

Randomized Controlled Trial looking at the efficacy of TouchPoints in attenuating both subjective and objective metrics of the stress response - in particular, pre- and post-treatment SUD ratings and salivary cortisol levels.

Journal of Biotechnology and Biomedical Science

ISSN: 2576-6694

Current Issue Volume No: 2 Issue No: 1 share this page

Research Article | Open Access Available online freely | Peer Reviewed

A Triple-Blind, Placebo-Controlled Randomized Trial of the Effect of Bilateral Alternating Somatosensory Stimulation on Reducing Stress-Related Cortisol and Anxiety During and After the Trier Social Stress Test

Ernesto Cesar Pinto Leal-Junior [1] Heliodora Leão Casalechi [1] Caroline dos Santos Monteiro Machado [1] Amy Serin [3] Nathan S. Hageman [4] Douglas Scott Johnson [2]

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[2]The Cliffside Group, Michigan, United States.

[3]The Touchpoint Solution, Serin Center, Phoenix, Arizona, United States

[4]David Geffen School of Medicine at UCLA, Los Angeles, California, United States

Published Research on TouchPoints

A Triple-Blind, Placebo-Controlled Randomized Trial of the Effect of Bilateral Alternating Somatosensory Stimulation on Reducing Stress-Related Cortisol and Anxiety During and After the Trier Social Stress Test, *Journal of Biotechnology and Biomedical Science*, 2(1), 22-30 doi:10.14302/issn.2576-6694.jbbs-19-2784

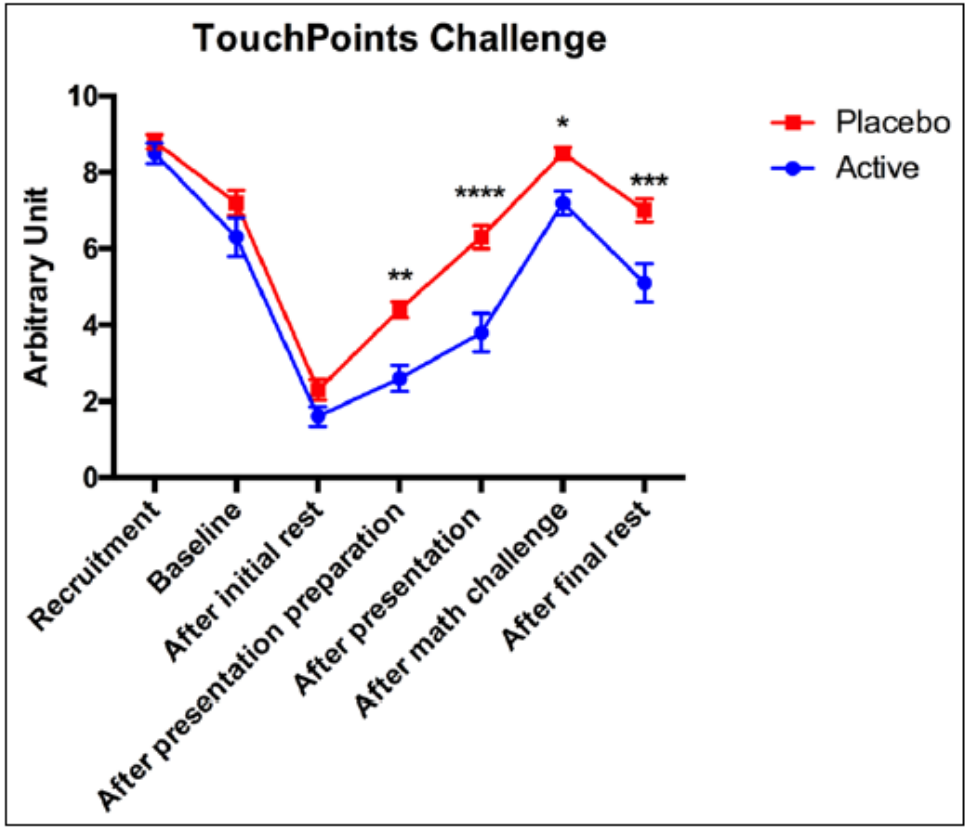


Figure 1. Comparison of the subjective stress ratings between the treatment and control groups.

Data are expressed as mean and SEM. *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001 between treatment (active) and placebo groups.

