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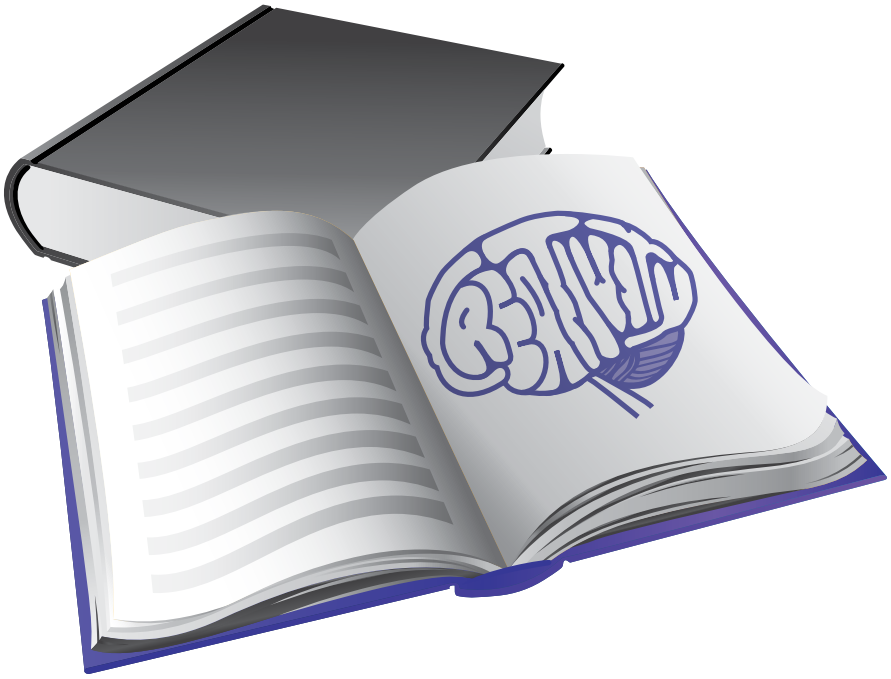

In this issue of *The Residents' Journal*, we address recent findings in the neurobiological mechanisms behind creativity. Dr. Gabriela Iagaru discusses the neurobiology of creativity and its association with mental illness. Then, Dr. Joanna Vaz MacLean presents the results of an original research study of psychiatric inpatients randomly assigned to a spontaneous creative expression activity. Dr. George C. Gettys takes us on a tour of computer-based creative software and outlines its use in the therapeutic treatment of psychiatrically ill patients. Finally, Dr. Mirjana Jojic presents a case report of a schizophrenia patient who developed catatonia and attributed the success of her treatment to her poetry. We hope, with this section, to instill curiosity for a deeper understanding into psychiatric illness.

Editorial

An Update on Changes at *The Residents' Journal*

Joseph M. Cerimele, M.D.
Editor-in-Chief

Over the last 3 months, we have made several changes at the *Residents' Journal.* Some of the major changes are the review and revision process, the responsibilities of guest editors, and the types of manuscripts accepted.

Review

In July, we initiated an in-house peer review process. The details of this process were described in an editorial in the September issue (1). Recently, we have identified interested residents to serve as peer reviewers. This process has been helpful for authors but has also served as a way for resident physicians to learn the mechanics of reviewing a manuscript and writing constructive comments. As others have noted, academic peer review is often reserved for senior faculty members, leaving early-career physicians without an opportunity to learn the basics of review (2, 3). By reviewing for the *Residents' Journal*, residents can learn the steps of the peer review process and ultimately learn to efficiently assess an article's arguments. Authors, reviewers, and the editors have been pleased with this process so far, but we are looking to expand this process and to include more peer reviewers. Residents interested in serving as a peer reviewer should get in touch with me via e-mail.

Guest Section Editors

Prior to October 2010, many issues of the *Residents' Journal* focused on a theme and only contained articles related to that theme. Issue Editors were responsible for creating and soliciting most articles in a month's issue. This is no longer the case. Each month, we will publish solicited and unsolicited articles that do not share a common theme. Some issues will have a theme-based section, which will include articles linked by a common topic. At times, these sections will be edited by a Guest Section Editor. Resident physicians interested in learning about editing can become involved with the Journal by becoming a Guest Section Editor. Becoming a Guest Section Editor requires a brief application process. As with the peer review process, residents interested in serving in this role should contact me to learn about the application process.

Article Types

Each month, we publish the Author Information for Submissions on the final page of the Journal. As readers will see on this page, we are moving away from accepting and publishing Introspections. In the past, introspective pieces have usually described an individual's unique experience and usually have not reviewed universal topics related to psychiatry residency training or clinical practice. Furthermore, these pieces generally have not referenced the literature and have left the resident to search on his or her own for related articles. Many authors have also found that revising an introspective piece based on peer reviewer comments alters the creative style and sometimes removes the introspective nature of the piece. Describing one's experience in a narrative may be an important skill; however, one of the Journal's goals is to provide a way for residents to learn the academic authorship process through idea development, writing, submission, review, and revision. Introspective pieces generally do not permit residents to see the complete process, as they are rarely reviewed or revised. Therefore, we encourage residents to learn and practice academic writing by composing the article types listed in the instructions for authors.

Through submission of Review articles, Original Research reports, Clinical Case Conferences, and Treatment in Psychiatry articles, residents will experience the entire process and allow the readers to learn about clinical topics. The Journal's goal of encouraging residents to learn the basics of academic writing, manuscript submission, review, and revision can be realized through the preparation, submission, and review of these manuscript types.

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Neural Correlates of Creativity and the Link to Mental Illness

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Artistic creativity as a human construct has been a constant endeavor of mankind, and only recently have there been scientific attempts to explain this phenomenon. Jamison (1) revealed the association of creativity with divergent thinking, an important predictor of creative ability, with the following three characteristics: fluency (ability to produce multiple ideas or problem solutions in a short period of time), flexibility (ability to simultaneously propose a variety of approaches to a specific problem), and originality (ability to produce new, original ideas). Additionally, a comprehensive definition of creativity included the creative person, the cognitive creative process, the creative environment, and the creative product (2, 3). The interest in linking creativity and mental illness has led to previous enthusiastic studies (4) but little evidence support. The present article aimed to examine the neurobiological relationship between artistic creativity and cognitive, affective, and perceptual changes in the artistic individual, following several lines of neuroscience research that has emerged in the last decade.

Method

Studies were selected through MEDLINE and PubMed searches and existing reviews. The search terms were "art," "creativity," "neurobiology," and "mental illness." Four individual categories of identified studies emphasized dehydroepiandrosterone-sulfate, dopamine, norepinephrine and biochemical factors, and neuroanatomical factors.

Results

The most conclusive study (5) examined how vulnerability to experiencing negative mood, measured biologically, and to intense negative emotions influenced artistic creativity. A total of 96 healthy adults were indexed for vulnerability to experiencing negative mood (with assessment of dehydroepiandrosterone-sulfate levels), previously linked to depression. Then, following another line of research, the authors assessed situational variables by examining emotional influences on creativity, which showed that activating (high arousal) moods with negative hedonic tone enhance creative fluency and originality through enhanced perseverance, and positive activating moods (low arousal) enhance creative fluency and originality through enhanced cognitive flexibility. They manipulated emotional responses by randomly assigning participants to receive social rejection or social approval or to a nonsocial situation. Participants' self-reported emotions were measured, and their creative products were assessed independently. The results were notable in that the more biologically vulnerable individuals (lower dehydroepiandrosterone-sulfate levels), exposed to rejection, experienced high-arousal negative moods and produced the most creative artistic products.

