Proceedings of the 44th Annual Gatlinburg Conference
March 2-4, 2011 • Hotel Contessa • San Antonio • Texas

Adolescence and Developmental Disabilities:
From Neurobiology to Interventions
The Gatlinburg Conference especially thanks the following institutions for their financial contributions and generous support of the 2011 conference:

- The *Eunice Kennedy Shriver* National Institute of Child Health and Human Development
  - The American Psychological Association–Division 33
- The Schiefelbusch Institute for Life Span Studies, University of Kansas
- The Eunice Kennedy Shriver Center, University of Massachusetts Medical School
  - The University of North Carolina
  - The University of Washington
- The Waisman Center, University of Wisconsin-Madison
- The Vanderbilt Kennedy Center, Vanderbilt University

Cover Art: *Doll’s Tea Party* by Anne Ambrose
44th Annual

Gatlinburg Conference

On Research and Theory in Intellectual and Developmental Disabilities

Hotel Contessa • San Antonio • Texas
March 2-4, 2011

This volume contains abstracts for invited talks, symposium papers, and poster presentations at the 44th Annual Gatlinburg Conference on Research and Theory in Intellectual and Developmental Disabilities. Permission to quote or reprint any of these materials must be obtained from the author(s).

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This conference is supported by grant number R13 HD38335 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development. Additional support provided through generous donations from:

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# Program at a Glance

## Wednesday, March 2, 2011

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<tr>
<td>7:30–8:45 A.M.</td>
<td>Registration</td>
<td>Atrium</td>
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<tr>
<td>8:45–10:15 A.M.</td>
<td>Symposium 1 <strong>Contessa A</strong> The Science and Art of Home-Based Interventions</td>
<td><strong>Symposium 2 Contessa B</strong> Health Care Disparities and Diagnosis for Latinos with Autism Across the Lifespan</td>
</tr>
<tr>
<td>10:30 A.M.–10:45 A.M.</td>
<td>Opening Remarks: Elisabeth Dykens, Ph.D.</td>
<td><strong>Contessa A &amp; B</strong></td>
</tr>
<tr>
<td>10:45 A.M.–12:15 P.M.</td>
<td>Plenary Session 1: Ronald Dahl, M.D. &quot;Adolescent Brain Development: A Window Into Vulnerabilities and Opportunities&quot;</td>
<td><strong>Contessa A &amp; B</strong></td>
</tr>
<tr>
<td>2–3:30 P.M.</td>
<td>Symposium 4 <strong>Contessa A</strong> Williams Syndrome: From Pixels to Parents (E. Dykens/M. Lense)</td>
<td><strong>Symposium 5 Contessa B</strong> Children of Adolescent Mothers During Late Adolescence (K. Weed)</td>
</tr>
<tr>
<td>3:45-4:45 P.M.</td>
<td>NIH Session Behind Closed Doors: What Really Happens at an NIH Study Section</td>
<td><strong>Contessa A &amp; B</strong></td>
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<tr>
<td>4:45-5:30 P.M.</td>
<td>NIH Session Tips and Tricks for Successful NIH Funding with Q&amp;A</td>
<td><strong>Contessa A &amp; B</strong></td>
</tr>
<tr>
<td>5:30-5:45 P.M.</td>
<td>NIH Session And Now, the Rest of the Story</td>
<td><strong>Contessa A &amp; B</strong></td>
</tr>
<tr>
<td>5:45–7:45 P.M.</td>
<td>Poster Session 1 Reception sponsored by Brookes Publishing</td>
<td><strong>Cedar &amp; Mesquite</strong></td>
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## Thursday, March 3, 2011

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<tr>
<td>8:45–10:15 A.M.</td>
<td>Symposium 7 <strong>Contessa A</strong> Down Syndrome and Alzheimer’s Disease: Longitudinal Studies of Dementia Status and Risk (W. Silverman)</td>
<td><strong>Symposium 8 Contessa B</strong> Adult Siblings of Individuals with Intellectual and Developmental Disabilities: New Perspectives (J. Lounds-Taylor)</td>
</tr>
<tr>
<td>10:30 A.M.–12 P.M.</td>
<td>Plenary Session 2: Cheryl Sisk, Ph.D. &quot;Pубertal Hormones Shape the Adolescent Brain“</td>
<td><strong>Contessa A &amp; B</strong></td>
</tr>
<tr>
<td>1:30–3 P.M.</td>
<td>Plenary Session 3: Bruce Compas, Ph.D. &quot;Coping with Stress: Insights from Intervention Research and Youth with Acquired Neurocognitive Problems&quot;</td>
<td><strong>Contessa A &amp; B</strong></td>
</tr>
<tr>
<td>3:30–5 P.M.</td>
<td>Symposium 10 <strong>Contessa A</strong> Biomarkers/Behavioral Indicators of Anxiety/Fear in Young Males w/Fragile X (J. Roberts/H. Hazlett)</td>
<td><strong>Symposium 11 Contessa B</strong> Transitions to Adulthood: Diverse Family Perspectives (L. Glidden)</td>
</tr>
<tr>
<td>5:30–7:30 P.M.</td>
<td>Poster Session 2 Reception sponsored by Noldus Technology</td>
<td><strong>Cedar &amp; Mesquite</strong></td>
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## Friday, March 4, 2011

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<tr>
<td>8:45–10:15 A.M.</td>
<td>Symposium 13 <strong>Contessa A</strong> Early Adolescence and Developmental Disabilities (B. Baker)</td>
<td><strong>Symposium 14 Contessa B</strong> Parent Stress, Health, and Interventions (N. Miodrag)</td>
</tr>
<tr>
<td>10:30 A.M.–12 P.M.</td>
<td>Plenary Session 4: Laurence Steinberg, Ph.D. &quot;A Social Neuroscience Perspective on Adolescent Risk-Taking“</td>
<td><strong>Contessa A &amp; B</strong></td>
</tr>
<tr>
<td>12 P.M.</td>
<td>Closing Remarks: Elisabeth Dykens, Ph.D.</td>
<td><strong>Contessa A&amp;B</strong></td>
</tr>
</tbody>
</table>
Objectives

After participating in this CE activity, participants should be able to:

• Increase their understandings of neural, physiological, and behavioral development in adolescence
• Apply knowledge about typical adolescent development to youth with intellectual or developmental disabilities
• Translate cutting-edge research findings from the conference into best practices and/or policies

Target Audience

Psychologists, scientists, graduate students, and postdoctoral fellows in the United States, Canada, the UK, France, and Peru.

Schedule

March 2, 2011
8:45–10:15 a.m. morning symposia
10:45 a.m.-12:15 p.m. plenary session
2-3:30 p.m. afternoon symposia

March 3, 2011
8:45–10:15 a.m. morning symposia
10:30 a.m.-12 p.m. plenary session
1:30-3 p.m. plenary session
3:30-5 p.m. afternoon symposia

March 4, 2011
8:45–10:15 a.m. morning symposia
10:30 a.m.-12 p.m. plenary session

Faculty disclosure

By participating in this CE activity, instructors agree to provide a sufficient basis for the interpretation of program information by informing participants of limitations of the content being taught, including contradictory evidence and its source.

Conflict of Interest

This activity received no funding in the form of commercial grants or exhibit fees.

CE Credits

Vanderbilt School of Medicine is approved by the American Psychological Association to sponsor continuing education for psychologists. Vanderbilt School of Medicine maintains responsibility for this program and its content.

Vanderbilt School of Medicine designates this educational activity for 13.5 CE credits toward the continuing education of psychologists.
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To obtain credit for your participation in this activity, return a completed Documentation of Attendance form to the conference coordinators at the end of your conference attendance.

You will receive email notification of online credit availability within 3 weeks after the conference.

You may access your record of participation at anytime by visiting the Vanderbilt CME website at www.cme.vanderbilt.edu and following the instructions to obtain a transcript.

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Evaluation

Performing a post-course evaluation is part of the accreditation requirements that permit Vanderbilt to offer CE credit for psychologists. Evaluation also provides planners of this conference with information about how to improve future sessions. You will be receiving an electronic post-conference survey the week following the conference.

Additional Information

For additional information about this activity, contact Laura McLeod at 615.343.5322 or laura.mcleod@vanderbilt.edu.
Awards Recipients

**David Zeaman Student Award**

Benjamin Feldman  
Case Western Reserve University

Michelle Viecili  
York University

Mallory Brown  
University of Oregon

Lisa Jacola  
University of Cincinnati

Michelle Comas  
University of Notre Dame

Christine Steeger  
University of Notre Dame

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Cincinnati Children's Hospital Medical Center

Margaret Griffith  
University of South Carolina School of Medicine

Timothy Moore  
University of Minnesota

Jody Nicholson  
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“Pubertal Hormones Shape the Adolescent Brain”

The expression of certain sex-biased psychopathologies, e.g., eating disorders, depression, and schizophrenia, is associated with puberty and adolescence, suggesting that complex interactions between pubertal hormones, experience, and the developing brain contribute to the etiology of these disorders. Using laboratory rodent models, my laboratory has investigated how, when, and where pubertal hormones shape the adolescent brain. Initial work showed that pubertal hormones induce long-lasting organizational influences on the adolescent brain by programming adult behavioral responses during social interactions. Subsequent experiments revealed that the potential for hormone-dependent organization decreases with postnatal age. A separate line of research uncovered a new mechanism by which pubertal hormones alter neural circuits underlying sex-specific social behaviors, namely modulation of neurogenesis and/or cell survival of cells born during puberty. We found that during puberty, new cells, including neurons, are added to sexually dimorphic cell groups in a sex-dependent manner, and that prepubertal gonadectomy obliterates these sex differences. We derive two testable hypotheses from our data. First, hormone-modulated addition of new cells to hypothalamic and limbic cell groups may be an active mechanism for either preserving sexual dimorphisms during remodeling of the adolescent brain, or for establishing new functional sexual dimorphisms that emerge with adolescent development. Second, individual variation in the timing of interactions between steroid hormones and the human adolescent brain, such as those that occur with precocious or delayed puberty, contribute to individual differences in behavior and risk for sex-biased psychopathology in adulthood.

Dr. Sisk is Director of the Neuroscience Program and a Professor of Psychology at Michigan State University.
Laurence Steinberg, Ph.D.  

“A Social Neuroscience Perspective on Adolescent Risk-Taking”

Adolescence is a period of heightened engagement in risky and reckless behavior, including substance use, unprotected sex, reckless driving, and criminal activity. This lecture will focus on recent discoveries in the study of adolescent brain development and the implications of this work for understanding risk-taking during adolescence. I present the results of a program of research on the underpinnings of risk-taking adolescence that is informed by recent advances in developmental neuroscience. It has been hypothesized that reward-seeking and impulsivity develop along different timetables and have different neural underpinnings, and that the difference in their timetables helps account for heightened risk-taking during adolescence. In order to test these propositions, age differences in reward-seeking and impulsivity were examined in a socioeconomically and ethnically diverse sample of 935 individuals between the ages of 10 and 30, using self-report and behavioral measures of each construct. Consistent with predictions, there is a substantial increase in reward-seeking during early adolescence, with sensitivity to rewards and preference for immediate rewards especially pronounced. In contrast, age differences in impulsivity follow a linear pattern, with impulsivity declining steadily from age 10 on. Heightened vulnerability to risk-taking in middle adolescence may be due to the combination of relatively higher inclinations to seek rewards and still maturing capacities for self-control. I also present findings showing that adolescents’ sensitivity to rewards is heightened by the presence of peers, as well as evidence that this effect is mediated by hyper-activation of the brain’s reward circuitry. I conclude by discussing the implications of this work for policy and practice.

Dr. Steinberg is Distinguished University Professor and Laura H. Carnell Professor of Psychology at Temple University.
March 2, 2011

8:45-10:15 A.M.

SYMPOSIUM 1—CONTESSA A
The Science and Art of Home-Based Interventions
Targeting IDD: Progress and Problems
Co-Chairs: Jody Nicholson, St. Jude Children's Research Hospital
Jaelyn Farris, Pennsylvania State University-Harrisburg
Discussant: John Borkowski, University of Notre Dame
Enhancing Parenting and Reducing IDD in At-Risk Families through Early Home-Based Intervention
Jaelyn R. Farris¹
Christine Noria²
John Borkowski³
Cathy Guttentag⁴
Susan Landry⁴
Kathleen Baggett⁵
Judith Carta⁶
Steve Warren⁷
Robin Lanzi⁸
Sharon Ramey⁹
The Centers for the Prevention of Child Neglect
¹Pennsylvania State University-Harrisburg
²Goshen College
³University of Notre Dame
⁴University of Texas-Houston
⁵University of Kansas
⁶University of Alabama-Birmingham
⁷Georgetown University

Get the Lead Out: Reducing Subthreshold Exposure for Children in Poverty
Jody Nicholson¹
John Borkowski²
¹St. Jude Children's Research Hospital
²University of Notre Dame

Adolescent Working Memory Training Improves Symptoms Associated with Attention-Deficit/Hyperactivity Disorder, Maladjustment, and Negative Parenting
Christine Steeger
Dawn Gondoli
Bradley Gibson
Becky Morrissey
Ann Johnson
Brad Dobrzenski
University of Notre Dame

SYMPHOSIUM 2—CONTESSA B
Health Care Disparities and Diagnosis for Latinos with Autism Across the Lifespan
Chair: Sandy Magaña, Waisman Center, University of Wisconsin-Madison
Discussant: Leonard Abbeduto, Waisman Center, University of Wisconsin-Madison
Differences in Items and Summary Scales of the Autism Diagnostic Interview-Revised Between Latino and Non-Latino White Adolescents and Adults with ASD
Sandy Magaña
Leann Smith
Waisman Center, University of Wisconsin-Madison
Parent Responses on the ADI-R as a Predictor of Autism in Latino Children
Terry Overton
University of Texas-Brownsville
Health Care Access, Utilization and Quality of Latino Children with Autism and DD
Susan Parish¹
Sandy Magaña²
Roderick Rose³
Jamie Swaine³
¹Lurie Institute for Disability Policy, Brandeis University
²Waisman Center, University of Wisconsin-Madison
³University of North Carolina-Chapel Hill

SYMPOSIUM 3—MAGNOLIA
Psychological Well-Being in Caregivers of Children and Adolescents with Autism Spectrum Disorders and Intellectual Disabilities
Chair: Jonathan Weiss, York University
Children with Intellectual and Developmental Disability, Typical Development, and Disruptive Behavior Disorders: The Effect on Families and Student Teacher Relationships
Stacy Lauderdale
Jan Blacher
University of California-Riverside
Psychological Well-Being of Couples with a Child with an Autism Spectrum Disorder
Leah Jones
Vasiliki Totsika
Richard Hastings
Michael Petalas
Alan Dowey
Susie Nash  
Bangor University (Wales)  

Predictors of Well-Being in Mothers of Children and Adolescents with Autism Spectrum Disorder  
Paula Hutchinson  
Susan Bryson  
IWK Health Centre, Autism Research Centre, Dalhousie University  

Predictors of Crisis in Mothers of Children and Adolescents with Autism Spectrum Disorders  
Jonathan Weiss\(^1\)  
Yona Lunsky\(^2\)  
\(^1\)York University  
\(^2\)Centre for Addiction and Mental Health, Canada  

**10:30-10:45 A.M.**  
OPENING REMARKS  
CONTESSA A & B  
Elisabeth Dykens, Ph.D.  
Gatlinburg Conference Chair  
Vanderbilt Kennedy Center, Vanderbilt University  

**10:45 A.M.-12:15 P.M.**  
PLENARY SESSION 1  
CONTESSA A & B  
Adolescent Brain Development: A Window Into Vulnerabilities and Opportunities  
Ronald Dahl, M.D.  
Dr. Dahl is a Professor of Community Health & Human Development in the School of Public Health and Joint Medical Program at the University of California-Berkeley.  

**2-3:30 P.M.**  
SYMPOSIUM 4—CONTESSA A  
Williams Syndrome: From Pixels to Parents  
Co-Chairs: Elisabeth Dykens, Vanderbilt Kennedy Center, Vanderbilt University  
Miriam Lense, Vanderbilt Kennedy Center, Vanderbilt University  
Discussant: Marilee Martens, The Ohio State University  

Parenting Stress, Coping, and Health: Comparing Mothers of Children with Williams Syndrome to Other Disability Groups  
Nathan Dankner  
Nancy Miodrag  
Elisabeth Dykens  
Vanderbilt Kennedy Center, Vanderbilt University  

Arousal and Anxiety in Williams Syndrome in Social and Non-social Situations: Associations Between Neuroendocrine Markers and Performance Abilities  
Miriam Lense  
Elisabeth Dykens  
Vanderbilt Kennedy Center, Vanderbilt University  

The Neural Basis of Heightened Empathy in Williams Syndrome: An fMRI Study of the Auditory Mirror Neuron System  
Tricia Thornton-Wells\(^1,2,3\)  
Jennifer Pryweller\(^1,2,3\)  
Liam Solus\(^2\)  
Elisabeth Dykens\(^2\)  
\(^1\)Center for Human Genetics Research, Vanderbilt University  
\(^2\)Vanderbilt Kennedy Center, Vanderbilt University  
\(^3\)Vanderbilt University Institute for Imaging Science  

The Effect of Intellectual Ability on Functional Brain Activation in Williams Syndrome: An fMRI Study  
Jennifer Pryweller\(^1,2,3\)  
Elisabeth Dykens\(^2\)  
Tricia Thornton-Wells\(^1,2,3\)  
\(^1\)Center for Human Genetics Research, Vanderbilt University  
\(^2\)Vanderbilt Kennedy Center, Vanderbilt University  
\(^3\)Vanderbilt University Institute for Imaging Science  

SYMPOSIUM 5—CONTESSA B  
Children of Adolescent Mothers During Late Adolescence  
Chair: Keri Weed, University of South Carolina-Aiken  
Discussant: Marsha Mailick Seltzer, Waisman Center, University of Wisconsin-Madison  

Cognitive and Psychosocial Outcomes of Children with IDD at Age 18  
Keri Weed\(^1\)  
John Borkowski\(^2\)  
Thomas Whitman  
\(^1\)University of South Carolina-Aiken  
\(^2\)University of Notre Dame
March 2, 2011

Early Trajectories of IQ and Adaptive Behavior and 18-Year Academic, Cognitive and Social Outcomes
Jennifer Lefever1
Jody Nicholson2
1University of Notre Dame
2St. Jude Children's Research Hospital

Trajectories of Child Abuse Potential: Predicting 18-Year Outcomes of Children of Adolescent Mothers
Julie Schatz
University of Notre Dame

Child Temperament Moderates the Relationship of Maternal Depression to Executive Functioning
Michelle Comas
Kristin Valentino
Center for Children and Families, University of Notre Dame

SYMPOSIUM 6—MAGNOLIA
Novel Approaches to Understanding and Treating Autism: The Biological and Behavioral Interchange
Chair: Blythe Corbett, Vanderbilt Kennedy Center, Vanderbilt University
Discussant: Paul Yoder, Vanderbilt Kennedy Center, Vanderbilt University

Harnessing a Biomarker to Inform Treatment
Jeremy Veenstra-VanderWeele
Vanderbilt Kennedy Center, Vanderbilt University

Psychological Stress of Children with Autism Spectrum Disorder: The Impact of a Service Dog's Presence in the Family
Stephanie Fecteau
M. Trudel
N. Champagne
F. Picard
University of Sherbrooke

SENSE Theatre: Collaboration Between Art and Science for Autism
Blythe Corbett
Vanderbilt Kennedy Center, Vanderbilt University

NIH SESSIONS
CONTESSA A & B
3:45-4:45 P.M.
Behind Closed Doors: What Really Happens at an NIH Study Section
4:45-5:30 P.M.
Tips and Tricks for Successful NIH Funding with Q&A
5:30-5:45 P.M.
And Now, the Rest of the Story

POSTER SESSION 1—CEDAR & MESQUITE
1. Environmental and Neuropsychological Correlates of Emotion Regulation in Children with Fetal Alcohol Spectrum Disorders: Preliminary Data from the UW PACE Study
Jason Baker
Rachel Fenning
Christine Meng
Waisman Center, University of Wisconsin-Madison

2. Parental Attributions, Perceptions, and Attitudes toward Parenting Children with Disabilities
Abigail Baxter
Lisa Turner
University of South Alabama

3. Utilization and Usefulness of Social Support for Families with Children with ASD
Mallory Brown
Laura Lee McIntyre
University of Oregon

4. The Relationship between Pain Coping and Mental Age in Individuals with Intellectual and Developmental Disabilities
Chantel Burkitt1
Lynn Breau2
Mark Zabalia3
1University of Minnesota
2Dalhousie University, Centre for Pediatric Pain Research, IWK Health Centre
3Université de Caen (France)
5. Communication Modes and Interpretability in Rett Syndrome
   Breanne Byiers\textsuperscript{1}
   Raymond Tervo\textsuperscript{1,2}
   Frank Symons\textsuperscript{1}
   \textsuperscript{1}University of Minnesota
   \textsuperscript{2}Gillette Children's Specialty Healthcare