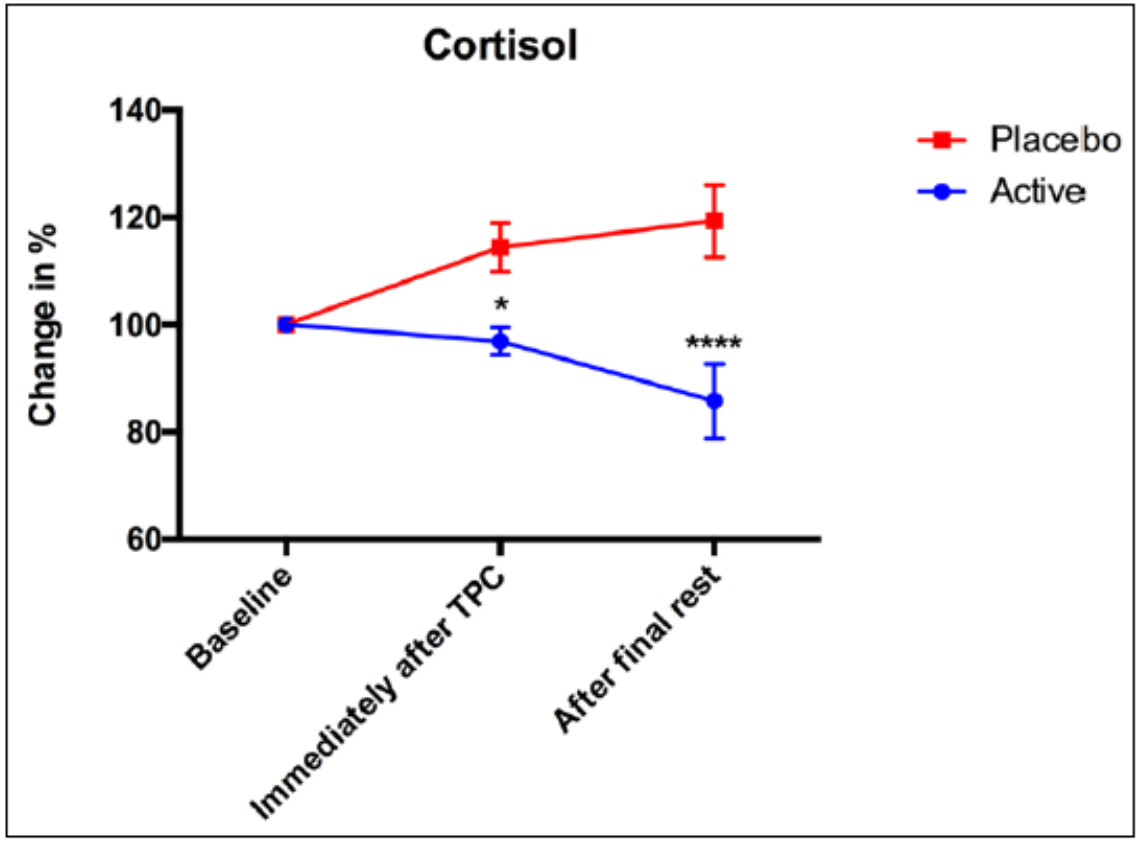


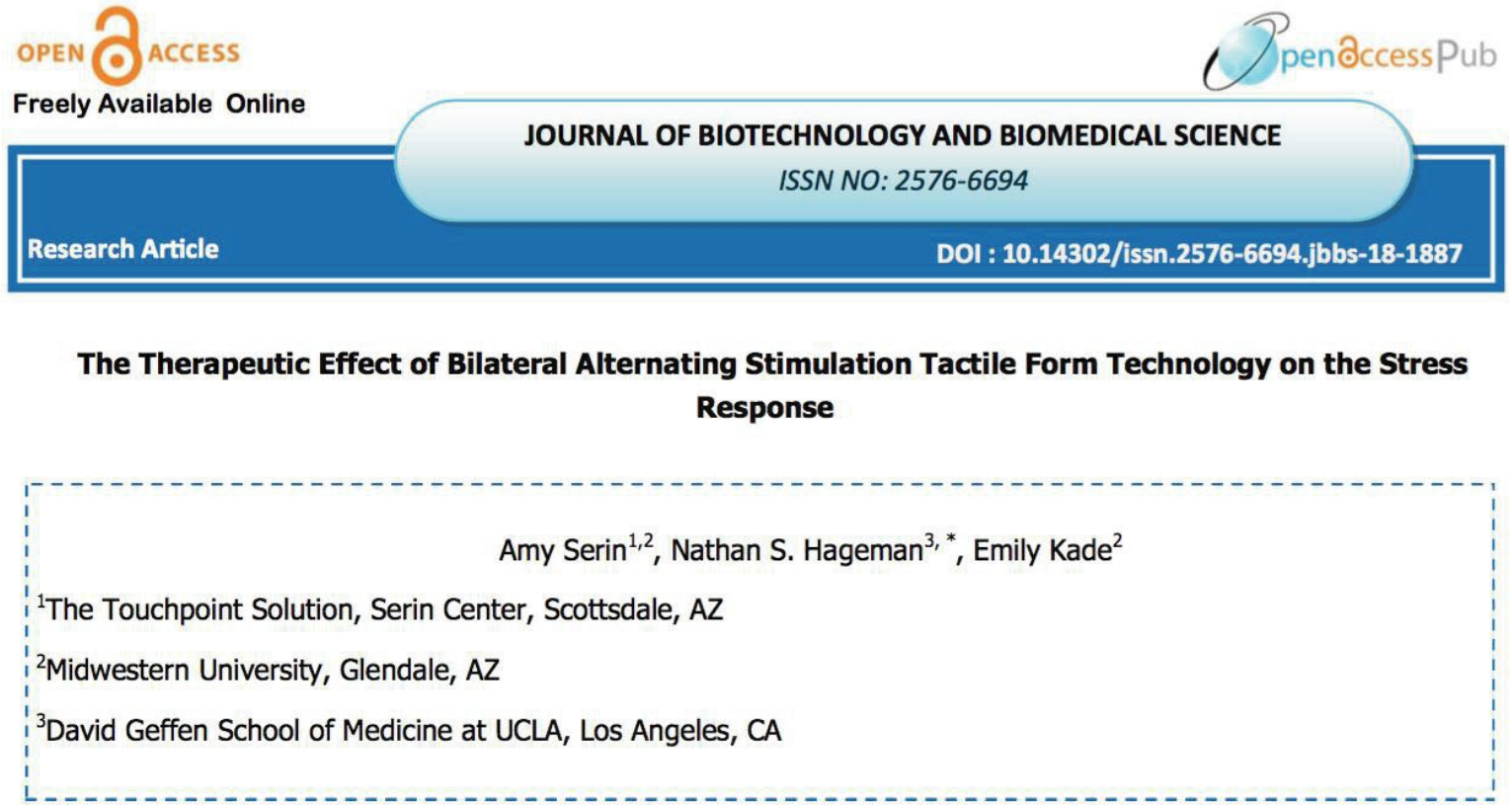
Figure 2. Change in cortisol levels between time points for the treatment (active) group and the control (placebo) group.

Data are expressed as mean and SEM. *p<0.05, ****p<0.0001.

Published Research on TouchPoints

Serin, A., Hageman, N.S., Kade, E. (2018). The Therapeutic Effect of Bilateral Alternating Stimulation Tactile Form Technology on the Stress Response. *Journal of Biotechnology and Biomedical Sciences, 1(2)*: 42-47. doi: 10.14302/issn.2576-6694.jbbs-18-1887

Large cohort of subjects (N = 1106) using TouchPoints who rated (SUD ratings) both emotional and physiologic symptoms associated with stress before and after the application of TouchPoints.



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JOURNAL OF BIOTECHNOLOGY AND BIOMEDICAL SCIENCE
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Research Article

DOI : 10.14302/issn.2576-6694.jbbs-18-1887

The Therapeutic Effect of Bilateral Alternating Stimulation Tactile Form Technology on the Stress Response

Amy Serin[1,2], Nathan S. Hageman[3,*], Emily Kade[2]

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[2]Midwestern University, Glendale, AZ

[3]David Geffen School of Medicine at UCLA, Los Angeles, CA

Published Research on TouchPoints

Serin, A., Hageman, N.S., Kade, E. (2018). The Therapeutic Effect of Bilateral Alternating Stimulation Tactile Form Technology on the Stress Response. *Journal of Biotechnology and Biomedical Sciences, 1(2)*: 42-47. doi: 10.14302/issn.2576-6694.jbbs-18-1887

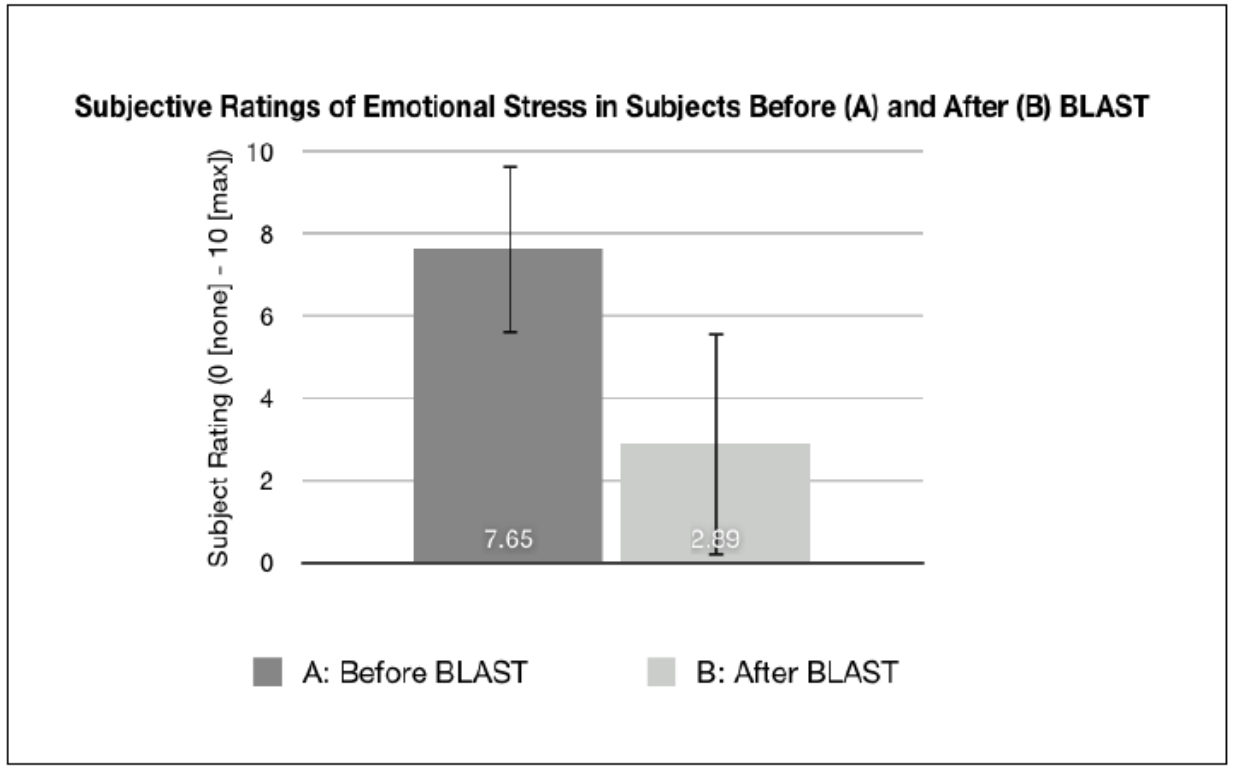


Figure 1: Mean and standard deviation of the ratings from (0 [no stress/distress] – 10 [worst stress/distress of subject's life]) of the level of emotional stress across all subjects (n=1109) before (A) and after (B) 30 seconds of treatment with BLAST via Touchpoints.