Further lines of evidence point toward dopamine. One study (6) investigated the relationship between creative ability, specifically divergent thinking, and dopamine D_2 receptor expression in healthy individuals, with a focus on regions where dopaminergic aberrations have been associated with psychotic symptoms (corticostriatal-thalamocortical loops). In 14 participants, divergent thinking (found to be influenced by dopamine) was measured and positron emission tomography and magnetic resonance scans were performed. Higher scores on items for divergent thinking were associated with lower D_2 binding potential in the thalamus. Decreased D_2 receptor densities in the thalamus lowered thalamic gating thresholds, thus increasing thalamocortical information flow. In healthy individuals, this increases performance on divergent thinking tests, but the same phenomenon could be disadvantageous in tasks with high selective attention, with the risk of overwhelming excitatory signals from the thalamus to the cortex and intensifying positive psychotic symptoms. The study controlled for intelligence but did not have a comparison sample.

Another study, using an anatomical conceptual model (7), proposed linking temporal lobes with frontal lobes and the limbic system in an attempt to explain human idea generation and creative drive. The temporal lobe was emphasized as the seat of creativity but also of creativity suppression when the balance between frontal and temporal activity (mediated by mutually inhibitory corticocortical projections) was disrupted. The findings indicate that dopamine is implicated in raising baseline arousal, in the focused aspect of creative drive, in metaphoric thought, in the experience of having a creative idea dictated by the muse (similar to auditory hallucinations), and in decreasing latent inhibition (a behavioral index of the ability to habituate to sensations). Low latent inhibition may be a mechanism that facilitates entry into flow-type states in schizotypal individuals to bring greater absorption in present experience (8).

In a more recent anatomical study (2), methodological gaps in the neurobiological research of creativity were addressed, since lesion studies have tended to localize creativity to the anterior frontal and temporal lobes, EEG studies have shown both higher and lower synchronization, and functional imaging studies have shown a tendency toward frontal, parietal, and cingulate localization. The study consisted of 61 healthy subjects who completed creative achievement and divergent thinking tests as well as intelligence and personality tests, and their creative products were assessed independently. Structural imaging measured

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cortical thickness, and the distribution of brain regions suggested that cognitive control of information flow among certain brain areas (right posterior cingulate and right angular gyri [positive correlation with creative measures]; left orbitofrontal cortex and cuneus, angular, and left lingual gyri [negative correlation with creative measures]) may be critical to understanding creative cognition. An interpretation was that the generation of original ideas is associated with less cortical thickness within frontal and posterior areas.

One tentative but promising line of research followed Horrobin's evolutionary theory of creativity (9), which is related to the hypothesis of schizophrenia as a disorder of phospholipid membrane metabolism with loss of highly polyunsaturated fatty acids from the membranes owing to increased activity of the enzyme phospholipase A2. The dynamic interplay between norepinephrine systems and phospholipase A2 modulates attention, divergent thinking, and arousal and mediates thought processes. The effect of aberrant phospholipase A2 activity has been shown in the left temporal lobe in relatives of schizophrenia and bipolar patients and in patients with schizotypal personality disorder. Fluctuations (increases/decreases) in norepinephrine levels related to creativity were found in healthy populations (decrease), depressed and healthy first-degree relatives of schizophrenia patients (decrease), and patients with manic and psychotic episodes (increase). A similar fluctuation in schizophrenia patients was reported as a result of elevated apolipoprotein D in the thalamus, a structure that receives norepinephrine projections from locus coeruleus and could potentially change EEG alpha oscillations, which are related to creative processes.

Discussion

Although preliminary results are premature to draw a neurobiological link between creativity and mental illness, findings are encouraging to stimulate more research questions and highlight the need for more carefully designed studies with comparison groups, follow-up assessment, and larger sample sizes.

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The Effects of Spontaneous Creative Expression on Anxiety and Depression in Psychiatric Inpatients

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Spontaneous creative expression through visual arts such as painting uses art as a nonverbal way to communicate one's inner feelings and perceptions. In the early 20th century, psychiatrists explored the connections between images and the unconscious mind and the idea that art was a form of tangible expression of a person's inner world. Sigmund Freud described how his patients could draw but not verbalize their dreams. Carl Jung believed that the arts accessed feelings and self-understanding, exposing the unconscious (1). In subsequent decades, psychiatrists used art to enhance their mentally ill patients' self-discovery and mental well-being. Spontaneous creative expression, a variant of art-as-therapy derived from the ideas of Freud and Jung, allows for uncensored communication and authentic self-expression.

Art therapy, broadly defined, has been used in many outpatient settings among individuals experiencing social-, emotional-, or health-related stress (2–7). However, there are limited reports of such approaches in more severely ill or inpatient populations. In the present study, we explored how nondirective spontaneous creative expression affects symptoms of anxiety and depression in acutely ill psychiatric inpatients.

Method

Participants

After obtaining Institutional Review Board approval, English speaking patients aged ≥18 years were randomly selected on their second day of admission at a general adult psychiatric inpatient unit of a tertiary care teaching hospital. All participants received their usual treatment throughout their stay in the unit. After complete description of the study to the participants, written informed consent was obtained.

Participant Characteristics

Of the 65 patients, there were 40 women and 25 men, with a mean age of 39 years (SD=14). Fifty-one (78.5%) had a primary mood disorder, and 14 (21.5%) had a psychotic disorder.

Procedure

Participants were randomly assigned to 1) spontaneous creative expression using canvas and paints, with instructions to paint anything; 2) a noncreative comparison activity involving completion of three standardized word searches; or 3) a no intervention comparison group. All patients, regardless of their assigned group, completed the Beck Anxiety Inventory (BAI) (8) and Beck Depression Inventory (BDI) (9) before the activity (or no activity) and 30 minutes after the activity.

The individual patient sessions were similarly facilitated by a nonphysician individual, using the same format for all sessions, with minimal interaction apart from facilitating the activity.

Analysis

This was a randomized clinical trial. The

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Table 1. Baseline Variables for Psychiatric Inpatients Randomly Assigned to Spontaneous Creative Expression, No Intervention, or Noncreative Activity[a]

Variable	SCE		NI		NCA	
	N	%	N	%	N	%
Men	13	37.1	6	40.0	6	40.0
Women	22	62.9	9	60.0	9	60.0
Mood disorders	26	74.3	11	73.3	14	93.3*
Psychotic disorders	9	25.7	4	26.7	1	6.7
	Mean	SD	Mean	SD	Mean	SD
Age (years)	38.3	14.7	38	12.05	41.8	13.9
Pre-BAI score	14.37	12.18	10.93	10.65	10.27	7.68
Pre-BDI score	18.37	12.23	20.47	14.79	21.93	15.93

[a]Abbreviations: SCE=spontaneous creative expression; NI=no intervention; NCA=noncreative comparison activity; BAI=Beck Anxiety Inventory; BDI=Beck Depression Inventory.

*p<0.05.

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distribution of scores was generally parametric, and all group results are described as mean (standard deviation) values. Paired t-test analysis was used to evaluate the significance of changes within each of the three groups, and unpaired t tests were used to examine outcomes between the groups.

A chi-square statistic was used to compare baseline gender and distribution of diagnoses among the groups.

