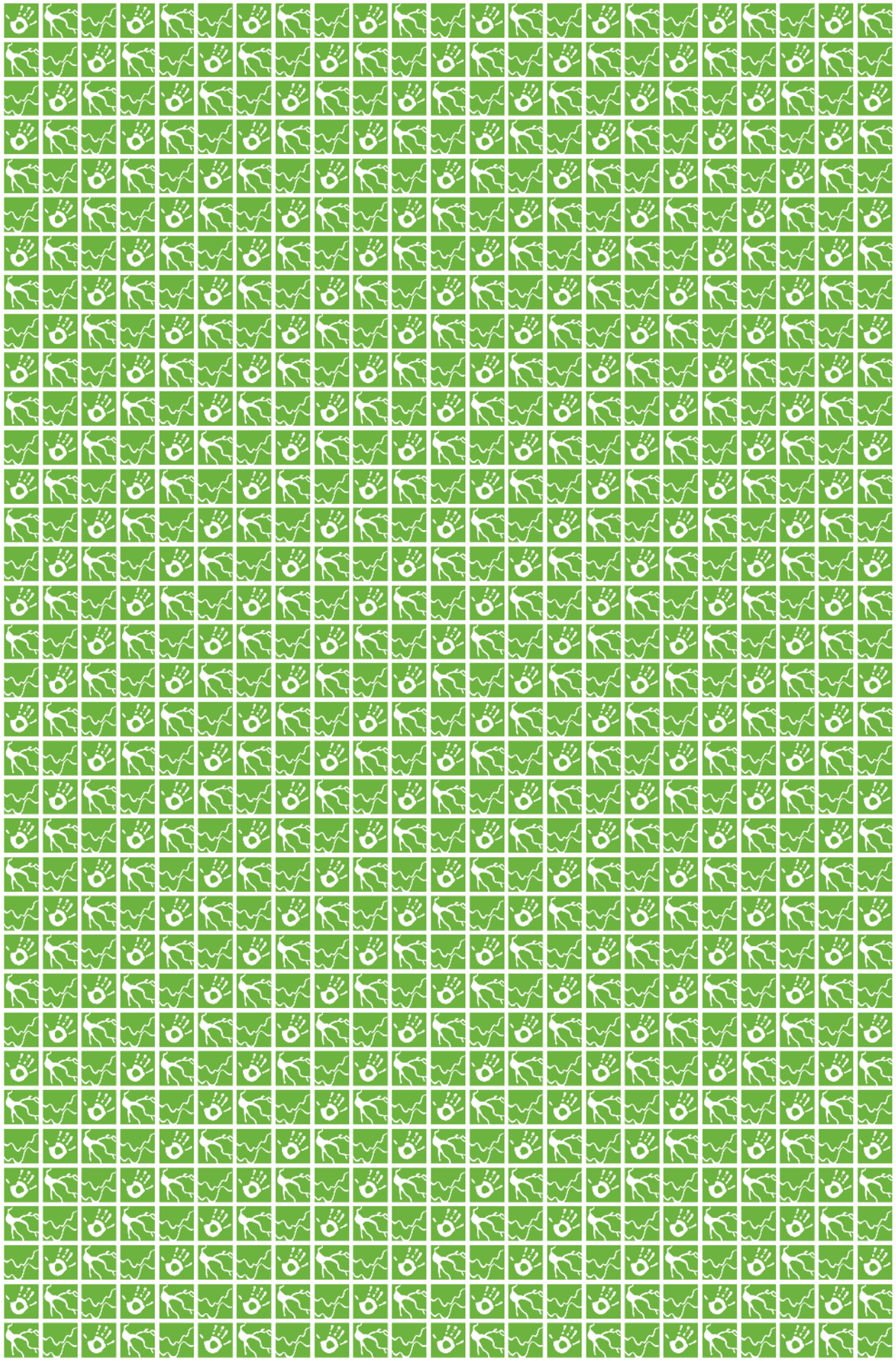
The Center for Neurobehavioral Development
Annual Report 2006–2007



From the Director

The Center for Neurobehavioral Development has undergone exciting changes this year! First and foremost, we moved into our new facility in the 717 Delaware Building.

The new Center is over three times as large as the old one and has far greater capabilities, including a second EGI system for assessing neurobehavioral development. We are grateful for the continuing support of the Academic Health Center, the Medical School and the College of Education and Human Development, as well as the National Institutes of Health.

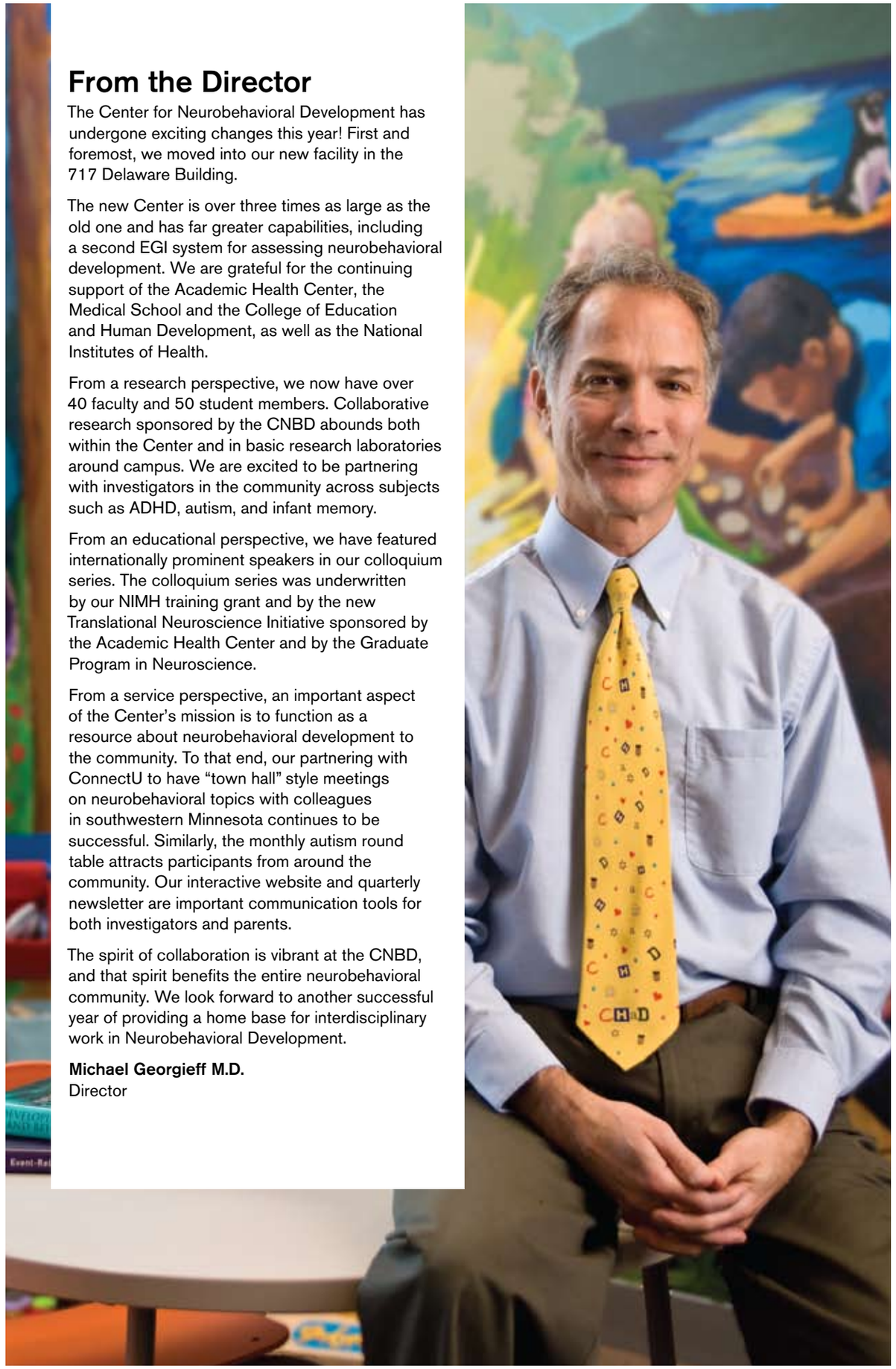
From a research perspective, we now have over 40 faculty and 50 student members. Collaborative research sponsored by the CNBD abounds both within the Center and in basic research laboratories around campus. We are excited to be partnering with investigators in the community across subjects such as ADHD, autism, and infant memory.

From an educational perspective, we have featured internationally prominent speakers in our colloquium series. The colloquium series was underwritten by our NIMH training grant and by the new Translational Neuroscience Initiative sponsored by the Academic Health Center and by the Graduate Program in Neuroscience.

From a service perspective, an important aspect of the Center's mission is to function as a resource about neurobehavioral development to the community. To that end, our partnering with ConnectU to have "town hall" style meetings on neurobehavioral topics with colleagues in southwestern Minnesota continues to be successful. Similarly, the monthly autism round table attracts participants from around the community. Our interactive website and quarterly newsletter are important communication tools for both investigators and parents.

