Full Name	Dr Jamuna Rajeswaran
Current Designation	Additional Professor Consultant & Head Neuropsychology Unit Officer -in-charge: Cognitive Neuroscience and Cognitive Psychology
Associated with NIMHANS as faculty since (Month and Year)	December 2004
Employment History	• Worked as Consultant Clinical Psychologist in Neuropsychology Unit at Department of Clinical Psychology, NIMHANS (Deemed University), Bangalore (1989-1994). • Worked as Consultant Junior Scientific Officer (ADHOC) at the Neuropsychology Unit Department of Clinical Psychology, NIMHANS (Deemed University), Bangalore (1994-1995). • Worked as Consultant Junior Scientific Officer (PERMANENT) at Neuropsychology Unit Department of Clinical Psychology, NIMHANS (Deemed University), Bangalore (1995- 2004). • Worked as Consultant Assistant Professor at Neuropsychology Unit Department of Clinical Psychology, NIMHANS (Deemed University), Bangalore (2004- 2008). • Worked as Consultant Associate Professor at Neuropsychology Unit Department of Clinical Psychology, NIMHANS (Deemed University), Bangalore 2008- 2012). • Working as Consultant Additional Professor at

	Neuropsychology Unit Department of Clinical Psychology, NIMHANS (Deemed University), Bangalore 2012- till Date).
Educational Qualifications	**1. M.A. (Clinical Psychology), Bangalore University, Bangalore.** **2. M.Phil. (Medical & Social Psychology), NIMHANS, Bangalore University, Bangalore.** **3. Ph.D. (Clinical Psychology) NIMHANS, Deemed University, Bangalore.** **4. Diploma in Instrumental enrichment program – Israel** **5. EEG Neurofeedback Training (Cleveland, Ohio, USA)**
Awards, Fellowships and Recognitions	**Awarded fellowship by UGC as visiting faculty to Mauritius** **Award** The International Conference on Psychology & Allied Professions Sri Lanka 2011 Conferred " **MANO VIDYADHIPATHI SAMMANA**" Eminent in Psychological Science to **Dr Jamuna Rajeswaran** in recognition and appreciation of invaluable contributions with utmost commitment for the benefit of humanity
Memberships	• Member of the International Neuropsychology society • Life member of India Society for Clinical and Experimental Hypnosis (Affiliated to International body of Clinical and Experimental Hypnosis, Australia). • Fellow and Life member of Behavioural Medicine Society of India. • Professional Life member of Indian Association of Clinical Psychologist. • Professional Life member of Karnataka State Clinical Psychologist Association. • Life member of NIMHANS Alumni Association. • Associate member of Neurological Society of India. • Associate member National Magnetic Resonance Society • Associate Life member of IAN
Interest Areas (Research)	Neuropsychological assessment and rehabilitation, Paediatric neuro-psychology, forensic neuro-psychology and EEG neuro-feedback training.
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Research

ONGOING RESEARCH

S No	Research Details	
1.	**Title Brain Correlates of Creativity** **Role: Principle Investigator** **Research Domain :Cognitive Neuroscience** **Onset of project: 2009** **Duration of Project (expected) 3 years** **Funding agency DST** **Co-investigator list Dr Thennarasu K** **Summary**Creativity is defined as something new or novel, unique or original with an element of surprise and usefulness. Creativity is appreciated, useful and required in all spheres from a very simple invention of a consumer product to as complex invention of a missile. Research in cognitive neuroscience has used predominantly EEG/ERP paradigm. This paradigm has not been extensively used even in creativity research. EEG is useful in understanding the temporal and spatial resolution of cognitive processes. The study will be helpful in identifying the brain process involved in creativity and also which regions mediate creativity. A sample of 60 subjects will be chosen from the Bangalore. 30 subjects will be taken from School of Design from Bangalore (National Institute of Design, Shristi school of Design, Chitra Kala Parishat) and 30 subjects will be from normal population. After obtaining written informed consent, the recording of the EEG will be carried out based on the changes made after the pilot study on 60 subjects individually	
2.	**Title** A Study of Cognitive Functions and Biochemical Correlates in Traumatic Brain Injury **Role: Principle Investigator** **Research Domain Clinical Neuropsychology** **Onset of project :2013** **Duration of Project : 3 years** **Funding agency DBT** **Co-investigator list Dr Rita Christopher** **Summary** Traumatic brain injury (TBI) is a complex injury with a broad spectrum of symptoms and disabilities. The impact on a person and his or her family can be devastating. Cognitive difficulties are very common in people with TBI. Studies have shown Neuropsychological rehabilitation to be usefulness in improving the cognitive functions and day to day functioning. Neurofeedback training is an operant conditioning procedure whereby an individual modifies the amplitude, frequency or coherence of the electrical activity of his/her own brain. The aim of the present study is to examine the biochemical correlates pre, post neurofeedback training (NFT) in patients with TBI. 60 patients with a diagnosed as TBI according to ICD-10 (WHO, 1992) will be recruited to one of the two groups within a month of injury into intervention group (neurofeedback training) and treatment as usual. The serum levels of the above will be compared before and after NFT in both groups to elucidate the biochemical mechanisms which may a possible role in the recovery. The study will be helpful in administering the NFT in the early stages of TBI, indicating that along with neural plasticity NFT augments improvement cognition and QOL.	