Results

Comparison of Groups

The spontaneous creative expression and no intervention groups had a similar percentage of mood disorder and psychotic disorder participants, while the noncreative activity group had only one participant with a psychotic disorder (spontaneous creative expression and no intervention vs. noncreative activity, p<0.001). The difference in mean pre-BAI and pre-BDI scores was not statistically significant.

There was a statistically significant mean improvement in BAI scores among spontaneous creative expression participants (–61%) relative to participants in the no intervention group (–1%) (p=0.002) and in the noncreative activity group (–8%) (p=0.005). There was no significant change in scores between the no intervention and noncreative activity groups. BDI scores also improved significantly among spontaneous creative expression participants (–37%) compared with a 6.5% increase in depressive symptom ratings in the no intervention group (p=0.0001) and only a –2% decrease in the noncreative activity group (p=0.001). No significant changes in scores were found between the two comparison groups.

Additional analysis was completed according to patients' primary diagnosis. Spontaneous creative expression participants with mood disorders had a significant decrease in mean BAI and BDI scores (–7.31 points [p=0.001]; –6.73 points [p=0.0001], respectively). Patients with psychosis in the spontaneous creative expression group demonstrated the largest statistically significant decrease in scores, with mean BAI ratings improving by –13.22 points (p=0.004) and mean BDI ratings by –7.11 points (p=0.024).

Analysis was also performed by categorizing patients into minimal, mild, moderate, or severe levels of anxiety based on their pre-BAI and pre-BDI scores. There was a significant positive correlation between increasing symptom severity and score change (e.g., for minimal vs. severe anxiety [p=0.04] and depression [p=0.0001]).

Discussion

Our study has three main findings that further support the use of spontaneous creative expression in a psychiatric inpatient population. Spontaneous creative expression resulted in a significant

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Table 2. Pre- and Postparticipation Scores and Change in Scores on the Beck Anxiety Inventory and Beck Depression Inventory Among Psychiatric Inpatients Randomly Assigned to Spontaneous Creative Expression, No Intervention, or Noncreative Activity[a]

			SCE Participants (N=35)				NI Participants (N=15)				NCA Participants (N=15)			
Diagnosis and Measure			N	Mean	SD	p	N	Mean	SD	p	N	Mean	SD	p
Mood Disorder	Anxiety	Pre	26	13.62	12.16		11	11.55	11.92		14	10.07	7.92	
		Post	26	6.31	7.33		11	11.45	12.96		14	9.21	6.65	
		Change	26	–7.31	10.05	0.001	11	–0.1	2.66	0.91	14	–0.86	2.36	0.21
	Depression	Pre	26	18.04	10.77		11	21	14.74		14	22.79	16.18	
		Post	26	11.31	7.83		11	23	17.78		14	22.29	16.11	
		Change	26	–6.73	6.76	0.0001	11	–2	1.36	0.14	14	–0.5	3.42	0.6
Pyschotic Disorder	Anxiety	Pre	9	19.11	11.16		4	9.25	7.14		1	13	N/A	
		Post	9	5.89	7.27		4	9.25	7.14		1	12	N/A	
		Change	9	–13.22	10.01	0.004	4	0	0	1	1	–1	N/A	N/A
	Depression	Pre	9	22.11	14.92		4	19	17.15		1	10	N/A	
		Post	9	15	11.76		4	18.5	17.06		1	10	N/A	
		Change	9	–7.11	7.64	0.024	4	–0.5	0.58	0.18	1	0	N/A	N/A

[a]A negative change in scores reflects an improvement in anxiety or depressive symptoms. Abbreviations: SCE=spontaneous creative expression; NI=no intervention; NCA=noncreative comparison activity.

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Figure 1. Mean Beck Anxiety Inventory Scores Among Psychiatric Inpatients Randomly Assigned to Spontaneous Creative Expression, No Intervention, or Noncreative Activity

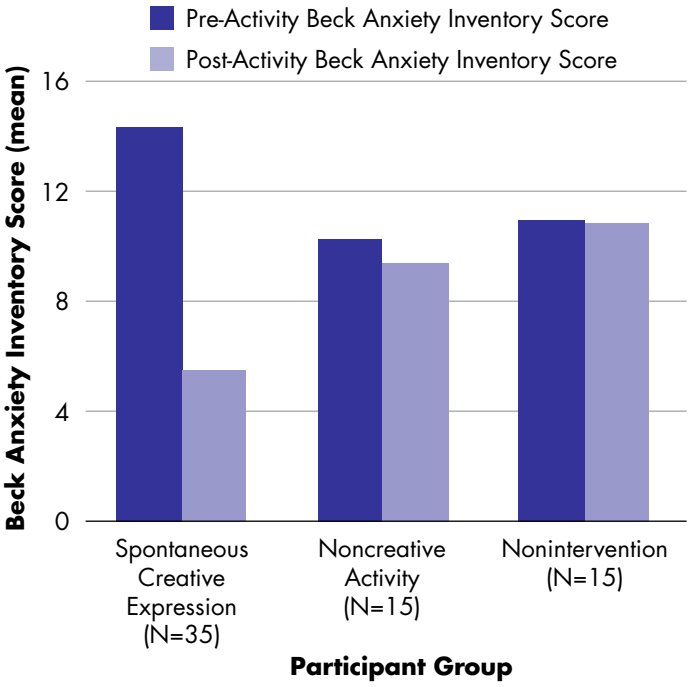
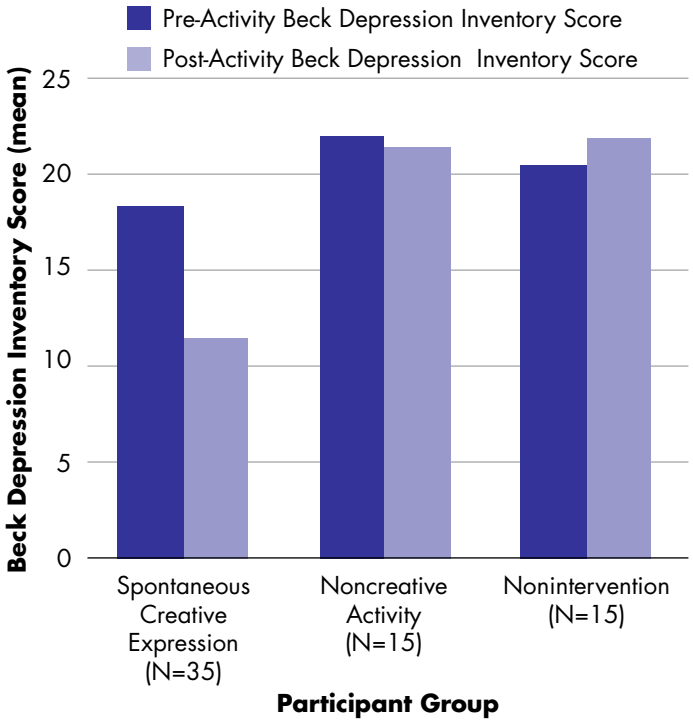


Figure 2. Mean Beck Depression Inventory Scores Among Psychiatric Inpatients Randomly Assigned to Spontaneous Creative Expression, No Intervention, or Noncreative Activity



acute improvement in anxiety and depressive symptoms. Patients in a noncreative activity or no activity group demonstrated no apparent benefit. The spontaneous creative expression activity was effective in patients with either mood or psychotic disorders, and the creative exercise was most effective for patients with more severe preintervention symptoms.