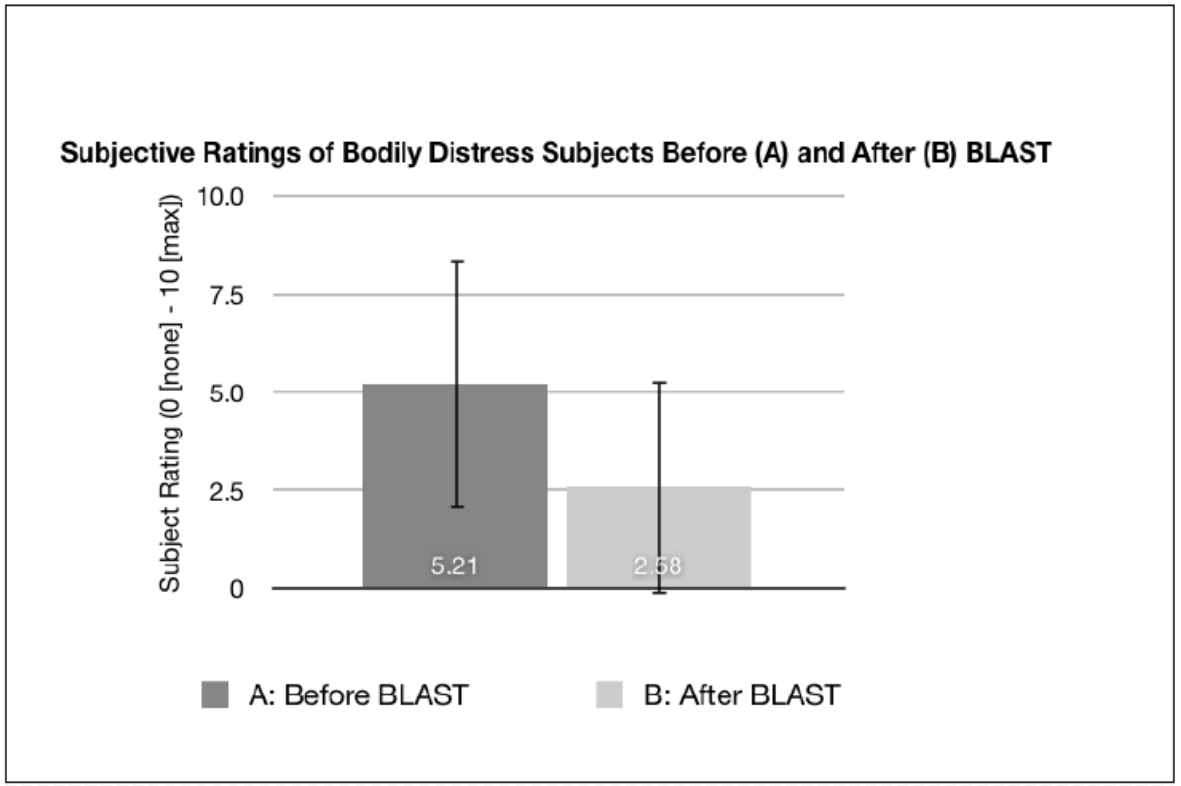


Figure 2: Mean and standard deviation of the ratings from (0 [no stress/distress] – 10 [worst stress/distress of subject's life]) of the level of bodily stress across subjects (n=1109) before (A) and after (B) 30 seconds of treatment with BLAST via Touchpoints.

Unpublished Research, White Papers, and Case Studies on TouchPoints

Unpublished Research, White Papers, and Case Studies on TouchPoints

Effects of BLAST on EEG

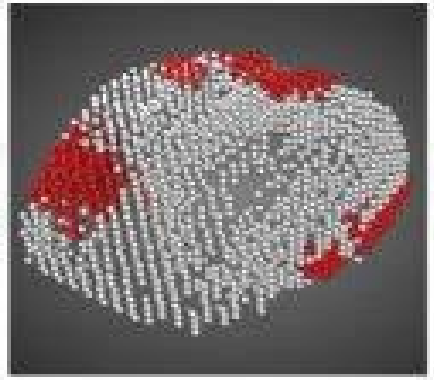
Methodology

- 22 volunteers (12 F, 10M); Ages 7-63 (mean = 28; SD = 16)
- 10 Clinical; 14 Non-clinical (heterogenous disorders)
- 4 five-minute recordings: Baseline, Stress, TouchPoints, After Baseline
- 19-channel EEG collected with Neurofield Q20, processed in Neuroguide
- Neuroguide's Neurostat used for statistics using Linked Ears/T-tests

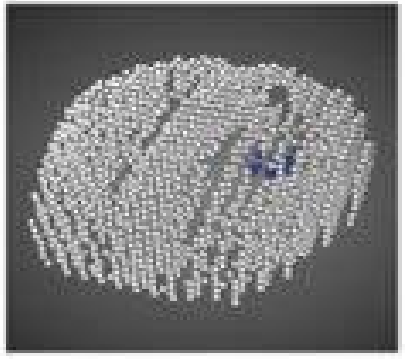
Hz Bands:
Delta (1-4Hz)
Theta (4-8Hz)
Alpha (8-12Hz)
Alpha 1 (8-10Hz)
Alpha 2 (10-12Hz)
Beta (12-25Hz)
Beta 1 (12-15Hz)
Beta 2 (15-18Hz)
Beta 3 (18-25Hz)
High Beta (25-30Hz)
Gamma (30-40Hz
Gamma 1 (30-35Hz)
Gamma 2 (35-40Hz).

Unpublished Research, White Papers, and Case Studies on TouchPoints

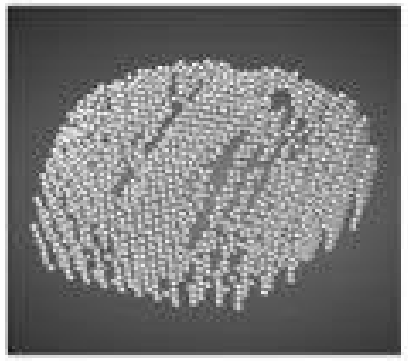
Case study of a single subject using quantitative electroencephalogram (EEG) showing brain wave activity after applying TouchPoints for stress versus control. EEG brain maps shows a reduction in brain wave activity in areas associated with anxiety (left shows excessive beta activity; right shows all types and associated BAs)