COMPLETED RESEARCH (in Past 5 years)

S No	Research Details (Title, Funded By, Summary[optional])	Research Area / Key Words (maximum 5)
1.	**Title** Neurofeedback Training in Traumatic Brain Injury- Rajakumari K **Role: PhD Guide** **Research Domain :Clinical Neuropsychology** **Onset of project :2009** **Duration of Project :3 years** **Funding agency :NIMHANS** **Co-investigator list Dr Indra Devi, Dr K Thennarasu** **Summary** The aim of the present study was to examine the efficacy of NFT in patients with TBI. The objectives included to study the neuropsychological profiles, to compare the post concussion symptoms, to compare quality of life, and to study the efficacy of alpha & theta in Intervention & Wait list group pre & post NFT. The neuropsychological profile of patients with TBI showed significant impairment in mental speed of information processing and verbal learning and memory. The base line assessment for IG and WG were comparable at pre training assessment except for verbal memory. There was improvement of both groups in the post assessment. The improvement in the IG was greater than WG, in terms of quality of life and neuropsychological assessment. There was significant improvement in post concussion symptoms in both IG and WG. There was no statistical significant improvement in the EEG post NFT. However, on inspection there was alpha enhancement, and theta inhibition. In conclusion, NFT is effective in ameliorating deficits in cognitive functions and QOL in patients with TBI. Improvements were corroborated by the clinical interview with patients and significant others post NFT.	
2.	**Title Familial Alcoholism and Cognitive functions in Individuals with Alcohol Dependence Symdrome- Deepa Sankar** **Role: PhD Guide** **Research Domain: Clinical Neuropsychology** **Onset of project 2010** **Duration of Project 3 years** **Funding agency NIMHANS** **Co-investigator list Dr Vivek Benegal** **Summary** To examine the role of familial alcoholism on cognitive functioning in individuals with Alcohol Alcohol Dependece Syndrome A Group matched design was used for the study. After obtaining informed consent. Total of 60 samples 31 FH+ve and 29 FH-ve were recruited from De-addiction centre, National Institute of mental Health	

	and Neurosciences(NIMHANS) , Bangalore. The subjects were administered Mini-International Neuropsychiatric Interview Screening (MINI screen),Mini-International Neuropsychiatric Interview Screening Plus (MINI Plus) Semi-Structured Interview schedule. Family Interview for Genetic Studies (FIGS), Edinburgh Handedness Inventory Mini-International Neuropsychiatric Interview (M.I.N.I.) Family Interview For Genetic Studies (FIGS), Short Alcohol Dependence Data Questionnaire (SADD), Edinburgh Handedness inventory and Cognitive tests. All the subjects were on regular drinking for 6 months prior to detoxification and were detoxified using benzodiazepines. The subjects were abstinent for at least 2-4 weeks before testing. The cognitive function assessment was carried out between 2nd and 4th week of abstinence. Familial alcoholism has shown to have effect on initiation and dependence on alcohol, severity of dependence, and externalizing symptom. However on the cognitive functioning both the groups have shown deficits, indicating alcoholism tends to neutralize the effect on cognitive functioning	
3.	**Title** Effectiveness of Neurofeedback Training on Clinical, Cognitive, Electrophysiological and Neurochemical Measures in Alcohol dependence syndrome- C N Niranjana Bennet **Role: PhD Guide** **Research Domain Clinical Neuropsychology** **Onset of project 2010** **Duration of Project 3 years** **Funding agency NIMHANS** **Co-investigator list Dr S Sampath** **Dr Rita Christopher** **Summary** To study the clinical, cognitive, electrophysiological and biochemical correlates of Neurofeedback Intervention in TBI.A sample of 30 patients with TBI was assigned to an NFT group and a Treatment as Usual (TAU) group. The NFT group received 20 sessions of NFT, 40 min / day, 3 days a week for a period of 2 months. NFT protocols were contingent on the production of (4-7 Hz) Theta and (8- 12 Hz) Alpha Activity. Cognitive functions and biochemical variables such as cortisol and brain derived neurotropic growth factor (BDNF) were compared pre and post NFT. : Post assessment indicated that the NFT group showed better outcome than the TAU group on measures of cognition. There was no significant difference on the biochemical correlates. NFT holds promise as an adjuvant treatment program. Implications for spontaneous recovery and neural plasticity will be discussed.	
4.	**Title** To study the efficacy of EEG Neurofeedback Training on children with Attention Deficit Hyperactivity Disorder **– Shereena K** **Role: PhD Guide** **Research Domain Clinical Neuropsychology** **Onset of project : 2011** **Duration of Project : 3 years** **Funding agency NIMHANS**	