The spirit of collaboration is vibrant at the CNBD, and that spirit benefits the entire neurobehavioral community. We look forward to another successful year of providing a home base for interdisciplinary work in Neurobehavioral Development.

Michael Georgieff M.D.
Director



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Mission Statement

It is the mission of the Center for Neurobehavioral Development (CNBD) to engage in basic and clinical research in the general field of Neurobehavioral Development. The CNBD accomplishes this goal by providing administrative, educational, and physical support to core and adjunct faculty and their student affiliates. The Center is comprised of three thematic cores. The first core focuses on research investigating the neural underpinnings of cognitive and emotional development in typically developing children. The focus of the second core is to examine the neurobiologic effects of early adversity (e.g. perinatal complications, malnutrition, institutionalization) on the developing brain. The third core is undertaking a Clinical Neuroscience approach to intervention in children diagnosed with neuropathology or psychopathology, and prevention in children at risk for developing such pathology.

The CNBD is a collaboration of University of Minnesota faculty, post-doctoral researchers, graduate students, and research staff, all of whom are interested not only in developmental research in their field but also across the many disciplines of our members.

With financial support from departments within and outside the University, the CNBD is able to offer a cutting-edge research facility, grants for research conducted by members, fellowships, trainings, workshops, and other collaborative efforts that provide converging information on the study of typical and atypical populations of children worldwide. The CNBD will ultimately provide the broader research community with advanced and expanded knowledge in the challenging, interdisciplinary field of neurobehavioral development.

Financial Resources

The Center for Neurobehavioral Development would like to thank the following University of Minnesota Departments for their generous support in fiscal year 2007.

General Funding Sources Fiscal Year 2007

Internal Sources	Amount Received
College of Education and Human Development	$50,000.00
Institute of Child Development	$25,000.00
College of Liberal Arts	$5,000.00
Academic Health Center	$25,000.00
Medical School	$100,000.00
Total Internal Funding	*$205,000.00*

External Sources	Amount Received
NIH/NCR General Clinical Research Center Grant M01 RR000100-37	$169,382.00
NIH/NIMH Postdoctoral Training Grant T32 MH073129	$159,775.00
Total External Funding	*$329,157.00*
Total General Funding	$534,157.00

Research

Research at the Center for Neurobehavioral Development focuses on the developing human brain and its relation to typical and atypical behavioral development. The Center has hardware and software equipment as well as research support for these systems.

Behavioral Testing Capabilities

Four behavioral testing rooms with digital video recording equipment
Weschler Preschool and Primary Scale of Intelligence (WPPSI)
Bayley Scales of Infant Development
Differential Ability Scales
Weschler Intelligence Scale for Children (WISC)
NEPSY
Elicited Imitation
Autism Diagnostic Observational Schedule (ADOS)
Cambridge Neuropsychological Test Automated Battery (CANTAB)
Wechsler Abbreviated Scale of Intelligence (WASI)
Test of Variables of Attention (TOVA)

Medical Testing Capabilities

Regular scale and infant scale
Tools for measuring length and head circumference
Blood draws*
Cortisol (salivary collection)
Vision and hearing testing

Psychophysiological Testing and Brain Imaging Capabilities

Low-density EEG recording systems (Grass 16-and 32-channel amps for startle/EMG)
2 High-density EEG recording systems (EGI)
Autonomic testing equipment (BioPak)
Eye tracking
MRI scanning available through the University of Minnesota Center for Magnetic Resonance Research (must apply through CMRR)

Computer and Software Capabilities

E-Prime
BESA
Matlab
SPSS
ERPw
Fetal Alcohol Syndrome Facial Analysis
IT support*
Secure server*

*Performed by the General Clinical Research Center

Current Research Protocols 2006–2007

This year the CNBD was home to thirty collaborative studies investigating many facets of neurobehavioral development. Studies must be approved by the CNBD's Scientific Advisory Committee as well the University of Minnesota's IRB.

Studies marked with an asterisk (*) are part of the General Clinical Research Center's Infant and Child Development Core. These studies are cross-disciplinary and coordinated through the CNBD and General Clinical Research Center.

More information about the General Clinical Research Center can be found at:
www.gcrc.umn.edu

Researchers interested in conducting research at the CNBD should contact:
Neely Miller
Infancy Core Coordinator
at mill1425@umn.edu

or visit our conducting research webpage at:
www.umn.edu/cnbd/research/conducting.php

Studies are listed alphabetically by title

Adolescent Brain Development and Effects of Drug Abuse

Researchers:
Kelvin Lim, M.D.
Department of Psychiatry
Monica Luciana, Ph.D.
Department of Psychology

Funding Source: NIDA

Abstract: The general goals of this proposal are 1) to use structural neuroimaging and neurocognitive assessments to expand upon a program of research on the neurodevelopment of the prefrontal cortex (PFC) in a sample of typically-developing adolescents and 2) to apply this knowledge to age-matched inhalant abusers in an exploratory study. Through cross-sectional and longitudinal investigations, behavioral and imaging tools will be used to quantify the development of PFC-mediated behaviors and white matter maturation in adolescents who are non-drug using controls versus a clinic-referred sample who abuse inhalant drugs.

*Autonomic Dysregulation in Children with Autism and Brain Injured Children

Researcher:
Frank Symons, Ph.D.
Department of Educational Psychology

Collaborators:
Elizabeth Gilles, M.D.
Department of Pediatrics, Pediatric Neurology
Jodi Dooling-Litfin
Department of Pediatrics
Desiree Czapanski-Beilman
Department of Pediatrics
Leah Brzezinski
Pediatric Clinical Neuroscience

Funding Source: NIH

Abstract: The overall goal of this research is to define whether autonomic dysfunction exists in autistic children. The main hypothesis is that abnormalities of afferent signal processing are the result of an altered autonomic nervous system in autistic children and contribute to maladaptive emotional behavior. The specific aims of this study are to 1) determine patterns of autonomic function of children with autism, children with moderate-severe traumatic brain injury and typically developing children; 2) determine the relationship between cognitive function and autonomic function measures in autistic children, children with moderate-severe TBI and typically developing children.

*Biomarkers of Oxidative Stress and Oxidative DNA Damage in Newborns

Researcher:
Logan Spector, Ph.D.
Department of Pediatrics

Co-Investigators:
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology
Julie Ross, Ph.D.
Department of Pediatrics

Funding Source: Gerber Foundation

Abstract: The goal of this study is to determine whether infants who receive 100 percent oxygen (0^2) at birth exhibit higher levels of biomarkers of oxidative stress and oxidative DNA damage at four and eight weeks of life than do unexposed infants.

The Confluence of Deprivation and Puberty on Emotional and Endocrine Reactivity

Researcher:
Karina Quevedo
Institute of Child Development

Funding Source: CNBD Seed Grant

Abstract: This project seeks to explore how early deprivation resonates with emotional and neuroendocrine vulnerabilities that emerge with the onset of puberty. A startle response paradigm, samples of salivary cortisol, behavioral and developmental data will be collected in pubertal and non-pubertal youth with diverse early histories.

*Control of Attention and Action in Child-and-Adolescent-Onset Schizophrenia and Attention Deficit Hyperactivity Disorder

Researcher:
Canan Karatekin, Ph.D.
Institute of Child Development

Co-Investigators:
Tonya White, M.D.
Department of Psychiatry
Kelvin Lim, M.D.
Department of Psychiatry
Nicholas Davenport
Department of Psychiatry

Funding Source: NARSAD

Abstract: The goal of this proposal is to compare adolescents with schizophrenia or ADHD to healthy controls on fine-grained measures of cognitive and motor function and neuroanatomy. Although qualitatively similar to adult-onset schizophrenia, the early-onset form of the disorder is more severe and genetically loaded. Thus, this relatively homogeneous group of patients can make it easier to draw inferences about core impairments in schizophrenia. The result of this direct and detailed comparison between schizophrenia and ADHD can constrain model-building and point to more effective treatment approaches in both disorders.

*Development of Auditory Memory in Newborn Infants

Researcher:
Jill Therien, M.D.
Department of Pediatrics

Co-Investigators:
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology
Charles Nelson, Ph.D.
Harvard Medical School
Raye-Ann deRegnier, M.D.
Northwestern University

Funding Source: NIH

Abstract: Memory is an essential cognitive function that is fundamental for learning in infancy and childhood. Further understanding of memory development will allow an enhanced understanding of early cognitive development in healthy infants that will ultimately benefit infants who are at increased risk for difficulties with learning and memory. The purpose of this study is to evaluate the role of postnatal experience in very early memory development in newborn infants.