Spontaneous creative expression as a form of art-as-therapy is a way to nonverbally express inner feelings, emotions, and perceptions. Creative expression may allow for emotional release, lead to self-discovery and insight, or provide a safe means for patients to communicate or objectify the source of their emotions. Anxiety and depression are often comorbid, and neglecting to consider the effect of anxiety may render treatment for the primary depressive disorder less effective (10). Whether the strong effect of spontaneous creative expression on the short-term relief of depression was a result of the alleviation of anxiety was not directly addressed in this study. As hypothesized by Jung and others, regardless of diagnosis, spontaneous creative expression activity may tap into deeper therapeutic mechanisms related to outward expression of unconscious feelings. The greater relief following spontaneous creative expression in patients with more severe symptoms, with no such relationship to severity in the two comparison groups, suggests that patients with more severe emotional disturbance are particularly suited for this nonverbal acute intervention.

The present study suggests that offering a spontaneous creative activity, which requires little additional staff support or training, might effectively provide short-term relief of symptoms. Patients may gain an additional measure of autonomy and control by alleviating symptoms using nonpharmacologic measures.

This study has some limitations. Spontaneous creative expression was offered only one time for each patient. Repeated sessions would determine whether symptom improvement can be enhanced or sustained over time. Further studies will replicate the findings and advance the understanding and use of spontaneous creative expression or related nonverbal therapies for psychiatric inpatients.

Previously presented as a poster at the 162nd Annual Meeting of the American Psychiatric Association, San Francisco, May 16–21, 2009. Dr. MacLean is a first-year resident in adult psychiatry at Cambridge Health Alliance (a Harvard Medical School affiliate), Cambridge, Mass.

The author thanks Dr. Gabor Keitner, Professor, Department of Psychiatry and Human Behavior, Brown University, Providence, R.I., for supervision with research.

No other articles using the same data set presented have been published.

Note From the Editor:

Mark Rothko, a Russian-born American painter who viewed his paintings as expressions of human emotions, is featured in the November 2010 Images in Psychiatry in The American Journal of Psychiatry.

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Thinking Outside the Clinical Box: Creative Use of Technology in Psychiatry

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Art therapies are used both diagnostically and as a mode of therapeutic treatment for numerous psychiatric disorders. However, interpretation of art elements is highly subjective, and validating their clinical usefulness has been a major challenge. Computer-based art assessment tools have enabled therapists to avoid many problems related to manual assessment methods. The advantages and limitations of computer-based art therapy assessments, their usefulness in clinical settings, and resources available to clinicians and residents are presented in this article.

Traditional instruments, such as the Diagnostic Drawing Series, Formal Elements Art Therapy Scale, and Person Picking an Apple from a Tree assessment, quantitatively evaluate variations in different art elements, including number of colors, intensity of color, blending of color, idiosyncrasies, fit, prominence of color, and details of objects, environment, and space, to gain insight into a patient's condition. Scores obtained may reflect the type and severity of various dimensions of a patient's illness and personality traits. For example, quantitative assessment of paucity of colors, dark shades, and constricted use of space in a drawing may reflect the severity of depressed mood. Software programs automate the assessment process using digital image processing techniques and complex computer algorithms. Expert systems, which are computer programs that incorporate validated information from a database of professional knowledge that nonprofessionals can draw upon for art therapy assessments, provide an objective solution to the interpretation of art (1). Ease of use and significantly short assessment time are major advantages of computer-based art assessments. Computerized assessments reduce subjective human errors and biases related to individual preference. The universal availability of computers at schools, day care centers, and nursing homes allows the use of assessment tools by teachers and primary caregivers, who are most likely to encounter psychiatric illness at the initial stages facilitating early detection. Use of computerized assessments provides quantitative data and enables rigorous statistical analysis and future research (2).

Proprietary programs, such as the Computer_Color Related Elements Art Therapy Evaluation System, incorporate elements of art therapy analysis from standardized assessment tools, such as the Diagnostic Drawing Series and Formal Elements Art Therapy Scale, allowing both trained professionals and untrained nonprofessionals to automatically obtain objective, detailed, and quantitative evaluations of patient drawings (3). Programs that assess individual elements of art, such as color and placement of subject matter, have been demonstrated (1).

Computerized assessment tools for most standard art therapy rating instruments, including the Diagnostic Drawing Series, Person Picking an Apple from a Tree assessment, Face Stimulus Assessment, Draw-a-Person Test, Kinetic Family Drawings, and House-Tree-Person Test, are available. Open source image analysis software, such as National Institutes of Health (NIH) Image and ImageJ (available from NIH), have built-in modules that can be applied to quantify most analysis elements of art therapy drawings.

A novel study conducted by Gussak (4) demonstrated the use of art therapy for assessing both the severity and treatment of depression in prison populations. The Formal Elements Art Therapy Scale was shown to be a valuable assessment tool for measuring the severity of depressive symptoms. The results were partially validated by a follow-up study using the Beck Depression Inventory, short form.

Computerized art assessments are limited by their inability to account for heterogeneity of human variables and the reductionist nature of assessment of a creative faculty. Established art therapy assessment tools have highly questionable validity (5), and computer algorithms are only as good as the instruments upon which they are based. Additionally, bias introduced during the creation of software may affect the validity of computerized assessments. The tendency to accept very general or vague characterizations and consider them accurate, called the Barnum effect, may mislead both the interpreter and the patient (2). Despite its limitations, art therapy is perhaps the only truly noninvasive, combined diagnostic and therapeutic tool available in psychiatry. Residents in psychiatry may use computerized art assessments as an additional tool encompassing the complex interplay of social, cultural, and individual factors in understanding a patient's illness.

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Case Report

Clozapine-Withdrawal Catatonia and Calligraphy

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Catatonia resulting from clozapine discontinuation in patients with schizophrenia has been documented in several case studies (1). Benzodiazepines and reinitiating clozapine have been effective interventions, but further studies are needed to establish absolute treatment guidelines (2, 3). Along with psychopharmacology, art therapy has been considered as adjunctive treatment for patients with verbal impairments in decompensated psychoses (4). Music therapy has been valuable for patients with psychosis (4); however, with the exception of personal reflections, few studies have focused on the benefits of writing to relieve symptoms of schizophrenia. We present the case of a patient whose treatment not only involved medications, but was positively augmented by her passions of calligraphy and poetry.