1.Before using TouchPoints™

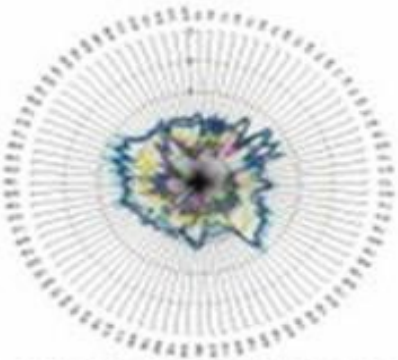


2. While using TouchPoints™

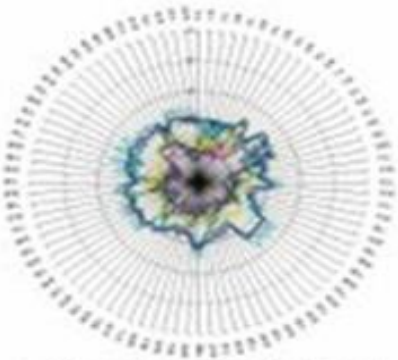


3. After using TouchPoints™

1.Before using TouchPoints™

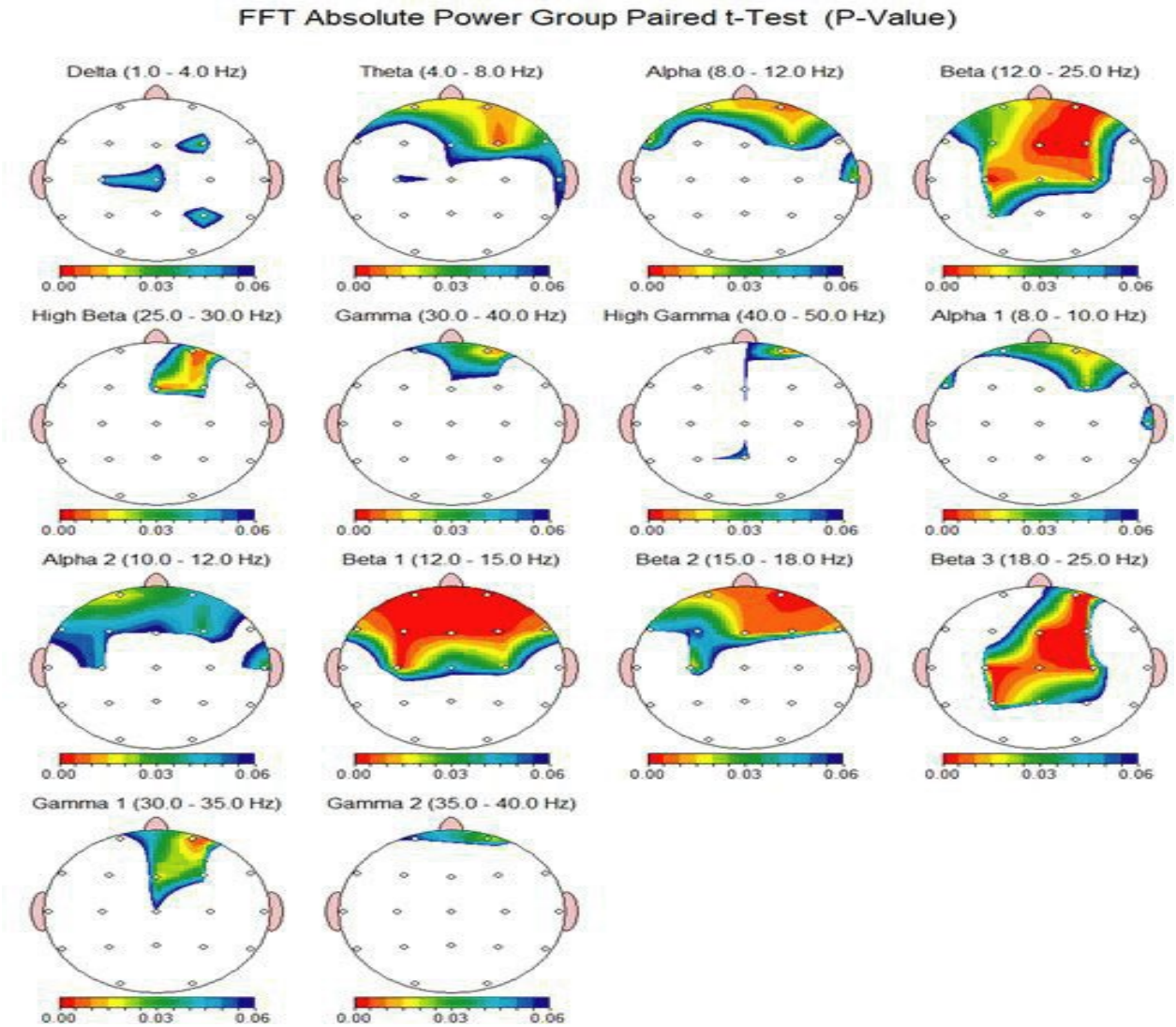


2. While using TouchPoints™



3. After using TouchPoints™

Unpublished Research, White Papers, and Case Studies on TouchPoints

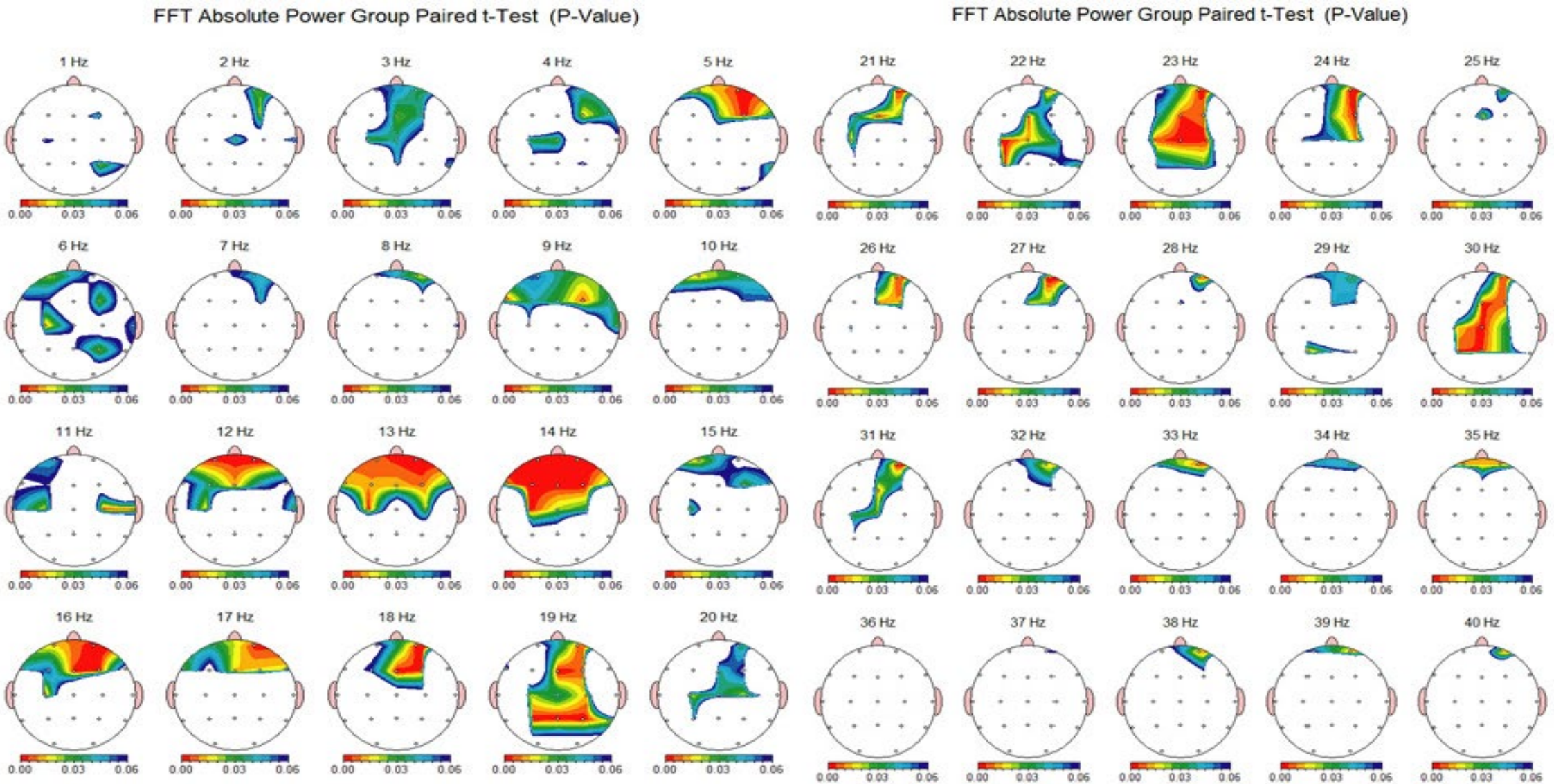


qEEG Results

- Surface head maps of Touchpoint vs. Stress condition in Linked Ears montage
- Significance of each frequency band is shown using color maps.
- Blue on the head maps corresponds to areas approaching statistical significance. This becomes increasingly more significant as the color reaches red (red = $p < 0.0001$)

qEEG Results

- Head maps showing significance for individual Hz frequencies (1-40 Hz)



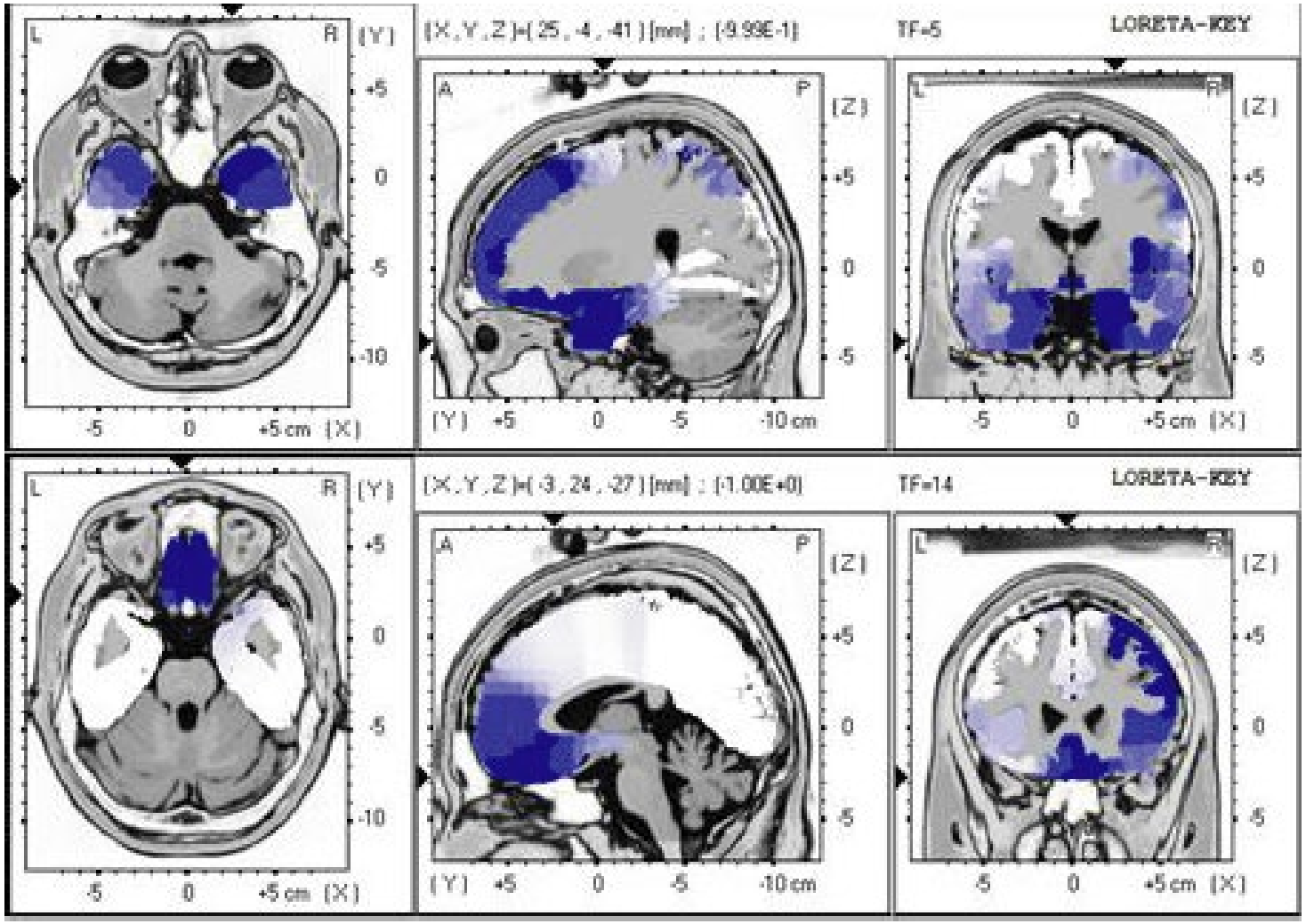
Unpublished Research, White Papers, and Case Studies on TouchPoints

Summary of qEEG Results

- Reduced activity in frontal Theta waves, specifically in 5 Hz at Fp2 and F4 site locations
- Reduced activity in Beta 1 waves, specifically in 12-14 Hz in the frontal site locations Fp1, Fp2, F3, Fz, F4
- Significant decrease in right frontal Beta 2 waves (16-18 Hz), Beta 3 bands at 19 Hz and 23 Hz, and Gamma 1 waves (30-35 Hz)
- Decrease along the midline in Beta 3 waves at 19 Hz and 23 Hz and Gamma 1 waves at 30Hz.