Development of Emotion-Modulated Startle Response: A Subcomponent of Developmental Psychobiology of Stress in Children

Researcher:
Karina Quevedo
Institute of Child Development

Co-Investigators:
Megan Gunnar, Ph.D.
Institute of Child Development
Bonny Donzella, M.A.
Institute of Child Development

Funding Source: NIMH

Abstract: The purpose of the project is to further the understanding of a measure called emotion-modulated startle response. In adults, this measure is used to indicate emotional state and to explore individual differences in emotional reactivity. In response to an acoustic probe, the muscles around the eye contract. The amplitude of this contraction varies with the emotional content of the stimulus presented. That is, negative stimuli potentiate the contraction of the eye muscles while positive stimuli diminish the contraction. Given the theoretical links between emotion-modulated startle response and individual differences in stress reactivity, there is an interest in utilizing this measure with young children. However, it is not clear that the stimuli used to induce emotions in adults (i.e., still pictures) would be effective with young children. Thus, a paradigm that relies on children's videos was developed for use with young children. The specific intent of the proposed project is to examine the effect of stimulus modality (i.e., still pictures compared to videos with soundtrack) on the startle response in adults.

CNBD Facts

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In 2007 the CNBD purchased a second high-density EEG recording system. The Geodesic EEG System 300 collects data from 128 electrodes using the Hydrocel Geodesic Sensor net. The HGSN features a geodesic tension structure of low-profile electrodes which increase the subject's comfort and create a better connection with the scalp.
Net application takes only 5–10 minutes, which is ideal for the young populations tested at the CNBD. Currently, researchers at the CNBD collect EEG data from subjects ranging in age from newborns to adolescents.

*Genotypic Influences on Prefrontally-guided Behaviors in Adolescents

Researchers:
Monica Luciana, Ph.D.
Department of Psychology
Tonya White, M.D.
Department of Psychiatry

Funding Source: CNBD Seed Grant

Abstract: This project will examine the genotypic influences on prefrontally guided behaviors in healthy adolescents and young adults, ages 9–25 years. In this study, the functional polymorphisms of three genes in relation to prefrontal function in adolescents will be examined. The impact of genotype on behavioral performance across tasks and within each age and maturational group to determine whether genotype-cognition interactions are equally potent pre-versus post-puberty will be considered.

*Intrauterine Growth Retardation (IUGR) and Fetal Adaptive Programming: A Multidisciplinary Pilot Study

Researchers:
Mary Pylipow, M.D.
Department of Pediatrics
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology
Kyriakie Sarafoglou, M.D.
Department of Pediatric Endocrinology

Co-Investigators:
Megan Gunnar, Ph.D.
Institute of Child Development
Bradley Miller, M.D.
Department of Pediatric Endocrinology

Funding Source: CNBD Seed Grant

Abstract: This pilot study is obtaining preliminary data to estimate the means and variability of outcome measures to determine whether 1) IUGR infants have significant alterations in the regulatory hormones of the Limbic-Hypothalamic-Pituitary-Adrenal (LPHA) axis and their anatomically and physiologically connected memory circuits after IUGR and 2) children with accelerated catch up growth have more neurodevelopmental, endocrine, and cytokine abnormalities than slower growing infants.

*Development of Auditory Memory in Newborn Infants

Researcher:
Jill Therien, M.D.
Department of Pediatrics

Co-Investigators:
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology
Charles Nelson, Ph.D.
Harvard Medical School
Raye-Ann deRegnier, M.D.
Northwestern University

Funding Source: NIH

Abstract: Memory is an essential cognitive function that is fundamental for learning in infancy and childhood. Further understanding of memory development will allow an enhanced understanding of early cognitive development in healthy infants that will ultimately benefit infants who are at increased risk for difficulties with learning and memory. The purpose of this study is to evaluate the role of postnatal experience in very early memory development in newborn infants.

Effects of Music and Ambient Noise on Physiological and Behavioral State Responses of Preterm Infants in the NICU

Researcher:
Diana Neal, M.S., R.N.
School of Nursing

Collaborators:
Linda Lindeke, Ph.D., R.N.
School of Nursing
Susan O'Conner-Von, Ph.D., R.N.
School of Nursing
Jill Therien, M.D.
Department of Pediatrics

Funding Source: CNBD Seed Grant

Abstract: This study combines the work of music therapy and neuroscience with nursing to provide evidence that preterm infant perception of music is different than ambient noise, by evaluating the effects of recorded music and ambient noise on physiological and behavioral state responses of preterm infants between 32 and 35 weeks gestation in the NICU.

Exploring the Function of a Novel Secreted Peptide in the Hippocampus-HPA Axis

Researcher:
Phu Tran, Ph.D.
Department of Pediatrics, Division of Neonatology

Funding Source: CNBD Seed Grant

Abstract: The purpose of this study is to examine levels of a potentially novel secreted peptide in male rats subjected to physiological and nutritional stress, and to determine whether exposure to stressors during important periods of brain development in early life results in permanent programming of this gene expression in adulthood. Collectively, this study may uncover the role for a novel neuro/hormone peptide and may provide an additional molecular marker for examining the effects of stress on neuronal structure and function at a molecular level, especially in the context of cognitive function and the hippocampus-HPA axis.

*Genotypic Influences on Prefrontally-guided Behaviors in Adolescents

Researchers:
Monica Luciana, Ph.D.
Department of Psychology
Tonya White, M.D.
Department of Psychiatry

Funding Source: CNBD Seed Grant

Abstract: This project will examine the genotypic influences on prefrontally guided behaviors in healthy adolescents and young adults, ages 9–25 years. In this study, the functional polymorphisms of three genes in relation to prefrontal function in adolescents will be examined. The impact of genotype on behavioral performance across tasks and within each age and maturational group to determine whether genotype-cognition interactions are equally potent pre-versus post-puberty will be considered.

*Intrauterine Growth Retardation (IUGR) and Fetal Adaptive Programming: A Multidisciplinary Pilot Study

Researchers:
Mary Pylipow, M.D.
Department of Pediatrics
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology
Kyriakie Sarafoglou, M.D.
Department of Pediatric Endocrinology

Co-Investigators:
Megan Gunnar, Ph.D.
Institute of Child Development
Bradley Miller, M.D.
Department of Pediatric Endocrinology

Funding Source: CNBD Seed Grant

Abstract: This pilot study is obtaining preliminary data to estimate the means and variability of outcome measures to determine whether 1) IUGR infants have significant alterations in the regulatory hormones of the Limbic-Hypothalamic-Pituitary-Adrenal (LPHA) axis and their anatomically and physiologically connected memory circuits after IUGR and 2) children with accelerated catch up growth have more neurodevelopmental, endocrine, and cytokine abnormalities than slower growing infants.

*Laboratory Assessment of Temperament and Physiology in Preschool Age Children: A Sub-component of 'Psychobiological Studies of Stress in Young Children'

Researcher:
Megan Gunnar, Ph.D.
Institute of Child Development

Co-Investigator:
Bonny Donzella, M.A.
Institute of Child Development

Funding Source: NIMH

Abstract: The overarching goals of this research program are to understand the psychological and social regulation of stress physiology in early childhood, and the relations of stress system activity to children's social and emotional development. In the course of three studies, several factors that might explain the different physiological and behavioral responses children have to the normal challenges of early life (ie: separation, interaction with peers) will be examined. These factors include child temperament (personality), sensitivity of adult care, child regulatory competence (effortful control), and peer relationships. The researcher hopes to construct an understanding of the regulation of stress physiology in early childhood that incorporates all of these factors.

Monitoring Movement Skills in Very Low Birthweight Infants

Researchers:
Carol Leitschuh, Ph.D.
School of Kinesiology

Collaborators:
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology

Abstract: The purpose of this study is to collect pilot data on monitoring the movement skills of infants born premature at 1500 gms or less to determine if the use of the monitoring tool, referred to as an Infant-Toddler Movement IGDI, is sensitive with a clinical population (infants born premature) to the movement skills of typical infants.

A Multi-method Study of Prefrontally-Mediated Tasks in Children and Adolescents with Schizophrenia and Their Siblings

Researchers:
Canan Karatekin, Ph.D.
Institute of Child Development
Tonya White, M.D.
Department of Psychiatry

Funding Source: CNBD Seed Grant

Abstract: The goals of this proposal are to use behavioral and psychophysiological methods to elucidate impairments in control of attention and action in children and adolescents with schizophrenia and to identify behavioral and neurological markers of genetic vulnerability to schizophrenia by testing the siblings or offspring of patients with schizophrenia. A long-term goal of the proposal is to identify which tasks demonstrate the greatest impairment in patients and genetic high-risk groups and to adapt these tasks to fMRI and ERP studies to test if impairments of attention and action are related to disruptions in cortical connectivity. The results of this project will have implications for our understanding of schizophrenia as well as measuring and understanding of brain-behavior relationships during adolescence.