6. Child-Related Stress and Mother-Child Interactions: The Down Syndrome Advantage
   Morgan Crossman\textsuperscript{1}
   Amanda Cannarella\textsuperscript{2}
   Alyssa Rosenfeld\textsuperscript{1}
   Penny Hauser-Cram\textsuperscript{2}
   \textsuperscript{1}Lurie Institute for Disability Policy, Brandeis University
   \textsuperscript{2}Boston College

7. Developmental Delay in Children with Subthreshold Lead Exposure: The Confounding Factor of Poverty
   Amy Curtis
   Jody Nicholson
   St. Jude Children's Research Hospital

8. Trait Anxiety and Controlling Behavior in Mothers of Children with and without Developmental Delays
   Jessica Diep
   Shulamite Green
   Bruce Baker
   University of California-Los Angeles

9. Parental Perspectives on the Transition to Adulthood in Adolescents with Developmental Disabilities
   Amie Duncan
   Anna Esbensen
   Somer Bishop
   Cincinnati Children's Hospital and Medical Center

10. A Cross Syndrome Study of Facial Discrimination Skills in Prader-Willi Syndrome and Autism
    Benjamin Feldman
    Anastasia Dimitropoulos
    Case Western Reserve University

11. Macrostructural Narrative Language of Adolescents and Young Adults with Down Syndrome or Fragile X Syndrome
    Lizbeth Finestack\textsuperscript{1}
    Meghan Palmer\textsuperscript{1}
    Leonard Abbeduto\textsuperscript{2}
    \textsuperscript{1}University of Minnesota
    \textsuperscript{2}Waismann Center, University of Wisconsin-Madison

12. Comparison of the Effects of Two Systematic Phonics Instruction Approaches on the Ability of Children with Severe Cognitive Disabilities to Read Words
    Elizabeth Finnegan
    St. Thomas Aquinas College

13. Encouraging Behavioral Flexibility in Children with Autism Spectrum Disorders
    Camila Gomes\textsuperscript{1}
    Mariana Simoes\textsuperscript{1}
    Deisy das Graças de Souza\textsuperscript{1}
    Harry Mackay\textsuperscript{2}
    Brooks Thompson\textsuperscript{2}
    William McIlvane\textsuperscript{2}
    \textsuperscript{1}Universidade Federal de São Carlos (Brazil)
    \textsuperscript{2}Eunice Kennedy Shriver Center, University of Massachusetts Medical School

14. Attitudes Regarding Inclusion of Students with Intellectual Disabilities at College
    Megan Griffin
    Elise McMillan
    Tammy Day
    Allison Summer
    Robert Hodapp
    Vanderbilt Kennedy Center, Vanderbilt University

15. The Risk of Intellectual Disability in Children Born to Mothers with Preeclampsia or Eclampsia with Partial Mediation by Low Birth Weight
    Margaret Griffith
    Joshua Mann
    Suzanne McDermott
    University of South Carolina School of Medicine

16. Social Referencing Abilities of Preschoolers with Down Syndrome or Williams Syndrome
    Angela John
    Carolyn Mervis
    University of Louisville

17. Generalized Effects of Parent Implemented Language Intervention
    Ann Kaiser
    Megan Roberts
    Vanderbilt Kennedy Center, Vanderbilt University

18. The Relationship Between Temperament and Language Development in children with FXS
    Juliana Keller
    Nancy Brady
Kandace Fleming
Steven Warren
University of Kansas

19. Impact of an Intervention to Increase Effective Decision Making by Adolescents with Intellectual and Developmental Disabilities in Situations Involving Peer Pressure
Ishita Khemka
Linda Hickson
Ruth Zealand
Sarah Mallory
Columbia University
College of New Rochelle

20. Sensory Features and Caregiver Adaptations for Children with Autism Spectrum Disorders and Other Developmental Disabilities
Lauren Little
Ashley Freuler
Grace Baranek
University of North Carolina-Chapel Hill

21. Self-Injury in a Statewide Sample of Young Children with Developmental Disabilities
William MacLean, Jr.
Kylee Dornbush
Wyoming Institute for Disabilities, University of Wyoming

22. Evaluation of the Aberrant Behavior Checklist Factor Structure in Fragile X Syndrome: A Multi-Site Collaborative Study
Stephanie Maltas
S. Hall
A. Reiss
A. Lightbody
K. Widaman
W. Kaufmann
L. Boyle
V. Talisa
A. Lachiewicz
N. Asante
E. Berry-Kravis
C. Hervey
A. DeSonia
D. Hessl
University of California-Davis
Stanford University
Johns Hopkins University
Duke University

23. Word Identification in Adolescents with Intellectual Disabilities
Marie Moore
Susan Loveall
Frances Conners
University of Alabama

24. Music and Sociability in Williams Syndrome
Rowena Ng
A. Järvinen-Pasley
Y. Searcy
I. Fishman
U. Bellugi
Salk Institute for Biological Studies

25. The Vocabulary of Adolescents with Down Syndrome: Just More Words?
M.-L. Joëlle Nuchadee
Facon Bruno
Université de Lille 3 (France)

26. Instructional Programming for Early Reading Skills in Adults with Intellectual Disabilities: Consonant Clusters
Kathryn Saunders
Yusuke Hayashi
Ibari Ezekwe
Sheila Tsau
Stephen Robertson
Life Span Institute, University of Kansas

27. Health Service Utilization in Families of Children with Severe Developmental Disabilities
Ami Tint
Jonathan Weiss
Adrienne Perry
Patricia Minnes
York University
Queen's University

28. An Evaluation of Clonidine, Methylphenidate, and Exercise on Motor Activity within the Open Field Paradigm in the Fmr1 Knockout Mouse
Maria Valdovinos
Craige Wrenn
Andrew Heitzer
Alexandra Roth
Lauren Nawrocki
Drake University
29. Bullying and Victimization Experiences of Children with Autism Spectrum Disorders: Differences Across the Spectrum
Michelle Viecili
M. Catherine Cappadocia
Jonathan Weiss
Debra Pepler
York University

30. Patterns of Gaze Fixation During Search for a Target Symbol on Visual Communication Displays
Krista Wilkinson¹,²
William McIlvane²
Kara Weasen¹
Tara O’Neill¹
¹Pennsylvania State University
²Eunice Kennedy Shriver Center, The University of Massachusetts Medical School

31. Teaching Teachers to Teach Symbolic Play and Joint Attention to Young Children with Autism
Connie Wong¹
Sarah Booth²
Barbara Gapinski²
Piper Maas²
¹Frank Porter Graham Child Development Institute, University of North Carolina-Chapel Hill
²Cleveland State University
2011 Gatlinburg Conference

**Thursday, March 3, 2011**

**SYMPOSIUM 7—CONTESSA A**

**Down Syndrome and Alzheimer’s Disease: Longitudinal Studies of Dementia Status and Risk**

Chair: Wayne Silverman, Kennedy Krieger Institute and Johns Hopkins University School of Medicine

*Estrogen Receptor β Gene Variants and Risk of Alzheimer’s Disease in Women with Down Syndrome*

Nicole Schupf1
Qi Zhao1
Deborah Pang1,2
Joseph Lee1
Simon Lacks1
Warren Zigman3
Wayne Silverman3
Benjamin Tycko1

1Columbia University Medical Center
2New York State Institute for Basic Research in Developmental Disabilities
3Kennedy Krieger Institute and Johns Hopkins University School of Medicine

*Depressive Symptomatology in Adults with Down Syndrome and Mild Cognitive Impairment*

Sharon Krinsky-McHale1
Warren Zigman1
Tiina Urv2
Wayne Silverman3

1New York State Institute for Basic Research in Developmental Disabilities
2Eunice Kennedy Shriver National Institute of Child Health & Human Development
3Kennedy Krieger Institute and John Hopkins University School of Medicine

*Predictive Validity of One-Time Evaluations of Dementia Status*

Wayne Silverman1
Warren Zigman2
Sharon Krinsky-McHale2
Nicole Schupf6
Robert Ryan2

1Kennedy Krieger Institute and Johns Hopkins University School of Medicine
2New York State Institute for Basic Research in Developmental Disabilities
6Columbia University Medical Center

**SYMPOSIUM 8—CONTESSA B**

**Adult Siblings of Individuals with Intellectual and Developmental Disabilities: New Perspectives**

Chair: Julie Lounds Taylor, Vanderbilt Kennedy Center, Vanderbilt University

Discussant: Ann Kaiser, Vanderbilt Kennedy Center, Vanderbilt University

*Guilt Among Adult Siblings of Individuals with Intellectual and Developmental Disabilities*

Carolyn Shivers
Julie Lounds Taylor
Robert Hodapp

Vanderbilt Kennedy Center, Vanderbilt University

*The Impact of Vocational Activities of Adults with Intellectual and Developmental Disabilities on Sibling Well-Being and Relationship Quality*

Julie Lounds Taylor
Robert Hodapp

Vanderbilt Kennedy Center, Vanderbilt University

*Life Course Patterns of Attainment Among Siblings of Adults with Intellectual and Developmental Disabilities*

Marsha Mailick Seltzer1
Jieun Song1
Bobbi Wolfe1
Jason Fletcher2

1Waisman Center, University of Wisconsin-Madison
2Yale University

**SYMPOSIUM 9—MAGNOLIA**

**Peer Relationships in Adolescents with an Autism Spectrum Disorder**

Chair: Gael Orsmond, Boston University

Discussant: Connie Kasari, University of California-Los Angeles

*Impact of Cognitive-Behavioral Treatment for Social Anxiety on Perceptions of Social Belonging in Teens with Autism Spectrum Disorders*

Audrey Blakeley-Smith
Susan Hepburn

JFK Partners/University of Colorado School of Medicine

*Bullying Across the Years: Reports from Public School Students with ASD*

Saara Mahjour
Connie Kasari

University of California-Los Angeles
Using Video Diaries to Understand Friendship Experiences in Adolescents with an Autism Spectrum Disorder
Gael Orsmond
Ellen Cohn
Boston University

Anxiety and Peer/Social Challenges in High-Functioning Adolescents with Autism
Jeffrey Wood
University of California-Los Angeles

10:30 A.M.-12 P.M.
PLENARY SESSION 2
CONTESSA A & B

Pubertal Hormones Shape the Adolescent Brain
Cheryl Sisk, Ph.D.
Dr. Sisk is Director of the Neuroscience Program and a Professor of Psychology at Michigan State University.

1:30-3 P.M.
PLENARY SESSION 3
CONTESSA A & B

Coping with Stress: Insights from Intervention Research and Youth with Acquired Neurocognitive Problems
Bruce Compas, Ph.D.
Dr. Compas is Patricia and Rodes Hart Professor of Psychology and Human Development at Vanderbilt University.

3:30-5 P.M.
SYMPOSIUM 10—CONTESSA A

Biomarkers and Behavioral Indicators of Anxiety and Fear in Young Males with Fragile X Syndrome
Co-Chairs: Jane Roberts, University of South Carolina
Heather Cody Hazlett, University of North Carolina-Chapel Hill

Outcomes Associated with Early Fear in Infants and Preschoolers with FXS
Bridgette Tonnsen
Pat Malone
Jane Roberts
University of South Carolina

Physiological Mechanisms of Fear and Anxiety in Young Children with Fragile X
Jane Roberts
Ashley Robinson
Bailey Tackett
Caroline Clark
University of South Carolina

Early Brain Development in Toddlers with Fragile X Syndrome
Heather Cody Hazlett
University of North Carolina-Chapel Hill

SYMPOSIUM 11—CONTESSA B

Transitions to Adulthood: Diverse Family Perspectives
Chair: Laraine Glidden, St. Mary’s College of Maryland

Challenges in Assessing Quality of Life for Adolescents and Young Adults with Intellectual Disability
Kristen Salkas
Frank Floyd
Georgia State University

Changes in the Mother-Child Relationship During the Transition to Adulthood for Youth with Autism Spectrum Disorders
Julie Lounds Taylor¹
Marsha Mallick Seltzer²
¹Vanderbilt Kennedy Center, Vanderbilt University
²Waisman Center, University of Wisconsin-Madison

Transition for Adolescents and Young Adults with Autism Spectrum Disorder: A Cross-Cultural Examination of Transition Planning, Family Involvement, and Impact
Bonnie Kraemer
San Diego State University

Continuity and Change in Parent Perceptions
Laraine Glidden
Meredith Powlison
Katherine Painter
Jesse Ludwig
Katherine Grein
St. Mary's College of Maryland
March 3, 2011

SYMPOSIUM 12—MAGNOLIA

Human Fetal Exposure to Psychobiological Stress Alters Developmental Trajectories

Chair: Curt Sandman, University of California-Irvine

Exposure to Psychobiological Stress Exerts Programming Influences on Mother and Child with Consequences for Infant/Child Development

Curt Sandman
University of California-Irvine

The Role of Glucocorticoids in Fetal Programming of Child Development

Elysia Poggi Davis
University of California-Irvine

The Impact of Maternal Prenatal Pregnancy-Specific Anxiety on Infant and Child Neurodevelopmental Outcomes

Claudia Buss
University of California-Irvine

Differences in Magnetic Resonance Imaging (MRI) and Neurobehavioral Testing in Preterm Infants Exposed to Chorioamnionitis

Tamera Hatfield
Deborah Wing
Kevin Head
L. Tugan Muftuler
University of California-Irvine

■ 5:30-7:30 P.M.

POSTER SESSION 2—CEDAR & MESQUITE

1. The Gastrostomy Tube: A Mother’s Blessing and Curse
Karla Ausderau
University of North Carolina

2. The Effects of Landmark Instruction on Wayfinding in Persons with Down Syndrome
Megan Benson
Frances Conners
Edward Merrill
Beverly Roskos-Ewoldsen
University of Alabama

3. Long-Term Effects of Maternal Responsivity for Children with Fragile X Syndrome
Nancy Brady
Steve Warren
Juliana Keller
Kandace Fleming
University of Kansas

4. Revisiting Inclusive Recreation: Predictors of Social Acceptance in a Camp Setting
Melissa Collins
Joanne Kersh
Gary Siperstein
Center for Social Development and Education, University of Massachusetts-Boston

5. Parenting Stress in Mothers of Very Young Children with Williams Syndrome
Nicole Crawford
Janet Woodruff-Borden
Carolyn Mervis
University of Louisville

Anastasia Dimitropoulos
Case Western Reserve University

7. Caregiver Directiveness Moderates the Relation Between Joint Attention and Subsequent Language in an At-Risk Sample
Dolores Farhat
Shira Kolnik
Marygrace Kaiser
Mia Esposito
Molly Niemiec
University of Miami

8. Teaching Young Adults with Intellectual and Developmental Disabilities to Respond Appropriately to Lures from Strangers
Marisa Fisher\(^1\)
Meghan Burke\(^2\)
Megan Griffin\(^2\)
\(^1\)Center for Social Development and Education, University of Massachusetts-Boston
\(^2\)Vanderbilt Kennedy Center, Vanderbilt University

J. Carolyn Graff
Laura Murphy
Frederick Palmer
10. The Understanding of Intentionality in Young Children with Williams Syndrome: A Pilot Study
Laura Hahn¹
Deborah Fidler¹
Susan Hepburn²
¹Colorado State University
²Health Sciences Center, University of Colorado–Denver

11. Peer Relationships and Extracurricular Activities of Children with Williams Syndrome: A Preliminary Study
Danielle Henderson
Nicole Crawford
Janet Woodruff-Borden
Carolyn Mervis
University of Louisville

Lynnette Henderson¹
Claire Hughes²
¹Vanderbilt Kennedy Center, Vanderbilt University
²College of Coastal Georgia

13. Factors Affecting the Receipt of Educational and Therapeutic Services for School-Aged Children with Autism Spectrum Disorder
Dwight Irvin
Brian Boyd
Matt McBee
Kara Hume
Sam Odom
Frank Porter Graham Child Development Institute, University of North Carolina-Chapel Hill

14. FMRI of Story Listening Reveals Atypical Activation Patterns in Comparison to Typically Developing Individuals Matched for Chronological and Mental Age
Lisa Jacola
J. Vannest
S. K. Holland
M. Schapiro
Cincinnati Children’s Hospital Medical Center

15. Innovative Communication Intervention for Older Nonverbal Children with ASD
Connie Kasari¹
Ann Kaiser²
Kelly Goods¹
Jennifer Nietfeld²
Amanda Guslrud¹
Courtney Wright²
¹University of California-Los Angeles
²Vanderbilt Kennedy Center, Vanderbilt University

16. Brain Mechanisms of Food Perception in Children, Adolescents, and Adults with Prader-Willi Syndrome
Alexandra Key
Dorita Jones
Susan Williams
Elisabeth Dykens
Vanderbilt Kennedy Center, Vanderbilt University

17. Does the Effect of a Parent Training Program on Parent Responsivity Vary by Parental Depression Severity?
Rebecca Lieberman¹
Allison S. Nahmias¹
Paul Yoder¹
Seniz Celimli²
Daniel Messinger³
Wendy Stone³
Alice Carter⁴
¹Vanderbilt Kennedy Center, Vanderbilt University
²University of Miami
³University of Washington
⁴University of Massachusetts-Boston

18. Self-Teaching of Reading in Individuals with Intellectual Disabilities
Susan Loveall
Frances Conners
University of Alabama

Jennifer MacMullin¹
Jonathan Weiss¹
Adrienne Perry¹
Patricia Minnes²
James Bebko¹
¹York University
²Queen's University

20. Early Psychopathology, IDD, and Service Involvement as Predictors of Mental Health Among At-Risk Adolescents
Karen Mapp¹
Jaelyn Farris¹
THURSDAY

March 3, 2011

21. Adherence to Treatment in a Behavioral Intervention Curriculum: The Effects of Parent Perception
Timothy Moore
Frank Symons
University of Minnesota

22. Modulation of Repetitive Behaviors Through Pharmacological Targeting of Striatal Heteromeric Receptor Complexes
Amber Muehlmann
Kaitlin Young
Sanaz Vaziri
Mark Lewis
University of Florida

23. Predicting MCHAT Scores from the BITSEA at 12 and 24 Months
Laura Murphy
J. Carolyn Graff
Jessica Myszak
Frederick Palmer
Kristin Hoffman
Pamela Najera
Colby Butzon
Bruce Keisling
Cynthia Klubnik
Christina Warner-Metzger
Phyllis Richey
Fran Tylavsky
University of Tennessee-Memphis

24. Maternal Responsivity and Physiological Arousal in Mothers of Young Boys with Fragile X Syndrome
Ashley Robinson¹
J. Roberts¹
N. Brady²
S. Warren²
¹University of South Carolina
²University of Kansas

25. Age and Genetic Subtype Differences in Behavior Problems in Prader-Willi Syndrome
Elizabeth Roof
Grace Kulbaba
Lauren Deisenroth

26. Impact of the Self-Determined Learning Model of Instruction on the Self-Determination of Adolescents with Intellectual Disability
Karrie Shogren¹
Michael Wehmeyer²
¹University of Illinois at Urbana-Champaign
²University of Kansas

27. Utility of the GARS-2, SRS, and SCQ for Adolescents with Autism and Hearing Loss
Christen Szymanski¹
Patrick Brice²
¹Strong Center for Developmental Disabilities, University of Rochester Medical Center
²Gallaudet University

28. Perceptions of Self and Family Among Adolescents with Developmental Disabilities
Miriam Tillinger
Ashley Woodman
Amanda Cannarella
Penny Hauser-Cram
Boston College

29. The Kindergarten Transition: Impact of Preparation Activities on Socio-Behavioral Outcomes for Children With and Without DD
Leah Wildenger¹
Laura Lee McIntyre²
¹May Center for Child Development, Syracuse University
²University of Oregon

30. Parental Concerns About the Sexuality of Adolescents with Disabilities
Ashley Woodman
Miriam Tillinger
Amanda Cannarella
Penny Hauser-Cram
Robyn Antonucci
Meagan Comstock
Holly Jacobs
Alyssa Rosenfeld
Boston College

(Poster Session 2, continued)
8:45-10:15 A.M.