Case

"Ms. S" was a 47-year old woman with schizophrenia who was well known to the inpatient unit for her poetry, which ranged from psalms about holidays to limericks celebrating nature. Unfortunately, she was also known for multiple antipsychotic trials and failures as well as an extended state hospital stay. For several years, she had lived in the community and was well controlled with clozapine treatment (200 mg twice daily). Two weeks prior to admission to our unit, she switched to aripiprazole, secondary to a significant weight gain of 80 lbs from the previous year. Within 10 days, she was catatonic and nonverbal, necessitating hospitalization. The patient was immediately restarted on clozapine (25 mg every night), which was titrated by 25 mg daily. She was also initially started on lorazepam (1 mg intramuscular twice daily) for the catatonia as well as risperidone (2 mg every night, per past effectiveness). During her first 3 days in the hospital, she refused meals and spent

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hours slumped in her chair, nonresponsive to stimuli. On day 4, she began to exhibit odd behaviors, such as removing furniture from her room, and started selectively speaking to staff but never to doctors. We had known of her interest in poetry from writings saved from prior admissions. A chart note also revealed that she liked calligraphy. In an attempt to engage her, one day we offered her a black calligraphy pen. She initially refused it, but by day 7 she took the pen. On day 9 she accepted paper, only to place it under her chair with the pen. On day 10 she wrote a short poem about birds with the pen. She also began to nod her head in response to questions, and when asked if she wanted more pens, she nodded a firm "yes." Throughout her hospital course, Ms. S accumulated numerous colored calligraphy pens and avidly wrote poems to share with the unit. She eventually spoke openly about the events leading up to her admission, her stress over weight gain with clozapine, and her desire to return home. By this time, her clozapine dose had been titrated to 200 mg twice daily, and she had been stable for several days. However, when asked what made a difference in her treatment, she never mentioned the medication but instead her calligraphy. She had poor recall of her catatonia but was able to vividly describe her first pen-to-paper experience and how free she had felt. She explained it as water rushing past her thoughts and flowing out on paper, relieving her anxiety. She said that by giving her the pens, we had allowed her to liberate her mind. She was eventually discharged home while receiving treatment with clozapine (200 mg twice daily) and risperidone (3 mg every night). Ms. S continued to produce poetry that was both literally and visually stunning, which she mailed to the unit to express her gratitude.

Discussion

The combination of lorazepam and clozapine was essential in the present patient's recovery from severe catatonia. However, the effect of calligraphy and poetry on her treatment cannot be overlooked. Since the mid-1900s, scientists have been curious about artists' works and the correlation of creativity with mental illness. Art therapy has been tried as treatment for schizophrenia, although poor recruitment in studies has hampered significant research outcomes (5). Inpatient psychiatric units have embraced group art therapy, but inconsistency in therapists, lack of standardized protocols, and variability in patient level of functioning have deterred success. Further research is necessary to establish guidelines for art therapy in patients with mental illness, while accounting for inherent differences in skills and interests. In the meantime, psychiatrists must be proactive in obtaining detailed patient histories and recognize that the artistic talents of patients with schizophrenia can be a simple and effective complement to existing standards of care.

Dr. Jojic is a first-year resident in the Department of Psychiatry, University of Massachusetts, Worcester, Mass.

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Treatment in Psychiatry

Treatment of Neuroleptic Malignant Syndrome With Electroconvulsive Therapy

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Neuroleptic malignant syndrome is characterized by a clinical presentation of altered consciousness, muscular rigidity, and hyperthermia typically associated with antipsychotic medication. Historically, it has been reported that incidence of neuroleptic malignant syndrome occurs in 3% of patients treated with antipsychotic medication, although more recent data suggest an incidence rate of 0.02%. Neuroleptic malignant syndrome affects more than 2,000 people each year in the United States, with a reported mortality rate of 10%. Although more commonly associated with typical antipsychotics, the syndrome has been seen with every available antipsychotic medication. The development of this syndrome has also occurred with other drugs, including lithium and antidepressants. In some cases, a neuroleptic malignant-like syndrome has been witnessed when drugs such as levodopa have been withdrawn (1).

The presentation of neuroleptic malignant syndrome typically occurs within 10 days of commencement or increase in dose of the precipitating medication, although much longer periods have been described. Symptoms tend to develop over 24–72 hours. The diagnosis of the syndrome should only be made if the symptoms seen are not the result of illicit substance use, such as phencyclidine, or a general medical condition or other mental disorder (2). A description of key symptoms is presented in Table 1.

Early recognition of neuroleptic malignant syndrome prompts removal of the precipitating medication, and commencement of supportive measures is vital. Supportive measures include fluid and electrolyte replacement, cooling devices such as ice packs as well as cooling blankets, and consideration of organ support (3). While supportive treatment and removal of the offending agent are sufficient in treating the majority of patients, a small number of patients may not respond to supportive or pharmacological interventions.

Table 1. Diagnosis of Neuroleptic Malignant Syndrome[a]

Symptoms	
Diaphoresis	Mutism
Dysphagia	Tachycardia
Tremor	Elevated or Labile Blood pressure
Incontinence	Leucocytosis
Altered Consciousness	Laboratory evidence of muscle injury

[a]A diagnosis can be determined by severe muscle rigidity and elevated temperature associated with neuroleptic medication, with two or more of the symptoms shown. (Adapted from DSM-IV [2].)

Since its description in 1960 by the French psychiatrist Delay, a variety of treatments have been used, including bromocriptine, dantrolene, benzodiazepines, and ECT. Unfortunately, the low incidence and idiosyncratic nature of neuroleptic malignant syndrome have prevented randomized control trials. Experience of treatment is largely anecdotal and stems from published case reports, which may be unrepresentative of the syndrome. ECT has been recommended as the treatment of choice in severe cases where a prompt response is needed, in cases where there are marked catatonic features, and in cases where psychotic depression is the primary psychiatric disorder (4).

The pathophysiology remains unknown. Some investigators have suggested that excessive dopaminergic blockage in the brain may be responsible, while others attribute the development of the syndrome to sympathetic nervous system overactivity and hierarchical dysregulation. It has also been suggested that neuroleptic malignant syndrome and catatonia may share a similar pathophysiology and be presentations of the same disorder. This has been further supported by the effectiveness of catatonia treatments, such as benzodiazepines as well as ECT, in some cases of neuroleptic malignant syndrome (1).

ECT Treatment in the Literature

A recent case report conducted by Casamassima et al. (5) highlighted the benefits of ECT when used with pharmacological therapy for treatment-resistant neuroleptic malignant syndrome. The authors reported on the case of a 39-year-old Caucasian woman with mixed-episode bipolar I disorder who developed neuroleptic malignant syndrome while concurrently receiving her regular doses of clozapine, valproic acid, lithium, and pipamperone, combined with haloperidol (as necessary) and diazepam (as necessary) for agitation. The patient was commenced on ECT following the treatment failure of a combination of supportive therapy, bromocriptine, and diazepam. She required two courses of ECT, with good response to the second course. Unfortunately, the first course was unsuccessful, and it was proposed that delays between treatments in the first course may have accounted for this poor response. The authors suggested

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that in treatment-resistant neuroleptic malignant syndrome, the use of pharmacotherapy should not delay the use of ECT.

ECT has been previously recommended as the treatment of choice in treatment-resistant cases, even at a late stage. Woodbury and Woodbury (6) developed a set of criteria to determine when to consider ECT in the treatment of neuroleptic malignant syndrome. They outlined five stages of symptoms they termed spectrum-related symptoms, with mild, moderate, and severe neuroleptic malignant syndrome being stages 3, 4, and 5, respectively. Consideration of treatment with ECT should be given in stage 4 or higher presentation, which would include, at a minimum, moderate rigidity, confusion, or catatonia, a temperature >38° Celsius, and a heart rate >100 beats per minute.

Trollor et al. (4) conducted a study of 55 patients with neuroleptic malignant syndrome. Among 40 of these patients, ECT was used as the primary treatment. The authors determined response by clinical improvement in fever, rigidity, and level of consciousness and catatonia combined with normalization of laboratory values such as leukocytosis. In the identified cases, 90% of patients experienced some benefit from ECT, with 63% having complete recovery. Both unilateral and bilateral ECT were used, with 10 treatments being the average number needed, although response to ECT was typically seen after only four sessions. Improvement in neuroleptic malignant syndrome was more quickly achieved with the use of ECT compared with the use of pharmacological methods alone.