Unpublished Research, White Papers, and Case Studies on TouchPoints

LORETA Source Localization

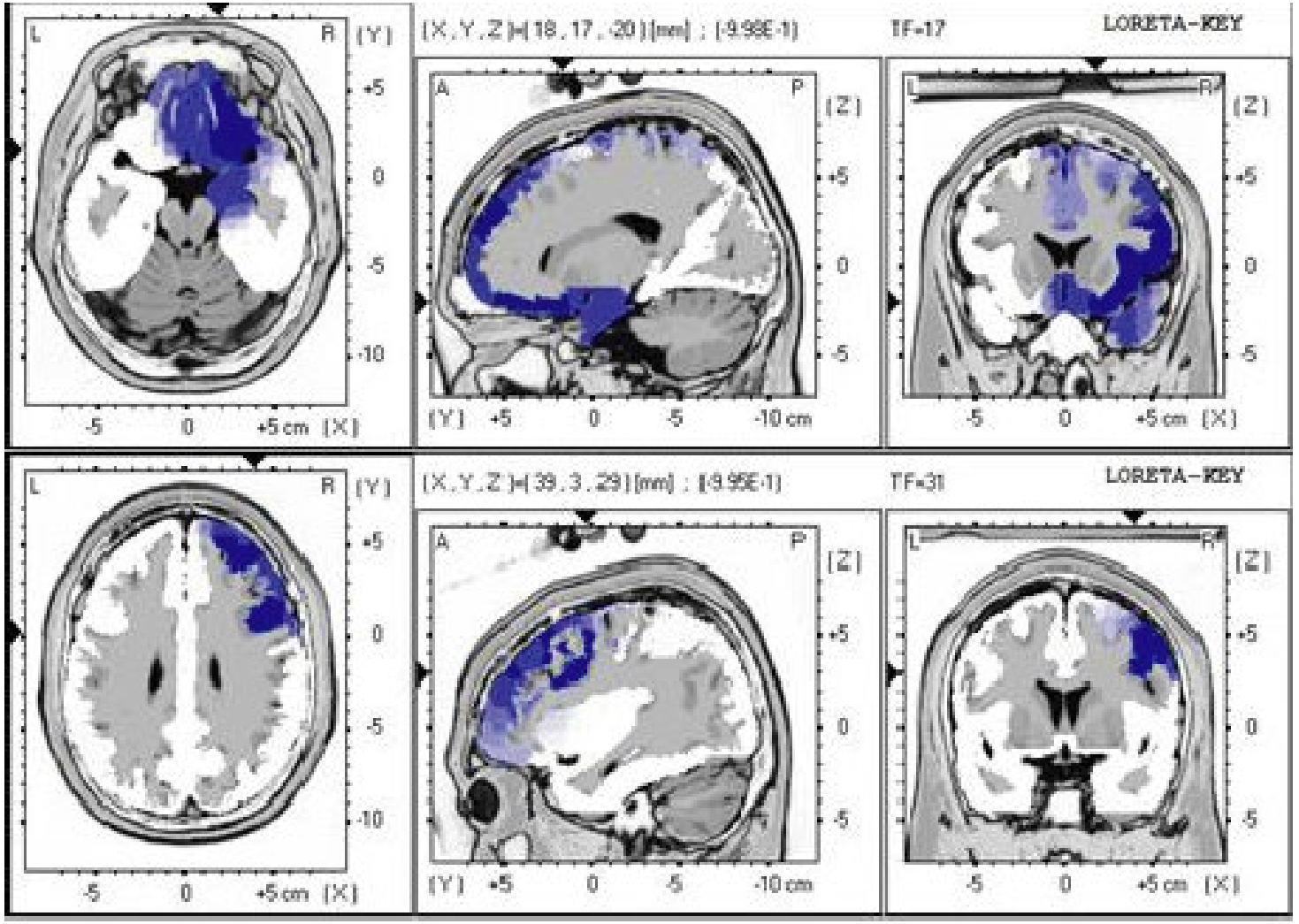


- **5Hz**
- **(X= 25 , Y= -4 , Z= -41)**
- **1st Best Match (d= 3 mm)**
- **Brodmann area 36**
- **Uncus (Amygdala)**
- **Limbic Lobe**
- **P=.001**

- **14Hz**
- **(X= -3 , Y= 24 , Z= -27)**
- **1st Best Match (d= 1 mm)**
- **Brodmann area 11**
- **Rectal Gyrus**
- **Frontal Lobe**
- **P=.0001**

Unpublished Research, White Papers, and Case Studies on TouchPoints

LORETA Source Localization



- **17Hz**
- **(X= 18 , Y= 17 , Z= -20)**
- **1st Best Match (d= 2 mm)**
- **Brodmann area 47**
- **Inferior Frontal Gyrus**
- **Frontal Lobe**
- **p=002**

- **31Hz**
- **(X= 39 , Y= 3 , Z= 29)**
- **1st Best Match (d= 1 mm)**
- **Brodmann area 9**
- **Inferior Frontal Gyrus**
- **Frontal Lobe**
- **p=.001**

Unpublished Research, White Papers, and Case Studies on TouchPoints

Assessment of symptom severity in an ADHD patient using the Pearson Quotient device before and after applying TouchPoints.

TOUCHPOINT™

Solutions for Kids with ADHD

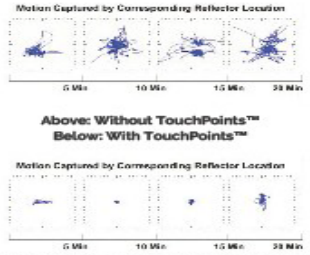
Did you know that **30%** of teens with ADHD have failed or have had to repeat another year of school? And of teenagers with ADHD, **21%** skip school repeatedly, **35%** eventually drop out of school, and **45%** are suspended.

Given these staggering statistics, parents are looking for solutions, and many look to natural treatments for ADHD to address school failure.

One solution is using TouchPoints™ to help kids and teens with ADHD in school and during homework. Preliminary results of a double-blind placebo controlled study shows that using TouchPoints™ may reduce hyperactivity and improve focus. Tracking actual movements with a sensor on PEARSON's Quotient device shows a real-time reduction while kids and teens are engaged in a task of attention and impulsivity while tracking their movements.

This image shows 30-second increments of subject's attention, impulsivity, distractibility, and disengagement during the task.

The subject above, a 13 year-old boy with ADHD, experienced **improved engagement** in an attentional task by over **50%** and **improved attention** by **27%** while using TouchPoints™, meaning that during a 7-hour school day he could have **3.65 more hours of sustained attention** with TouchPoints™.. His **hyperactivity was improved** from borderline deficient to the average range of functioning with TouchPoints™.



This image represents a response of a teenage girl with OCD to two trials of the Quotient Test.

Hyperactivity and TouchPoints™

Individuals with OCD can have severe anxiety that limits their attention and creates internal distractibility and hypervigilance with external distractors. Often they also have problems with attention and impulse control.

The blue lines represent actual movements and it's easy to see the significant reduction in hyperactivity during the second trial with TouchPoints™.

This subject's accuracy improved by a factor of 13x, meaning that during a 7-hour school day she could have **3.5 more hours of sustained attention** with TouchPoints™.