*Neurobehavioral Correlates of Early Deprivation

Researcher:
Megan Gunnar, Ph.D.
Institute of Child Development

Co-Investigators:
Charles A. Nelson, Ph.D.
Harvard Medical School
Dana Johnson, M.D., Ph.D.
Department of Pediatrics, Division of Neonatology
Seth Pollak, Ph.D.
University of Wisconsin, Madison

Funding Source: NIMH

Abstract: This work explores the neurobiological bases of problems in attention/executive functions, sensory integration and emotion/stress regulation that are often exhibited by children who have experienced neglect/privation early in life. Studies of institutionally-reared children yield consistent evidence that early deprivation can have long-term consequences for cognitive and social functioning. Our goal is to more directly examine brain-behavior processes in children from institutionally deprived environments. We argue that this research will (a) inform our understanding of the brain-behavior impact of early deprivation/neglect, (b) enhance our ability to assess the bases of deprived children's cognitive and social-emotional difficulties, and (c) inform research on prevention/intervention for children who experienced early neglect/deprivation.

Neurobehavioral Development of Socially-Mediated Decision-Making

Researcher:
Elizabeth Olson
Department of Psychology

Collaborators:
Monica Luciana, Ph.D.
Department of Psychology
Charles Nelson, Ph.D.
Harvard Medical School

Funding Source: CNBD Seed Grant

Abstract: This project examines behavior on a socially-mediated decision-making task (the Prisoner's Dilemma) during adolescence. The game involves repeated decisions regarding social cooperation vs. defection, and is thought to be a model for cooperative social behavior. Performing the task recruits prefrontal regions in adults. Because prefrontal regions develop over the course of adolescence, we expect task behavior to vary based on the level of prefrontal development. Participants (age 9, 13, 17, and 21) will play the task versus a computerized 'partner,' while event-related potentials, heart rate, and skin conductance are monitored.

*Neurocognitive Outcomes of Infants of Diabetic Mothers

Researcher:
Kathleen M. Thomas, Ph.D.
Institute of Child Development

Co-Investigators:
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology
Charles Nelson, Ph.D.
Harvard Medical School

Funding Source: NIH

Abstract: In this study we are focusing our efforts specifically on three areas. First, we intend to document more specifically the nature of the functional and structural deficits observed to date: thus, what types of memory are impaired, and how extensive is the damage to the hippocampus? Second, we seek to determine whether deficits in other cognitive functions emerge as our study populations makes the transition to school age; specifically, do we observe deficits in striatal or prefrontal functions? And, is there an association between such deficits and school performance? Finally, we wish to characterize further what neural circuits have been compromised by the adverse fetal environment that is common among IDMs; specifically, confirm our prediction of hippocampal damage (as inferred from reduced hippocampal volume and/or metabolism) and/or whether we observe damage to striatum, and/or whether we observe reductions in white matter due to prenatal iron deficiency. We will address these questions by conducting detailed electrophysiological (ERPs), metabolic (fMRI), anatomic (MRI), and behavioral (neuropsychologic) studies on our current samples of IDMs and comparison children.

Neurodevelopmental Correlates of Early Adversity in Five-Year-Old Children

Researcher:
Kristin Wiik
Institute of Child Development

Funding Source: CNBD Seed Grant

Abstract: This research project serves as the fourth wave of longitudinal research focused on understanding the neurobehavioral development of internationally adopted children. Specific aims of this project include exploring possible relationships between electrophysiological measures (EEG and ERPs), attention, and disinhibited social behavior in children adopted from institutional care. Stability in patterns of EEG power from eighteen months to five years of age in internationally adopted children will also be examined.

*Neuroendocrine Functions in Post-institutionalized Children

Researcher:
Dana Johnson, M.D., Ph.D.
Department of Pediatrics, Division of Neonatology

Co-Investigators:
Megan Gunnar, Ph.D.
Institute of Child Development
Maria Kroupina, Ph.D.
Department of Pediatrics
Anna Petryk, M.D.
Department of Pediatrics
Sandra Lee Iverson, R.N., C.N.P., M.S.
Department of Pediatrics
Bradley Miller, M.D., Ph.D.
Pediatric Endocrinology

Collaborator:
Patricia Bauer, Ph.D.
Emory University

Funding Source: NIH, MMF

Abstract: The main goal of this research program is to determine whether early neglect and deprivation can influence the development and interactions between the stress-sensitive system, the hypothalamic-pituitary-adrenocortical (HPA) axis and the growth hormone (GH) system in children that affect physical growth in post-institutionalized children.

Neuroimaging and Cognitive Changes in Childhood Leukemia Survivors

Researcher:
Fiona Anderson, Ph.D.
Department of Pediatrics, Neuropsychology

Funding Source:
National Children's Cancer Society and Viking Childrens Fund

Abstract: This study proposes to advance the knowledge about neurocognitive late effects of chemotherapy for Acute Lymphoblastic Leukemia with a combination of Diffusion Tensor Imaging and specific neuropsychological measures.

*Neurophysiologic Assessment of the At-Risk Newborn

Researchers:
Kathleen M. Thomas, Ph.D.
Institute of Child Development

Co-Investigators:
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology
Charles Nelson, Ph.D.
Harvard Medical School

Collaborator:
Patricia Bauer, Ph.D.
Emory University

Funding Source: NIH

Abstract: In this study, we hypothesize that the adverse fetal events common in the diabetic pregnancy (i.e. iron deficiency, hypoxemia, and hypoglycemia) will have a deleterious and specific effect on the hippocampus. This should result in selective impairments in explicit memory due to the established vulnerability of this structure to these metabolic disturbances. Our results thus far have established a consistent pattern of deficits in recognition memory, from birth through four years of age, as inferred from electrophysiological data (event-related potentials) and behavioral data (Elicited Imitation).

*Newborn Iron Deficiency

Researcher:
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology

Co-Investigator:
Charles Nelson, Ph.D.
Harvard Medical School

Funding Source: NIH

Abstract: This study will provide important information regarding the neurophysiologic, metabolic and behavioral sequelae of fetal/neonatal iron deficiency in newborn intrauterine growth restricted (IUGR) infants. The goal of this study is to demonstrate abnormal recognition memory processing in IUGR infants via electrophysiological (event-related potentials) and behavioral (Elicited Imitation) methods.

*Newborn Iron Deficiency: Treatment

Researcher:
Michael Georgieff, M.D.
Department of Pediatrics, Division of Neonatology

Co-Investigator:
Charles Nelson, Ph.D.
Harvard Medical School

Collaborators:
Raghu Rao M.D.
Department of Pediatrics, Division of Neonatology
Rolf Gruetter Ph.D.
Department of Radiology

Funding Source: NIH

Abstract: The aim of the study is to isolate the specific effect of iron deficiency on the developing hippocampus by studying auditory recognition memory with high-density event related potentials (ERPs) and behavioral studies dependent on intact hippocampus. We will enroll brain-iron deficient infants of diabetic mothers (IDMs) and compare them to brain-iron sufficient IDMs, as well as brain-iron deficient and brain-iron sufficient infants born to mothers without diabetes. We hypothesize that medicinal iron supplementation started at two weeks of age and continued for 4 weeks will accelerate the process of normalization of iron stores, and in turn the normalization of ERP wave pattern.

Nutritional Status and Neurodevelopment in Internationally Adopted Children

Researcher:
Anita Fuglestad
Institute of Child Development

Funding Source: CNBD Seed Grant

Abstract: This project aims to assess the nutritional status and neurobehavioral development of internationally adopted children at arrival and at six months post-adoption. We expect the status of specific nutrients will map onto the neurodevelopmental profile of internationally adopted children initially and six months post-adoption. Understanding the role of early nutrient deficiencies on neurodevelopment and subsequent cognitive and behavioral outcomes is of particular interest for the development of effective early intervention programs targeted for at-risk populations.

A Pilot Study of Brain Function and Structure in MPS I and II

Researchers:
Elsa Shapiro, Ph.D.
Department of Pediatrics
Kathleen M. Thomas, Ph.D.
Institute of Child Development

Co-Investigators:
Kate Delaney
Department of Pediatrics
Kendra Bjoraker, Ph.D.
Department of Pediatrics
Lawrence Charnas, M.D., Ph.D.
Department of Pediatrics
Chester Whitley, M.D., Ph.D.
Department of Pediatrics

Funding Source: Genzyme Corporation

Abstract: This is a pilot study to explore the central nervous system effects in MPS I and II (mucopolysaccharidosis) with special attention to the role of the hippocampus. MRI and neuropsychological tests will be used to explore brain structures and CNS functions, especially memory and learning in relationship to the hippocampus.

Prefrontal Mediated Tasks in Youth with Anxiety Disorders Pre-Versus Post-Medication

Researcher:
Kathryn Cullen, M.D.
Department of Psychiatry

Collaborators:
Monica Luciana, Ph.D.
Department of Psychology
Tonya White, M.D.
Department of Psychiatry

Funding Source: CNBD Seed Grant

Abstract: This study aims to measure pre- versus post-medication changes in prefrontal-mediated cognitive domains among children, adolescents, and younger adults with anxiety disorders who have been prescribed SSRI medications, as well as compare medication-related changes in prefrontal mediated cognitive domains between younger and older age groups.