In a study of 48 cases of ECT in the treatment of neuroleptic malignant syndrome, Davis et al. (7) found similar supportive findings. They noted that the mortality rates between patients treated with ECT and those treated with pharmacological methods were similar (10.3% versus 9.7%, respectively). The use of ECT was associated with a 50% decrease in the mortality rate seen in supportive therapy alone (21%). This decrease in mortality with ECT has been attributed to increased dopamine turnover as well as increased receptor sensitivity to dopamine in the brain (8).

Safety

There have been concerns regarding the safety of administering ECT for treating neuroleptic malignant syndrome. There is potential for overlap between this syndrome and malignant hyperthermia, a condition that develops in response to anesthetic agents as well as to muscle relaxants, such as succinylcholine, and presents with a clinical picture similar to that for neuroleptic malignant syndrome. However, there is no clear pathophysiological link between malignant hyperthermia and neuroleptic malignant syndrome. Advice to anesthesiologists is to monitor patients who have developed the syndrome as though they are at risk for developing malignant hyperthermia (9). Some anesthesiologists may prefer not to use depolarizing muscle relaxants, such as succylcholine, but those who do have not found any adverse reactions, such as worsening of symptoms or of laboratory findings (8). In one study of 17 patients with neuroleptic malignant syndrome treated with ECT (4), no episodes of malignant hyperthermia were encountered, suggesting that the association between the syndrome and malignant hyperthermia may not be of clinical relevance.

The autonomic instability seen in neuroleptic malignant syndrome has also given rise to concerns over the safety of the use of ECT in treating the syndrome. While ECT has been safely used in medically unstable patients, including those with pneumonia, urinary tract infection, and recent cardiac problems, some investigators have reported mortality arising as a result of cardiac arrhythmia. Notably, in these cases, it did not appear that ECT was the causative of the mortality, and on the balance of evidence, ECT in the treatment of neuroleptic malignant syndrome is believed to be generally safe and effective (7, 10).

Conclusions

The largely anecdotal data suggest that ECT in the treatment of neuroleptic malignant syndrome is safe, effective, and useful in treatment-resistant cases. Because of the significant mortality associated with neuroleptic malignant syndrome, early consideration and initiation of ECT would greatly benefit patients, especially those whose presentation proves refractory to supportive and pharmacological interventions alone.

Drs. Vahabzadeh and Wittenauer are both first-year resident physicians in the Department of Psychiatry and Behavioral Sciences, Emory University School of Medicine, Atlanta.

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Exploring Mental Health in the Land of the Rising Sun: Perspectives From the Fulbright Graduate Research Fellowship Experience

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The people here are polite. The traditions and history are rich. The efficiency is high. The bright lights of the big city cast a glow on the serene rock gardens and trickling streams that seem to highlight the beautiful contradictions that resonate throughout Tokyo.

Before I lived in Japan, I was trapped in the A-to-B mentality that medical/graduate school steers one toward. I was enrolled in the M.D./M.S. program at Albany Medical College and had completed 2 years of medical school, followed by 2 years of graduate school in neuroscience. During my first year in graduate school, I began the laborious process of applying for the Fulbright Graduate Research Fellowship and was humbled to receive this award for travel to Tokyo during the 2008–2009 academic year. The purpose of my trip was to complete research. Little did I know that this particular year would be the best experience of my academic, professional, and personal life. Upon returning from the 1-year experience, I can now see that the A-to-B mentality may have some shortcomings.

Participating in the Fulbright Program taught me to ask unscripted questions, to find potential challenging questions, and to gain perspective by zooming out. Through these exercises, I was able to think outside of the box and outside of a predetermined path of questioning (and subsequent answering). In my opinion, new neurons should fire everyday to aid development of ideas that will lead to important discoveries. This inside-out approach was once novel to me, but it is one I truly endorse after living the Fulbright experience.

Motivation for Project Design

The inspiration for my Fulbright research project developed many years ago, after spending 1 year (2003–2004) working at the National Institutes of Mental Health (Bethesda, Md.). I spent half of my time performing basic science experiments on schizophrenia candidate genes and the other half on clinical research studies in which I worked directly with schizophrenia patients. During this experience, I observed the psychosocial barriers many of our patients with schizophrenia face and the negative effect this has on their lives. Patients reported significant stigma associated with their diagnosis, which oftentimes outweighed the biological manifestation of their illness. I wondered whether this problem was specific to the American culture and, if not, what those in other cultures were doing to help patients seek adequate treatment. After researching the literature, I began to see that the problem of stigma in mental illness was spread throughout the world (1–4). In Japan, specifically, it seemed that stigma had been a huge barrier to patients with mental health issues (5–7).

During the summer following my first year in medical school (2006), I pursued my interest in studying schizophrenia in the Japanese population by spending 10 weeks at the National Center of Neurology and Psychiatry (Tokyo). While my primary objective was to investigate nonsynonymous polymorphisms of identified candidate genes in schizophrenia, I was also able to observe schizophrenia patients and the medical treatment they received. This brief time in Japan solidified my decision to apply for the Fulbright Graduate Research Program once I entered graduate school in order to study the social stigma experienced by schizophrenia patients in Japan. It seemed, at least through preliminary observation, that true differences existed in the ways that patients with schizophrenia were treated and viewed in Japan versus the United States.

Fulbright Research Project

I applied and gained acceptance into the Fulbright program during graduate school and then returned to the National Center of Neurology and Psychiatry in Tokyo. My colleagues and I began work on the first cross-cultural study on stigma in Japan versus the United States. Our goals were to identify and subsequently compare specific aspects of social stigma associated with schizophrenia in these two cultures, and we are now in the process of analyzing our U.S. data to compare with our Japanese results (8). To complete this study, we surveyed hundreds of U.S. and Japanese physicians, psychiatrists, and psychiatric staff as well as the general public on their views of schizophrenia and people suffering from this illness. It is our hope that the results of this stigma study will reach far beyond the pages of an academic journal. We hope that our study will help advocate for those suffering from schizophrenia throughout the world, giving patients the resolve they need to adequately treat their illness.

During the 12 months I spent working at the National Center of Neurology and Psychiatry, which serves as a research center as well as a mental health institution, I encountered patients with schizophrenia (*togo shitcho sho*) and mental illness everyday. Moreover, I saw patients with severe cases of epilepsy, brain retardation, and rare genetic diseases as they tried desperately to make their way down the hall. Each step for them was careful and calculated and seemed to take just as much courage as it did energy to execute. These patients were my heroes, for they were alive and functioning in a world that

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may not be as considerate as it could be in these modern times. The stigma, discrimination, and shame often associated with such illnesses are global problems, permeating all cultures and geographic boundaries. We must realize—as scientists, physicians, and human beings—that a major part of healing and understanding brain pathophysiology resonates in comprehending the integration of nature with nurture. We often neglect the nurture aspect of this partnership by dismissing the effect that an individual's upbringing and culture can have on personal development. Narrowing our perspective is comparable to looking through a window with the shades half drawn. Seeing these patients at the hospital and learning their stories reminded me that it is essential to open the shades completely to let the sunshine, or lack thereof, stream in.

Perspective

It has been an incredible experience to learn more about the mental health system in Japan and to compare this with how we approach mental illness in the United States. I hope the results of this first cross-cultural study on stigma associated with schizophrenia between Japan and the United States will elucidate ways that we can help patients throughout the world live more comfortably and happily.