SYMPOSIUM 13—CONTESSA A
Early Adolescence and Developmental Disabilities
Chair: Bruce Baker, University of California-Los Angeles
Discussant: Jan Blacher, University of California-Riverside

Friendships in Adolescents with and without Intellectual Disabilities
Lisa Christensen
Leigh Ann Tipton
Bruce Baker
University of California-Los Angeles
University of California-Riverside

The Sibling Relationship of Young Adolescents with and without Intellectual Disabilities
Gazi Begum
Jan Blacher
University of California-Riverside

Academic Engagement in Early Adolescents with and without Intellectual Disabilities
Rebecca Fraynt
Bruce Baker
University of California-Los Angeles

SYMPOSIUM 14—CONTESSA B
Parent Stress, Health, and Interventions
Chair: Nancy Miodrag, Vanderbilt Kennedy Center, Vanderbilt University
Discussant: Julie Lounds Taylor, Vanderbilt Kennedy Center, Vanderbilt University

Comparison of Hospitalization in Mothers of Children with Down Syndrome, Spina Bifida, and from the Tennessee Population
Nancy Miodrag
Holly Stone
Robert Hodapp
Vanderbilt Kennedy Center, Vanderbilt University

Factors Associated with Parenting Stress in Parents of Children with Angelman Syndrome
Sarika Peters
Nancy Miodrag
Vanderbilt Kennedy Center, Vanderbilt University

Transitioning Together: A Pilot Intervention for Parents of Adolescents with Autism Spectrum Disorders
Leann Smith
Marsha Mallick Seltzer
Jan Greenberg
Waisman Center, University of Wisconsin-Madison

A Comparison of Resiliencies of Families Raising a Child with Autism or Fetal Alcohol Spectrum Disorder
Shelley Watson
Stephanie Hayes
Elisa Radford-Paz
Laurentian University

SYMPOSIUM 15—MAGNOLIA
Bio-Behavioral Approach to Severe Behavioral Problems in Developmental Disabilities
Chair: Stephen Schroeder, University of Kansas
Discussant: Frank Symons, University of Minnesota

Observing Non-Verbal Signs of Pain in Relation to Instances of Self-Injury Among Individuals with Intellectual Disabilities
Andrea Courtemanche
Stephen Schroeder
Jan Sheldon
James Sherman
University of Kansas

Differential Effects of Aripiprazole on the Form and Function of Problem Behavior
Stacy Danov
Raymond Tervo1,2
Stephanie Meyer
Frank Symons1
1University of Minnesota
2Gillette Children's Specialty Healthcare

Mass Screening for Severe Problem Behavior Among Infants and Toddlers in Peru
Liliana Mayo
Rosa Oyama
Judith LeBlanc
Stephen Schroeder
Nancy Brady
Merlin Butler
R. Mathew Reese
David Richman
Georgina Peacock
Jessica Foster
March 4, 2011

Janet Marquis
Centro Ann Sullivan del Peru
Life Span Institute, University of Kansas
Kansas University Medical Center
Centers for Disease Control and Prevention
Nationwide Children's Hospital

**A Biobehavioral Approach to Assessment and Treatment of Severe Problem Behavior in Persons with Intellectual Disabilities: Beyond Scratching the Surface**
Deborah Napolitano
Holly Brown
University of Rochester
Hillside Children's Center

**Differential Functional Properties of Self-Injurious Behavior in Autism Spectrum Disorders, Cornelia de Lange and Smith-Magenis Syndromes**
Johannes Rojahn
D. Richman
W. Dotson
K. Medeiros
S. Elsea
M. Herbert
A. Smith

1 George Mason University
2 Texas Tech University
3 Virginia Commonwealth University School of Medicine
4 National Institutes of Health

**10:30 A.M.-12 P.M.**

**PLENARY SESSION 4**

**CONTESSA A & B**

**Social Neuroscience Perspective on Adolescent Risk-Taking**

Laurence Steinberg, Ph.D.
Dr. Steinberg is the Distinguished University Professor and Laura H. Carnell Professor of Psychology at Temple University.

**12 P.M. CLOSING REMARKS**

**CONTESSA A & B**

Elisabeth Dykens, Ph.D.
Gatlinburg Conference Chair
Vanderbilt Kennedy Center, Vanderbilt University
THE SCIENCE AND ART OF HOME-BASED INTERVENTIONS
TARGETING IDD:
PROGRESS AND PROBLEMS

Chairs: Jody Nicholson, St. Jude Children's Research Hospital
Jaelynn Farris, Pennsylvania State University-Harrisburg

Discussant: John Borkowski, University of Notre Dame
SYMPOSIUM 1

The Science and Art of Home-Based Interventions Targeting IDD: Progress and Problems

Chairs: Jody Nicholson, St. Jude Children's Research Hospital
       Jaelyn Farris, Pennsylvania State University-Harrisburg

Discussant: John Borkowski, University of Notre Dame

Developing and implementing interventions is a combination of science and an art. Empirically-based programming should be tailored to fit the family, target critical periods of development to optimize effectiveness, and contain enough treatment dosage to create change without overwhelming or turning off participants. Deciding on the form of implementation for the interventions also provides an element of art to the science of intervention development. For example, family and home-based interventions aim to affect changes in the contexts in which families live. This allows parents to carry out the functions that are necessary to optimize their children's development once programming is complete. Working with youth who have intellectual and/or developmental disabilities, and their families, often brings about an even stronger emphasis on the art of intervention planning and implementation, as they have unique challenges that are not faced by the general population.

This symposium will discuss intervention strategies for home-based programs aimed at youth with or at risk for IDD and related issues, with a focus on the problems that can be encountered in planning these interventions as well as the progress that has been made in this field in recent years. We will present three papers which demonstrate studies that targeted familial, environmental, and/or heritable risks for IDD. Discussions will focus on promises and problems related to the designs, intervention foci, and small effect sizes in three intervention curricula for families with or at risk for IDD. Specifically:

- Paper 1 will summarize findings from an intensive home-based intervention designed to reduce child maltreatment for at-risk adolescent and adult mothers through parent training.
- Paper 2 will examine the results of an intervention administered to low-income families which aimed to educate parents on how to reduce their children's subthreshold blood lead levels - which place children at risk for IDDs.
- Paper 3 will discuss adolescent and parenting behavior outcomes from an intensive, home-based computerized working memory training intervention for adolescents with ADHD.

Enhancing Parenting and Reducing IDD in At-Risk Families through Early Home-Based Intervention
1Pennsylvania State University-Harrisburg
2Goshen College
3University of Notre Dame
4University of Texas-Houston
5University of Kansas
6University of Alabama-Birmingham
7Georgetown University

Get the Lead Out: Reducing Subthreshold Exposure for Children in Poverty
Jody Nicholson1, John Borkowski2
1St. Jude Children's Research Hospital
2University of Notre Dame

Adolescent Working Memory Training Improves Symptoms Associated with Attention-Deficit/Hyperactivity Disorder, Maladjustment, and Negative Parenting
Christine Steeger, Dawn Gondoli, Bradley Gibson, Becky Morrissey, Ann Johnson, Brad Dobrzenski
University of Notre Dame
Enhancing Parenting and Reducing IDD in At-Risk Families through Early Home-Based Intervention

Jaelyn Farris¹, Christine Noria², John Borkowski¹, Cathy Guttentag³, Susan Landry⁴, Kathleen Baggett⁵, Judith Carta⁵, Steve Warren⁶, Robin Lanzii, Sharon Ramey⁷, and the Centers for the Prevention of Child Neglect

¹Pennsylvania State University-Harrisburg, ²Goshen College, ³University of Notre Dame, ⁴University of Texas-Houston, ⁵University of Kansas, ⁶University of Alabama-Birmingham, ⁷Georgetown University

Pennsylvania State University-Harrisburg, Department of Human Development and Family Studies, W331-C Olmsted Building, 777 W. Harrisburg Pike, Middletown, PA 17057
(jfarris@psu.edu)

Introduction: There have been several efforts to enhance the development of at-risk children through early intervention; most of these programs have achieved modest effects at best, and the majority of effects have been related to maternal, rather than child, development. This paper will describe findings from a randomized clinical trial which used intensive home visitations aimed at improving parenting practices and reducing maltreatment in families headed by an adolescent or low-educated adult mother in which children are generally considered to be at risk for intellectual and developmental disabilities.

Method: Adolescent and low-educated adult mothers were recruited during the prenatal period and randomly assigned to either a high-intensity (i.e., a comprehensive home-based parenting intervention program) or low-intensity intervention condition. Participants in the low-intensity group received a set of “enabling conditions” and those in the high-intensity condition received up to 55 home visits beginning in the last trimester of pregnancy and lasting until the child was 2½ years of age. This randomized clinical trial included a combination of overlapping modules likely to enhance parenting practices and prevent child maltreatment by altering trajectories of maternal development, and, in turn, promote optimal child development.

Results: Analyses focused on: (1) Observed measures of parenting practices, (2) ratings of neglectful parenting, and (3) children’s outcomes in relation to changes in parenting. Results indicated that participants in the high-intensity condition were significantly warmer, more flexible, less intrusiveness, less negative, and more verbal toward their children than participants in the low-intensity condition at the conclusion of the intervention. Moreover, mothers in the high-intensity intervention condition had significantly steeper slopes on flexibility, physical intrusiveness, and negativity, indicating that the high-intensity intervention caused more rapid changes in positive parenting as compared to the low-intensity condition. Participants in the high intensity condition were less neglectful toward their children than low-intensity participants.

Children in the high-intensity condition showed significantly higher expressive language and less negative affect and made more rapid gains on environmental engagement, expressive language, and social engagement than children in the low-intensity condition. In both conditions, changes in parenting practices tended to predict changes in children's outcomes at age 2½.

Discussion: Findings suggested that an intensive, early, home-based intervention had a substantial impact on high-risk mothers’ parenting practices and a modest effect on children's development. This presentation will incorporate a discussion of the “art” and “scientific challenges” of working with high-risk mothers over the course of a 2½ year intensive home visitation program.
Get the Lead Out: Reducing Subthreshold Exposure for Children in Poverty

Jody Nicholson¹ and John Borkowski²

¹St. Jude Children's Research Hospital, ²University of Notre Dame
St. Jude Children's Research Hospital, 262 Danny Thomas Place, MS 740, Memphis, TN 38105
(Jody.Nicholson@stjude.org)

Introduction: Lead exposure can affect the developing brain, negatively impacting cognitive and behavioral outcomes, even for children with levels of exposure below the government sanctioned action level (10 μg/dl; Hubbs-Tait, et al., 2005). Children from low-income families are at greater risk for lead exposure in part due to their home environments (Moore, 2003). This increased risk is a particular concern as some children at or near the poverty line are already at risk for developmental delays (Evans, 2004). This family-based intervention aimed to (1) reduce children's blood lead levels (BLLs) and (2) increase maternal knowledge of lead risk and protective factors in this at-risk population.

Method: Low-income families (n = 84) with children who had lead levels within a subthreshold range (3-10 μg/dl) were recruited to an intervention aimed to reduce lead exposure by helping parents improve their home environment. Families were randomly assigned to four intervention groups which received: (1) basic knowledge of lead risks and prevention tactics through EPA brochures (treatment as usual control – each group received this baseline treatment); (2) cleaning kits (CK), including vacuums with HEPA filters; (3) professional home lead risk assessments (RA); and (4) a combination of the CK and RA. After 6 months, children were retested for lead and mothers reassessed on their knowledge of lead risk/protective factors.

Results: A two-factor (CK & RA) MANCOVA assessed intervention efficacy by comparing group mean post scores while controlling for initial levels of each outcome variable. Parental education was also added as a covariate. Results indicated no main or interaction effect for children's BLLs or maternal knowledge; however, when collapsing across groups participants seemed to have benefited from intervention participation regardless of group assignment. Children's BLLs decreased (t (75) = 10.80; p < .001) and parental knowledge increased (t (70) = -6.89; p < .001). To dispute internal validity issues, a community control sample was collected from a health department chart review of children falling within the same subthreshold range, but having received no treatment during the same time period as the intervention. In contrast to those who received intervention, these children's BLLs increased (t(28) = -2.50; p < .05).

Discussion: Lead exposure is estimated to account for 2 - 4% of the variance in neurodevelopmental measures; therefore, if lead exposure is minimized, children living in poverty may benefit more from interventions targeting other risk factors. Results from the current study indicated a beneficial gain regardless of group assignment, suggesting perhaps the most cost-effective method of reducing children's subthreshold BLLs and increasing maternal knowledge may be through dissemination of EPA brochures. Discussion of the project will focus on how the current study mirrored prior research findings of small effect sizes for lead dust reduction, offering problems and promises that arose from the implementation of the project and focusing on implications for working with families of children at risk for developmental delays.

References:


Adolescent Working Memory Training Improves Symptoms Associated with Attention-Deficit/Hyperactivity Disorder, Maladjustment, and Negative Parenting

Christine Steeger, Dawn Gondoli, Bradley Gibson, Becky Morrissey, Ann Johnson, Brad Dobrzenski
University of Notre Dame
University of Notre Dame, Psychology Department, 118 Haggar Hall, Notre Dame, IN 46556 (guasto@nd.edu)

Introduction: Working memory training has recently demonstrated efficacy for improving inattentive and hyperactive/impulsive symptoms, and executive functioning deficits (e.g., working memory) associated with Attention-Deficit/Hyperactivity Disorder (ADHD; Gibson et al., 2010; Klingberg et al., 2005). Given that ADHD is associated with problems in other domains beyond cognitive deficits (e.g., adolescent oppositional behaviors and maladjustment, and negative or ineffective parenting behaviors; Ellis & Nigg, 2009; Johnston et al., 2002), it is important to examine multiple intervention outcomes. The current study focuses on the effects of a working memory training intervention for improving both the cognitive deficits of working memory in a sample of adolescents, and also for improving adolescent maladjustment symptoms and negative parenting behaviors.

Method: Participants were 41 adolescents diagnosed with ADHD (M age =12.51, SD age = 1.29; 83% boys) and their mothers. Adolescents completed Cogmed-RM (Klingberg et al., 2005) a 5-week, at-home, computerized intervention for training working memory. Adolescent ADHD diagnosis was confirmed with a maternal structured interview, and mothers and teachers completed the DuPaul ADHD symptom rating scale. Mothers and teachers assessed adolescent working memory deficit and inattentive and hyperactive symptoms; mothers rated adolescent aggression and anxiety symptoms; and adolescents and their mothers completed parallel self-report measures to assess maternal psychological control.

Results: Repeated-measures ANOVAs examined the effects of Cogmed-RM on adolescent working memory deficits, inattentive and hyperactive symptoms, maladjustment (aggression and anxiety), and negative parenting (psychological control). Results indicated decreases on symptom and parenting behavior ratings for parent, teacher, and adolescent-reports on all study variables of interest from pre- to post-training. Extended findings on all analyzed variables will be presented.

Discussion: Results of the current working memory training study illustrated secondary improvement in psychosocial domains, beyond primary improvement in cognitive working memory. Positive and negative aspects of the home-based working memory training intervention will be discussed. Future research could benefit from combined treatments for ADHD samples, such as working memory training and behavioral parent training, to further increase effective parenting techniques and improve adolescent adjustment.

References:


HEALTH CARE DISPARITIES AND DIAGNOSIS FOR LATINOS WITH AUTISM ACROSS THE LIFESPAN

Chair: Sandy Magaña, Waisman Center, University of Wisconsin-Madison

Discussant: Leonard Abbeduto, Waisman Center, University of Wisconsin-Madison
SYMPOSIUM 2

Health Care Disparities and Diagnosis for Latinos with Autism Across the Lifespan

Chair: Sandy Magaña, Waisman Center, University of Wisconsin-Madison
Discussant: Leonard Abbeduto, Waisman Center, University of Wisconsin-Madison

Differences in Items and Summary Scales of the Autism Diagnostic Interview-Revised between Latino and Non-Latino White Adolescents and Adults with ASD
Sandy Magaña
Leann Smith
Waisman Center, University of Wisconsin-Madison

Parent Responses on the ADI-R as a Predictor of Autism in Latino Children
Terry Overton
University of Texas-Brownsville

Health Care Access, Utilization and Quality of Latino Children with Autism and DD
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SYMPOSIUM 2

Differences in Items and Summary Scales of the Autism Diagnostic Interview-Revised between Latino and Non-Latino White Adolescents and Adults with ASD

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Introduction: Recent research documents that Latinos are less likely to be diagnosed with autism than their non-Latino counterparts (Mandell et al., 2009; Palmer et al., 2010). One factor that may contribute to these differences in diagnostic rates is that autism diagnostic instruments have not been adapted for the Latino population; therefore, whether these instruments measure the same constructs across cultures has not been determined. The focus of this study is on the use of the Autism Diagnostic Interview-Revised (ADI-R) among Latinos with an ASD diagnosis compared to non-Latino Whites. Because the ADI-R is based on parent report, cultural perceptions about normative language, social, and behavioral development may influence parental responses. Some research shows that Latina mothers place more emphasis on social development and may have a lower threshold for behavioral presentations in their children (Garcia, Perez, & Ortiz, 2000). We hypothesized that: 1) Latina mothers will report more social impairments in their children with ASD, 2) similar levels of impairment in nonverbal communication, and 3) fewer restrictive and repetitive behaviors than non-Latina White mothers.

Methods: We created a matched sample consisting of 48 Latina mothers and 96 non-Latina White mothers of adolescents and adults with an ASD from a larger study of adolescents and adults with autism across the lifespan. The sample was matched on verbal fluency, whether the person with ASD had an intellectual disability and age of person with ASD. In the Latino sample, 85% of the mothers were foreign born and 69% were interviewed in Spanish. All participants were interviewed in their homes by interviewers trained by researchers certified in the use of the ADI-R. The interviews included the 37 ADI-R items that comprise the diagnostic algorithm. Separate analyses of variance (ANOVA) were conducted for individual items and summary scores in the three domains of the ADI-R: impairments in social reciprocity, nonverbal communication and repetitive behaviors and restrictive interests.

Results: There were no differences in level of total social reciprocity impairments between the two groups; However, Latina mothers reported a higher level of impairment in direct gaze among their children than non-Latina white mothers. Both groups reported similar levels of impairments in nonverbal communication. The Latina mothers reported lower levels of restrictive and repetitive behaviors among their children than non-Latina White mothers. Specific items that were significantly different in this category included circumscribed interests, unusual preoccupations and compulsions or rituals.

Discussion: Findings suggest that social and communication items may work similarly across the two groups; however, whether there is cultural equivalency for the restrictive and repetitive behavior items warrants further exploration.

References:


SYMPOSIUM 2

Parent Responses on the ADI-R as a Predictor of Autism in Latino Children

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Introduction: The diagnosis of autism spectrum disorders in Latino children from the Rio Grande Valley region in Texas is complicated and results in false positives and false negative classifications (Overton, Fielding, Garcia de Alba, 2007). Latino parents report autism less often (Centers for Disease Control and Prevention, 2006); however, in the Rio Grande Valley Region I Educational Service area, the reported number of cases nearly doubled from 2007-2010 (Texas Education Agency, 2010). Although the number of classified cases increased during this time period, the age of diagnosis continues to lag behind non-Latino White children (Palmer, Walker, Mandell, Bayles, & Miller, 2010).

Methods: This study examined the results from assessments of 75 Latino children from bilingual home environments to determine what variables were more likely to predict autism spectrum disorders group membership. The ages of the sample ranged from 2 years to 22 years of age. Assessments were completed in English or Spanish as determined by the primary language spoken in the home. In addition to ADOS and ADI-R scores, subscales of the PDD-BI were applied to the administration video tapes of the ADOS to determine if examining pragmatic language ratings improved the prediction of group membership.

Results: Using logistic regression for the analysis, three models were generated. Of the variables used in the analysis, the ADOS Communication and the ADI-R Social and Behavior Domains more successfully predicted children with autism spectrum disorders; however, the single variable of the ADI-R Social Domain was the most successful predictor of children who were not within the range of autism spectrum disorders.

Discussion: The reporting of social behaviors in this population through the use of the ADI-R was a significant predictor and fewer qualitatively abnormal behaviors also was significant in predicting cases that were non spectrum cases in this sample. Clinical and research implications will be discussed.

References:


Introduction: Research has found disparities in whether children receive a diagnosis of autism between Latinos and non-Latino whites (Mandel et al., 2009; Palmer, et al., 2010). However research on whether there are disparities in health care for Latino children with autism compared to non-Latinos is sparse. Using a national sample of children, Liptak and colleagues (2008) found that Latino parents in the sample rated their children as being more severe, and that being Latino was associated with decreased access to health services. The present study investigates disparities in health care access, utilization and quality of care between Latinos and non-Latino whites in a sample of children with autism and other developmental disabilities. We hypothesize that Latino children will have worse access to health care, lower utilization, and that their parents will report worse quality of care than non-Latino whites.

Methods: This study used the National Survey of Children with Special Health Care Needs which is a randomized telephone survey conducted by the National Center for Health Statistics from April 2005 to February 2006. We included 5,110 children who had developmental disabilities in our analyses, including 2,132 with autism. Twelve percent of the sample consisted of Latino children. We conducted logistic regression on variables relating to health care access, utilization and quality adjusting for income, education level, parent marital status, severity of condition, age of child and health insurance status.

Results: Consistent with findings from Liptak et al. (2008), we found disparities in health care access among Latino children compared to non-Latino whites. Latinos were less likely to have public or private insurance, and were less likely to have a usual source of care. In the health care utilization category, they were more likely to have difficulty using services, more likely to indicate problems with referrals, and more likely to say they did not receive routine care. With respect to health care quality Latino parents were more likely to say they were not satisfied with their child's health care services and that the provider was not sensitive to family values and customs. These findings did not vary by whether the child had autism versus other developmental disabilities.

Discussion: Our findings on health care access replicate previous research and contribute information needed to understand why Latino children are less likely than whites to be diagnosed with autism. Our findings regarding health care utilization and quality are the first analyses of their kind, and establish new evidence of ethnic disparities among children with autism and other developmental disabilities. The finding that Latino families were more likely to say their health care providers were not sensitive to family values and customs is troubling. This finding suggests that health care providers must improve their understanding of cultural issues if they are to effectively meet the health care needs of Latino children with disabilities.

