

Department of Psychiatry Eleventh Annual Research Day

June 2, 2011





Giving Back to Their Communities:

Peer Education as Civic Engagement for Depressed Elders of Color

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Background

Research suggests that individuals who have personal experience with the mental health treatment system gain unique and potentially valuable insight from their treatment experiences. By sharing concrete and practical skills learned during their own experience with mental illness, Peer Educators (PEs) can act as positive role models for individuals currently in a state of mental distress. PE and support services also offer a mechanism for working with vulnerable populations that may feel alienated from the traditional mental health system. However, little research has examined the impact of participating in these activities on the PEs themselves.

Purpose of the Study

The purpose of this study was to examine the benefits of working as a Peer Educator among depressed African-American elders and how this role has impacted their views on mental health, health treatment, and productive engagement.

Methods

Data were compiled by 9 African American elders working as Peer Educators to assess their perceptions of being in the role and how it has impacted their views on mental health, health treatment, and productive engagement.

Qualitative interviews were conducted at 9 and 12 months post-training to assess a more in-depth understanding of their experiences.

Results and Clinical Characteristics

Age	62
Gender	58
Years high school/college	100
Years in care for depression	56
Years in care for other conditions	100
Years in care for any condition	9

Interviews were audio taped and transcribed. Transcripts were analyzed for themes using a grounded theory approach. Commonly observed themes were that PEs had changed their views on mental health, health treatment, and productive engagement. 7 tests were utilized to analyze survey

Results

Overview

Respondents in this study identified clear benefits they received as a result of their participation in the Peer Educator program and identified several changes in the way they think about mental health subsequent to their work as a Peer Educator.

Impact of the Peer Educator Program

- 100% of participants responded 'very true' that they feel that their work with the peers had a positive impact.
- 83.3% of participants responded 'very true' and 16.7% 'somewhat true' that they are more likely to volunteer in the future.
- 67.7% of participants responded 'very true' and 33.3% 'somewhat true' they have brought resources, information, and new skills back to family and friends.

Impact on the Peer Educators Themselves

- 83.3% of participants responded 'very true' and 16.7% 'somewhat true' that they feel better about themselves because of their involvement with the project.
- 67.7% of participants responded 'very true' and 33.3% 'somewhat true' that they have increased their circle of friends and acquaintances.
- 67.7% responded 'very true' and 33.3% 'somewhat true' that they feel their life has improved because of their involvement with the project.

Impact on Perceptions of the Mental Health System

- 83.3% of participants responded 'very true' and 16.7% 'somewhat true' that they would be more likely now to seek professional mental health treatment if they became depressed.
- 100% responded very true that:
 - They are more positive about seeking mental health treatment;
 - They are more interested in learning about mental health; and
 - Their participation in the Peer Educator Project has changed their outlook about mental health treatment for the positive.

Quotes From Peers



"It benefits me from the struggles that I've gone through and to be able to help others... I'm glad that I can help them... I'll know those people that are there for me."

Implications

- Peer education is an effective way to engage elders of color in mental health research.

The LPP as an ...
 Emotion ...

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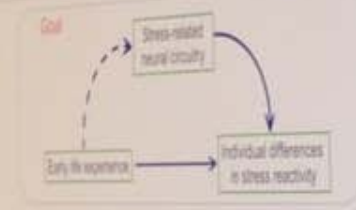
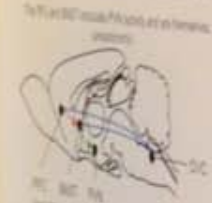
Effects of early life experience on stress-related ...
 Laja Barak-Oshri, Lei K. Sheu, and Peter J. Gianaros, Department of Psychiatry, University of Pittsburgh



Background: The HPA axis is a central component of the stress response. It involves the hypothalamus, which releases CRH, stimulating the pituitary to release ACTH, which stimulates the adrenal cortex to release cortisol. This system is regulated by negative feedback loops involving the hypothalamus, pituitary, and adrenal cortex.