Ms. Richards is currently a third-year medical student at Albany Medical College, Albany, N.Y.

Note From the Editor:

A large-scale study examining changes in public reactions to psychiatric disorders, along with a commentary by Psychiatric Services *Editor Howard Goldman, M.D., appears in the November 2010 issue of* The American Journal of Psychiatry.

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Book Review

Lessons From Literature: Reading the Trauma Experience in Sapphire's *Push*

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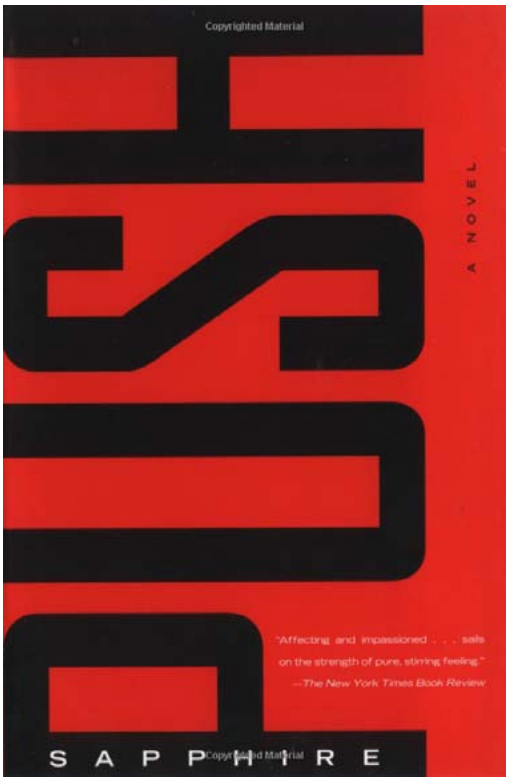

Push

By Sapphire, New York, Vintage Books, 1996, 192, pp, $13.00 (paper).

As *Push* commences, 17-year-old Precious Jones, an obese and impoverished African American teenager from New York City, is pregnant with her second child by her father Carl and endures regular beatings from her mother Mary. Carl's exploitation at night consumes Precious's existence at school, stripping her of a meaningful education. She explains, "Carl is the night and I disappear in it….I disappears from the day, I jus' put it all down—book, doll, jump rope, my head, myself." Remarkably, Precious's invalidation intensifies at school, where peers ridicule her and instructors judge her. The cumulative mistreatment renders her voiceless and motionless. And for years she sits at the back of the class staring at words and numbers she cannot understand. She internalizes an explicit message regarding her value and worth: "I know who they say I am…. Ugly black grease to be wipe away….I watch myself disappear in their eyes….I talk loud but I still don't exist."

Precious's recovery represents a reversal of the traumatic process: the acquisition of literacy and an integration of self and story. Ms. Rain, her new teacher at a school for academically challenged young women, facilitates her recovery by surrendering judgment and assuming her innate worth. Precious finally sits in the front row and confesses, "[T]he pages look alike." After reading her first sentence, she exclaims, "I want to cry. I want to laugh. I want to hug kiss Miz Rain… I never readed nuffin' before." Precious enters daily journal entries about her ongoing strife, and Ms. Rain writes back with advice and support. Finally in a safe environment, Precious masters the written word, unearths her own voice, and overcomes her psychological inertia. She begins to push: she renounces her mother's abuse and secures independent housing. And through her hope for something more for herself and her son, she comes to life. As she reads to him in the final passage, she explains, "I love to hold him on my lap, open up the world to him. When the sun shine on him…he is an angel child….And my heart fill….In his beauty I see my own."

Push dramatizes the overwhelming impact of trauma, while highlighting the barriers that often impede recovery. The secrecy surrounding Precious's abuse represents an additional layer of victimization that intensifies her sense of invisibility (1). As a result, her recovery requires significant acknowledgment and validation. Though Ms. Rain nurtures this safe environment, Precious controls the retelling of her experience and, therefore, owns her recovery entirely. This process underscores critical therapy components for traumatized patients, namely creating sanctuary and deferring control. Equally important, Precious's abuse plays out in her everyday life, realistically complicated by racism and socioeconomic disadvantages. The raw and unforgiving details also challenge the natural tendency to deny egregious acts of human evil, an inclination that sometimes precludes acceptance of the truth (2). Finally, Push demonstrates a woman's tremendous resilience and potential to heal. That a therapy-like relationship facilitates this process is perhaps the most valuable lesson of all.

Dr. Legha is a second-year resident in the Department of Psychiatry, University of Colorado, Aurora, Colorado.

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Commentary

Curious Mind

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With two toddlers at home, everyday I watch them use their *curious* minds to explore and reinvent new things in their lives. I get to work, and my therapy supervisor asks me, "Were you not *curious* to know what she meant by that"? Off to my didactics, and here again people talk about the various research projects and possibilities set to explore the human mind with some *curiosity*. I hear that "to be a researcher you need a *curious* mind to know what is going on in [the] human brain."

So curiously, I read up on curiosity, which is often defined as "an emotion related to natural inquisitive behavior such as exploration, investigation, and learning, evident by observation in human and many animal species." And it is generally curiosity that makes a human being want to become an expert in a field of knowledge.

The Neuroscience of Curiosity

Curiosity is linked to activities in the Broca's area in the inferior frontal gyrus and in the putamen in the basal ganglia. People that are curious activate both the part of the brain that comprehends information and the part that anticipates information. Curiosity also causes increased activity in memory areas such as the hippocampus, and it may act to enhance a person's long-term memory for new information. Neuroscientists call this increase of ease in neural firing "kindling," and this physiological mechanism can be leveraged to increase curiosity. Dopamine receptors in part of the hippocampus (dentate gyrus) have been contributed to the generation of curiosity in mice (1). These receptors are also important for plasticity and learning and therefore are proposed to represent a molecular link between intelligence and curiosity. Thus, curiosity is one of those malleable, learnable personality traits.

The Role of Curiosity in Psychotherapy

Curiosity as a clinical entity has been a neglected subject in the psychoanalytic literature. Nonetheless, internal curiosity is what increases the appetite for an exploration of one's own motives—it is part and parcel of psychoanalytic inquiry. And as psychotherapists, we are curious about the psychodynamic forces that may be contributing to a patient's problems and strive to instill a sense of curiosity within our patients for transformation.

Curiosity is now being sold as a missing ingredient to a fulfilling life and also as an acquired skill in leadership. As once stated, "Curiosity dimmed is a future denied." All this, and yet I wish curiosity was treated as a skill to be enriched and taught in medical education.

Dr. Khan is a third-year resident in the Department of Psychiatry, University of Texas Southwestern Medical Center, Dallas.

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Introspection

A Psychotherapeutic Challenge for the Beginning Therapist

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"Mrs. A" was a married Hispanic woman in her early 40s who was diagnosed with borderline personality disorder and opiate dependence and had a history of multiple physical and sexual traumas. Because of her intelligence, verbal ability, high motivation, ability to attach, and trauma history with a borderline personality disorder, my supervisor suggested transference-focused psychotherapy twice weekly.