References:


SYMPOSIUM
3

PSYCHOLOGICAL WELL-BEING IN CAREGIVERS OF CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM DISORDERS AND INTELLECTUAL DISABILITIES

Chair: Jonathan Weiss, York University
SYMPOSIUM 3

Psychological Well-Being in Caregivers of Children and Adolescents with Autism Spectrum Disorders and Intellectual Disabilities

Chair: Jonathan Weiss, York University

Children with Intellectual and Developmental Disability, Typical Development, and Disruptive Behavior Disorders: The Effect on Families and Student Teacher Relationships
Stacy Lauderdale
Jan Blacher
University of California-Riverside

Psychological Well-Being of Couples with a Child with an Autism Spectrum Disorder
Leah Jones
Vasiliki Totsika
Richard Hastings
Michael Petalas
Alan Dowey
Susie Nash
Bangor University (Wales)

Predictors of Well-Being in Mothers of Children and Adolescents with Autism Spectrum Disorder
Paula Hutchinson
Susan Bryson
IWK Health Centre, Autism Research Centre, Dalhousie University

Predictors of Crisis in Mothers of Children and Adolescents with Autism Spectrum Disorders
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SYMPOSIUM 3

Children with Intellectual and Developmental Disability, Typical Development, and Disruptive Behavior Disorders: The Effect on Families and Student Teacher Relationships

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Introduction: Children with intellectual and developmental disabilities (IDD) have interactions that differ from their typically developing (TD) peers with various target individuals. In terms of teachers, children with IDD may experience poorer student-teacher relationships (STRs) than their (TD) peers (Blacher, Baker, & Eisenhower, 2009). The lower STRs for children with IDD are of concern because there is evidence that STRs play a particularly strong role for children at risk for adverse outcomes, by deflecting the course of their adjustment in school (e.g. Hamre & Pianta, 2001). In addition, family members of children with IDD may also experience lower levels of positive impact and higher levels of negative impact when compared to families with TD children (Baker, Blacher, Crnic, & Edelbrock, 2002). In our previously reported studies, poorer student-teacher relationships, for children with or without disabilities, have been shown to relate strongly to the children’s levels of behavior problems and social skills, and in fact, the STRs were fully mediated by child behavioral characteristics. From this information we can hypothesize that children with IDD and a Disruptive Behavior Disorder (DBD) would be at elevated risk of poor STRs and, consequently, less positive overall school outcomes. Previous studies have also found that not only disability status, but also level of behavior problems, caused higher levels of negative family impact at age 3. The current study looked to examine this relationship between DBD and disability status and STR and family impact. Thus, this study addressed four questions of interest: (1) Are there significant differences in STRs and family impact based on disability status over time from ages 6 to 13? (2) Are there significant differences in STRs and family impact based in disruptive behavior disorder status over time from ages 6 to 13? (3) Does the influence of disability status and disruptive behavior disorder status affect STRs over time from ages 6 to 13? (4) Does the influence of disability status and disruptive behavior disorder status affect family impact both positively and negatively over time from ages 6 to 13?

Method: Participants to date include 72 parents and teachers of individuals with (n=26) and without IDD (n=46). This is a subsample from the longitudinal Collaborative Family Study and participant data were used from ages 6, 7, 8, 9, and 13. Participants were assessed with the Stanford Binet and Vineland Adaptive Behavior Scales. Assessments were conducted annually from child age 3 through 9 years and then again at age 13. The Diagnostic Interview Schedule for Children (DISC) was administered to mothers at child ages 5 through 9. Behavior problems and mental disorders indicated by these three measures were utilized in the current study. In addition, teachers provided ratings on the Student-Teacher Relationship Scale (STRS) (Pianta, 2001) and parents provided rating on the Family Impact Questionnaire (FIQ; Donenburg & Baker, 1993). For this study, both the total score and the subscale scores (Conflict, Closeness, Dependency) on the STRS will be used as outcome variables and, from the FIQ, family positive and negative impact will also be used as outcome variables.

Results and Discussion: Results from a repeated measure ANOVA (ages 6-9) using STRS dependency and total scores as individual outcome variables indicated main effects for both ID and DBD status. When using closeness and conflict as outcome variables, main effects for ID status and DBD status were found respectively. Total STR scores were the highest among teachers of children who were typically developing and did not have DBD, and the lowest among teachers of children with ID and DBD. In terms of family impact, TD children without DBD were found to have higher positive impact and lower negative impact over time when compared to children with DBD and ID. Additional analyses will be presented including STR and FIQ scores from age 13 in the repeated measures ANOVA. Data collection for this time point is still ongoing.
Introduction: Parenting a child with an ASD is associated with a range of negative outcomes. Parents of children with an ASD are at risk of higher levels of mental health problems and lower quality of life compared to parents of children without disabilities, parents of children with other disabilities, and parents of children with chronic illness. Findings have suggested an association between parental well-being and the child's level of autism symptoms and/or behaviour problems. However, studies typically focus on either the mother or the father, without usually exploring the inter-relatedness of mothers' and fathers' well-being. In the current study, we aim to examine the association between maternal and paternal well-being in couples with a child with an ASD.

Method: One hundred and sixty one couples with a child with ASD took part in the study. Mothers’ mean age was 41.8 years (SD=6.6), fathers’ mean age was 44 years (SD=5.9), and the mean age of the child with an ASD was 10.4 years (SD=2.9).

Results: Paired-samples t-tests comparing mothers’ and fathers’ scores on well-being measures showed that mothers reported significantly higher levels of anxiety, depression and stress, while (unusually) fathers reported significantly higher levels of positive perceptions. Mothers and fathers showed high levels of agreement when reporting marital satisfaction (r=.72, p<.001). Regression analysis was used to explore predictive associations between child variables and parental well-being. Child variables (autism symptoms, adaptive behaviour, behaviour problems and pro-social behaviour) contributed significantly towards predicting variance in maternal anxiety (20%), maternal depression (21%) and maternal stress (19%). Child variables also contributed significantly towards predicting variance in paternal stress (19%) and paternal positive perceptions (14%). Further data analysis is currently underway to explore the impact of partner mental health on parental well-being, using a multilevel modelling approach. A two-level model (individuals nested within families) with a number of explanatory variables (gender, socio-economic position and child variables) will be applied.

Discussion: Although data analysis is not yet complete, preliminary results show how the well-being of couples is highly related. The models on maternal and paternal outcomes separately indicated that child variables follow a different pattern of association between mothers and fathers. Results of the multilevel model will clarify the inter-relationship of maternal and paternal well-being while controlling for the effects of child autism symptomatology and behaviour problems.
SYMPOSIUM 3

Predictors of Well-Being in Mothers of Children and Adolescents with Autism Spectrum Disorder

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Introduction: Mothers caring for children with autism are at high risk for poor mental health outcomes (Hastings et al., 2005a). Although poor outcomes prevail, some mothers do well despite their caregiving challenges. While ample research exists on mothers’ supports and stress, virtually nothing is known about their strengths. Emerging research suggests that mothers’ strengths (i.e., self-efficacy and empowerment) may contribute to their well-being and better mental health outcomes. However, no studies have examined whether these strengths are related to the receipt of helpful supports and services, or whether they differ with the age of the child. The purpose of the present study was to identify the key predictors of well-being and better mental health outcomes in mothers of children with autism.

Methods: Using a postal survey design, relationships among child disruptive behaviour, informal and formal supports, maternal self-efficacy, empowerment, and well-being (i.e., lower depression and anxiety, and more positive perceptions of parenting) were examined in mothers caring for a child with autism and living full-time in the family home (N = 113). Mothers (M age = 41.9 years, SD = 7.5) of children with autism (M age = 10.9 years, SD = 5.2) provided demographic information and completed various scales (i.e., the Developmental Behaviour Checklist, Family Support, Difficult Behaviour Self-Efficacy, Family Empowerment, Hospital Anxiety and Depression, Positive Contribution).

Results: Pearson correlations indicated that child's age was related to helpful formal support (r = -.21, p < .05) and maternal depression (r = -.23, p < .05). Hence two groups were formed: mothers of younger children (n = 62; M age = 6.9 years, age range: 3–11 years) and of adolescents (n = 51; M age = 15.8 years, age range: 12–21 years). Mothers of children reported significantly higher levels of family income t(109) = 2.28, p = .025, helpful formal support, t(110) = 2.13, p = .035, and maternal depression t(111) = 3.11, p = .002, than mothers of adolescents. There were no other differences between the groups. For each group, hierarchical regressions were conducted for each of the dependent variables (i.e., depression, anxiety, and positive perceptions of parenting) and entered in the following order: 1. family income; 2. child disruptive behaviour; 3. maternal self-efficacy and service empowerment; 4. informal and formal support. For mothers of children and adolescents, respectively, the final models explained 50.2% vs. 39.5% of the variance in depression, 27.7% vs. none of the variance in anxiety, and 22% vs. 33.4% of the variance in positive perceptions of parenting. Additionally, the patterns of predictors differed between groups. For mothers of younger children, less difficult behaviour and higher levels of maternal self-efficacy, empowerment, and supports were significant predictors of their well-being. In contrast, for mothers of adolescents, only higher levels of family income and maternal self-efficacy predicted their well-being (i.e., lower levels of depression and higher levels of positive perceptions of parenting).

Discussion: In the present study, mothers’ self-efficacy for managing their children's difficult behaviour was a key predictor of well-being in mothers of both younger children and adolescents. Discussion will focus on outstanding issues to be addressed. The findings suggest that tailoring formal services to enhance parental efficacy, rather than providing support and consultation services alone, would be more in line with mothers’ needs and possibly improve outcomes for both children and families.
Introduction: Mothers of individuals with autism spectrum disorders (ASD) often experience stressors associated with caring for their child. This is particularly true when their son or daughter has challenging behaviours or mental health needs. These stressors can cause distress that ranges from mild stress to full-blown crisis. Understanding when families are approaching a point of crisis is important, as it emphasizes when added supports are required for crisis prevention or management. The causes of an experience of crisis may be different in parents of children, adolescents, and adults with ASD, who are at different life stages, with inherent developmental and systemic differences. The current study examines how the psychological processes that lead to distress and crisis in mothers of people with ASD may vary depending on their stage in the lifecycle.

Methods: The current study measured the subjective experience of crisis in 149 Canadian mothers of people with ASD through a single item instrument, the Brief Family Distress Scale (BFDS; Weiss & Lunsky, in press). Individuals with ASD ranged in age from 5 to 22 years (M = 12.8, SD = 6.5), with 53% being children (5 – 11 years), and the rest being adolescents or young adults (12 – 22 years). Mothers completed an online survey that included known stressors (severity of aggressive behavior, parent negative life events), measures of psychological coping and resources (burden, worry, family hardiness, parent empowerment), and outcome (crisis).

Results: Parents of children reported significantly less family hardiness, $t(147) = -1.99, p = .05$, and tended to report less worry, $t(147) = -1.82, p = .07$, and better physical health, $t(147) = 1.82, p = .07$, than parent of adolescents and young adults. There was no difference in the level of reported crisis, parent mental health problems, intensity of child aggression, number of significant negative life events, burden, or parent empowerment (all $p’s > .10$). Two hierarchical linear regressions were calculated to determine whether different variables predicted maternal reports of crisis, separately for mothers of children and of adolescents. Negative life events and intensity of aggression were included as stressor variables in a first step, followed by the psychological coping variables in a second step. For mothers of children, appraisals of family hardiness and caregiver burden emerged as significant predictors of crisis, in addition to child aggression and negative life events. For mothers of adolescents, only negative life events emerged as a significant stressor variable (not child aggression), and only caregiver appraisal of burden emerged as a significant psychological coping variable.

Discussion: The presentation will expand on these results by conducting mediator analyses of significant predictors. Input from caregivers from different ages can help to identify deficiencies in the system that lead them to crisis and to develop mental health problems, and help to tailor age-relevant services to meet their needs.

WILLIAMS SYNDROME: FROM PIXELS TO PARENTS

Chairs: Elisabeth Dykens
Miriam Lense
Vanderbilt Kennedy Center, Vanderbilt University

Discussant: Marilee Martens, The Ohio State University
SYMPOSIUM 4

Williams Syndrome: From Pixels to Parents

Co-Chairs: Elisabeth Dykens
Miriam Lense
Vanderbilt Kennedy Center, Vanderbilt University

Discussant: Marilee Martens, The Ohio State University

Parenting Stress, Coping, and Health: Comparing Mothers of Children with Williams Syndrome to Other Disability Groups
Nathan Dankner
Nancy Miodrag
Elisabeth Dykens
Vanderbilt Kennedy Center, Vanderbilt University

Arousal and Anxiety in Williams Syndrome in Social and Non-Social Situations: Associations between Neuroendocrine Markers and Performance Abilities
Miriam Lense
Elisabeth Dykens
Vanderbilt Kennedy Center, Vanderbilt University

The Neural Basis of Heightened Empathy in Williams Syndrome: An fMRI Study of the Auditory Mirror Neuron System
Tricia Thornton-Wells1,2,3
Jennifer Pryweller1,2,3
Liam Solus2
Elisabeth Dykens2
1Center for Human Genetics Research, Vanderbilt University
2Vanderbilt Kennedy Center, Vanderbilt University
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The Effect of Intellectual Ability on Functional Brain Activation in Williams Syndrome: An fMRI Study
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Elisabeth Dykens2
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Parenting Stress, Coping, and Health: Comparing Mothers of Children with Williams Syndrome to Other Disability Groups

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Introduction: Variation across different genetic disorders lead to unique behavioral phenotypes that often influence individual behavior. At the same time, different disorders show a high degree of similarity to one other. This “same and different” combination can inform us about indirect effects on the family—that is, do children’s behaviors influence parents to respond in certain ways? In particular, are maternal responses disability-specific or generalized across disabilities? Individuals with Williams syndrome (WS) have adaptive (e.g., friendly-charming) and maladaptive (e.g., fears, anxiety) behaviors that are characteristic of their diagnosis and may challenge or be an advantage to mothers. Maternal responses including psychological stress, coping, physical health, depressive symptoms, and having a positive view on life and parenting have yet to be examined in the context of other disorders.

Method: Data from 306 mothers of offspring with WS (n = 109), Prader-Willi syndrome (PWS; n = 107); Down syndrome (DS; n = 19); and Autism Spectrum Disorders (ASD; n = 71) were drawn from a larger study. Mothers and offspring ranged in age from 23-79 (M = 44.51) and 2-48 (M = 13.96), respectively. The majority of mothers were white (83.3%) and married (64.1%). Mothers completed the Parenting Stress Index, COPE inventory, Health Questionnaire, Beck Depression Inventory, Positive Perceptions in Families Questionnaire; Parent Positive Contributions Questionnaire; Satisfaction with Life Scale; and Day to Day Experiences Scale.

Results: A series of MANCOVAs controlling for maternal age, education, and child age were conducted to determine the effect of the four child diagnostic groups on psychological stress, coping, health problems, depressive symptoms, and positive life and parenting. There were no significant differences among the four groups on coping (Wilks Λ = .93, F(3, 202) = 1.63, p > .05) and depressive symptoms (Wilks Λ = .97, F(3, 218) = 1.04, p > .05). There was a trend for significant differences among the groups for health problems, Wilks Λ = .92, F(3, 272) = 2.06, p = .058 and positive life and parenting, Wilks Λ = .88, F(3, 162) = 1.74, p = .056. Significant group differences were found on psychological stress, Wilks Λ = .70, F(3, 250), = 7.89, p < .001. ANCOVAs on the dependent variables for stress were conducted as follow-up tests. Using the Bonferroni method, each ANCOVA was significant: parental distress, F(3, 250) = 5.09, p < .05; parent-child dysfunctional interaction, F(3, 250) = 14.32, p < .001; difficult child, F(3, 250) = 11.80, p < .001; total stress, F(3, 250) = 13.51, p < .001; and life stress, F(3, 250) = 6.01, p < .001. Post hoc analyses revealed significant differences between mothers of children with WS and ASD as well as WS and PWS with the former reporting less distress, parent-child problems, difficult child behaviors, overall stress, and fewer life stressors.

Discussion: The findings suggest differential stress effects for mothers of children with WS compared to mothers of children with other disability groups in that, raising a child with WS is perceived as less stressful. Other maternal responses (e.g., how one copes, how depressed one feels, how mindful one is from day to day) are not differentiated by child diagnosis. Mothers of children with WS are both distinctive from, and share commonalities with, mothers of children with ASD, PWS, and DS and parent interventions might reflect that finding.
Arousal and Anxiety in Williams Syndrome in Social and Non-Social Situations: Associations between Neuroendocrine Markers and Performance Abilities

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Introduction: Williams syndrome (WS) is a genetic neurodevelopmental disorder associated with both hypersociability and high rates of anxiety and fears (e.g., Martens et al., 2008). In performance-demanding situations, hormones released by the hypothalamic-pituitary-adrenal axis (HPA) relate to levels of arousal and anxiety. These hormones also modulate memory consolidation in emotional situations (e.g., Smeets et al., 2008). This HPA activity is associated with the hippocampus and amygdala, two brain areas known to be aberrant in WS. We compared HPA activity (via cortisol levels) in individuals with WS in situations of high social/low cognitive demands (a musical performance in front of an audience) and low social/high cognitive demands (a cognitive and memory battery).

Methods: Thirteen adults (61.5% male) with WS provided salivary cortisol samples before and after a solo musical performance in front of an audience. Individuals were rated for signs of performance anxiety and also self-rated their own level of anxiety. Performances were rated for musical ability and parents completed questionnaires about musical training. An additional six adults with WS (total n=19, 52.6% male) also provided cortisol samples and anxiety ratings before and after a cognitive test battery involving memory for emotional and neutral words and faces. Thirteen typically developing (TD) individuals (38.5% male) also completed saliva samples before and after the cognitive test battery.

Results: Cortisol levels in WS measured before and after a musical performance were highly associated with performance abilities (r's=.725 and .556, respectively, p's<.05). No differences emerged in baseline cortisol levels across the music performance vs. memory battery conditions. However, while cortisol levels remained constant during musical performances, they significantly declined in response to the memory battery (Cohen's d=1.22). Comparing cortisol responses to the memory battery in WS vs. TD individuals, there was no difference in baseline levels, but the WS group exhibited a significant pre-post cortisol decrease, whereas the TD group exhibited a cortisol increase (Cohen's d =.54) (see figure).

Discussion: This study is the first to examine HPA reactivity in WS, and to do so with paradigms that reflect salient aspects of the WS phenotype. Cortisol, a biomarker of arousal, was elevated during the socially-loaded, solo musical performance, especially in persons with musical training and high levels of musical skill. In contrast, cortisol levels in WS decreased in response to a non-socially demanding, but cognitively challenging test battery. As arousal levels measured via cortisol have routinely been linked to memory consolidation in TD individuals, these findings suggest important differences in links between arousal, learning and memory in individuals with WS. Implications are discussed for learning and memory in WS based on arousal, anxiety, and social versus non-social contexts.
The Neural Basis of Heightened Empathy in Williams Syndrome: An fMRI Study of the Auditory Mirror Neuron System

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Introduction: Empathy is a socially adaptive skill that involves the ability to judge another person's intentions or emotions. Empathy is also a heritable trait that shows variability in the general population.1 In persons with autism and schizophrenia, empathy is notably diminished; whereas in persons with Williams syndrome (WS), empathy is heightened. By investigating the neural processes of empathy in persons with WS, we might also learn about the typical development of this socially adaptive skill, with implications for other disorders in which it is disrupted. Based on previous studies of empathy and the mirror neuron system (MNS) in typical subjects,2-4 we hypothesized that the neural basis of increased empathy in WS would involve increased responsiveness of the MNS.

Methods: We previously piloted the Interpersonal Reactivity Index (IRI), which we had modified to be at a 5th grade reading level and to include more concrete (less abstract) phrasing of questions. We made a few additional changes based on feedback from WS participants, and in the current study, we measured this modified IRI (Empathic Concern and Perspective Taking modules only) in all subjects. We conducted a functional MRI (fMRI) study aimed at activating the auditory MNS in persons with WS and typical controls, which we based off a previous study in typical subjects.3 We utilized a set of auditory stimuli (6 sec each) from the International Affective Digital Sounds (IADS). The fMRI study used a block design, with four passive-listening stimulus conditions—Hand, Mouth, Laughter and Environment—plus a silent/rest condition. Each block length was 30 sec (five stimuli per condition, 6 sec each) and the presentation of blocks was counterbalanced across 3 runs.

Results: Compared to controls, WS subjects showed increased MNS activity. While listening to action versus environmental (non-action) sounds, brain regions comprising the MNS, including the middle temporal gyrus, superior temporal gyrus, inferior frontal gyrus, middle frontal gyrus, superior frontal gyrus, precentral gyrus, supramarginal gyrus and inferior parietal lobe showed an increase in BOLD response (random effects GLM, p < 0.01, cluster threshold = 50 mm³).

Discussion: In previous studies of typical subjects, the MNS has been associated with empathy and “theory of mind” tasks. Our findings that subjects with WS showed increased MNS activity supports the hypothesis that the neural basis of their heightened empathy involves the MNS. Future regression analysis will further elucidate the relationship between MNS activity and IRI empathy scores in both WS and control subjects.