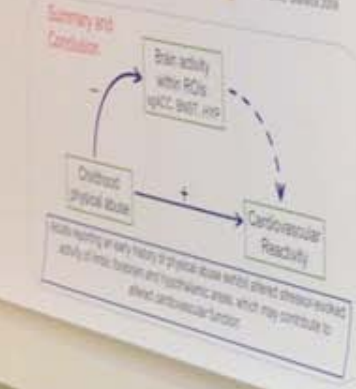
The anatomical location of the hypothalamus (HYP) and nucleus of the solitary tract (NTS) within the brainstem.

The HPA axis is a central component of the stress response.



Method

- Oxford Tube Countdown (CTC)
- FM 300-Scans (randomized Task 300T) - identify the number that differs and ignore its spatial location



Cortical Midline Alterations During Implicit Identity Processing in Bipolar Disorder

Matthew T. Keener, Jay C. Fournier, Benjamin Mullin, Jorge Almeida, Susan Perlman, and Mary L. Philip
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INTRODUCTION

Bipolar disorder (BD) demonstrates significant alterations in the brain with both social dysfunction as well as self-related alterations in personality traits such as grandiosity and inflated self-esteem. These alterations are thought to be related to socially valid stimuli that convey implicit information about the self. Studies implicating fusiform gyrus and amygdala as important regions for face identity and face emotion processing, and the amygdala as important regions for social processing in general, we hypothesized that remitted bipolar and healthy adults would both show activation in these regions during face emotion and face identity processing.

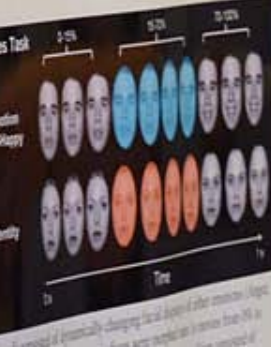
QUESTION

Are there regions subserving face emotion and face identity processing that are similar?

METHODS

Characteristics	Group	N	Age	IQ	Right	Left
Remitted patients	BD	27	49	2	114	49
Y-MRSK 10 diagnosed	HC	27	49	2	112	50
Disorder were compared to 27 healthy controls.						

No significant differences between groups.



RESULTS

Across Both Face Emotion and Face Identity
All participants showed activation in the fusiform gyrus and amygdala during face emotion and face identity processing. Significant clusters were found in the fusiform gyrus (BA 37) and amygdala (BA 34).
Fusiform gyrus: $x=38, y=-52, z=18$
Amygdala: $x=24, y=-12, z=8$
L. Parahippocampal Cortex: $x=-40, y=-22, z=18$
Fusiform gyrus: $x=38, y=-52, z=18$
Amygdala: $x=24, y=-12, z=8$



RESULTS-Continued

Regions showing significant activation during face emotion and face identity processing were compared. Significant clusters were found in the fusiform gyrus (BA 37) and amygdala (BA 34).
Fusiform gyrus: $x=38, y=-52, z=18$
Amygdala: $x=24, y=-12, z=8$

CONCLUSIONS

Regions subserving face emotion and face identity processing are similar. Significant clusters were found in the fusiform gyrus (BA 37) and amygdala (BA 34).

Dr. Matthew T. Keener
POSTER 1402



Marked deficit of GAD67 protein levels in parvalbumin-containing axon terminals in the prefrontal cortex of subjects with schizophrenia

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Introduction

- Impaired GABA synthesis in the prefrontal cortex (PFC) may contribute to dysregulation of excitatory-inhibitory balance in the PFC. One mechanism for this is a deficit in GAD67, the major isoform of GAD, the rate-limiting enzyme in GABA synthesis. We have shown that GAD67 mRNA levels are significantly reduced in the PFC of subjects with schizophrenia.
- However, levels of GAD67 protein at the axon terminal, the critical site of GABA synthesis and function, are not known. We have examined GAD67 protein levels in parvalbumin-containing axon terminals in the PFC of subjects with schizophrenia and age-matched controls.
- To overcome these challenges, we used a recently-developed fluorescent, immunocytochemical approach to visualize GAD67 protein in parvalbumin-containing axon terminals and compare the distribution of GAD67 protein in the PFC of subjects with schizophrenia and age-matched controls.