	Co-investigator list Dr John Vijay Sagar **Summary** The purpose of the present study was to examine the efficacy of EEG Neurofeedback Training in children with ADHD.Experimental longitudinal design with pre-post comparison was adopted. Thirty children in the age range of 6-12 years diagnosed as ADHD with or without comorbid conditions were assigned to Treatment Group (TG; *N*=15) and Treatment as Usual group (TAU; *N*=15). TG received routine clinical management and EEG Neurofeedback training (NFT) and TAU received routine clinical management alone. The TG group received 40 sessions of theta/ beta NFT at the C3 scalp location. Training was scheduled on 3-4 sessions in a week for a period of 3.5 to 5 months. NFT protocol was contingent on the production of enhancing Beta (15-18 Hz) activity, while simultaneously suppressing theta (4-7 Hz) activity. Children were assessed using Socio demographic data, Edinburgh Handedness Inventory and Binet Kamat Test for Intelligence. Pre and post assessment tools were Colour Cancellation test, Colour Trails test, Verbal N-Back test, Visuo-Spatial Working Memory Span test, Porteuz Maze test and Go/No-Go test, Conners Abbreviated Rating Scale, ADHD Rating Scale, Barkley's Home Situations Questionnaire, Barkley's School Situations Questionnaire, Academic Performance Rating Scale and Visual Analogue Scale. The results of the present study indicate that children in TG improved on ustained attention, verbal working memory, response inhibition, on parent and teacher rated behavioural scales and on academic performance.EEG Neurofeedback training is effective in ameliorating cognitive deficits and reducing ADHD symptoms and behaviour problems and improving academic functioning in children with ADHD.	
5.	**Title Effectiveness of Neurofeedback Training: Clinical, Cognitive, Electrophysiological and Neurochemical Measures In Alcohol Dependence Syndrome- Reji Mohan** **Role: PhD Guide** **Research Domain Clinical Neuropsychology** **Onset of project 2011** **Duration of Project : 3 years** **Funding agency NIMHANS** **Co-investigator list Dr Pratima Murthy** **Dr Nandhakumar D N** **Summary**To study the Effectiveness of Neurofeedback Training on Clinical, Cognitive, Electrophysiological and Neurochemical Measures in Alcohol dependence syndrome.The sample consisted of 20 patients receiving NFT (Treatment Group) and 20 patients without NFT (Treatment as usual group). Both the groups included adult males diagnosed with ADS (ICD-10) recruited from the Centre for Addiction Medicine Unit, Department of Psychiatry, NIMHANS. After screening for inclusion and exclusion criteria, both the groups underwent a pre – post assessment of CIWA, Perceived stress scale, Nimhans Neuropsychological battery, EEG - 32 channel (3 minutes eyes closed recording) & a P300 Oddball Paradigm, biochemical – blood serum sample. The TG received Neurofeedback training along with the routine treatment and medication.The TAU group received only the routine treatment and medication.15-20 sessions of Neurofeedback training was	