References:

SYMPOSIUM 4

The Effect of Intellectual Ability on Functional Brain Activation in Williams Syndrome: An fMRI Study

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Introduction: Williams Syndrome (WS) is a rare genetic disorder caused by the deletion of ~26 genes on chromosome 7q11.23 and is characterized by mild to moderate intellectual disability (ID), although some individuals with WS have normal intelligence and some have severe ID. Most people with WS are less proficient in non-verbal versus verbal IQ tests, and this difference is more profound than that seen in typically developing populations. People with WS or other developmental disorders who have intellectual disability have been excluded from some functional neuroimaging studies based on the assumption that low IQ is associated with substantially higher functional activity in the brain. If this were true, IQ would be a confounding factor limiting the ability of the researcher to attribute group differences in brain activity to the particular task or behavior under study and not just to intellectual ability. We hypothesized that functional MRI (fMRI) activity is not correlated with IQ.

Methods: Participants included 16 subjects with WS (age [mean±SD]: 27.1±10.1; 6 females, 10 males), demonstrating a range of standardized IQ scores ([range, mean±SD] composite IQ: 40-102, 69.3±20.9; verbal IQ: 40-107, 76.3±18.7; non-verbal IQ: 40-98, 67.6±21.6). We used a T2* weighted MRI sequence to measure blood-oxygenation level dependent (BOLD) response during passive listening tasks, and we applied a random effects general linear model to calculate each individual’s BOLD response to the contrast of interest. We extracted average BOLD activation for each of 30 anatomically defined regions of interest (ROIs) across the whole brain in each individual and correlated those measures with composite, verbal and non-verbal IQ scores in Spearman rank correlation analyses. We also dichotomized IQ using a breakpoint of 85 (one sd below normal) and performed t-tests to evaluate group differences in BOLD response.

Results: There were no significant group (low vs. high IQ) differences in BOLD response across 30 ROIs (t-test p < 0.05). There also were no significant correlations (Spearman’s rho p < 0.05) between BOLD response and composite IQ in any of the 30 ROIs. Nominally significant (uncorrected p < 0.05) correlations were found for 4 ROIs in either the low or high IQ groups, although none support the hypothesis that IQ is negatively correlated with BOLD response.

Discussion: These data suggest that the inclusion of subjects with below normal IQ does not introduce a confounding factor—at least for some types of fMRI studies with low cognitive load—and by including subjects who are representative of the range of ID in the disorder being studied, findings are more likely to generalize to that population. Ongoing analyses will investigate whether this finding holds for a variety of fMRI studies in WS, and future work should involve other populations with intellectual and developmental disabilities.
CHILDREN OF ADOLESCENT MOTHERS DURING LATE ADOLESCENCE

Chair: Keri Weed, University of South Carolina-Aiken

Discussant: Marsha Mailick Seltzer, Waisman Center, University of Wisconsin-Madison
SYMPOSIUM 5

Children of Adolescent Mothers During Late Adolescence

Chair: Keri Weed
University of South Carolina-Aiken

Discussant: Marsha Mailick Seltzer, Waisman Center, University of Wisconsin-Madison

Cognitive and Psychosocial Outcomes of Children with IDD at Age 18
Keri Weed¹
John Borkowski²
Thomas Whitman
¹University of South Carolina-Aiken
²University of Notre Dame

Early Trajectories of IQ and Adaptive Behavior and 18-Year Academic, Cognitive and Social Outcomes
Jennifer Lefever¹
Jody Nicholson²
¹University of Notre Dame
²St. Jude Children's Research Hospital

Trajectories of Child Abuse Potential: Predicting 18-Year Outcomes of Children of Adolescent Mothers
Julie Schatz
University of Notre Dame

Child Temperament Moderates the Relationship of Maternal Depression to Executive Functioning
Michelle Comas
Kristin Valentino
University of Notre Dame
Cognitive and Psychosocial Outcomes of Children with IDD at Age 18

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Introduction: Risk factors for mild intellectual impairments include low socioeconomic status, and lack of early intellectual stimulation in the home. Many of these same risk factors occur in homes headed by mothers who gave birth during adolescence. For these and other reasons, children born to adolescent mothers are at high risk of developing mild intellectual disabilities. The NDAPP has followed a sample of adolescent mothers and their children from the prenatal period through childhood and adolescence. When children were 18 years of age a comprehensive array of outcomes were assessed including functional academics, executive functioning (EF), self-perceptions, involvement with child protective services, aggressive and violent behaviors, psychopathology, substance abuse, and teen pregnancy. We will describe how well this sample of children born to adolescent mothers were meeting age appropriate standards in regards to these outcomes at age 18 to 20. Our analyses will highlight the subgroup of youth who was classified at age 8 as meeting criteria for mild intellectual disabilities (IDD) on the basis of both low intelligence scores and low adaptive behaviors.

Method: Teen mothers and their children were followed longitudinally until children were between 18 and 21 years of age, with 107 youth remaining in the sample. Major assessments were conducted during the prenatal period and when children were 6-months of age, and at 1, 3, 5, 8, 10, and 14 years of age. A complete description of all measures can be found in Whitman et al. (2001).

Results: Only 65% of the sample scored within 1 SD of the mean on reading and 70% on math achievement at age 18, with children identified at age 8 as IDD continuing to score significantly lower compared to children without disabilities. Scores on some executive functioning tasks showed a similar deficit pattern, but on other EF tasks the sample attained normative scores. Over 90% of the sample held a paying job, but only 50% for children with IDD at age 8. Approximately 30% of the sample had been pregnant or fathered a child, considerably higher than the national estimate of 7.15% (Guttmacher Institute); teens with IDD had similar rates of pregnancy to the full sample. Despite past research suggesting that teens with IDD are much more likely to exhibit emotional and behavioral problems, they were not significantly more likely to score in the clinical range on self-report assessments with 28.6% of the sample experiencing one or more disorders, and 36.1% reporting alcohol, tobacco, or other drug use. Children with IDD at age 8 faced significantly higher levels of violence at school and in their neighborhoods as adolescents. Children with IDD were also over 3 times more likely to report that their families had been investigated by child protective services when compared to the full sample (75% v 22.9%). Despite challenges faced by children born to adolescent mothers, the majority of the sample had positive self-perceptions across several domains including scholastic achievement, close friendships, job competence and global self-worth; teens with IDD did not differ significantly from the full sample except on job competence, consistent with the significantly lower percentage who had actually held a paying job.

Discussion: As adolescents, many children born to adolescent mothers appear to have met age appropriate expectations in domains of achievement, behavior, and self-perceptions. However, within any domain, approximately one-third of the sample appeared to be struggling to meet expectations. During adolescence, youth with IDD at age 8 were remarkable similar to those without disabilities in self-perceptions, autonomy, psychiatric problems, pregnancies, and substance use. Despite these similarities, youth with IDD had significant problems with functional academics, executive functioning, and occupational attainment; and encountered more violence at school and in their neighborhoods.
Introduction: Children of adolescent mothers are at risk of early cognitive and emotional delays as well as school drop-out and delinquency in adolescence. The current proposal seeks to test whether early trajectories of IQ and adaptive behavior, both central to diagnosis of intellectual disabilities, predict how the children are functioning in terms of cognitive and socio-emotional outcomes as they reach late adolescence.

Method: Intercepts and slopes were estimated for IQ and adaptive behavior using data collected from 98 of the NDAPP children when they were 3, 5, 8, and 10 years old. IQ was individually assessed at 3 and 5 using the Stanford Binet Form LM and at 8 and 10 using the WISC-III. Adaptive behavior was measured via maternal report using the Vineland Adaptive Behavior Scales (VABS). The individual trajectories were used to predict the outcomes at 18 years in functional academics (math and reading), executive functioning, self-perception of competencies (academic, work, and relationships), and educational and occupational attainment.

Results: On average, children in the Adolescent Parenting Project had relatively stable IQ scores from ages 3 to 10 years (improving at a rate of less than 1 point per year), but adaptive behavior scores declined rapidly during this same period (dropping at a rate of over 2 points per year). Using the HLM parameter estimates, at age 3 years children had an average IQ of 83.32 and adaptive behaviors score of 90.75. At age 10 years the gap between IQ and adaptive behavior had widened to 88.78 and 75.63. When these estimates were used to look at the potential for an IDD diagnosis (IQ lower than 75 and at least 2 adaptive behavior scores lower than 75), only .7% at 3 years met this criteria but over 8% met the criteria at 10 years. At 18 years, children appeared to be functioning about one-half standard deviation below average for academic achievement, but had self-perceptions of their competencies in the normal range. Multiple regressions were used to predict 18 year outcomes. All four predictors were significant for functional academics in math (KFAST Arithmetic), explaining 47% of the variance. For reading (KFAST Reading), 3 of the 4 parameters (all but VABS at 3) were significant predictors, explaining 42% of the variance. The parameters significantly predicted self-perceptions of academic (R2=.07) and job competence (R2=.10) as well as close friends (R2=.07), with the IQ variables playing the most significant roles. The intercepts and slopes of IQ were also the best predictors of executive functioning (R2=.15 for the DKEFS Tower Task and R2=.13 for the Test of Everyday Attention Dual Task). Change in VABS scores was the best predictor for job attainment, explaining 18% of the variance. In each of these instances, higher IQ and higher adaptive behavior scores and more positive changes/less decline in IQ and adaptive behavior related to higher academic achievement, higher level executive functioning, more positive self-perceptions, and a greater likelihood of employment. Surprisingly, none of the parameters predicted high school graduation.

Discussion: Early IQ played a consistent role in prediction of adolescent achievement as well as self-perceptions of academic and job competence. Including information about how the children changed from 3 to 10 years in IQ and adaptive behavior accounted for more variance than the static predictors. The implications of these results for intervention will be explored.
Introduction: Maternal child abuse potential is a consistent predictor of problematic child outcomes, especially academic and social delays, even within the high-risk sample of adolescent mothers. Less is known about how child abuse potential changes over time as the child becomes more mature and the adolescent mother becomes an adult. The current study explored maternal child abuse potential, including its prenatal antecedents, and children's developmental outcomes in a sample of first-time adolescent mothers and their children. Maternal cognitive readiness to parent was investigated as a predictor of abuse potential trajectories from 1 to 14 years. Trajectories of abuse potential at age 1, 3, 5, 8, 10, and 14 years and intercepts were examined as predictors of children's achievement, executive functioning, and behavioral problems at age 18.

Method: The sample included 145 mother-child dyads drawn from an ongoing longitudinal study of adolescent mothers and their first-born children. The majority of the sample was African American. At the prenatal interview, cognitive readiness to parent was assessed and included measures of parenting attitudes and expectations, as well as knowledge of infant/child development. Abuse potential was assessed with the Child Abuse Potential Inventory (CAPI) when children were 1, 3, 5, 8, 10, and 14 years. At age 18, children's achievement, executive functioning, and behavior problems were assessed.

Results: Approximately 27% of the mothers from this sample were classified as borderline or above in terms of abuse potential. According to the means, average child abuse potential change was minimal over time: 8.7 (1 year), 9.0 (3 years), 8.6 (5 years), 8.6 (8 years), 7.9 (10 years), and 8.2 (14 years). Correlational results also suggested that child abuse potential was relatively stable from 1 to 14 years with each time-point significantly related to each of the following ones (r's ranged from .49 to .73). A test of the unconditional model using HLM, however, provided evidence for significant individual variability in both the rate of change and the endpoint intercept at 14 years. Incorporating maternal cognitive readiness measures as predictors of this change was significant: More positive parenting attitudes and better knowledge of infant/child development were associated with lower intercept terms, more specifically, lower abuse potential, at 14 years. In addition, mothers with more realistic expectations exhibited a greater decrease in their abuse potential over time. In a series of regression analyses, CAPI slope and intercept terms were extracted from the HLM analyses and used to predict children's outcomes. The intercept term was significantly predictive of children's functional academics, (K-Fast Composite Standard score, $\beta = -.25$); and 3 components of executive functioning (EF): the tower task from the Delis-Kaplan Executive Functioning System (D-KEFS), $\beta = -.38$; letter and number switching from the D-KEFS, $\beta = -.22$, and TEA dual-task performance, $\beta = -.28$, $p < .05$. Greater maternal abuse potential at 14 years, as evidenced by intercept terms, was associated with children's lower academic and EF; however, the intercepts did not predict behavior problems. In addition, EF as assessed by the tower task was also predicted by the rate of change of child abuse potential over time. A greater increase in child abuse potential from years 1 to 14 was associated with lower EF at 18 years, $\beta = -.23$ $p < .05$.

Discussion: The results provide support for maternal child abuse potential as an important predictor of children's outcomes at age 18. Interventions targeting knowledge about parenting and child development and fostering realistic attitudes and expectations can reduce abuse potential and potential developmental difficulties for at-risk adolescents.
Introduction: Past research examining the moderating role of child temperament on maternal depression has been limited to predicting only childhood or adolescent outcomes of psychopathology, socio-emotional factors, and academic performance. Recent literature designates two trends pertaining to maternal depression and child temperament with respect to the consideration of a new outcome variable – executive functioning (EF). Children of depressed mothers are marked with deficits in EF, and child temperament is proposed to influence EF because they focus on similar attentional and regulatory behaviors. Specifically, an element of temperament that may hold particular relevance for EF is approach, which represents the level of children's willingness and comfort with which they engage in general social interactions and novel activities. The present study considers the individual and potentially interactive importance of maternal depression and temperament to executive functioning capacities, hypothesizing that middle childhood temperament will moderate the relationship between early maternal depression and the child’s EF at age 18.

Method: The present study included 38 pregnant teenage mother and child dyads from the Notre Dame Adolescent Parenting Project. During prenatal evaluations, maternal IQ was obtained using the Wechsler Intelligence Scales. Maternal depression was assessed using the Beck Depression Inventory when the children were age 3. Child temperament was measured at ages 8 and 10 via maternal report with the Carey Middle Childhood Temperament Questionnaire. A composite score was attained by averaging approach scores across both time points. The child’s 18-year EF performance was derived from two separate tasks – the dual-task scaled score from the Test of Everyday Attention (TEA) and the total achievement score from the Delis-Kaplan Executive Functioning System (D-KEFS) tower task.

Results: Multiple regression models tested the moderation effect of middle childhood temperament on the relationship between early maternal depression and 18-year EF. In the model predicting TEA dual-task performance, maternal IQ was entered as a covariate in the first step of analysis, (β =-.38, p<.05). Maternal depression and child temperament were entered in the second step, accounting for a significant proportion of variance, ΔR² =.14, p<.05. There was a significant main effect of maternal depression, β =-.27, p<.05, and a positive trend for the effect of child temperament, β =.29, p=.06. These main effects were qualified by a significant maternal depression x child temperament interaction, F(4,33) = 4.63, p<.05. A strong negative relationship existed between maternal depression and child TEA dual-task performance among children who were high in approach; whereas no variation was revealed in children’s performance as a function of maternal depression among children low in approach. In the model predicting child performance on the tower task, maternal IQ was a significant covariate, (β =.51, p<.01). Maternal depression and child temperament were entered in the second step; the main effect of maternal depression neared significance, β =-.29, p=.10; however, the main effect of child temperament was not significant β =.09, n.s. The interaction term was inserted in the final step of the model, and failed to provide evidence for moderation, β =-.11, n.s.

Discussion: Middle childhood temperament moderated the relationship between early maternal depression and children’s EF performance at age 18 on some EF task. This resulting disparity in significant findings may be attributable to the different underlying EF abilities required by each task; the TEA dual-task necessitates divided attention, whereas the D-KEFS tower task involves spatial planning and problem solving, learning, inhibition of impulsivity, and maintenance of instructional sets.
NOVEL APPROACHES TO UNDERSTANDING AND TREATING AUTISM: THE BIOLOGICAL AND BEHAVIORAL INTERCHANGE

Chair: Blythe Corbett, Vanderbilt Kennedy Center, Vanderbilt University

Discussant: Paul Yoder, Vanderbilt Kennedy Center, Vanderbilt University
SYMPOSIUM 6

Novel Approaches to Understanding and Treating Autism: The Biological and Behavioral Interchange

Chair: Blythe Corbett
Vanderbilt Kennedy Center, Vanderbilt University

Discussant: Paul Yoder
Vanderbilt Kennedy Center, Vanderbilt University

Harnessing a Biomarker to Inform Treatment
Jeremy Veenstra-VanderWeele
Vanderbilt Kennedy Center, Vanderbilt University

Psychological Stress of Children with Autism Spectrum Disorder: The Impact of a Service Dog’s Presence in the Family
Stephanie Fecteau
M. Trudel
N. Champagne
F. Picard
University of Sherbrooke

SENSE Theatre: Collaboration between Art and Science for Autism
Blythe Corbett
Vanderbilt Kennedy Center, Vanderbilt University
Introduction: Biomarkers may provide a window into ASD susceptibility and may identify subgroups of children who may benefit from particular treatments. Elevated whole blood serotonin (5-HT) levels are present in more than 25% of children with autism and are more heritable than autism itself. In males, the serotonin transporter gene (SERT, SLC6A4) is a quantitative trait locus for whole blood serotonin levels based upon GWAS data. Linkage studies in autism point to the chromosomal region containing SLC6A4, particularly in males. Sutcliffe and colleagues (2005) detected multiple rare SLC6A4 amino acid variants within families with evidence for linkage to this chromosomal region. The most common of these variants, Gly56Ala, was associated with rigid-compulsive behaviors and sensory aversion. In transfected cells and lymphoblastoid cell lines, Prasad and colleagues (2009) demonstrated that the Ala56 variant shows increased 5-HT transport and elevated basal phosphorylation, while being refractory to upregulation through PKG and p38 MAPK pathways.

Methods: We developed a SERT Ala56 knock-in mouse line to pursue the physiological significance of these findings in vivo. We have explored the resulting phenotype using biochemical, electrophysiological, and behavioral assays to compare mice expressing this rare SERT variant to wildtype littermate control mice. Treatment studies with a serotonin reuptake inhibitor are underway to evaluate whether observed phenotypes can be reversed in adulthood.

Results: The SERT Ala56 variant mice show elevated whole blood serotonin levels, recapitulating the ASD biomarker. Matching the data from cell models, they exhibit enhanced 5-HT clearance in vivo. Consistent with increased 5-HT uptake at the synapse, the SERT Ala56 mice show increased sensitivity at 5-HT receptors, both pre- and post-synaptically. In slice preparations, 5-HT neurons show a decreased basal firing rate and increased sensitivity to inhibition by 5-HT. Behavioral testing reveals both repetitive behavior and altered social function. Chronic but not acute treatment with a serotonin reuptake inhibitor partially reverses receptor hypersensitivity and social dysfunction in adult animals. Further studies are ongoing.

Discussion: We have established a new mouse model based upon an autism-associated gene variant that manifests autism-relevant social and repetitive behavior, as well as recapitulating the most robust autism biomarker. The response seen to pharmacological treatment suggests that this model may accelerate the development of autism therapeutics. These results will be discussed in the context of emerging data in other mouse models of childhood brain disorders that include social phenotypes. The path from gene to new treatments for ASD will be reviewed, using Fragile X Syndrome as the primary example and focusing on the possibilities and challenges in translating mouse findings into human studies. Given the heterogeneity present in ASD, the need to evaluate biomarkers in future treatment studies will be emphasized.
**Introduction:** There is an abundance of literature suggesting that the presence of companion animal “promotes a sense of well-being and security”. More specifically, previous studies have proposed that the use of a service dog could improve regulation of stress and behavior in children with autism spectrum disorder (ASD) and facilitate social interactions (Burrows et al., 2008; Viau et al., 2010). We hypothesize that the presence of a well trained service dog in the family will reduce stress levels not only in children with ASD but also in their parents. Furthermore, this effect will vary depending on the level of attachment between the child and his dog as perceived by his parent (Melson, 2003). The use of a homogeneous group of dogs, such as those from the Mira Foundation, can offer a comparable response to each child and his family in addition to further identify the impact on the child’s stress.

**Methods:** In doing so, we designed a controlled study, which was aimed at evaluating cortisol response before and after the introduction of a service dog. 112 children diagnosed with ASD (22 girls; ages 5-12 years-old) and their families took part in this study. From this sample, 38 families with a service dog and 33 families from a waiting list (control group) took part in two home visits. After a three-week baseline period, a service dog was introduced in families from the experimental group. Salivary cortisol was collected in both groups at home one day per week (awakening, 30 minutes later and bedtime) for 15 weeks. Parental stress, severity of autistic behaviors, and attachment between the child and his dog were evaluated at baseline and after the 15 week period based on the Parental Stress Index short form (Abidin, 1995), the Childhood Autism Rating Scale (Schopler et al., 1988) and the Inventory of child’s and dog’s attachment behaviors (Cournoyer & Fecteau, 2007).

**Results:** Statistical differences were analyzed by 2 x 2 ANOVA (child and presence of the dog as main factors) and ANOVA repeated measures. Diminution of cortisol both at awakening ($p = 0.0005$) and at bedtime ($p = 0.005$) was possibly associated with an enhancement of the hypothalamic-pituitary-adrenal function, as evidenced by a reduction in cortisol awakening response ($p = 0.0003$). As for the bond formed between the child and his dog, the parental perception was associated with the parent’s stress levels and not with the severity of the child’s behaviors related to autism.