Methods and Results

- Five matched pairs of control and schizophrenia subjects with a range of illness duration (1-30 years) were included (Table 1).

Case	Age	Sex	Illness Duration (years)	Medication (mg/day)
1	32	F	10	Haloperidol 10
2	35	M	15	Haloperidol 10
3	38	F	20	Haloperidol 10
4	40	M	25	Haloperidol 10
5	42	F	30	Haloperidol 10

Table 1. Demographic characteristics of schizophrenia and control subjects. Age, sex, illness duration, medication, and duration of illness are shown. Mean (SD) age was 38 (5) years, mean (SD) illness duration was 20 (10) years, and mean (SD) medication dose was 10 (0) mg/day.

Figure 1. Summary of immunocytochemical results. Immunocytochemical results for GAD67 and PV in the PFC of schizophrenia and control subjects are shown. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case.

Immunocytochemistry and Sampling

- Sections 100 μ m apart along the rostro-caudal axis, from caudomedial to rostral, were stained for GAD67 and PV. The sections were processed for immunocytochemical staining of GAD67 and PV. The sections were processed for immunocytochemical staining of GAD67 and PV. The sections were processed for immunocytochemical staining of GAD67 and PV.

Microscopy

- Images were collected on an Olympus 1024 camera/fluorescence microscope with a 100x objective lens. Images were collected on an Olympus 1024 camera/fluorescence microscope with a 100x objective lens. Images were collected on an Olympus 1024 camera/fluorescence microscope with a 100x objective lens.

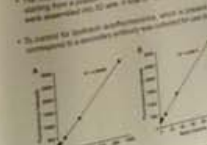


Figure 2. Immunocytochemical results. Immunocytochemical results for GAD67 and PV in the PFC of schizophrenia and control subjects are shown. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case.

Image Post-Processing

- Images were processed using a series of steps to enhance contrast and reduce background. Images were processed using a series of steps to enhance contrast and reduce background. Images were processed using a series of steps to enhance contrast and reduce background.

Statistical Treatment (Immunocytochemical Approach)

- Immunocytochemical results were analyzed using a series of statistical tests. Immunocytochemical results were analyzed using a series of statistical tests. Immunocytochemical results were analyzed using a series of statistical tests.



Figure 3. Examples of GAD67 and PV immunocytochemical staining. Examples of GAD67 and PV immunocytochemical staining in parvalbumin-containing axon terminals are shown. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case.

Data Analysis

- Mean values and standard deviations were calculated for each group. Mean values and standard deviations were calculated for each group. Mean values and standard deviations were calculated for each group.

Evaluation of Specific Subpopulations

- Specific subpopulations of axon terminals were analyzed. Specific subpopulations of axon terminals were analyzed. Specific subpopulations of axon terminals were analyzed.

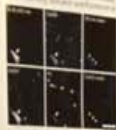


Figure 4. Summary of immunocytochemical results. Summary of immunocytochemical results for GAD67 and PV in the PFC of schizophrenia and control subjects are shown. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case.

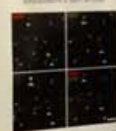


Figure 5. Examples of GAD67 and PV immunocytochemical staining. Examples of GAD67 and PV immunocytochemical staining in parvalbumin-containing axon terminals are shown. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case. The number of axon terminals (AT) is shown for each case.

Conclusions

- Our results show a marked deficit of GAD67 protein levels in parvalbumin-containing axon terminals in the PFC of subjects with schizophrenia. Our results show a marked deficit of GAD67 protein levels in parvalbumin-containing axon terminals in the PFC of subjects with schizophrenia.

References

- Carley AA, Fish KN, Lewis DA (2010) Marked deficit of GAD67 protein levels in parvalbumin-containing axon terminals in the prefrontal cortex of subjects with schizophrenia. *J Neurosci* 30:1234-1245.