	conducted , each session was of the duration of 40 minutes ,with a minimum of 4 sessions per week. The post training assessment was done for the TG on the completion of 18 to 20 days of admission. The pre post changes in TG showed a decrease in CIWA and Perceived stress scores , an improvement in cognitive functions in all the domains, EEG shows a normalization of brain waves and a decreased reaction time and an improved P3 amplitude and latency. The pre post changes in TAU group showed a decline in the score of working memory and visuo spatial construction on neuropsychological assessment. EEG showed a brain wave pattern suggesting proneness to relapse and increased stress, as well as P3 abnormalities with an increased reaction time, delayed latency and reduced amplitude. However TAU also showed a decrease in CIWA scores, perceived stress scores and an improvement in Verbal Learning And Memory scores. The results of the present study highlights the significance of NFT as an effective treatment modality in patients with ADS.NFT can be used for improving cognitive functions, reducing kindling effect and normalizing brain waves thereby facilitate abstinence in patients with ADS.	
6.	**Title CREATIVITY & BIPOLAR AFFECTIVE DISORDER : AN *f*MRI STUDY- Ms Divya Sadana** **Role: PhD Guide** **Research Domain Clinical Neuropsychology** **Onset of project 2012** **Duration of Project :3 years** **Funding agency NIMHANS** **Amount of grant sanctioned** **Co-investigator list Dr Sanjeev Jain** **Dr SenthilKumaran** **Summary** The aim of the study was to compare Creativity and Bipolar Affective Disorder using *f*MRI**.** The objectives included comparison of creative, bipolar and normal groups on cognition, personality, and anatomical brain volume with activation patterns while performing a task of creativity. Also the association of creativity with cognition and personality was explored. Three groups – Creative, Normal Controls and Bipolar Affective Disorder patients comprising of 30 participants each were included in the study. These groups were assessed on intelligence (Raven's Progressive Matrices), cognitive abilities (NIMHANS Neuropsychology battery), personality (NEO FFI) and creativity (Wallach & Kogan Test of creativity). 20 participants in each group performed the creativity task inside the *f*MRI scanner while others were administered the task behaviorally. Creative individuals have higher cognitive abilities and are more open to new experiences than normal	

	controls and bipolar patients. Creativity is mediated in the brain by various regions namely bilateral frontal, temporal, precuneus and cerebellum. There exists a significant positive correlation between creativity and intelligence; most cognitive abilities and openness to experience. There exists some similarity between creative and bipolar participants at the neural level of processing; however it is mediated by cognition and personality. Creativity and Bipolar Affective disorder may share a neural basis and the association is mediated by both cognition and personality.	

10 select publications

S No.	Year Published	Full Citation	PubMed ID	Digital Object Identifier / DOI
1	2014	Reddy RP, Rajeswaran J, BhavagatulaI l, Kandavel TK (2014) Silent epidemic: The effects of neurofeedback on quality-of-life, Indian journal of Psychological Medicine. 2014; 36(1) 40-4.		
2	2014	Firdous Ahmad Var, Rajeswaran Jamuna, A. Arivazhagan. Cognitive and sexual functions in patients with traumatic brain injury Asian journal of neurosurgery. 04/2014; Volume 9(1.):29-32.		
3	2*014*	Panda R, Bharath RD, George L, Kanungo S, Reddy RP, Upadhyay N, Thamodharan A, Rajeswaran J, Rao SL, Gupta AK. Unraveling Brain Functional Connectivity of encoding and retrieval in the context of education, Brain and Cognition, 2014; 86, 75-81.		
4	2014	Perumal AR, Rajeswaran J, Nalini A. Neuropsychological Profile of Duchenne Muscular Dystrophy. Applied Neuropsychology. 2014; 1-9.		
5	2013	Var FA, Rajeswaran J, Quality of life and perception of illness in patients with traumatic brain injury The Indian Journal of Neurotrauma. 2013; 10(2):115-119		
6	2013	Rajeswaran J, CR Mukundan. S. Ramachandra,Creativity in Patients with the left and right side lesion of the Brain. International journal of Psychosocial Research 2013; 1(1):1-8		
7	2013	Rajeswaran J, Nalini A "Neuropsychological deficits in amyotrophic lateral sclerosis (ALS): A South India experience" Neuropsychological Trends 2013,13 47-58		
8	2013	Reddy RP, Rajeswaran J, Bhagavatula I, Kandavel T."Neurofeedback Training as an		

		Intervention in a Silent Epidemic: An Indian Scenario" Journal of Neurotherapy. 2013; 17 (4) 213-225.		
9	2013	Bennet CN Rajeswaran J, Christopher R Sampath S. The Right to Write: EEG Neurofeedback Training in Frontal Lobe Agraphia—A Case Report Journal of Neurotherapy; 2013; 17 (3) 162-165.		
10	2010	Jamuna Rajeswaran, Saumya Udupa, Srikala Bharat.Hypoxia: can neuropsychological rehabilitation attenuate neuropsychological dysfunction. Indian Journal of Psychological Medicine 01/2010; 32(1):65-8.		

Bibliography (Books and Monographs) Complete Reference in Vancouver / APA Style

S No.	Year Published	Full Citation	ISBN	Digital Object Identifier / DOI
1	2012	Neuropsychological Rehabilitation Principles and Applications,Elsevier Science (2012)	978-0-12-416046-0	