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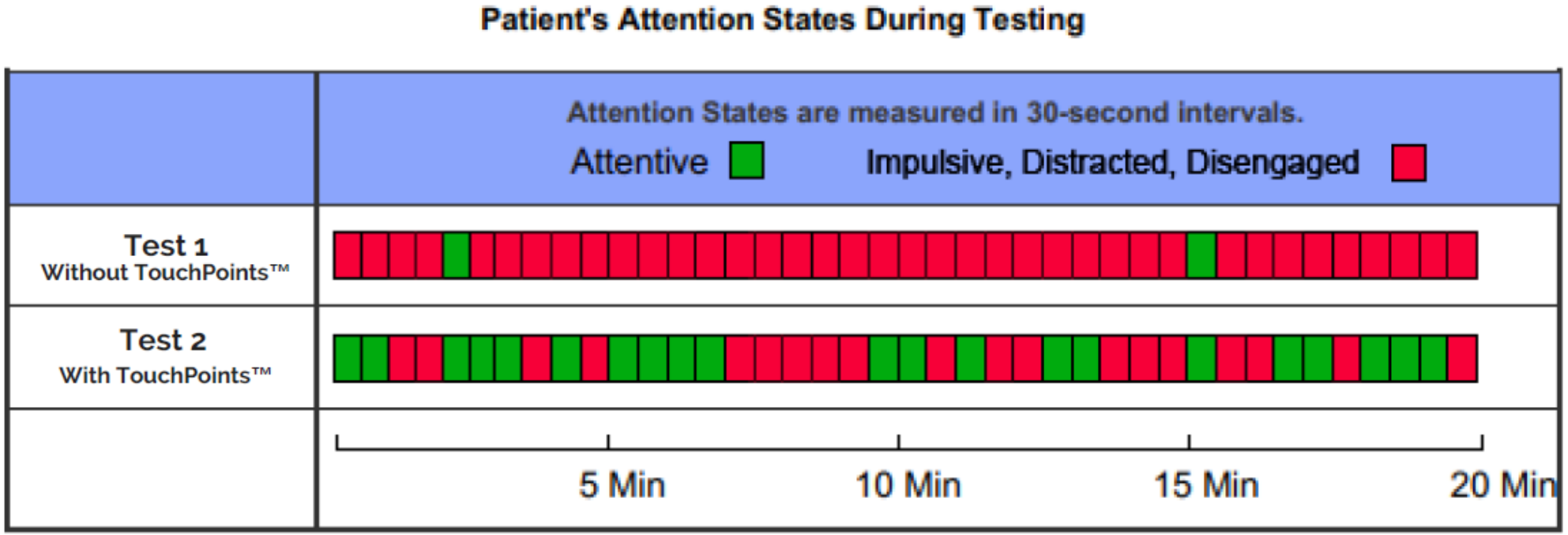
Unpublished Research, White Papers, and Case Studies on TouchPoints

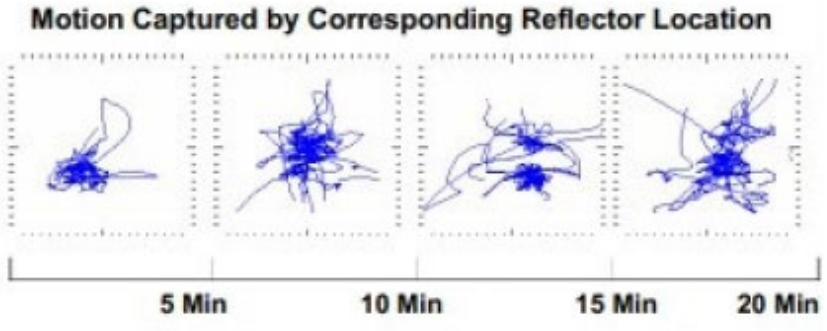
Case study of a 13-year-old boy with ADHD demonstrated improved engagement in an attentional task by over 50% and improved attention by 27% while using TouchPoints, meaning that during a 7-hour school day he could have 3.65 more hours of sustained attention with TouchPoints.



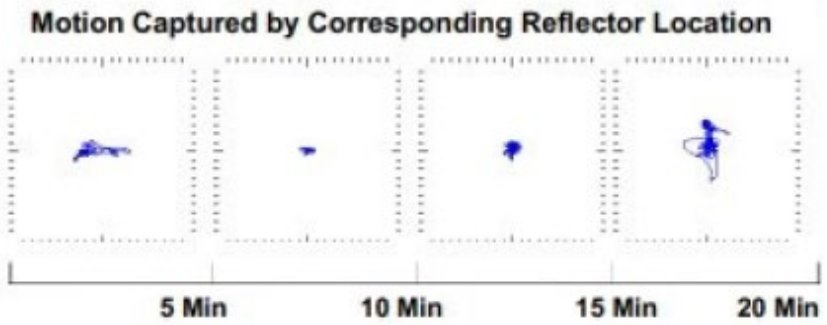
This image shows 30-second increments of subject's attention, impulsivity, distractibility, and disengagement during the task.

Unpublished Research, White Papers, and Case Studies on TouchPoints

Applying TouchPoints showed a reduction in the severity of hyperactivity symptoms assessed using the Pearson Quotient device. The subject's accuracy improved by a factor of 13x, meaning that during a 7-hour school day he/she could have 3.5 more hours of sustained attention



Above: Without TouchPoints™
Below: With TouchPoints™



This image represents a response of a teenage girl with OCD to two trials of the Quotient Test.

Research Posters Presented on TouchPoints

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[7] by mediating sympathetic nervous system (SNS) arousal and de-potentiating amygdala activity[2,5]
- 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[4]
- Anxiety disorders are the most common form of mental illness in children and adolescents. Up to 41.2% of children[3] and 31.9% of adolescents have an anxiety disorder[6]

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

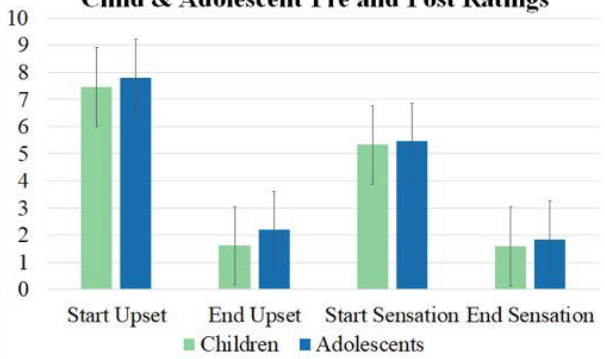
	Children	Adolescents
Subjective Unit of Disturbance	$p < 0.001$*	$p < 0.001$*
Body Sensation	$p < 0.001$*	$p < 0.001$*

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[4,6]
- BLAST has been found to induce feelings of comfort/relaxation [1,5]
- 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[2,3]

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

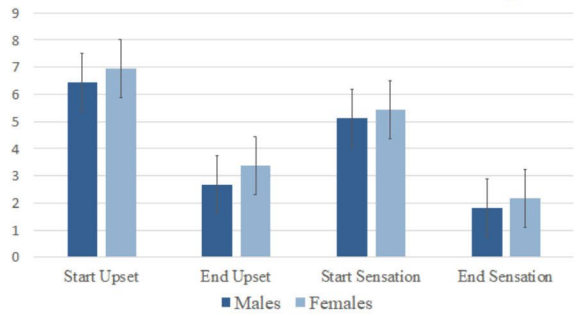
	Start SUD	End SUD	Start BS	End BS
Mean	6.43	2.69	5.11	1.80
Standard Deviation	1.53	1.66	1.79	1.69

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

Amy(Serin,(Ph.D[1,2],(Dominic(Di(Loreto[2],(M.A.,(Emily(Kade,(M.A.[1]
Midwestern University[1], Serin Center[2]

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

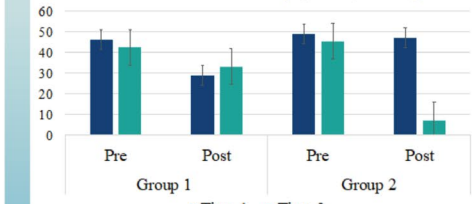
- BLAST technology has been found to significantly reduce subjective feelings of stress up to 62% and physiological body sensations up to 50% in 30 seconds[9]
- BLAST is believed to have this stress-reducing effect on anxiety by inhibiting amygdala activity.[5] This reduces fear-induced sympathetic nervous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

Methods

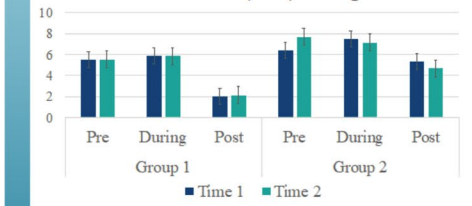
- College students (n=16), ages 18-51 (M=24.6) enrolled in a community college public speaking course were recruited and randomly assigned to Group 1 or Group 2
- Students completed a public speech twice
- During Time 1, Group 1 wore TouchPoints while Group 2 did not; and vice versa during Time 2
- Students 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

Pre to Post State Anxiety (STAI) Ratings



Pre to Post Subjective Unit of Disturbance (SUD) Ratings



Paired Sample One-Tail t-Tests

		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
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