Quantifying the Time Course of Tantrum Anger

Researcher:
Michael Potegal, Ph.D.
Department of Pediatrics, Pediatric Neurology

Collaborator:
Elsa Shapiro, Ph.D.
Department of Pediatrics

Funding Source: NICHD

Abstract: This project is developing a quantitative, behaviorally-based model of children's anger. In this model we use the temporal variations in each angry behavior previously observed during naturally occurring tantrums to reconstruct both the time course of anger and the "linkage functions" through which anger controls the probabilities of the observed behaviors. The model is being tested by collecting audio/video recordings of a set of tantrums of two year olds and conducting video coding and data analysis.

CNBD Facts

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The CNBD was constructed in 2000 with financial support from within the University of Minnesota and from external resources. Ms. Debra Sedgwick-Brittan made a generous individual donation to the CNBD that afforded the purchase of an audio/visual system, which is integral to collecting data and training researchers. The Minnesota Medical Foundation awarded two equipment grants to benefit the CNBD. These grants enabled us to install equipment in the autonomic and electrophysiological laboratories. Annual fiscal responsibilities are equally supported by the College of Education and Human Development and the Medical School, both of the University of Minnesota.

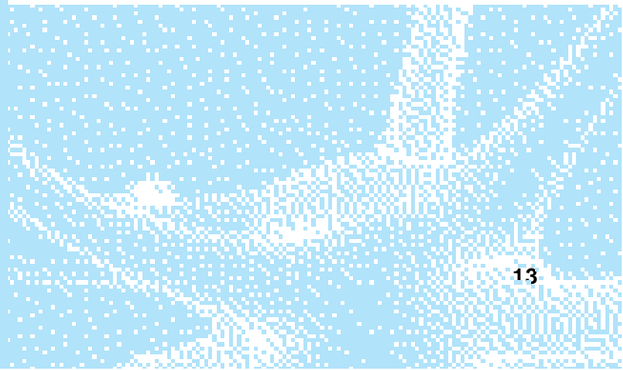
Structural and Functional Development of the Anterior Cingulate in Adolescence

Researcher:
Kristin Sullwold
Department of Psychology

Collaborators:
Monica Luciana, Ph.D.
Department of Psychology
Kelvin Lim, M.D.
Department of Psychiatry

Funding Source: CNBD Seed Grant

Abstract: The aims of this study are to 1) examine the development of white matter microstructure in the ACC during adolescence and early adulthood, 2) determine how white matter development in this region relates to behavioral evidence for ACC development, and 3) to investigate associations to between white matter organization and electrophysiological evidence for ACC development using ERP testing techniques.



Nutritional Status and Neurodevelopment in Internationally Adopted Children

Researcher:
Anita Fuglestad
Institute of Child Development

Funding Source: CNBD Seed Grant

Abstract: This project aims to assess the nutritional status and neurobehavioral development of internationally adopted children at arrival and at six months post-adoption. We expect the status of specific nutrients will map onto the neurodevelopmental profile of internationally adopted children initially and six months post-adoption. Understanding the role of early nutrient deficiencies on neurodevelopment and subsequent cognitive and behavioral outcomes is of particular interest for the development of effective early intervention programs targeted for at-risk populations.

A Pilot Study of Brain Function and Structure in MPS I and II

Researchers:
Elsa Shapiro, Ph.D.
Department of Pediatrics
Kathleen M. Thomas, Ph.D.
Institute of Child Development

Co-Investigators:
Kate Delaney
Department of Pediatrics
Kendra Bjoraker, Ph.D.
Department of Pediatrics
Lawrence Charnas, M.D., Ph.D.
Department of Pediatrics
Chester Whitley, M.D., Ph.D.
Department of Pediatrics

Funding Source: Genzyme Corporation

Abstract: This is a pilot study to explore the central nervous system effects in MPS I and II (mucopolysaccharidosis) with special attention to the role of the hippocampus. MRI and neuropsychological tests will be used to explore brain structures and CNS functions, especially memory and learning in relationship to the hippocampus.

Research Screening in Autism: Minnesota Biobehavioral Autism Program

Researchers:
Elsa Shapiro, Ph.D.
Department of Pediatrics
Michael Reiff, M.D.
Department of Pediatrics
Robin Rumsey, Ph. D., C.P.
Department of Pediatrics

Abstract: The purpose of this research screening program is to create a database of medical and behavioral information about children with autistic spectrum disorders. This database will be used for research study of characteristics of children with ASDs and for selection of children to participate in a number of research studies that will be started in the Autistic Spectrum Disorders program.

Risks to Developing Self-Regulation and Stress-Response Systems in Kindergarten-Aged Homeless Children: The Role of Parenting

Researcher:
Joseph J. Cutuli
Institute of Child Development

Funding Source: CNBD Seed Grant

Abstract: This study looks at the factors associated with good and poor development of the ability to self-regulate behavior in a sample of kindergarten-aged children living in an emergency homeless shelter. Following past risk and resilience research, this study seeks to uncover specific factors that are particularly salient in leading to good or negative outcomes, especially good parenting as a buffer of stress, or poor parenting as an exacerbating factor. A unique perspective is being pursued that links risk and resilience processes across biological, behavioral, and family and school-systems levels of analysis.

Structural and Functional Development of the Anterior Cingulate in Adolescence

Researcher:
Kristin Sullwold
Department of Psychology

Collaborators:
Monica Luciana, Ph.D.
Department of Psychology
Kelvin Lim, M.D.
Department of Psychiatry

Funding Source: CNBD Seed Grant

Abstract: The aims of this study are to 1) examine the development of white matter microstructure in the ACC during adolescence and early adulthood, 2) determine how white matter development in this region relates to behavioral evidence for ACC development, and 3) to investigate associations to between white matter organization and electrophysiological evidence for ACC development using ERP testing techniques.

Awards & Fellowships

The Center for Neurobehavioral Development is committed to facilitating the training of young investigators in the field. Currently, we are able to offer the following funding opportunities to foster investigation and collaboration in neurobehavioral development.

Seed Grants

Since its inception in 2001, the CNBD has awarded 35 Seed Grants totaling over $80,000 to faculty and student members of the Center. These Seed Grants provide opportunities for researchers to explore preliminary or high-risk research. The awards are competitive, and require a commendable research idea that is central to the goals of the Center.

Seed Grants help to further the collaborative mission of the Center. Interdisciplinary and collaborative project proposals may be favored for funding. Grant recipients are asked to present their research in a colloquium, and all recipients submit annual reports with updates on their research.

During the 2006–2007 academic year applications were received from graduate students and faculty in a variety of departments. The Scientific Advisory Committee awarded funding to the research projects that are listed. Their abstracts are included in the "Current Research Protocols."

Seed Grant Awardees for 2006–2007 academic year were:

Julia Cohen
Institute of Child Development
Exploring the Developing Interface of Cognition and Emotion During Early Adolescence

Elizabeth Olson
Department of Psychology
Neurobehavioral Development of Socially-Mediated Decision Making

Karina Quevedo
Institute of Child Development
The Confluence of Deprivation and Puberty on Emotional and Endocrine Reactivity

Phu Tran, Ph.D.
Department of Pediatrics
Exploring the Function of a Novel Secreted Peptide in the Hippocampus-HPA Axis

Travel Awards

The Center for Neurobehavioral Development also offers travel awards to graduate student members presenting at national and international scientific conferences. Applications are considered bi-annually to support travel to conferences or meetings held throughout the academic year. Applicants may be awarded up to $500 based on a review of scientific merit, conference being attended, and the number of applicants per cycle.

Travel Awardees for 2006–2007 academic year were:

Erik Carlson
Pediatric Academic Society Annual Meeting
Toronto, ON
Iron Deficiency and Alterations in Developmental Gene Expression in Rat Hippocampus

Joseph J. Cutuli
Society for Research in Child Development
Boston, MA
Mobility and Conduct Competence from Childhood through Adulthood

John Hoch
Society for Psychophysiological Research Conference
Vancouver, BC
The Correspondence Between Problem Behavior and Cardiac Measures During Classroom-based Functional Behavioral Analyses

Elizabeth Olson
2007 Cognitive Neuroscience Society Annual Meeting
New York, NY
Relationships Between White Matter Development and Delay/Probability Discounting in Adolescence

Kristin Sullwold
Society for Psychophysiological Research Conference
Vancouver, BC
Error-related Negativity N2 and Frontal Midline Theta Activity as Correlates of the Development of Response Monitoring and Cognitive Control in Adolescents

Dustin Wahlstrom
Society for Research in Child Development
Boston, MA
Relationship Between Catechol O-Methyltransferase Polymorphism and Performance Tests of Cognition in Adolescents.