The first 6 months of treatment consisted of suicidal crises intervention and management of the patient's acting out multiple sexual traumas she experienced with several men she dated. During this period, the patient also pushed treatment boundaries. For instance, in one appointment, she demanded to know my height. I spent some time trying to determine why she wanted to know this information. I felt confused and pressured, finally capitulating because she became so angry. Her whole life consisted of situations with no boundaries, and her request was an attempt to destroy treatment boundaries. I would need to demonstrate assertion without feeling cruel toward her. I would need to assert myself in order to maintain the treatment boundaries, to demonstrate that I could tolerate her aggression, and to model healthy behaviors.

Another instance was when she mentioned that her internist wanted to speak to me about her use of opiates. She wanted me to tell her primary care physician that she wouldn't have any problems managing prescription opiates. I informed her about her opioid abuse history and my reluctance to report what she wanted to her primary care physician. She became enraged and told me that I was uncaring. I questioned my motives and wondered whether I was uncaring. However, I also didn't want to lie. We eventually had a supervisor come to a session to negotiate. During supervision, we discussed the identity diffusion that some patients experience. Mrs. A experienced me as sadistically neglectful, and I too started to experience that because of projective identification. However, just like the adult who tells a child not to stick a fork into an outlet, assertion can be a manifestation of caring also. Mrs. A needed to experience that in many ways over time.

Approximately 6 months into the treatment, she requested to touch my penis at the start of a session. Startled and frightened, I emphasized the importance of describing her thoughts instead of acting them out. She ignored me and instead provocatively walked to a chair near me. My heart pounded, and I wanted to dart out of the room. I commented that she was the abuser and I was the victim. Eventually, she stated, "I do not want to see your penis!" She said, "It was all a test to see if you would actually give in." She needed to know whether she could trust me. Her seduction was charged with anger. It was a reenactment of what she had experienced with her previous abusers. I realized that this was a demonstration of the rage that she felt toward herself and those who had physically and sexually exploited her before. She was willing to destroy the treatment in order to determine whether I would exploit her. Rather, I experienced fear, intimidation, and helplessness, which I told her. When I responded to her provocation with a calm affect and curiosity, she learned that I wanted to help her.

This was an incredible learning experience. I learned firsthand about primitive defense mechanisms and repetition compulsion. I experienced how overt sexual behavior may be charged with aggression. Along those lines, I learned the importance of transference and countertransference. As the therapeutic alliance strengthened, Mrs. A increasingly respected the treatment contract. She understood that verbalizing her emotions was an option, instead of discharging them in actions. She began to demonstrate a growing motivation to communicate rather than act out. Whether these changes persisted after the end of treatment is an important question, and time will tell. Either way, it is nice to know that psychotherapy can work.

Dr. Chardavoyne is a PGY-5 Fellow in dialectical behavior therapy, Department of Psychiatry, Yale University School of Medicine, New Haven, Conn.

TEST YOUR KNOWLEDGE

In preparation for the PRITE and ABPN Board examinations, test your knowledge with the following questions.
(answers will appear in the next issue)

***This month's questions are courtesy of Deepak Prabhakar, M.D., M.P.H., Chief Resident (PGY-III), Department of Psychiatry and Behavioral Neurosciences, Wayne State University, Detroit.**

1. A 30-year-old man who recently emigrated to the United States is diagnosed with panic disorder. The patient believes that his penis is shrinking into his body as a result of frequent panic attacks. This belief is reflective of which of the following culture-bound syndromes?

A. Amok
B. Latah
C. Koro
D. Shenjing
E. Rootwork

2. A psychiatrist is evaluating a 45-year-old Asian woman. The psychiatrist is considering starting the patient on diazepam for the management of debilitating anxiety symptoms. Which of the following mutations is relatively common in Asian populations, warranting careful dose titration of diazepam in this patient?

A. CYP2D6*4
B. CYP2D6*17
C. CYP3A4*2
D. CYP2C19*3
E. CYP1A2*1

ANSWERS

Answers to October Questions. To view the October Test Your Knowledge questions, go to http://ajp.psychiatryonline.org/cgi/data/167/10/A34/DC3/1.

Question #1

Answer: B. Severe obsessive-compulsive disorder (OCD)

The Food and Drug Administration (FDA [www.fda.gov]) approved deep brain stimulation for the treatment of essential tremor in July 1997, Parkinson's disease in January 2002, and dystonia in April 2003. *The FDA approved* deep brain stimulation therapy *for OCD under the Humanitarian Device Exemption program in February 2009.*

Question #2

Answer: E. All of the Above

Complications from deep brain stimulation *therapy* can usually be classified as surgery-related, hardware-related, or stimulation-related. Stimulation-related complications are associated with the brain target and electrode location. These include cognitive changes, depression, mania, suicide, aggression, obsession/compulsion, anxiety/panic attacks, muscle contractions, dysarthria, and paresthesias. Neuropsychiatric complications may be a result of the stimulation of limbic and associative structures.

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We are currently seeking residents who are interested in submitting Board-style questions to appear in the Test Your Knowledge feature. Selected residents will receive acknowledgment in the issue in which their questions are featured.
Submissions should include the following:
1. Two to three Board review-style questions with four to five answer choices.
2. Answers should be complete and include detailed explanations with references from pertinent peer-reviewed journals, textbooks, or reference manuals.
***Please direct all inquiries and submissions to Dr. Fayad; fayad@ufl.edu.**

Author Information for *Residents' Journal* Submissions

The Residents' Journal accepts manuscripts authored by medical students, resident physicians, and fellows; manuscripts authored by members of faculty cannot be accepted.

1. **Commentary:** Generally includes descriptions of recent events, opinion pieces, or narratives. Limited to 500 words and five references.

2. **Treatment in Psychiatry:** This article type begins with a brief, common clinical vignette and involves a description of the evaluation and management of a clinical scenario that house officers frequently encounter. This article type should also include 2-4 multiple choice questions based on the article's content. Limited to 1,000 words and 10 references.

3. **Clinical Case Conference:** A presentation and discussion of an unusual clinical event. Limited to 750 words and five references.

4. **Original Research:** Reports of novel observations and research. Limited to 1,000 words, 10 references, and two figures.

5. **Review Article:** A clinically relevant review focused on educating the resident physician. Limited to 1,000 words, 10 references, and one figure.

6. **Letters to the Editor:** Limited to 250 words (including references) and three authors. Comments on articles published in the Residents' Journal will be considered for publication if received within 1 month of publication of the original article.

7. **Book Review:** Limited to 500 words.

Abstracts: Articles should not include an abstract.

References: Use reference format of *The American Journal of Psychiatry* (http://ajp.psychiatryonline.org/misc/Authors_Reviewers.dtl).

Upcoming Issue Themes

Please note that we will consider articles outside of the theme.

December 2010
Section Theme: Specialists in Psychiatry
Guest Section Editor: Jay Augsburger, M.D.;
augsburj@ohsu.edu

January 2011
Section Theme: Internal Medicine Skills and Psychiatry
Guest Section Editor: Rosalyn Womack, M.D.;
womackr@uthscsa.edu

February 2011
Section Theme: Eating Disorders
Guest Section Editor: Mike Rosen, M.D.;
drmikerosen@gmail.com

March 2011
Section Theme: The On-Call Experience
Guest Section Editor: Monifa Seawell, M.D.;
mseawell@med.wayne.edu

We invite residents who are interested in participating as Guest Section Editors to e-mail Dr. Cerimele at joseph.cerimele@mssm.edu. If you are interested in contributing a manuscript on any of the themes outlined, please contact the Section Editor for the specified month.