**Discussion:** By using an interdisciplinary approach, this study indicates that the presence of a service dog attenuates the overall physiological stress in children with ASD. The parents’ perceived stress level had an impact on their perception of the children’s bond to their service dog.

**References:**


Introduction: Autism is defined by impairment in social interaction, reciprocal communication and flexible adaptation to the changing environment. Moreover, elevated and variable arousal and stress responsivity may be an important moderator in symptom profile (Corbett et al., 2008, 2009). It is well established that peer and video modeling can significantly improve a variety of skills in children with autism spectrum disorders (ASD). Notably actors excel in many of the very skills that children with ASD often lack; therefore, they may serve as master models for intervention. Additionally, theatrical techniques may complement behavioral science methods to facilitate learning. Based on this overarching rationale, psychological and theatrical approaches were merged to create a unique community-based intervention program called SENSE (Social Emotional NeuroScience Endocrinology) Theatre. It was hypothesized that measurable changes in biological and behavioral functioning would result following exposure to SENSE Theatre using a pre- and post-treatment design. Data are presented from two different studies of children and adolescents with autism spectrum disorders.

Methods: Study 1 included 8 children (7 boys, 1 girl) with ASD (6 autism, 2 PDD-NOS) from 6 to 17 years (Corbett et al., in press). Study 2 included 15 participants with ASD (13 boys, 1 girl 7-18 years and 1 adult male 32 years of age). Neuropsychological measures included NEPSy Memory for Faces (MF), Affect Recognition (AR) and Theory of Mind (TOM). Biological measures included salivary cortisol from home (pre-post), and the initial, middle and last rehearsals. Behavioral questionnaires included: Stress Survey Schedule (SSS; Groden et al., 2001; Short Sensory Profile (SSP; Dunn, 1999) and Adaptive Behavior Assessment System (ABAS; Harrison & Oakland, 2000). Biological and behavioral measures were analyzed using paired sample t-test. The cortisol stress response was analyzed using repeated measures.

Results: In study 1: significant differences were observed on the NEPSy MF (t(7) = -2.61, p =0.034) and TOM (t(7) =-2.73, p = 0.034) and reduced cortisol response from the first to last rehearsal (t(6) = 4.31, p = 0.005). Home cortisol values for morning and evening levels were correlated with SSS and SSP values similar to previous findings (Corbett et al., 2009). In study 2, significant changes were demonstrated for ABAS social (t(13) = -2.45, (0.03), communication (t(13) = -2.34, 0.038, and conceptual (t(13) = -2.67, p =0.038) adaptive functioning.

Discussion: Across two investigations, the SENSE Theatre intervention resulted in a variety of measurable biobehavioral changes in the participants showing promise in treating children with ASD. The SENSE Theatre experience reciprocally enriched the lives of the typically developing peers and actors by instilling in them as sense of responsibility, achievement and community.

References:
POSTER SESSION 1

WEDNESDAY, MARCH 2, 2011
5:45-7:45 p.m.
Fetal alcohol spectrum disorders (FASD) affect approximately 1 out of every 100 children. The success of primary prevention efforts has been limited, underscoring the importance of secondary and tertiary prevention focusing on mitigating the sequelae of FASD and improving child and family functioning. Children with FASD are at high risk for a host of poor social, emotional, and behavioral outcomes (Streissguth, 2007). These deficits are thought to stem from difficulties regulating arousal and related behavior, but little is known about the etiology and course of emotion regulation difficulties in this population. Regulation deficits are, in turn, thought to emanate mainly from structural and/or functional brain dysfunction (e.g., problems with executive functioning; Schonfeld et al., 2006). A wealth of information on the development of regulation in typically-developing populations suggests that the environment (and the family in particular) plays a large role in promoting children's regulatory abilities (Morris et al., 2007), and there is evidence that parent co-regulation may be even more important for children with developmental difficulties (Baker, Fenning et al., 2007). The current study was designed to investigate the relative contributions of child neuropsychological functioning and parent-child co-regulation to the regulation abilities of children with FASD.

Data are drawn from a new project examining emotion regulation in children with FASD between the ages of 4 and 8 years old. Six children have completed data collection to date, and we anticipate that at least six additional children will contribute data by the time of presentation. Half of the six children were Caucasian and four were adopted. Mean age was 6.33 years (SD = 1.03), and average IQ was 70.00 (SD = 11.45). Children's cognitive functioning was assessed directly and children completed laboratory tasks alone and with their mothers, including a delay of gratification task, a locked-box frustration task, and two parent-child problem-solving tasks. Neuropsychological measures included the ABIQ and working memory scales from the Stanford Binet, the T.O.V.A. tests of executive functioning, and the meta-cognition scale of the BRIEF. Child regulation measures included dysregulation ratings across multiple tasks (Baker et al., 2007), second-by-second ratings of negative emotion (Baker, Haltigan, et al., 2010), and latency to touch the prohibited toy during the wait task. Parenting was measured during the dyadic task (scaffolding; Baker et al., 2007) and with a novel, reliable broad rating that included aspects of parent-child interaction, parent attitudes, and parent advocacy.

Adoptive status was related only to maternal report on the BRIEF (adoptive = higher). Spearman correlations already suggest strong associations between children's regulatory abilities and parenting, with our broad parenting rating significantly associated with dysregulation and negativity, each $\rho (n=6) = -.97, p < .01$, and latency to touch, .84, $p < .05$, and scaffolding relating to latency to touch, .87, $p < .05$, and to dysregulation at a trend level, -.80, $p =.08$. Associations involving neuropsychological measures currently demonstrate reasonable effect sizes but appear less related to child dysregulation than are parenting ratings, $\rho$ ranging from -.26 to -.64, ns. Although causality cannot be addressed, these preliminary data suggest that the regulatory abilities of children with FASD may correlate at least as strongly with the parenting environment as with their FASD-related neuropsychological deficits. Implications for our understanding of FASD and for related intervention efforts are discussed.
Family adjustment is influenced by (a) characteristics of the event, (b) interpretations of the event, (c) resources available to the family, and (d) the larger context (Hill, 1949; Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992). This study considers how parents’ interpretations of the cause of their child’s disability relate to parents’ perceptions of the child and their attitudes toward parenting. Many studies that describe parents’ tendency to attribute children’s behavior to internal characteristics of the child or external characteristics of the situation exist (Esdaile & Greenwood, 2003). However, only a few studies have attempted to describe the parental attributions about their children’s developmental disabilities. These studies indicate that the attributions parents adopt for their child’s disability are related to parent depression (Mickelson, Wroble & Helgeson, 1999) and parent perceptions of the child (Masood, Turner & Baxter, 2007). Research has not integrated these three variables (depression, attributions, and parent perceptions) in one study or considered the broader context of parent attitudes. The current work extends earlier research by examining parental attributions among families with young children with disabilities. Parents reported their perceptions of the problems and benefits associated with caring for the child, their attitudes toward the child, and their level of depressive symptoms. We hypothesized that attributions and depression would be related to more negative perceptions of the child and more negative parental attitudes.

Participants: Of the 101 participants, 88% reported being the mother, 6% reported being the father, and 6% were other caregivers of the child. The age of the child ranged from 14 to 108 months (M = 49 months, SD = 13.3). Mothers’ average age was 31 years (SD = 7.5) and fathers’ average age was 35 years (SD = 8.3). The ethnically diverse sample included European Americans (37%), African-American (28%), and other groups (35%).

Measures: Parents Causal Attribution Rating Scale (Mickelson et al., 1999; Masood, Turner & Baxter, 2007), the Attitudes Toward Child Scale (Granger & Sameroff, 1984), the Child Problems and Benefits Survey (Brinker, Sameroff, Granger, & Seifer, 1998) and the CES-D (Center for Epidemiological Studies-Depression) were completed by parents.

Results: The 19 causes from the attribution rating scale were factor analyzed and resulted in six factors reflecting: (1) self-blame (e.g., something I did), (2) health (virus, infection), (3) God’s will/gift, (4) medical problem, (5) parental age, and (6) punishment from God. Attributions were intertwined with perceptions of the child, parental attitudes, and parental depression. Attributions to health were related to perceiving fewer child benefits (r = -.25), more child problems (r = .38), and reporting a more negative attitude toward the child (r = -.24). Attribution to parent age was related to a more negative attitude toward the child (r = -.26). Attribution to God’s will was related to a more positive attitude toward the child (r = .23). Attributions of self-blame were related to perceiving fewer benefits with the child (r = -.27). As expected, attributions were also related to depression. Attribution of the disability to health (r = .22), parent age (r = .32), and self-blame (r = .42) were related to more depressive symptomology. Finally, depression was related to perceiving fewer benefits (r = -.36), more problems (r = .56), and reporting a more negative attitude toward the child (r = -.51).

Discussion: Attributions influenced parents’ evaluation of their relationship with their child and their own mental health. Knowledge of parental attributions may be helpful in assisting parents to understand the impact that these attributions have on their relationship with their child.
3. Utilization and Usefulness of Social Support for Families with Children with ASD

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Introduction: Evidence suggests that parents of children with autism spectrum disorders (ASD) are particularly susceptible to psychological distress as compared to parents of typically developing children (e.g., Baker-Ericzen, Brookman-Frazee, & Stahmer, 2005). Social support has been identified as a useful resource that families can draw upon, reducing the negative psychological impact of raising a child with ASD (Bromley et al., 2004). Yet, despite its value, families have access to varying levels of social support.

Methods: This study was part of a larger study investigating early identification and treatment of children with autism spectrum disorders (Early Autism Project; PI, McIntyre). The purpose of the current investigation was to explore utilization and usefulness of social support, as well as investigate variables related to social support in families of young children with ASD. Data were collected from 78 families with children 2 – 6 years (m age = 55.50 months) through the use of extensive, in-home interviews. Data for the current investigation included family demographic variables, child autism symptoms (CARS; Schopler et al., 1986), social support (Family Support Scale; Dunst et al., 1984), and children’s current service utilization and satisfaction.

Results: The most commonly utilized sources of support were a spouse (92.3%), family doctor or pediatrician (94.9%) and professional helpers (93.6%); although the most helpful sources were identified to be: spouse, early intervention, school or daycare center, and professional helpers. Family income was positively associated with social support (r = .227, p < .05), although not associated with parent education. Mothers currently married or living with a partner reported significantly greater levels of social support than single mothers (t (1, 76) = -3.796, p < .001). Number of helpful sources of social support differed significantly across employment status (unemployed (M = 8.95), part-time (M = 6.38), full-time (M = 9.82)) for mothers, F (2, 70) = 3.193, p < .05. This difference was not observed for fathers. Family utilization of helpful supports was positively related to satisfaction with children’s current services (r = .284, p < .05). Although more impaired children likely require additional support needs, social support did not vary as a function of child symptom severity.

Discussion: The availability of social support, and families’ utilization of such support, is important when considering the best ways to support families through the diagnostic process and service utilization and access. Data from the present study suggest that families endorsed receiving both formal and informal sources of support (e.g., spouse and professional helpers). Results also indicated that mothers with live-in partners and mothers with full-time jobs experienced greater levels of social support. Limitations of the current sample will be identified and future research directions will be described.


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POSTER SESSION 1

4. The Relationship between Pain Coping and Mental Age in Individuals with Intellectual and Developmental Disabilities

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Introduction: While research has increased our ability to assess pain in people with intellectual and developmental disabilities (IDD), aspects of the multidimensional pain experience such as thoughts, emotions and coping have been relatively neglected. Pain coping is thought to be the most significant behavioral contribution to the adjustment to pain. Little is known about how those with IDD cope with pain. The aims of this survey study were to (a) determine what coping styles were most used by individuals with IDD, (b) determine if coping styles varied by mental age or pain parameters (e.g., intensity, frequency), and (c) to determine if there is a connection between coping style and behavioral signs of pain.

Methods: Survey packages were completed by parents or caregivers of an individual with IDD. Surveys included the Pediatric Pain Coping Inventory (PPCI) – parent version, to assess pain coping style; the Demographic Questionnaire to collect chronological age, gender, and the caregiver’s estimate of mental age; The Structured Pain Questionnaire to obtain a comprehensive profile of pain experiences within the last three months including pain intensity, frequency, and duration; The Non-Communicating Children’s Pain Checklist - Revised (NCCPC-R) to record the everyday behavioral signs of pain. The sample (n=77) included 39 males and individuals were a mean age of 16.6 years (4 - 39 years).

Results: Individuals with IDD use more Problem Solving, Seeking Social Support, and Catastrophizing/Helplessness than Cognitive Self-Instruction and Distraction ($F(5,73)= 66.50, p< .001, n= 77$). Participants were grouped according to mental age (‘≤4 years’, ‘5 - 11 years’ and ‘≥12 years’) and those in the ‘5 - 11 year’ group used more coping styles than those in the ‘≤4 years’ group, and those in the ‘≥12 years’ group used more cognitively demanding coping styles than the other two groups ($F(10,130)= 2.68, p= .005$). Pain coping was not related to pain intensity, frequency, or duration. There was a significant correlation between behavioral signs of pain (NCCPC-R) and Seeking Social Support ($r= .39, p= .001$) and Catastrophizing/Helplessness ($r= .33, p= .005$) coping styles.

Discussion: Individuals with greater mental ages are able to use more coping strategies and those with the most advanced mental ages seem to abandon earlier coping strategies for more effective ones. We also found that individuals with IDD seem to be limited in their ability to cope despite their past pain experiences. Individuals who used Social Support and Catastrophizing coping styles had more behavioral signs of pain, which may reflect an attempt to seek external resources to cope when pain is beyond their ability to deal with using their own abilities.

References:

POSTER SESSION 1

5. Communication Modes and Interpretability in Rett Syndrome

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Introduction: The behavioral phenotype of Rett syndrome (RS) includes severe impairments in receptive and expressive language. Before effective communication interventions can be developed for this population, communicative behaviors and abilities need to be documented. The empirical base regarding communication in RS is extremely limited. Most of the studies have very small samples. Those with larger samples have used primarily ad hoc measures, which do not allow for comparisons across studies within RS, or with studies in other populations. The purpose of this survey study was to (a) describe communicative behaviors of individuals with RS using a standardized scale, (b) describe how effectively others are able to interpret the communicative behaviors of individuals with RS, and (c) determine whether certain modes of communication are more effective than others.

Methods: Survey packages included the MacArthur-Bates Communicative Development Inventory (MCDI), Words and Gestures form; the Inventory for Client and Agency Planning (ICAP), to assess overall level of functioning; and the Rett Syndrome Communication Survey (RS-CS), an ad hoc measure to gather additional information regarding communicative behaviors, interpretability, and demographics. Survey packages (220) were sent to families registered with a local parent group for families affected by RS. A total of 44 (20%) surveys were returned. The mean age of the sample was 20.6 years (2 - 45 years; 98% female; all analyses conducted on females).

Results: One parent reported the use of spoken language as their daughter’s primary mode of communication whereas 86% of respondents reported that their daughters ‘never’ used words to communicate. Although the majority (23; 52.3%) of caregivers reported that they were frequently able to interpret their daughters’ desires, only one caregiver (2.3%) indicated that others who were unfamiliar with their daughter could interpret her communication. Gesture production (r = .463), eye gaze (r = .376), and grabbing for desired objects (r = .417) were all positively related to understandability for the caregiver. Statistically significant positive relationships between understandability for unfamiliar others and eye gaze (r = .485), and orienting towards a desired object (r = .495) were found. Relationships with gesture production, grabbing and reaching, and arm/hand gestures were positive, but not statistically significant.

Discussion: These results suggest that there is a great deal of variability across females with RS in their reported use of different communicative behaviors. Understandability with unfamiliar individuals is a significant challenge for the individuals with RS, but some modes of communication may be more effective than others. The study is limited by the fact that all data were collected by parent report, and the sample may not be fully representative of all individuals with RS. These results extend the current knowledge of communication in individuals with RS and suggest several key areas (communication modality, interpretability) for future research.

References:


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The "Down syndrome advantage", described by Hodapp (2001), suggests that families of children with Down syndrome (DS) experience greater well-being than families of children with other developmental disabilities (DD). Hodapp et al. (2003) found specifically that mothers of children with DS reported less child-related stress.

Stoneman (2007) examined this concept further and found that the advantage for families of children with Down syndrome disappeared after controlling for socioeconomic status (SES). In line with the previous findings, Corrice and Glidden (2009) found that after controlling for child functioning and maternal age, the advantage for families of adolescents with DS no longer existed. The current study examines the proposed “Down syndrome advantage” in mothers of children at age three controlling for SES, child functioning, gender, and maternal age. Although research on mother-child interactions among families with children with disabilities has been comprehensive, such interactions have not been included in research on the “Down syndrome advantage.” Therefore, in this investigation we examine the purported advantage in terms of the contributions of both mothers and children within their interactions as well as mother-reported child-related stress.

The sample represented in this study is comprised of 73 3-year-old children and their mothers who were enrolled in the Early Intervention Collaborative Study (EICS), a longitudinal investigation of children with developmental disabilities and their families in the Northeast (Hauser-Cram et al., 2001; Shonkoff et al., 2002). Children were diagnosed with DS (n=33) or other DD (n=40). In the current investigation, criterion variables included (1) child-related stress and (2) mother-child interaction; control variables included child adaptive and cognitive scores, and family demographics. Alphas for all measures were >.70.

Regression analyses were conducted on all Parenting Stress Index (PSI) (Abidin, 1983) child domain subscales as well as on mother-child interactions, using the Nursing Child Assessment Teaching Scales (NCAT) mother and child subscales (Barnard, 1994). The aim was to test whether advantages existed for families of children with DS in comparison to families of children with other forms of DD once controls for child skills and family demographics were included. Results indicated that while many of the subscales were no longer significant after including control variables, DS continued to be a significant predictor of less stress related to children's demandingness (p<.05) and more positive levels of aspects of children's interaction with mothers, specifically clarity of cues (p<.05) and responsiveness to parent (p<.05). No differences were found in mothers' responses to children. Overall, these findings add support to a possible Down syndrome advantage and add new information by suggesting that child-related behaviors during mother-child interactions may have an effect on the well-being of mothers of children with DS.

References:
POSTER SESSION 1

7. Developmental Delay in Children with Subthreshold Lead Exposure: The Confounding Factor of Poverty

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Introduction: Given the detriments associated with even minute levels of lead, prominent researchers have argued that the current marker for “lead poisoning” (10 µg/dl) is not a meaningful biological marker by which to gage the impact of exposure on child development (Rogan & Ware, 2003). When compared to children testing in the “lead poisoned” range, children exposed to subthreshold levels of lead have shown a similar decrease in cognitive scores (i.e., reading, math, and visual skills; Lanphear, et al., 2000) and an even greater IQ discrepancy (Canfield et al., 2003), even when controlling for confounding variables. In addition, poverty is a particular concern as children from low-income families are at greater risk for lead exposure in part due to poorer quality home environments, further contributing to their preexisting risk for developmental delay (Evans, 2004; Moore, 2003). The current study aimed to 1) predict cognitive and verbal functioning for a sample of children from low-income families with subthreshold lead exposure and 2) provide a multimodal description of their functioning with the inclusion of teacher and parent reports in addition to child assessments collected by the research team.

Method: Get the Lead Out recruited low-income families if their children’s (n = 84) capillary blood tests performed by the local health department or Women, Infants, and Children (WIC) agency indicated subthreshold blood lead levels (BLLs; 3 – 9.9 µg/dl). Depending on the child’s age, either the Bayley Scales of Infant Development (Bayley II) or the Differential Ability Scales (DAS II) was administered by a member of the research team. For the portion of the sample attending Head Start (n=54), reports of cognitive and behavioral development were collected from parents and teachers as assessed by the DENVER Developmental Screening Test (DENVER II) and the Devereaux Early Childhood Assessment (DECA).

Results: Children’s BLLs were included in an hierarchical regression model as predictors of their percentile rank scores for cognitive and verbal functioning. Because poverty is a significant confounding factor, family income and maternal education were entered as covariates as a proxy of SES. While model fit indices for both cognitive ($R^2 = .300; F(3,48) = 6.86; p < .001$) and verbal ($R^2 = .221; F(3,42) = 3.98; p < .05$) outcomes were significant with the inclusion of children’s BLLs, results indicated that family income and maternal education explained the majority of the variance in children’s cognitive functioning and BLL coefficients were non-significant. For the children who were old enough to attend Head Start, almost half gave some indication of not meeting developmental milestones by teacher report (DENVER II). Parent and teacher report (DECA) provided further evidence that while the children were not doing exceptionally poorly, they were not excelling either, and performed between the 41st and 55th percentile in most subscales (Initiative, Attachment, Protective factors, Behavioral concerns).