Kristin Wiik
Society for Research in Child Development
Boston, MA
Relations Between Neurophysiological and Motor Functioning in Children with Diverse Early Life Experience

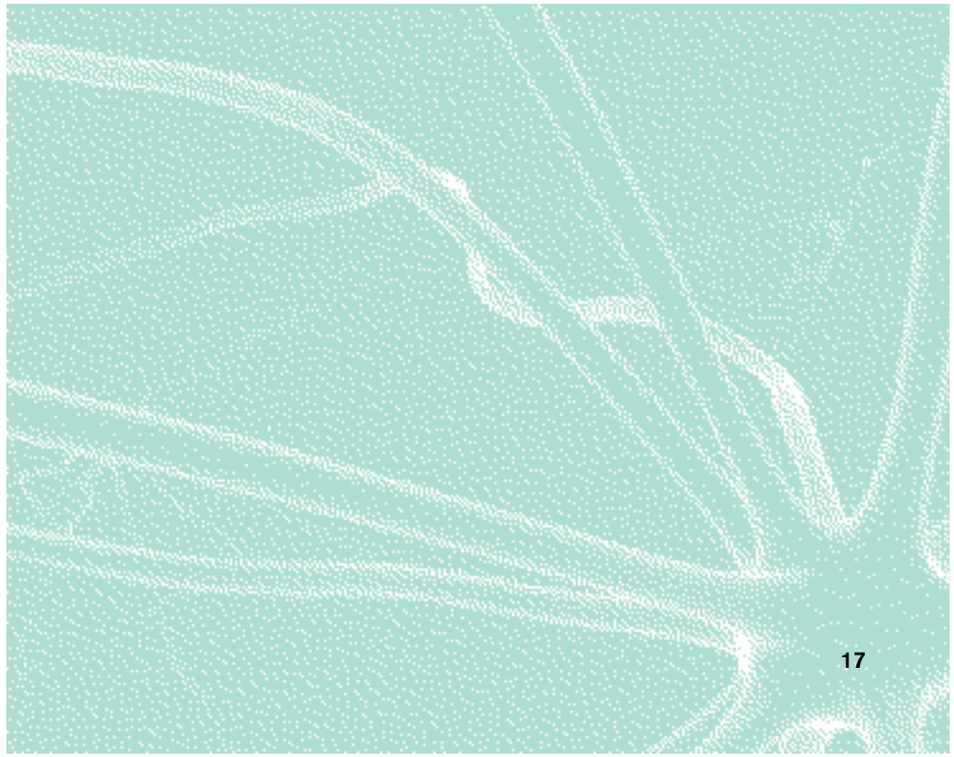
Predoctoral Fellowship

The CNBD also allocates a portion of its annual budget to support predoctoral fellowships that are awarded to graduate student members of the Center. The fellowship includes a stipend, health insurance and tuition for one year. A panel of CNBD core faculty determines the awards based on academic performance and caliber of research efforts in the field.

Predoctoral Fellows for 2006–2007 academic year were:

Stephanie Bohmer is a doctoral candidate in the Department of Neuroscience. She is performing her graduate research in the laboratory of CNBD Director Michael Georgieff, investigating the effect of iron deficiency on the regulation of the target of rapamycin (TOR) signaling pathway. She is using molecular techniques to directly examine the gene products of members of the TOR pathway and uses behavioral assays to examine the direct effects of localized pharmacological manipulation of TOR signaling on behavior as compared to ID effects.

Anita Fuglestad is a doctoral candidate in the Institute of Child Development. Her graduate research focuses on the relationship between nutrition and brain development. Her research takes place in the CNBD and the International Adoption Clinic, where she examines nutrient deficiencies in children and determines whether these deficiencies are linked to specific developmental outcomes based on the effects these nutrients have on brain development given the timing and severity of the deficiency.



Postdoctoral Fellowship

In August 2004 the Center for Neurobehavioral Development was awarded a grant from the National Institutes of Health, "Postdoctoral Training in Neurobehavioral Development." The training grant is intended to promote interdisciplinary postdoctoral research training in neurobehavioral development, thereby providing junior investigators the ability to integrate research and theory in human behavioral development with explication of underlying neural circuitry and processes.

Postdoctoral trainees in the program integrate laboratory techniques and coursework in a field complementary to their prior training. A particularly unique dimension of this training program is that it exposes Ph.D. students to clinical training and M.D. students to research experience, thereby providing knowledge of the neurobiological mechanisms underlying behavioral development to those interested in a range of behavioral phenomena, and vice versa. Research training is also supplemented by proseminars, workshops, and colloquia at the CNBD.

In addition to a stipend, the training grant provides trainees with funds to cover expenses for conducting research, as well as funds for travel expenses to present at national and international conferences.

Postdoctoral Fellows for 2006–2007 academic year were:

Kathryn Cullen, M.D.
Dr. Cullen completed her medical schooling, psychiatry residency and Child and Adolescent Fellowship training at the University of Minnesota. Her research interests include the pathophysiology of pediatric mood disorders, and the role of neurodevelopment in both illness and treatment. Dr. Cullen's postdoctoral fellowship research includes a CNBD Seed Grant-sponsored study under the mentorship of CNBD Core Faculty members Tonya White and Monica Luciana, examining the impact of anti-depressant medications on cognitive development, as well as a similar study of adolescents with Major Depressive Disorder. During her fellowship she will be mentored by CNBD Faculty members Sanjiv Kumra, M.D. and Bonnie Klimes-Dougan, Ph.D., and will also collaborate with CNBD Core Faculty member Kathleen Thomas, Ph.D.

Judith Eckerle Kang, M.D.
Dr. Kang received her M.D. in May 2004 from the Medical College of Wisconsin. She completed her residency in Pediatrics at the New York Presbyterian Hospital at the Weill Cornell Medical Center. Dr. Kang will be training with her mentor, CNBD Core Faculty member Dana Johnson, at the International Adoption Clinic, working with recently adopted children while investigating low birth weight and fetal alcohol exposure as risk factors for future decreased cognitive or psychological functioning in international adoptees.

CNBD Facts

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The Center for Neurobehavioral Development is comprised of faculty members from 12 different academic departments across the University. Research conducted at our Center is a collaboration of members from these varying backgrounds. We believe that many disciplines working together will be able to more fully understand how children's brains develop.

Affiliated Departments:
Department of Neuroscience
Institute of Child Development
Department of Psychology
Department of Psychiatry
Department of Pediatrics
Division of Neonatology in the Department of Pediatrics
Department of Educational Psychology
Medical School
School of Nursing
Department of Radiology
Department of Kinesiology
Department of Speech, Language and Hearing Sciences

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brain regions. He aims to provide insights into how environmental factors (e.g. nutrition, stress) affect the programming of neuronal networks during the embryonic period and/or preadolescence that underlies stereotypical behaviors such as feeding and affective behavior. Also, in collaboration with his mentor, CNBD Director and Core Faculty member Dr. Michael Georgieff, and CNBD Faculty member Dr. Jonathan Gewirtz, Dr. Tran has examined the long-term effects of early life iron deficiency on the expression of neurotrophic growth factors and stress biomarkers, which may provide the molecular basis underlying behavioral impairment observed in early life iron deficiency animal models.

Shang-Zhi Xu, Ph.D.
Dr. Xu received his Ph.D. from the Chinese Academy of Medical Sciences & Peking Medical College in 1999. Just before starting his postdoctoral fellowship at the CNBD in August 2006, Dr. Xu studied the neurodegeneration associated with Huntington's Disease at the Mayo Clinic. His CNBD fellowship training is in the lab of Dr. Lorene Lanier in the Department of Neuroscience, studying the role of protein Arp2/3 in controlling growth cone orientation and translocation. Specifically, Dr. Xu is examining the significance of Arp2/3 in brain development and function (in vivo and in vitro). He hopes to predict that mice with conditionally inhibited Arp2/3 function will have significant abnormalities in dendritic spine morphology and neurite growth of neuron development, which is seen in most types of mental retardation.

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In addition to a stipend, the training grant provic trainees with funds to cover expenses for condu research, as well as funds for travel expenses tc at national and international conferences.

O. Evren Güler, Ph.D.
Dr. Güler received her Ph.D. in Child Psychology at the University of Minnesota-Twin Cities in 2007. Her research focus was examining the relations between mental processing speed, working memory and autobiographical memory in four-, six- and eight-year-old children. Her postdoctoral fellowship expands on this area as she trains with mentor and CNBD Core Faculty member, Dr. Kathleen Thomas, addressing memory development in infants of diabetic mothers, with a specific focus on the measures of autobiographical memory being collected in Dr. Thomas' longitudinal dataset.

Danielle Grove-Strawser, Ph.D.
Dr. Grove-Strawser received her Ph.D. in Cell, Molecular and Developmental Biology from Tufts University School of Medicine in 2006. Her Ph.D. thesis examined the neuronal basis for the age-related transition from regular reproductive cycles to acyclicity in a rat model. She is interested in the organizational and activation effects of steroid hormones upon brain function. With her mentor, Dr. Paul Mermelstein, Associate Professor in the Department of Neuroscience, she is working on examining non-traditional effects of estradiol upon cell function.