		Group 1	Group 2
Time 1	STAI	37%	4%
	SUD	64%	16%
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 the reason for the continued decreased 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

Emily Kade, M.A.[1] and Amy Serin, Ph.D.[1,2]
Midwestern University[1], Serin Center[2]

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[4]
- 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[1]
- 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)[5]
- Increased work stress has been associated with hypertension and increased risk for cardiovascular disease[2]
- 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

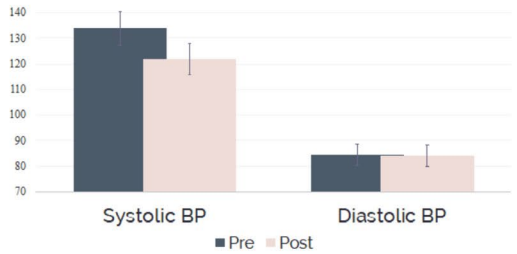
- Data was assessed utilizing an archival sample of individuals who's blood pressure and heart rate were taken before and after BLAST technology was applied
- Paired one-tailed sample t-tests were conducted to assess for significant changes in pre and post BP and HR

HYPOTHESIS

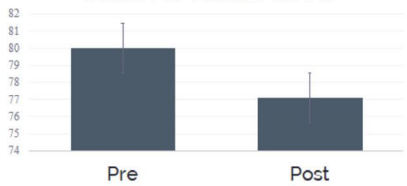
It was hypothesized that both systolic and diastolic blood pressure and heart rate would significantly decrease following delivery of BLAST

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[3]
- 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

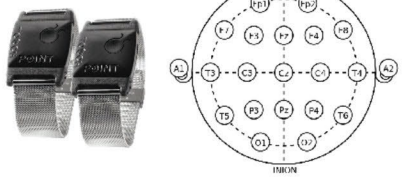
- BLAST technology is embedded in a pair of devices, one placed on either side of the body, alternating haptic microvibrations at a specified frequency and intensity
- BLAST has been found to reduce subjective feelings of stress up to 62% and physiological body sensations up to 50% in 30 seconds[6]
- 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[1,2,3]
- Beta EEG rhythm has been correlated with high situational stress and personal anxiety[4] while prefrontal cortex gamma power (>30Hz) has been associated with increased stress[4] 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

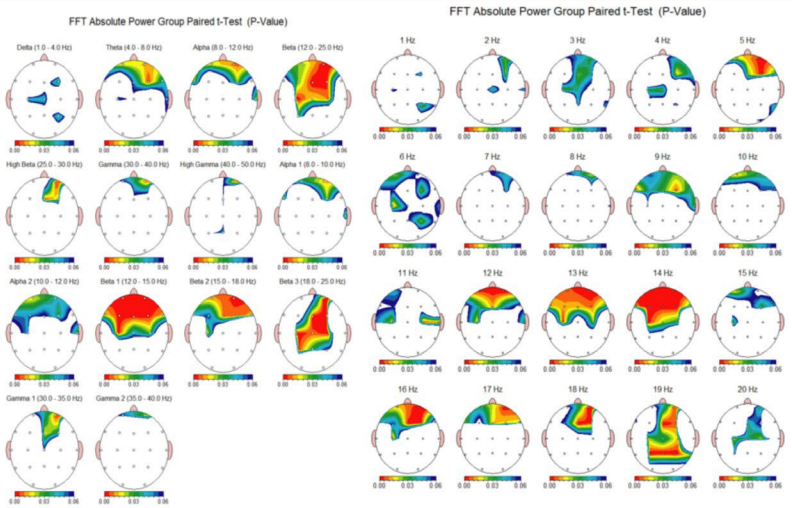
	DELTA	THETA	ALPHA	BETA	HIGH BETA	BETA 1	BETA 2	BETA 3
FP1 - LE	0.148	0.019	0.019	0.025	0.164	0.001	0.012	0.124
F3 - LE	0.200	0.116	0.131	0.024	0.325	0.002	0.057	0.089
C3 - LE	0.042	0.052	0.084	0.000	0.108	0.000	0.009	0.001
P3 - LE	0.141	0.145	0.359	0.032	0.069	0.143	0.163	0.004
O1 - LE	0.395	0.215	0.898	0.567	0.864	0.656	0.899	0.298
F7 - LE	0.101	0.064	0.022	0.073	0.846	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
C4 - LE	0.172	0.139	0.185	0.009	0.109	0.024	0.320	0.002
P4 - LE	0.030	0.075	0.678	0.142	0.149	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	0.012	0.012	0.899
T4 - LE	0.058	0.052	0.020	0.171	0.523	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	0.018	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[4,5] 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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Midwestern University[1], Serin Center[2]

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).[2] The tactile form has been found to reduce SUDs up to 62% in 30 seconds.[4]
- 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.[3]
- Studies examining the efficacy of bilateral stimulation in EEG profiles have focused primarily on populations consisting of Caucasian individuals.[3,4] 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.

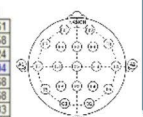
Results

- 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)

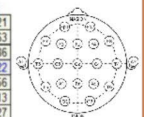
Intrahemispheric: LEFT

	DELTA	THETA	ALPHA	BETA	HIGH BETA	BETA 1	BETA 2	BETA 3
FP1 - CSD	0.176	0.062	0.406	0.602	0.525	0.916	0.956	0.561
F3 - CSD	0.221	0.129	0.066	0.683	0.403	0.364	0.823	0.458
C3 - CSD	0.052	0.074	0.096	0.264	0.958	0.090	0.855	0.424
P3 - CSD	0.070	0.055	0.412	0.010	0.021	0.022	0.097	0.004
O1 - CSD	0.319	0.781	0.535	0.870	0.598	0.992	0.911	0.768
F7 - CSD	0.342	0.385	0.740	0.576	0.305	0.912	0.790	0.468
T3 - CSD	0.044	0.032	0.863	0.814	0.682	0.687	0.469	0.933
T5 - CSD	0.057	0.114	0.978	0.287	0.616	0.335	0.245	0.343



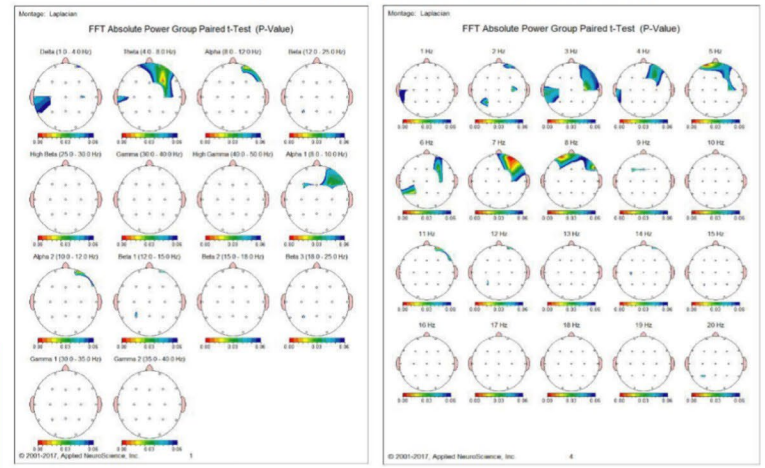
Intrahemispheric: RIGHT

	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	0.004	0.141	0.331	0.097	0.873	0.340	0.263
C4 - CSD	0.020	0.032	0.198	0.355	0.876	0.213	0.741	0.486
P4 - CSD	0.485	0.964	0.857	0.076	0.280	0.288	0.044	0.022
O2 - CSD	0.605	0.899	0.406	0.917	0.519	0.841	0.840	0.756
F8 - CSD	0.100	0.094	0.037	0.645	0.138	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	0.604	0.292	0.825	0.798	0.226	0.535	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	0.826	0.224	0.645	0.834
Cz - CSD	0.975	0.826	0.763	0.358	0.333	0.344	0.540	0.399
Pz - CSD	0.929	0.979	0.776	0.544	0.657	0.486	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.[3]
- Theta activity in the anterior regions have been found to correlate to meditative states and increased internal attention.[4] 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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Common Stress Profiles in Adults Utilizing Bilateral Alternating Stimulation Tactile to Reduce Somatic and Cognitive Distress

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Abstract

The purpose of this archival analysis was to assess differences in ratings of subjective units of distress (SUD) and body sensation (BS) following the application of bilateral alternating stimulation tactile (BLAST). Further, stress profiles via survey data were conducted. Pre and post subjective distress levels and body sensations significantly reduced following BLAST. Most participants (48%) reported an "Overwhelmed" profile.