Discussion: While children’s lead levels remained a contributing factor to the models predicting their cognitive and verbal functioning, proxy variables for SES (family income, maternal education) were the significant predictors of outcome variables. Prior research has shown a real but small effect size for the impact of lead, with 2-4% of the variance in neurodevelopmental measures explained by lead exposure. Therefore, sample size likely had a role in the non-significance of BLL coefficients in the models predicting cognitive and verbal functioning. If lead is minimized as a negative influence on children’s development, however, these children may benefit more from other intervention programming in order to optimize developmental achievement. Further discussion will be provided of the confounding factor of poverty status on cognitive development. Moreover, further elaboration on the sample’s developmental functioning will be provided descriptively, referencing the multimodal approach of assessment that was implemented for the project.
**POSTER SESSION 1**

8. Trait Anxiety and Controlling Behavior in Mothers of Children with and without Developmental Delays

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**Introduction:** Studies examining parental controlling behaviors in mothers of typically developing (TD) children and children with intellectual disabilities (ID) have consistently found that parents of children with ID display more controlling behaviors with their children than parents of TD children (e.g., Marfo, 1991; Herman & Shantz, 1983; Landry, Garner, Pirie, & Swank, 1994). These maternal controlling behaviors have generally been categorized into two categories, intrusiveness and directiveness. However, due to inconsistencies across studies’ operational definitions of the constructs, studies examining the relationship between maternal provisions of each type of controlling behavior and child delay status have yielded inconsistent results. For example, some studies have found that parents of children with ID are more intrusive towards their children than parents of TD children (e.g., Floyd, 1997) while others have found that mothers of children with developmental delays (DD) are more directive (e.g., Cunningham, Reuler, Blackwell, & Deck, 1981). Moreover, some studies have emphasized the importance of distinguishing between supportive control related to the child’s current focus or goal, and intrusive or interfering control unrelated to the child’s goal (Marfo, 1991; Flynn & Masur 2007), another reason for inconsistent findings. Therefore, in an examination of parental controlling behavior, distinguishing between intrusive and directive interactive styles should reconcile inconsistencies attributable to the variety of ways in which both constructs have been conceptualized and defined. Accordingly, we have differentiated between supportive directiveness, which follows the child’s ongoing behavior and attentional focus, and interference, which leads the child’s attentional focus. Furthermore, anxious parents have been found to display more controlling behaviors than their non-anxious counterparts with TD children (e.g., Bruggen, Stanms, & Bogels, 2008), but there is little research on the relationship between parent anxiety and parent controlling behaviors in parents of children with DD.

The purpose of this study is to (1) measure two categories of maternal controlling behavior: verbal and nonverbal acts related to the child’s goal attentional focus or goal (supportive directiveness) and those unrelated to the child’s focus or goal (interference), and (2) to examine the relationship between maternal trait anxiety and provision of these controlling behavior categories, as well as how this relationship may be differ in mothers of children with and without DD.

**Methods:** Participants were 60 mothers and their children recruited to participate in a longitudinal study, classified as DD (n = 30, Bayley Scales of Infant Development II (BSID-II) 30-75) or TD (n = 30, BSID-II >85) (Bayley, 1993). The present study utilized data collected when the children were 3 years old. Frequency of maternal supportive direction (SD) and interference will be coded based on a 5-minute free play interaction at child age 3, using a frequency count coding system based on that developed by Flynn and Masur, 2007. Maternal behaviors that direct the child’s attention or behavior are coded as either SD or interference “acts,” depending on whether or not they are related to the child’s current focus or goal. Maternal trait anxiety was measured using mother’s report on the Anxiety subscale of the Symptom Check List (SCL-35, Derogatis,1992).

An ANOVA will be conducted to examine levels of directiveness and interference in mothers of children with and without DD. In addition, a regression will be conducted to examine DD status as a moderator of the relationship between parent anxiety and parent controlling behavior.

**Discussion:** Results of this study will contribute to our understanding controlling behaviors and their relationship to trait anxiety in mothers of children with and without DD. Implications for future research and intervention will be discussed.
POSTER SESSION 1

9. Parental Perspectives on the Transition to Adulthood in Adolescents with Developmental Disabilities

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Introduction: The transition from adolescence to adulthood involves areas such as education, vocation, independent living, social skills, and recreation. This transition is often complicated in adolescents with developmental disabilities (DD), but little is known about how best to help these adolescents reach their goals and obtain an optimum quality of life (Lounds & Seltzer, 2010; Newman et al., 2009; Wehman, 2006). Whereas parents of adolescents with DD often play a critical role in facilitating their child’s transition to adulthood, many parents indicate that they lack necessary information to aid their children during this transition (Hetherington et al., 2010). A better understanding of parental concerns in adolescents with DD is needed to identify the most pressing transition needs and to inform the development of appropriate transition interventions and supports. The current study examines parental concerns, opinions, and goals for adolescents with DD across multiple transition areas using the Adolescent Transition Survey.

Methods: Parents of adolescents with DD (e.g., autism, ADHD, cerebral palsy, Down syndrome, and spina bifida) were recruited via fliers, support groups, and specialty clinics in the greater Cincinnati area. A newly developed parent questionnaire, the Adolescent Transition Survey (ATS), obtains information about the transition to adulthood in adolescents with DD. The ATS addresses areas such as general concerns, education, vocation, residential placement, independent living, recreation, transportation, and social skills. Parents also completed a background history form and the Vineland Adaptive Behavior Scales-Caregiver rating scales.

Results: Data collection is ongoing and the sample is expected to exceed 100 participants by March, 2011. The current sample consists of 26 parents of adolescents with DD. Adolescents were predominately male (65%) and ranged in age from 13 to 17 (mean age = 14.9 years). Preliminary analyses indicate that when parents were asked to identify their top three concerns among various transition issues, the following issues were selected most often: 42% social skills and social support; 39% independent living skills; 31% vocational issues; 27% communication skills; and 24% money management skills. Qualitative analyses of open-ended responses will be conducted to determine what parents identify as the most desired supports, most concerning areas, and future goals for education, vocation, and independent living. Analyses will also explore whether parental responses differ by adolescent diagnosis, as well as whether parent identified concerns and goals are related to adaptive behavior scores on the Vineland.

Discussion: Identifying the concerns and perspectives of parents of adolescents with DD is an essential first step in understanding what specific transition issues need to be addressed both within and across different diagnostic groups. Knowledge of what parents view as their biggest areas of concerns will allow for the development and use of interventions that target how to reach transition goals that will help to increase the overall quality of life in adolescents with DD.

Reference:


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10. A Cross Syndrome Study of Facial Discrimination Skills in Prader-Willi Syndrome and Autism

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Introduction: The Uniparental Disomy (mUPD) and Paternal Deletion (pDEL) genetic subtypes Prader-Willi Syndrome (PWS), display much phenotypic similarity. In addition, research has indicated differences between the phenotypes of PWS genetic subtypes, with the mUPD showing more similarity to Autistic Spectrum Disorder (ASD) than the pDEL. While both ASD and PWS have severe social deficits, PWS has been shown to display social deficits more similar to ASD than other developmental disorders (Koenig et al., 2004). Since the ability to discriminate faces is central to social skills, facial processing skills have been investigated in various developmental disabilities and facial processing deficits have been found in ASD. However, to date, investigations of facial processing skills in PWS have been limited (Halit et al., 2008). The current study compared PWS and ASD facial discrimination, predicting that the PWS group would perform better than ASD on facial discrimination tasks, but performance would differ by PWS genetic subtype with mUPD being more similar to ASD.

Method: 42 individuals with PWS (pDEL=12, mUPD=17, unknown=13) and 14 individuals with ASD participated by completing the Benton Facial Recognition Test (BFRT), and the WAIS-III or WISC-IV intelligence tests. The BFRT was further divided in subtests of: direct gaze, indirect gaze, and lighting variation.

Results: ASD and PWS groups performed in the impaired range on the BFRT (ASD mean=35.50, PWS means=36.54). Covarying for Age and IQ, groups did not significantly differ on BFRT but did differ significantly on the Lighting subtest (F=9.98, p<.05) with PWS scoring higher. Regarding genetic subtypes, pDEL and mUPD differed significantly on Direct gaze, (F=7.13, p<.05) with pDEL scoring higher. Covarying for IQ, ASD, pDEL, and mUPD differed significantly on Lighting (F=5.32, p<.010) with post hoc analysis revealing both pDEL and mUPD having higher Lighting scores than ASD, but no significant difference between pDEL and mUPD on Lighting.

Discussion: While it was predicted that the PWS group as a whole would outperform ASD on all Benton measures of facial processing, they only differed significantly on the Lighting subtest. Also, while it was predicted on all measures of facial processing that mUPD would perform more similarly to ASD than the pDEL and that pDEL would outperform both mUPD and ASD, it was found that both mUPD and pDEL significantly outperformed ASD and only significantly differed between one another on Direct Gaze, with pDEL performing better. These results contrast with findings (Halit et. al., 2008) that the BFRT does not distinguish between PWS genetic subtypes and sheds new light on findings that PWS social skills are similar to ASD (Koenig et al, 2004) with our study using face processing as a measure of social skills.

References:


POSTER SESSION 1

11. Macrostructural Narrative Language of Adolescents and Young Adults with Down Syndrome or Fragile X Syndrome

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Introduction: Relatively little is known about the acquisition of more advanced language skills by adolescents and young adults with Down syndrome (DS) or fragile X syndrome (FXS). This is especially true of skills involving supra-sentential structure, such as expressive narrative language. It is important to gain a better understanding of the language skills of older, verbally expressive individuals with DS or FXS in order to develop language interventions with appropriate targets for these groups of individuals. Thus, this study was designed to examine the narrative language profiles of verbally expressive adolescents and young adults (ages 11 through 23 years) with DS or FXS by comparing them to a group of younger, typically developing (TD) children with similar nonverbal mental ages. Additionally, the narrative language abilities of adolescents and young adults with DS and those with FXS were compared to each other to gain a better understanding of the similarities and/or differences in expressive narrative language across the two syndromes and to determine if both groups should receive interventions focused on similar language targets.

Method: The study participants were 24 adolescents and young adults with DS (mean age = 16.9 years), 12 adolescents and young adults with FXS (mean age = 14.95 years), and 21 younger children with typical cognitive development (TD; mean age = 4.82 years). To be included, participants had to demonstrate no more than a mild hearing loss and only speak English. Participants were excluded if they met diagnostic criteria for autism. Because the focus of this study was on narrative language development, it was important that each narrative sample provided a sufficient corpus of utterances to analyze; thus, participants were excluded if they produced fewer than 50 utterances and had a mean length of utterance (MLU) less than 3.0 in a narrative language sample. Samples were elicited using a wordless picture book and were evaluated using the Narrative Scoring Scheme (NSS; Heilmann et al., 2010).

Results: Three comparisons were made using: (a) the full sample matched groupwise on nonverbal mental age, (b) a subset of the participants individually matched on nonverbal mental age, and (c) a subset of participants individually matched on MLU. Across all comparisons, the DS and FXS groups significantly outperformed the TD group on several NSS measures, including the NSS Total measure ($F(2, 54) = 3.81, p = .03$). No differences emerged between the DS and FXS groups.

Conclusions: The results suggest that narrative language, when considered at the macrostructural level, may be a relative strength for adolescents and young adults with DS and those with FXS. However, it is important to note that most verbally expressive adolescents and young adults with DS or FXS have not mastered narrative language; rather, their narrative macrostructural language skills appear to be emerging. Therefore, it is important for intervention to focus on these emerging skills and relative strengths, as well as on areas that are in very early stages of development.

Reference:

POSTER SESSION 1

12. Comparison of the Effects of Two Systematic Phonics Instruction Approaches on the Ability of Children with Severe Cognitive Disabilities to Read Words

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This study compared the effect of two systematic methods of phonics instruction for children with significant cognitive disabilities. Paucity in the literature on phonics instruction for children with cognitive disabilities, combined with legislative demands for evidence-based practice, stress the need for studies to test the effectiveness of instructional methods for all members of the school-aged student population.

Fifty-two participants (mean IQ = 55.96), aged 5-12 years were randomly assigned to one of three treatment groups; (1) a synthetic phonics instruction group, in which participants received 12 sessions of instruction, in which they were taught how to blend individual sound-letter correspondences to read words, (2) an analogy phonics instruction group, in which participants received 12 sessions of instruction, in which they were taught to learn segments of words known as “rimes” that follow consistent visual and auditory patterns to read words and (3) a control group.

Analysis of covariance showed no significant effect between groups on post test scores of Letter-Word Identification Test and Word Attack Test on the Woodcock-Johnson III Diagnostic Reading Battery (WJIIIDRB, Shrank, Mather & Woodcock, 2004). Significant effects were found on measures created by the researcher for training word identification $F(2,48) = 16.353, p<.01$ and for transfer word identification $F(2,48) = 4.293, p<.05$, after controlling for pretest scores. In post hoc analysis paired t-tests showed a significant difference between the pretest and posttest scores on the Letter-Word Identification Test (Shrank et al., 2004). Analysis of the variance showed significant differences between the nine participants who did not learn any training or transfer words in the course of the study and other participants on the pretests for Letter-Word Identification Test and Word Attack Test (Shrank at al., 2004).

Findings suggest that for many students with significant cognitive disabilities phonics instruction, especially synthetic phonics instruction is beneficial. The design of the instructional materials and one-to-one instruction may have been contributing factors to the effectiveness of both approaches. Further research should focus on the maintenance and generalization of phonics skills acquired by children with significant cognitive disabilities.

References:


POSTER SESSION 1

13. Encouraging Behavioral Flexibility in Children with Autism Spectrum Disorders

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Purpose: One of three core deficits that define autism spectrum disorder (ASD) is behavior that is repetitive and inflexible by comparison with individuals of comparable intellectual functioning. Behavioral inflexibility may be exhibited in repetitive overt behavior or aspects of attention (e.g., stimulus overselectivity) and cognition. With support from funding sources in both the US and Brazil, we are conducting a program aimed at bypassing and/or overcoming inflexibility (and inefficiency) in behavioral tasks intended to model and potentially improve discrimination learning procedures that are used widely in discrete-trial instruction for children with ASD.

Study 1 concerns procedures aimed at improving learning outcomes in so-called “stimulus control shaping” for children who are minimally verbal and do not respond well to syntactically complex verbal instructions. Shaping is a useful step in teaching children to respond to visual symbols that can be arranged on a communication board or other augmentative/alternative communication medium. For example, one might transform a full-sized color picture of a cup of juice into a small black-and-white image that would be recognizable as a symbol for juice in an array that provided a range of drinks from which the child might choose. One challenge to effective shaping is apparent inflexible attending to unchanging stimulus features during the transformation process and resulting breakdowns in the teaching process. To forestall such breakdowns, we have been investigating computer-based shaping methods that vary stimulus features “dynamically” such that inflexible attending is discouraged. One aspect of dynamic shaping, for example, is transforming stimuli within trials, creating apparent “morphing” of images along multiple stimulus dimensions. Our poster will present data from four children who have been studied to date on dynamic shaping methods, none of whom have shown breakdowns that often occur with standard shaping methods.

Study 2 concerns instructional procedures intended to address certain perhaps negative features of otherwise useful discrete-trial procedures such as matching to sample. Typical MTS procedures are largely organized and paced by the instructor. There is a repetitive quality to the procedures in that every trial presents only one sample, requires only one response, and is much like every other in the trial sequence. Such repetitive sequences may not be optimal and/or efficient and may encourage stereotypical MTS response patterns. To forestall this possibility and to increase the overall efficiency of instruction, we have been investigating MTS variants that give the child multiple opportunities to respond within a given trial, allow greater flexibility in organizing his/her behavior, and increasing the learning/practice opportunities per unit time. Our poster will present data from 20 individuals with ASD comparing typical MTS procedures with MTS variants on an identity matching-to-sample task. For 15 of the 20 participants, these variants proved substantially more effective than typical MTS (4 children were at ceiling on both). The magnitude of difference was often remarkable (high accuracy on the MTS variants and low-to-intermediate accuracy on the typical MTS procedure).

Discussion: Data to be reported in our poster and others like them suggest that there may be substantial room for improvement in certain widely used discrete-trial instructional methods for children with ASD and related disorders. Given the time, effort, and cost associated with such instruction, efforts to optimize the methodologies are clearly warranted. Moreover, to the extent that procedures can be designed to discourage repetitive, inflexible responding, they may have therapeutic benefits beyond the specific content of instruction and specific skills taught.

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14. Attitudes Regarding Inclusion of Students with Intellectual Disabilities at College

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Introduction: With over 150 programs in the United States, post-secondary education (PSE) is an increasingly viable option for students with intellectual disabilities (ID; Grigal & Hart, 2010). PSE options are expanding, yet little is known about the attitudes of typical college students toward the inclusion of students with ID. Research on this issue is critical to supporting the inclusion of students with ID on college campuses. Therefore, we surveyed typical students at Vanderbilt University during the first semester of a pilot PSE program, Next Steps at Vanderbilt.

Methods: Participants were 256 undergraduates at Vanderbilt who responded to a confidential survey to learn more about their attitudes toward the inclusion of students with ID. To develop the survey, we drew on prior research on attitudes of typical students toward inclusion of students with ID (Siperstein, Parker, Bardon, & Widaman, 2007). The survey was composed of 35 items, most of which were multiple-choice or involved ratings on a 5-point scale (1 = least, 5 = most). The survey addressed students’ demographics, interaction with people with ID, perceptions of the abilities of people with ID, willingness to interact with students with ID, and perceived benefits or concerns related to including students with ID at college.

Results: Overall, respondents indicated positive attitudes toward students with ID. On items regarding perceptions of abilities, the mean on a 5-point scale was 4.20 (.65). Likewise, the mean on items regarding willingness to interact with students with ID was 4.52 (.56), and on the perception of benefits associated with their inclusion was 4.00 (.72). Though responses were positive overall, some characteristics were correlated with more positive attitudes. For example, respondents with closer relationships to people with ID were more willing to interact with students with ID ($r = 0.323$, $p < .01$), and perceived more benefits associated with their inclusion ($r = 0.234$, $p < .01$). Likewise, respondents who had more frequent interaction with people with ID were more willing to interact with them, ($r = 0.244$, $p < .01$). Larger, more consistent differences were related to respondent gender and comfort level with people with ID. Females had more positive perceptions of the abilities of people with ID, $F(1, 251) = 9.47$, $p = .002$; were more willing to interact with students with ID, $F(1, 252) = 21.07$, $p < .01$; and perceived more benefits associated with their inclusion, $F(1, 244) = 43.85$, $p < .01$. Respondents who were more comfortable with people with ID had more positive perceptions of the abilities of people with ID ($r = 0.285$, $p < .01$); perceived more benefits associated with their inclusion ($r = 0.301$, $p < .01$); and were more willing to interact with them ($r = 0.435$, $p < .01$). Findings regarding concerns associated with the inclusion of students with ID were less consistent.

Discussion: Survey responses demonstrate positive attitudes toward the inclusion of students with ID on college campuses; however, group differences were found. Female respondents and those who reported a higher comfort level with people with ID had more positive perceptions of students with ID, and more positive attitudes toward their inclusion.

References:


15. The Risk of Intellectual Disability in Children Born to Mothers with Preeclampsia or Eclampsia with Partial Mediation by Low Birth Weight

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Introduction: Preeclampsia and eclampsia (PE) are potentially modifiable risk factors for maternofetal complications. Because a paucity of research exists connecting PE to the risk of intellectual disability (ID) in the offspring, this study examined this relationship. Additionally, mediation of low birth weight (LBW) on the effect of PE on ID was explored.

Methods: Data related to all South Carolina Medicaid births from 1996 to 2002 were comprised of linked data from maternal Medicaid records, delivery records, birth certificates, Department of Education (DOE), and the Department of Disabilities and Special Needs (DDSN). After exclusions such as nonidiopathic etiologies of ID, multiple gestations, subsequent siblings in the cohort, pregnancy losses, births under 20 weeks’ gestation, and children neither in DOE nor DDSN records; 80,866 maternal-child dyads remained. After adjusting for five covariates of maternal age, race, and education as well as the child's birth year and sex, the effect of PE on ID was examined.

Results: The rates of PE and ID were 6.4% and 2.0%, respectively. The rates of ID among children exposed and not exposed to PE were 3.0% and 2.0%, respectively. The crude odds ratio (OR) was 1.549 (95% CI 1.310, 1.832) and the adjusted OR was 1.58 (95% CI 1.334, 1.870). LBW was a significant mediator of the relationship accounting for approximately half of the association.

Discussion: Because of the association of PE, ID, and LBW; additional research is needed to explain mechanisms and to investigate possible impacts of different PE treatment on ID prevalence and severity.

References:
16. Social Referencing Abilities of Preschoolers with Down Syndrome or Williams Syndrome

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**Background and Purpose:** One of the key challenges impacting children's ability to cope with life demands involves understanding and navigating the surrounding world of people. Children learn to make sense of a person's actions in terms of his or her underlying mental states and can use these actions to learn about objects and events within the environment. This socially guided method of learning, referred to as social referencing, is one of the most important ways children are socialized into their environment. While there is some research indicating that social referencing is delayed in children with intellectual disabilities, few of these studies have used a standard social referencing paradigm or have focused on specific neurodevelopmental disorders, especially genetic syndromes. In the present study, the regulatory function of social referencing is examined in two neurodevelopmental disorders that have been well defined genetically and are characterized by differing patterns of socio-cognitive development: Down syndrome (DS) and Williams syndrome (WS).