Lyric Jorgenson, Ph.D.
Dr. Jorgenson received her Ph.D. in Neuroscience in 2005 at the University of Minnesota-Twin Cities. During her doctoral studies, Dr. Jorgenson investigated the long-term structural and functional consequences of fetal/early postnatal iron deficiency on the rodent hippocampus, as this region has been shown to be critical in learning and memory processes. During her postdoctoral fellowship at the CNBD, Dr. Jorgenson hopes to determine if there is persistent abnormal recognition memory processing at 8 years of age in the previously examined infants of diabetic mothers cohort. Her mentor is CNBD Core Faculty member, Dr. Kathleen Thomas.

Eugena Mitchell, Ph.D.
Dr. Mitchell received her Ph.D. in Neuroscience from the University of Texas-Houston Health Science Center in May 2007. Her graduate work focused on the effects of neonatal vs. adult lesions of the amygdala, orbital frontal cortex, or hippocampus on the discrimination of facial expressions by adult rhesus monkeys. Her postdoctoral fellowship research will focus on anxiety-like behavior in rats and the effects of early drug exposure, to determine whether adolescent rats exhibit withdrawal-potentiated startle, and whether drug exposure in adolescence increases withdrawal-potentiated startle in adulthood. Her mentor is CNBD Faculty member, Dr. Jonathan Gewirtz.

Phu Tran, Ph.D.
Dr. Tran received his Ph.D. from the University of Iowa, Department of Biological Sciences in December 2000. Before beginning his CNBD fellowship in 2006, he conducted postdoctoral research in Neuroendocrinology at the University of California, San Francisco. With this fellowship, Dr. Tran has been interested in defining the molecular basis of hypothalamic-limbic circuitry development and establishing molecular markers for these brain regions. He aims to provide insights into how environmental factors (e.g. nutrition, stress) affect the programming of neuronal networks during the embryonic period and/or preadolescence that underlies stereotypical behaviors such as feeding and affective behavior. Also, in collaboration with his mentor, CNBD Director and Core Faculty member Dr. Michael Georgieff, and CNBD Faculty member Dr. Jonathan Gewirtz, Dr. Tran has examined the long-term effects of early life iron deficiency on the expression of neurotrophic growth factors and stress biomarkers, which may provide the molecular basis underlying behavioral impairment observed in early life iron deficiency animal models.

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Collaboration and Outreach

The Center for Neurobehavioral Development encourages active collaborations by hosting colloquia presentations, housing a library of resources spanning several disciplines of human development, and implementing several committees comprised of members with diverse backgrounds to oversee the Center's many functions.

Colloquium Presentations

Scholars within the University of Minnesota and from outside institutions present their research at CNBD colloquia. Members as well as interested faculty and students in the academic community are invited to attend. The colloquia schedule in 2006–2007 included a series on Dopamine Systems: Reward and Executive Functioning.

Colloquium presentations are a valuable CNBD resource. They supplement the training of our students and foster an atmosphere conducive to faculty discussions regarding research topics across disciplines. The colloquia have proven to be useful as a training device because they provide demonstrations of high-quality research efforts and help our students develop a critical attitude toward their work and the research of other academics. During the discussion period after the presentation, attendees and the presenters consider the study, design, execution, data analysis, interpretation, and directions for further research. The colloquia keep Center members informed about their peers' research and aid in facilitating interdisciplinary interaction, which in turn fosters further research.

Fall Series: Reward and Addiction

September 26, 2006
Synaptic Plasticity in the Mesolimbic Dopamine System
Mark Thomas, Ph.D.
Departments of Neuroscience and Psychology
University of Minnesota

October 17, 2006
Micronutrient Deficiencies and Child Development
Maureen Black, Ph.D.
Department of Pediatrics
University of Maryland

November 14, 2006
Developmental Factors Influencing Prediction, Prevention, and Treatment of Drug Abuse
Marilyn E. Carroll, Ph.D.
Professor of Psychiatry and Neuroscience
University of Minnesota

November 21, 2006
Rewards and Addiction
Jonathan Gewirtz, Ph.D.
Department of Psychology
University of Minnesota

December 5, 2006
Drug-Using Environments: Interaction Between Alteration in Parental Environment and Disruption in Reward Systems
Linda Mayes, M.D.
Departments of Child Psychiatry, Pediatrics and Psychology
Yale University

Spring Series: Executive Functioning

February 6, 2007
Emotion and Motivation From Childhood to Adolescence: What Could Be Happening with the Onset of Puberty?
Karina Quevedo
CNBD Seed Grant Recipient
Institute of Child Development
University of Minnesota

February 20, 2007
Neurochemical Modulation of Executive Functions in Adolescence
Monica Luciana, Ph.D.
Department of Psychology
University of Minnesota

March 6, 2007
Impulsivity, Reward Seeking and the Adolescent Brain
B.J. Casey, Ph.D.
Department of Developmental Psychobiology
Cornell University
New York, NY

March 27, 2007
Exploring the Function of a Novel Secreted Peptide in the Hippocampus-HPA Axis
Phu Tran, Ph.D.
CNBD Postdoctoral Fellow
Department of Pediatrics, Neonatology Division
University of Minnesota

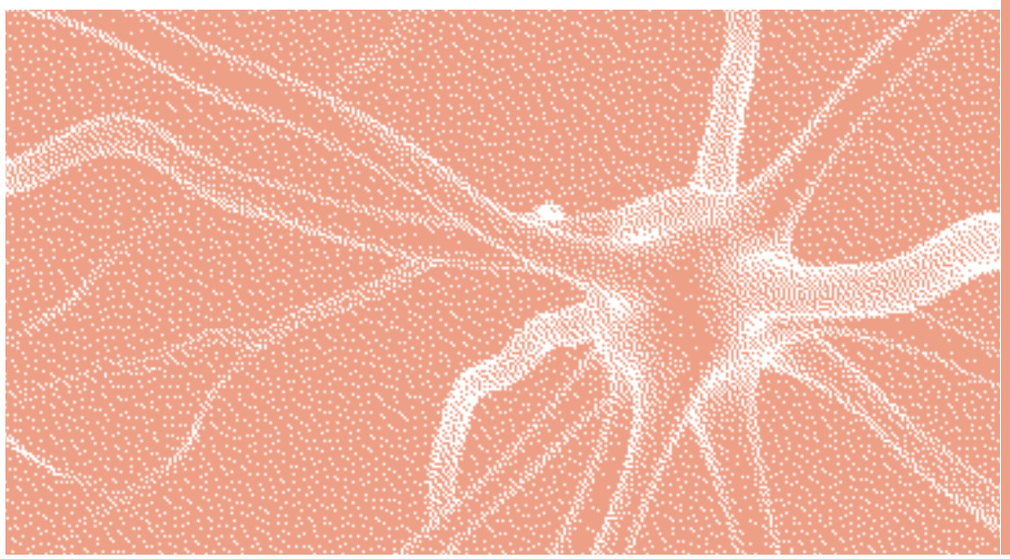
April 10, 2007
Taking the Lab to the Schoolhouse: Autonomic Regulation and Classroom Problem Behaviors
John Hoch, M.A.
CNBD Predoctoral Fellow
Educational Psychology
University of Minnesota

April 10, 2007
Emotion-Modulated Startle and Attention to Emotional Faces in Children Internationally Adopted from Institutional Care
Kristin Wiik
CNBD Predoctoral Fellow
Institute of Child Development
University of Minnesota

April 17, 2007
Behavior in Rats with Perinatal Iron Deficiency and Other Neurobehavioral Models
Barbara T. Felt, M.D.
The Center for Human Growth and Development
University of Michigan
Timothy Schallert, Ph.D.
Department of Psychology
University of Texas
Austin

April 24, 2007
Self-Control and the Developing Brain
Philip Zelazo, Ph.D.
Departments of Psychology and Psychiatry
University of Toronto

May 15, 2007
Fat Mass, Glucocorticoids and Insulin: All Sculpt Feeding and Stress Responses
Mary Dallman, Ph.D.
Department of Physiology
University of California
San Francisco



CNBD Facts

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While some methods for collecting data from children are based on new technology, others have been used
for years. In particular, the Elicited/Deferred Imitation task, developed
by former core faculty member
Dr. Patricia Bauer, is used to assess recognition memory in infants and children. By using props specifically designed for the task, a researcher models a sequence of steps with the prop to create a specific result. The infant is then given the opportunity to replicate the sequence. This task is central to several studies of memory development conducted at the Center because of its ability to quantify recognition memory
in a non-verbal population.