Background

- Bilateral alternating stimulation in tactile form (BLAST) is a non-invasive, somatosensory-based methodology that has been found to significantly reduce subjective feelings of stress up to 62% and physiological body sensations up to 50% in 30 seconds [4]
- BLAST has been utilized for the past 30 years in EMDR therapy as a method of treatment to de-escalate PTSD arousal
- BLAST is hypothesized to reduce stress by de-potentiating fear-memory synapses within the brain leading to decreased sympathetic nervous system (SNS) arousal.[2]
- American's reported stress levels are at a historic high at 4.8 out of 10[1]
- Americans are reporting increasing sleeplessness (45%), anxiety (36%), irritability/anger (34%), and fatigue (34%) due to high levels of stress[1]
- **Hypothesis:** It was hypothesized that both SUD and BS would significantly decrease following 30 seconds of BLAST

Methodology

- The non-clinical sample consisted of 9,821 adults aged 18-90 (male=3,233; female=6,381).
- Archival data of subjective stress, body sensations (BS) self-report ratings, and stress profile were collected from survey data via a mobile application
- Responses which did not include both a pre or post rating or demographic data were excluded
- Subjects were asked to think of a stressor and rate the intensity of their subjective distress and body sensation on a scale from 1-10 with 10 as most intense
- While continuing to think of a stressor, subjects held the pair of BLAST devices, which deliver quick, alternating rhythmic vibrations. After 30 seconds, subjects were prompted to re-rate SUD and BS

Results

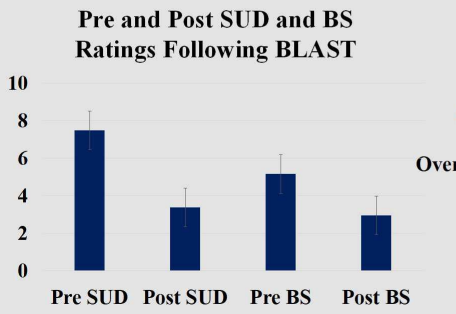
- Ratings of SUD and BS significantly reduced by 55% and 43% respectively following BLAST
- "Overwhelmed" and "Scattered" were the most common stress profiles

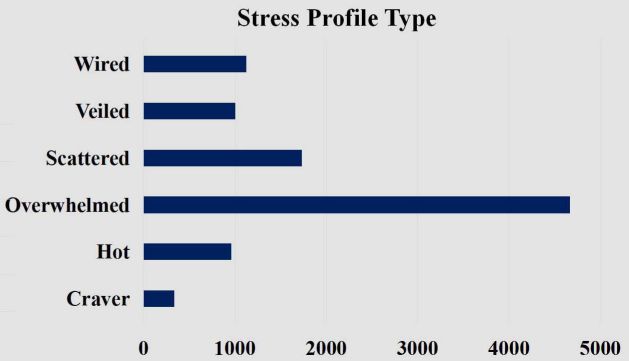
Paired Sample One Tail t-Tests

Subjective Unit of Distress (SUD)	$p = 0.000$*
Body Sensation (BS)	$p = 0.000$*

Note: *Significant at p<0.05

Results





	Pre SUD	Post SUD	Pre BS	Post BS
Average	7.49	3.39	5.16	2.95
Standard Deviation	1.88	2.80	3.01	2.76

	Total	%		Total	%
Male			**Female**		
Craver	100	3%	**Craver**	226	4%
Hot	348	11%	**Hot**	584	9%
Overwhelmed	1386	43%	**Overwhelmed**	3187	50%
Scattered	575	18%	**Scattered**	110	17%
Veiled	434	13%	**Veiled**	541	8%
Wired	390	12%	**Wired**	733	11%

Discussion/Limitations

- Nearly half of the sample (48%) indicated an "Overwhelmed" stress profile, which may be related to the most common U.S. stressors which include money, work, and health concerns[1]
- The "Stress Profile Survey" was created preliminary to assess current symptoms of stress individuals were experiencing but was not analyzed for measurement efficacy/specificity
- Ratings were highly subjective and it is unknown whether there were confounding variables that may have contributed to decreases in SUD and BS ratings
- Follow-up longitudinal research utilizing a randomized control group and standardized measures of stress may be helpful in assessing whether BLAST may be an effective tool in mediating somatic and cognitive stress symptoms for non-clinical and clinical populations

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Reducing Adolescent Stress-Related Somatic Distress Utilizing Somatosensory-Based Methodology

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Midwestern University[1] Serin Center [2]

Introduction

Adolescence is a developmental period marked with heightened stress-induced hormone responses associated with psychological and physical manifestations.[4] Bilateral Alternating Stimulation in Tactile form (BLAST) is a non-invasive, somatosensory-based methodology that has shown significant reductions in subjective units of distress[6] and de-potentiates fear-memory synapses within the brain.[2] This archival study aimed to assess the efficacy of BLAST methodology in reducing stress-related somatic distress in adolescents.

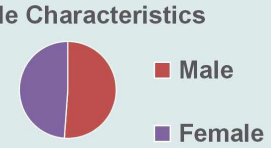
Hypothesis: It was hypothesized that ratings of distressing Body Sensation (BS) associated with stress in male and female adolescents would significantly decrease, following 30 seconds of BLAST.

Literature Review

- BLAST was administered via a pair of devices that administered quick, alternating rhythmic vibrations.
- Bilateral stimulation has been previously found to reduce Subjective Units of Distress (SUD). [2] The tactile form has been found to reduce SUDs up to 62% in 30 seconds. [5]
- Studies examining the efficacy of bilateral stimulation in EEG profiles have found that reductions in Beta 1 and Beta 2 EEG rhythms in the right hemisphere correlate with decreases in reported personal anxiety. [3]

Methodology

- The non-clinical sample consisted of 348 adolescents aged 13-17 (n=348; male=178, female=170).



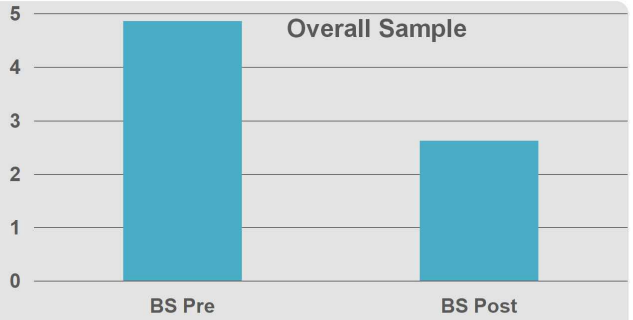
- Archival data of body sensation (BS) self-report ratings from the BLAST device's mobile app was collected and imported directly into an excel document for sorting and analyzing.
- Every BS rating was associated with the respondent's age and gender.
- Responses were not included in data analysis of an entry did not include both a pre- and post- rating, or if demographic data (i.e. age and gender) was not provided
- When experiencing stress, adolescents rated the intensity of their BS on a scale of 1 to 10 (1 being no distressing sensation, 10 being the worst sensation).
- Adolescents were instructed to hold the devices, one in each hand, for 30-seconds while BLAST was delivered.
- Immediately following BLAST, adolescents were re-prompted to rate BS intensity.

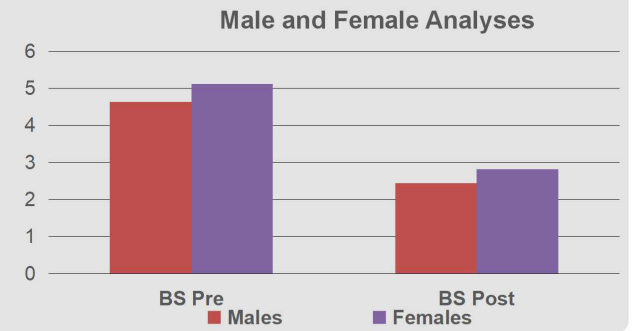
Results

- Paired sample two-tailed t-tests were conducted to assess for significant effects between pre-and-post BS ratings.
- Potential differences between males and females were also separately assessed.

- Overall Sample:
  - Results yielded a significant decrease in BS ratings pre (M= 4.87, SD= 3.23) and post (M= 2.63, SD= 2.86) BLAST delivery [t(347)= 11.58, p= 0.00].

- Male and Female analyses:
  - Similar results were found when separate analyses were run for male only [t(177)= 8.17, p= 0.00] and female only samples [t(169)= 8.19, p= 0.00].





Conclusion

BLAST significantly reduced stress-related distressing body sensations (BS) in 30 seconds. Adolescence is a critical period for intervention to prevent the onset of life-long challenges[1], thus, establishing effective treatment interventions is critical. The results of this study suggest BLAST may be an effective adjunct to psychological treatment, and can be an alternative to other techniques used to reduce SNS arousal, such as mindfulness (research has indicated adolescents are skeptical of the credibility of the technique[1]). This fast-acting, non-invasive technology may positively disrupt the common internalization of distress in adolescents, and can have substantial impacts on health-care systems and everyday well-being outside of a treatment setting. Future research should investigate this methodology with a clinical sample to assess specific efficacy.

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