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Developmental trajectories of molecular transcripts regulating GABA inputs to pyramidal cells in monkey prefrontal cortex

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Introduction

Developmental trajectories of molecular transcripts regulating GABA inputs to pyramidal cells in monkey prefrontal cortex. We investigated the developmental trajectories of molecular transcripts regulating GABA inputs to pyramidal cells in monkey prefrontal cortex. We used single-cell RNA sequencing to identify differentially expressed transcripts in pyramidal cells at different developmental stages. We found that several transcripts, including *PCP2*, *PCP1*, and *PCP3*, were upregulated during development. These transcripts are involved in GABAergic signaling and may play a role in the maturation of GABAergic inputs to pyramidal cells.

Methods

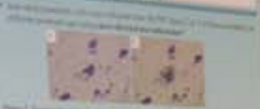


Figure 1. Single-cell RNA sequencing analysis of pyramidal cells in monkey prefrontal cortex. The heatmap shows the expression levels of differentially expressed transcripts across developmental stages. The color scale ranges from blue (low expression) to red (high expression).

Transcript	Stage 1	Stage 2	Stage 3
PCP2	Low	Medium	High
PCP1	Low	Medium	High
PCP3	Low	Medium	High

Results

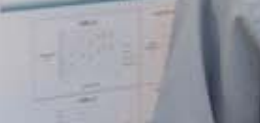
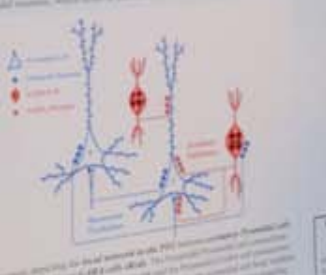


Figure 2. Schematic diagram of a pyramidal cell showing GABAergic inputs. The diagram illustrates the cell body, dendrites, and axon, with GABAergic inputs shown as red dots on the dendrites. The diagram also shows the distribution of GABAergic inputs across different developmental stages.



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POSTER 108

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POSTER 102

Using Human Induced Pluripotent Stem Cells to Investigate Neurodevelopmental Effects of Human Cytomegalovirus

Leanne Thacker, Shreyashree Srinivasan, Christopher M. Basso, et al.





Post-traumatic stress symptoms correlate with smaller subgenual cingulate, and insula in unmedicated combat veterans

April 2013
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Background
PTSD is a common mental health condition among military veterans. The subgenual cingulate and insula are brain regions that are thought to be involved in emotional processing and regulation. This study investigated whether PTSD symptoms were associated with smaller volumes of these brain regions in unmedicated combat veterans.

Methods
We conducted a cross-sectional study of 40 unmedicated combat veterans. PTSD symptoms were measured using the Clinician Rating Scale for PTSD (CRS-PTSD). Brain volumes were measured using structural MRI scans. We used regression analyses to examine the relationship between PTSD symptoms and subgenual cingulate and insula volumes, controlling for age, sex, and education.

Results
Higher PTSD symptom scores were associated with smaller volumes of the subgenual cingulate and insula. This relationship remained significant after controlling for age, sex, and education.

Conclusions
These findings suggest that smaller volumes of the subgenual cingulate and insula may be associated with PTSD symptoms in unmedicated combat veterans.

Table 1. Demographic and clinical data

	Mean	SD	Min	Max
Age	34.1	7.8	18	51
Sex	24	2.0	18	30
Education	12.8	1.2	10	16
CRS-PTSD	18.1	7.8	0	35
Subgenual cingulate volume (cm ³)	12.5	3.8	6.5	20.5
Insula volume (cm ³)	10.1	3.2	5.5	18.5

CRS-PTSD = Clinician Rating Scale for PTSD.



PTSD symptoms were associated with smaller volumes of the subgenual cingulate and insula.

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Functional role of AMPA and NMDA receptors in pyramidal neurons: NMDAR hypofunction hypothesis

NMDA antagonist administration
recapitulates core features of
schizophrenia

Javitt & Zukin Am J Psychiatry 1991
Coyle, Tsai & Goff. Ann N Y Acad Sci 2003
Krystal, Anand & Moghaddam Arch Gen Psychiatry 2002

NMDA antagonists produce
disinhibition, suggesting NMDA is
critical for GABA neuron activation

Coyle, Biochem Pharmacol 2004
Lewis & Moghaddam Arch Neurol 2006
Hamayoun & Moghaddam J Neurosci 2007