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Center is to strengthen the bond between eurobehavioral development, the University and the community at large. The CNBD is omplishing this through several avenues e plans to expand the CNBD's outreach nation efforts in the future. In addition to and workshops, some of our other current deavors include:

program connecting youth and family professionals innesota to research and resources from the nnesota in addressing critical needs of children and dinated by University of Minnesota Extension and the earch and Outreach Center (SW ROC). The CNBD d by Connect U's organizers, Colleen Gengler, Pauline ias Spanier in the spring of 2006 to plan a series nts at the SW ROC for fall 2006, spring 2007 and

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B.J. Casey, Ph.D.
Department of Developmental Psychobiology
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Peptide in the
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CNBD Postdoctoral F
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Kristin Wiik
CNBD Predoctoral Fe
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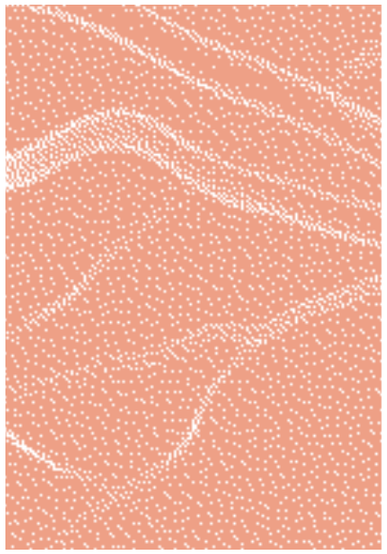

Trainings and Workshops

In addition to colloquium, the CNBD offers training and workshops to our members intended to enhance skills associated with child development research.

This year the CNBD offered a training event on:

February 16, 2007
High-Density EEG Training: An introduction to the EGI system for researchers
Vanessa Vogel-Farley
Children's Hospital
Boston, MA

CNBD Resources

Conference Room

The CNBD conference room is a regular meeting space for many developmentally-focused groups outside and within the University, including the NIMH Prenatal Stress Network, Autism Initiative Group, the Affective Neuroscience Group, Pediatric Neonatology Fellows, and GCRC Protocol Commitee. It is A/V-equipped and is ideal for smaller-scale presentations. If you are interested in utilizing the CNBD conference room for a meeting or event, please contact us by e-mail at cnbd@umn.edu.

Resource Library

The CNBD resource library is located in the conference room. It contains academic journal collections, textbooks, and recently published articles in the field of neurobehavioral development. There is also an archive of articles published by CNBD members and faculty.

Outreach

A goal of the Center is to strengthen the bond between research in neurobehavioral development, the University community, and the community at large. The CNBD is currently accomplishing this through several avenues and there are plans to expand the CNBD's outreach and dissemination efforts in the future. In addition to our colloquia and workshops, some of our other current outreach endeavors include:

Connect U

Connect U is a program connecting youth and family professionals of southwest Minnesota to research and resources from the University of Minnesota in addressing critical needs of children and youth. It is coordinated by University of Minnesota Extension and the Southwest Research and Outreach Center (SW ROC). The CNBD was approached by Connect U's organizers, Colleen Gengler, Pauline Nickel, and Tobias Spanier in the spring of 2006 to plan a series of outreach events at the SW ROC for fall 2006, spring 2007 and fall 2007.

The Children, Youth and Family Consortium, directed by CNBD core faculty member Cathy Jordan, is facilitating the collaborative planning. The first event took place on October 23rd and 24th. Dr. Megan Gunnar spoke on *Brain Basics and Stress on Young Children* and Dr. Arthur Reynolds discussed *Making Early Care and Education Effective*. The events were aimed at professionals working in child care, ECFE & School Readiness, Head Start, social services, health care, crisis centers, as well as others involved in early childhood coalitions. The spring 2007 event featured Drs. Frank Symons and Jennifer McComas who spoke with educators and youth workers about strategies for preventing, recognizing and intervening in behavioral disorders.

CNBD Website

The CNBD website is available as a resource for members of academia as well as parents and members of the community interested in research at the CNBD. Expansion of the community website is regularly updated to provide more connections between the CNBD, parents, current research, and informational, clinical, and educational services in the field of child development.

Career/Educational Tours

The CNBD is open for tours and demonstrations for students and individuals interested in learning about the research equipment and studies conducted at the CNBD. Recently, demonstrations were given to students involved in the Research Experiences for Undergraduates program at the University of Minnesota.

Undergraduate Opportunities

Undergraduates studying in fields related to Neurobehavioral Development are often able to gain experience in developmental research by working with investigators on research projects running in the CNBD, performing tasks such as data analysis and collection.

Publications

The following list contains journal articles that were published, or accepted in 2006 and 2007. While the complete publication list of each Center for Neurobehavioral Development researcher would be more extensive, this list represents collaborative research that is facilitated by the CNBD.

2006 Collaborative Publications

Bauer, P.J., Wiebe, S.A., Carver, S.A., Lukowski, A.F., Haight, J.C., Waters, J.M., & Nelson, C.A.
Electrophysiological indexes of encoding and behavioral indexes of recall: Examining relations and developmental change late in the first year of life.
Developmental Neuropsychology, 29(2), 293-320.

Benedict, L., Nelson, C.A., Schunk, E., Sullwold, K., & Seaquist, E.R.
Effect of insulin on the brain activity obtained during visual and memory tasks in healthy human subjects.
Neuroendocrinology, 83(1), 20–26.

Cheatham, C.L., Bauer, P.J., & Georgieff, M.K.
Predicting individual differences in recall by infants born preterm and full term.
Infancy, 10(1), 17–42.

Couperus, J.W., & Nelson, C.A.
Early Brain Development and Plasticity. In K. McCartney & D. Phillips (Eds.),
The Blackwell Handbook of Early Childhood Development. Blackwell Press: Oxford, UK

Curtis, W.J., Zhuang, J., Townsend, E.L., Hu, X., & Nelson, C.A.
Memory in early adolescents born prematurely: A functional magnetic resonance imaging investigation.
Developmental Neuropsychology, 29(2), 341–377.

Davis, E.P., Townsend, E.L., Gunnar, M., Guiang, S.F., Lussky R.C., Cifuentes, R.F., & Georgieff, M.K.
Antenatal betamethasone treatment has a persisting influence on infant HPA axis regulation.
Journal of Perinatology, 26(3), 147–153.

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2007 Collaborative Publications

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Schizophrenia Research, 90(1–3), 302–307.

Membership

Our members come together from many backgrounds to collaborate and conduct research at the Center. University departments involved in the CNBD include the Departments of Pediatrics, Neuroscience, Psychology, Psychiatry, Radiology, Educational Psychology, Kinesiology, the Medical School, the School of Nursing, and the Institute of Child Development.

In evaluating candidates for membership, we will look for evidence that the individual is productive in research that is related to the objectives of the Center.

Core Faculty

The Core Faculty comprise the governing body of the Center. Core Faculty members hold either a Ph.D. or an M.D. and are employed at the University of Minnesota. Core Faculty membership is reserved for the most active faculty of the CNBD who have strong research programs in neurobehavioral development.

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Department of Educational Psychology

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Faculty members of the CNBD are persons with a Ph.D. or M.D. employed at the University of Minnesota who collaborate with one or more of the CNBD's core faculty. Faculty members conduct research that is applicable to the aims of the CNBD, employing neuroscientific and behavioral approaches to an understanding of child development.

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CNBD Facts

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The CNBD has a comprehensive Resource Library available to all members. This library includes all collaborative publications of members and any related journal publications as well as a number of books on Center related topics.Some of these titles include:

Executive Function in Education: From Theory to Practice
edited by
Lynn Meltzer Ph.D

Human Behavior, Learning and the Developing Brain: Atypical Development
edited by
Donna Coch, ED.D
Geraldine Dawson, ED.D
Kurt W Fischer, Ph.D

The Neurobehavioral and Social-Emotional Development of Infants and Children
written by
Ed Tronick, Ph.D

The Ethical Brain
written by
Michael S Gazzaniga, Ph.D

Brain, Mind, and Behavior
written by
Floyd Bloom M.D.
Charles Nelson Ph.D.
Arlyne Lazerson

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Kinesiology

M.D., FAAP
Pediatrics

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Pediatrics

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on, Ph.D.

Pediatrics

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Associates are non-faculty members that are heavily involved in CNBD research and committee work.

Associate Members of fiscal year 2007 were:

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Faculty

Faculty members of the CNBD are persons with a Ph.D. or M.D. employed at the University of Minnesota who collaborate with one or more of the CNBD's core faculty. Faculty members conduct research that is applicable to the aims of the CNBD, employing neuroscientific and behavioral approaches to an understanding of child development.

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Affiliates are people with substantive interests in the topics of research at the CNBD.

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Design layout created by ByDesign, an internal graphic design service within the Department of Design, Housing, and Apparel, in the College of Design, at the University of Minnesota.

Photos on title pages were taken from a mural painted by Club De Arte, a group of Latino newcomer 10–14 year-old students from Jefferson Community School in Minneapolis, and led by instructor Elissa Cedarleaf-Dahl. The theme of the mural is “childhood ideas and discoveries” and it is painted on the walls of the CNBD waiting/playroom.

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