**Methods:** Participants were 20 children with DS (13 boys, 7 girls) aged 3.51 to 5.88 years (m=4.93 years, SD=.77) and 20 children with WS (13 boys, 7 girls) aged 3.52 to 5.94 years (m=4.97 years, SD=.76) matched on CA (p=.86) and gender. Children were presented with an ambiguous stimulus paired with a behavioral response communicated by an researcher. Each child participated in two conditions varying in terms of behavioral response (Joy vs. Fear). The conditions also varied with respect to experimenter, room, and ambiguous stimulus. Order of behavioral response, experimenter, room, and stimulus was counterbalanced across children. The child also completed the Differential Ability Scales-II Early years version and parents completed a series of standardized questionnaires.

**Results:** Children with DS were significantly more likely than children with WS to produce behaviors that clearly showed they correctly interpreted the researcher's behavioral response and mapped it to the ambiguous stimulus (Joy: p=.01; Fear: p=.03). In addition, in the Fear condition, children with WS spent a larger proportion of time looking at the researcher (p=.04) than children with DS and were significantly more likely to superficially mimic the researcher's affective cue (p=.03). Both groups of children were more likely to touch the ambiguous stimulus in the Joy condition relative to the Fear condition (DS: p=.04; WS: p=.03); however, in both conditions, children with DS were more likely to touch the stimulus than children with WS (Joy: p=.01; Fear: p=.006). In addition, while children with WS demonstrated better verbal ability (DAS-II Verbal Cluster standard score, p=.045) and were more likely to demonstrate positive anticipation of expected pleasurable activities [Children's Behavior Questionnaire (CBQ) Approach, p=.03] than children with DS, children with DS were more likely to demonstrate a cautious approach in novel or uncertain situations (CBQ Shy, p=.02), were harder to soothe (CBQ Soothability, p<.001), and demonstrated better executive functioning (Behavior Rating Inventory of Executive Function-Preschool, GEC, p<.001) than children with WS.

**Discussion:** Children with DS were more likely than children with WS to clearly demonstrate that they correctly interpreted the adult's affective display and mapped it to the ambiguous stimulus. In addition, children with DS were more likely than children with WS to approach the stimulus regardless of the adult's affective cue, and children with WS were more likely than children with DS to superficially mimic the adult's fear expression. Between-group phenotypic differences in temperament and executive functioning abilities likely contribute to the differences observed on the social referencing task. Theoretical implications will be discussed.
POSTER SESSION 1

17. Generalized Effects of Parent Implemented Language Intervention

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Introduction: There is convincing evidence that young children with intellectual disabilities (ID) and significant language delay can learn new skills during naturalistic language intervention. Determining how intervention can be configured to optimize generalized changes in communication and promote development over time remains challenging. The present study examined the specific contribution that parents make as co-interventionists in improving the generalized outcomes of naturalistic language intervention for young children with ID. We compared communication gains of children who received Enhanced Milieu Teaching (EMT) by a parent and a therapist (Parent+Therapist) to the communication gains of children who received EMT from therapists (Therapist Only). Primary research questions were:

Do children receiving Parent + Therapist EMT show larger developmental gains in language than children receiving Therapist Only EMT over time?

Do parents receiving Parent + Therapist EMT use more EMT strategies at home than parents receiving Therapist Only EMT over time?

Methods: Seventy-seven children and their primary caregivers were randomly assigned two experimental conditions. Children were: (a) between 30-54 months; (b) had nonverbal IQ between 50 and 80; (c) PLS-4 Total Language Standard Score less than the 11th percentile; (d) MLUw between 1.0-2.0; (e) produced at least 10 words; and (f) were verbally imitative. In the Parent + Therapist condition, both the parent and a therapist used EMT procedures during 24 play sessions in the clinic and 12 home-based sessions. In the Therapist Only condition, two therapists provided 24 clinic sessions and one therapist provided 12 home sessions. All other aspects of the intervention were identical in the two treatments.

Results: Parents in the Parent + Therapist group used significantly more EMT strategies (responsive feedback, target talk, expansions, and prompting) at home in trained and untrained probes than parents in the Therapist Only group. These differences remained significant over time. There were no child language differences between groups for any norm-referenced, parent report or language sample measures. On observational measures during the home play probes, children in the Parent + Therapist group performed better on four productive language measures than children in the Therapist Only group at each time point and across trained and untrained probes. Children in both groups showed growth on some standardized measures over time, suggesting both interventions were effective in promoting language development.

Discussion: Naturalistic communication intervention delivered by parents or therapists has positive effects on language development in children with ID, however, generalized use of newly-trained language across settings is greater when parents are trained to implement the intervention. Maximizing child benefits from communication intervention will be discussed.
18. The Relationship Between Temperament and Language Development in Children with FXS

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Introduction: The relationship between temperamental characteristics and measures of language have been documented for typically developing (TD) children\(^1\), but there is very little work on that relationship in children with fragile X syndrome (FXS). Individual differences in temperament are often thought to influence the child’s social environment, thereby indirectly influencing his or her language input from interaction partners. This analysis sought to determine if children with FXS show the same pattern of relationship between temperament and language as TD children.

Method: As a part of an ongoing longitudinal study on maternal responsivity and language development in children with FXS\(^3\), 52 mothers of children with FXS completed the Children’s Behavioral Questionnaire (CBQ) when the children were between 33 and 54 months of age and the children were given the Mullen Scales of Early Learning (MSEL) and the Childhood Autism Rating Scale (CARS). Between 75 and 104 months of age the children were given the PPVT-4 and EVT-2, and they participated in videotaped structured and unstructured interactions with their mothers. From the transcripts of those videos, several language production measures were calculated, including MLU in words and morphemes, number of different words (NDW), type/token ratio (TTR), and total amount of communication. In this analysis, the correlations between early temperament and later language outcomes were explored, and the children's early temperamental characteristics also were examined as predictors of the later language outcomes.

Results: Only three CBQ subscales were significantly correlated with any of the later language measures. The anger/frustration, approach/anticipation, and sadness subscales were positively correlated with the participants' raw PPVT-4 scores (.34, .34, and .38, respectively). Those three subscales were also significant predictors of PPVT-4 scores after controlling for participants’ MSEL receptive subscale scores. The approach/anticipation subscale was also a significant predictor of the number of different words used by the participants. None of the subscales were significant predictors of EVT-2 scores, TTR, total communication acts, or MLU, but several did approach significance. Most interestingly, the inhibitory control, soothability, and attention subscales were not related to any of the language outcomes for children with FXS.

Discussion: Children with FXS show a different pattern of relationships between temperamental characteristics and later language outcomes than that of TD children. Very few of the temperament characteristics expected to relate to language development were predictive of the language outcomes for children with FXS.

References:


Supported by NICHD 02538 and NICHD 03110
POSTER SESSION 1

19. Impact of an Intervention to Increase Effective Decision Making by Adolescents with Intellectual and Developmental Disabilities in Situations Involving Peer Pressure

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Introduction: Effective decision making is essential for successful community participation, especially in challenging situations that pose a threat of coercion or victimization. The vulnerability of youth with disabilities is often exacerbated by limited decision-making skills in the face of the complex peer situations associated with adolescence. Over the past several years, we have conducted a series of studies on decision making in a variety of school and community situations (Khemka, & Hickson, 2006; Khemka, Hickson, Casella, Accetturi, & Rooney, 2009). Building upon our past work, the present study was designed to obtain a fuller understanding of the decision-making difficulties experienced by adolescents with intellectual and developmental disabilities in situations involving peer pressure and to evaluate the effectiveness of an intervention aimed at increasing their decision-making effectiveness.

Method: Twenty-two adolescents with intellectual and developmental disabilities participated in the study. All subjects received an individually-administered pretest battery that included the CREVT-2 (Pro-Ed, 2002) and the Adolescent Decision-Making Scale (developed for this study). Subjects assigned to an intervention group (n = 10) and a control group (n = 12) did not differ significantly on age (intervention mean = 16.50; control mean = 16.74), CREVT-2 Expressive Vocabulary age-equivalent scores (intervention mean = 9.40; control mean = 8.52), CREVT-2 Receptive Vocabulary age-equivalent scores (intervention mean = 7.87; control mean = 8.44), or effective decision-making responses on the Adolescent Decision-Making Scale (intervention mean = 3.20; control mean = 2.58). Effective decision making responses were those that involved an attempt to resist the peer pressure either by negotiation, direct refusal, or reporting). The Intervention group received a six-session intervention designed to introduce concepts of peer pressure and to teach a four-step strategy for making effective decisions. All subjects received an individually-administered decision-making posttest.

Results: Preliminary data analyses indicated that adolescents in the intervention group produced more effective decision-making responses in response to posttest situations of negative peer pressure than did adolescents in the control group (t (20) = 2.28, p = .034).

Discussion: The group that received instruction in a decision-making strategy was more likely than the control group to produce responses involving active attempts to deal with negative pressure from peers in a range of situations. These attempts included negotiations that involved balancing the competing goals of the protagonist and the peer, direct verbal refusals, and responses that involved seeking assistance in the face of peer pressure to steal, use alcohol or drugs, shirk responsibilities, or join in an activity that might jeopardize the protagonist's safety.

References:


**POSTER SESSION 1**

**20. Sensory Features and Caregiver Adaptations for Children with Autism Spectrum Disorders and Other Developmental Disabilities**

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**Introduction:** Sensory features are highly prevalent, although not universal, among young children with ASD and developmental disabilities. Patterns of sensory response are characterized by hypo-responsiveness (a lack of or under response to sensory stimuli), hyperresponsiveness (an exaggerated response to sensory stimuli) and sensory seeking (prolonged engagement with sensory stimulation). Research has shown that caregivers of children implement adaptations to everyday activities based on their children's impairments (Watson, 1998); however, there is little research on the association between caregiver implemented adaptations and severity and pattern of the child's sensory symptoms. This study addressed the following: 1) What is the association between the severity of child sensory symptoms and the rate of caregiver adaptation? 2) What is the association between patterns of sensory processing and caregiver adaptations? 3) Do the differences in caregiver adaptations vary as a function of child diagnostic group?

**Methods:** The Sensory Experiences Questionnaire (Baranek, 2006) Version 2.1 is a 43 item caregiver report instrument that evaluates children's responses to everyday sensory experiences, as well as if and how caregivers implement adaptations in an attempt to change the child's behavior. The sample consisted of 214 caregivers of children with ASD (n=94), DD (n=62), and TD (n=58). Correlations were used to evaluate the severity of sensory features and rate of caregiver adaptation, and mean score of patterns of sensory features and mean rate of caregiver adaptation. ANOVA was used to determine if the diagnostic groups differed on rate of adaptation. Post hoc contrasts used Tukey's LSD.

**Results:** Total sensory processing severity score was significantly correlated with total rate of caregiver adaptation ($r=.656$, $p<.001$). The mean severity scores for hyper-, hypo-responsiveness and seeking were found to significantly correlate with mean rate of caregiver adaption ($r=.565$, $p<.001$; $r=.557$, $p<.001$; $r=.351$, $p<.001$, respectively). ANOVA revealed significant main effects for group, $p<.001$. The ASD group significantly differed from both the DD ($p<.001$) and TD ($p<.001$) groups for the total score of caregiver adaptations. Further analysis will explore other variables that may mediate the relationship between sensory features and caregiver adaptations.

**Discussion:** Although all patterns of children's sensory features were significantly associated with caregiver adaptations, the strongest association with hyperresponsiveness suggests that caregivers most often change activities that children find aversive. The association between sensory seeking patterns and adaptations suggests that caregivers may not view seeking as interfering with everyday activities and therefore implement fewer adaptations. The current findings suggest that caregivers implement an increasing number of strategies during everyday activities based on the severity of child sensory features.


21. Self-Injury in a Statewide Sample of Young Children with Developmental Disabilities

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Introduction: A recent study (MacLean et al., in press) of young children (18-72 months) referred for comprehensive neurodevelopmental evaluations revealed that 32% engaged in self-injurious behavior (SIB). Risk markers for SIB reported for adults, adolescents, and older children were not evident in this younger age group. Further analyses revealed that SIB co-occurred with other externalizing behavior problems. The current project was conducted to replicate the previous findings in a state-wide sample and to determine the specific topographies of SIB reported for this age group.

Methods: The 257 children in this sample were being considered for the developmental disabilities waiver program. To facilitate comparison with MacLean et al. (in press), only children between the ages of 18 and 71 months were included (mean age = 44.58). The sample was predominately male (67.7%) and white (91.1%). As part of the waiver determination process, people familiar with children's daily functioning participate in the completion of the Inventory for Client and Agency Planning (ICAP, Bruininks, et al., 1986). The ICAP yields an estimate of adaptive functioning, the extent of behavior problems (e.g., hurtful to self or others, destructive to property, or behavior that is disruptive, unusual or repetitive, or uncooperative), and co-occurring diagnoses such as autism, cerebral palsy, vision, hearing, or mobility impairment, and seizure disorder.

Results: 49 children (19.1%) were reported to engage in self-injury. SIB occurred 1-6 times per week for 13 children, 1-10 times per day for 30 children, and 1 or more times an hour for 6 children. Severity varied among the children with 8 considered not serious, 32 moderately serious and 8 very serious. The most common forms were head banging (35%), body hitting (18%), and biting (14%). The children exhibiting SIB did not differ in average adaptive age equivalent, rates of visual or hearing impairment, mobility, or diagnoses of autism, cerebral palsy, or seizure disorder as compared with children who did not exhibit self-injury. In contrast to the findings of MacLean et al. (in press), the two groups did not differ significantly in rates of hurts others, destructive behavior, or unusual habits.

Conclusions: The findings reflect sampling differences in the children participating in the two studies. The children in the MacLean et al. (in press) sample were seen in a specialty diagnostic clinic with a greater representation of families with developmental and behavioral concerns – including self-injury; while the children in the current study represented a statewide sample of children with developmental disabilities. However, the current analyses are consistent with the earlier study in that risk markers reported for adults, adolescents and older children were not evident. Finally, the specific types of self-injury reported for the current subjects are quite similar to those reported for older children (Hyman et al., 1990).

References:


Clinical trials of novel medications to normalize neurobiology and improve functioning in fragile X syndrome are now underway, spurred by recent groundbreaking discoveries based on the \textit{FMR1} knockout animal models. To document efficacy of these or any other treatments, reliable, valid and sensitive outcome measures suitable for this population are urgently needed. Following the pattern of prior trials in autism and idiopathic intellectual disability, but without validation in FXS, many current trials have used the Aberrant Behavior Checklist (ABC; a 58-item behavior questionnaire) as a primary clinical endpoint. Following a recommendation arising from the Outcome Measures for Clinical Trials in Children with Fragile X Syndrome meeting hosted by the National Institute of Child Health and Human Development in November 2009, we initiated a multi-site collaboration to examine the psychometric properties of the ABC in a very large population of children and adults with FXS, including its applicability to FXS, factor structure, reliability and construct validity. Five fragile X centers in the U.S., upon IRB approval, de-identified and uploaded archived caregiver-reported ABC, cognitive, medical, \textit{FMR1} DNA, and demographic information to the National Database for Autism Research (NDAR), an NIH-supported data repository. Use of this repository allowed for all centers to combine their de-identified data and preserve the ability to exclude redundant information from patients seen at multiple sites. The resulting aggregate data set was then analyzed using exploratory and confirmatory factor analyses (n = 630; 459 males and 171 females between 3 and 25 years). Additionally, we are examining the stability of the factor structure across gender and age groups, and in those with and without psychoactive medication use. In preliminary results with the whole sample, EFA suggests that the ABC factor structure for FXS may not be consistent with the original 5 subscales of Irritability, Lethargy/Social Withdrawal, Stereotypic Behavior, Hyperactivity and Inappropriate Speech. For example, items related to social avoidance loaded onto a single factor, separate from the original Lethargy/Social Withdrawal subscale. Additionally, a number of other items from the original Hyperactivity and Irritability subscales appear to cluster differently in this FXS sample. However, EFA did reveal consistency in the placement of items of the original Stereotypic Behavior and Inappropriate Speech subscales. Subsets of these data from the Rush and U.C. Davis sites demonstrated that the ABC has high test-retest reliability and adequate inter-rater reliability. In a separate study, preliminary results applying factors derived from this study indicate that they may provide greater sensitivity in the ongoing double-blind and placebo controlled trials of mGluR5 antagonists (Novartis, Roche, Seaside Therapeutics), GABA-B agonists (Seaside), minocycline, and other targeted treatments. Furthermore, the results from this study provide critical preliminary information needed for the development of a new measure now in its planning stages specifically designed to more accurately measure the FXS behavioral phenotype.

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23. Word Identification in Adolescents with Intellectual Disabilities

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Introduction: Children with intellectual disabilities (ID) struggle with learning to read, and this can cause them to fall behind even further in academics. Word identification is a crucial skill in reading, and children with ID sometimes lag behind their mental age matched peers in this domain. The current study sought to explain why word identification may be poor in adolescents with ID. In typically developing (TD) children, phonological decoding (PD; sounding out), orthographic knowledge (OK; understanding letter patterns in words), and rapid automatic naming (RAN; rapid name retrieval) are the three main reading subskills that contribute to word identification. Thus, we examined each of these as possible reasons for poor word identification in students with ID. In a previous analysis of our data, we found that adolescents with ID were poor in PD relative to mental age matched TD children, but similar in OK and RAN. Until now, we have not specifically examined the relations of PD, OK, and RAN to word identification.

Method: Participants were 64 students: 18 adolescents with ID in grades 6-12 (mean CA = 15.90, SD = 1.67, mean verbal MA =7.39, SD = 1.78, mean IQ = 55.00, SD = 12.26), and 46 TD children in grades 2-3 (mean CA = 8.68, SD = 0.80, mean verbal MA = 8.63, SD = 1.85, mean IQ = 103.65, SD = 13.29). Because the groups differed slightly on verbal ability, all data analyses controlled for verbal mental age. Participants completed a 3-session battery of tests designed to assess a wide range of reading-related skills. The tests applicable to the present analysis were: (1) the Word Identification subtest of the Woodcock Reading Mastery Tests-Revised (WRMT-R), which requires participants to read aloud real words; (2) the Word Attack subtest of the WRMT-R, which measures phonological decoding by requiring participants to read aloud nonwords; (3) three orthographic knowledge tasks, designed specifically for this study, which measure participants’ knowledge of how letters tend to fit together to form words; and (4) a rapid naming composite of the Comprehensive Test of Phonological Processing, which requires participants to quickly retrieve the names of visually presented letters and digits.

Results and Discussion: In the TD group, hierarchical regression confirmed that PD, t(40) = 4.60, p < .01, OK, t(40) = 2.49, p = .02, and RAN, t(40) = -2.00, p = .05, had independent effects on word identification, with the entire model accounting for 78% of the variance in word identification. Further, hierarchical regression confirmed a significant effect of Group on word identification, t(62) = 3.12, p < .01. However, when PD, OK, and RAN were added to the model in the first step, the effect of Group was no longer significant, t(55) = .18, p = .86. Thus, it appeared that one or more of the reading subskills mediated the relation between group and word identification. The bootstrapping method of multiple mediation (Preacher & Hayes, 2008) indicated that PD, point estimate = -8.86, CI = -16.16 to -4.45, significantly mediated the effect of Group on word identification, while OK, point estimate = -1.13, CI = -6.00 to 1.93, and RAN, point estimate = -.33, CI = -4.17 to .94, were not significant independent mediators. Further, in this model, the direct effect of Group was not significant, t = -.18, p = .86, indicating that PD fully mediated the relation between Group and word identification. Thus, deficits in PD may explain why students with ID are poor at word identification. This finding emphasizes the importance of reading instruction targeting PD in this population. Future research should investigate these skills across etiologies and, to firmly establish causality, use longitudinal and training designs.

Reference:


POSTER SESSION 1
Introduction: Williams syndrome (WS) is a neurogenetic disorder associated with a mild to moderate cognitive impairment and a hypersocial personality, most notably an unusually high tendency to approach and interact with strangers (Järvinen-Pasley et al., 2008). Within the WS phenotype, increased sociability is accompanied by an interesting profile of music processing. Reports of increased emotionality in response to music are largely anecdotal in the WS literature. For example, individuals with WS demonstrate a high affinity to music, including a high engagement in musical activities (Don et al., 1999; Levitin et al., 2005), which may be linked to increased activation of the amygdala to music (Levitin et al., 2003). Despite enhanced neurological responsiveness to music, individuals with WS do not necessarily demonstrate enhanced music processing abilities (e.g., Deruelle et al., 2005). Interestingly, increased emotional expressivity has been reported to extend from social interactions (e.g., Reilly et al., 2004) to the experience of music (Don et al., 1999; Levitin et al., 2005) in WS. Levitin et al. (2005) utilized a parental questionnaire designed to initially characterize the musical phenotype in WS; one also employed in the current study. WS individuals reported a higher degree of emotionality than Down syndrome and typical development (TD) groups when listening to music. Individuals with WS were also reported to show greater and earlier interest in music than the comparison groups, and music had a significantly greater propensity to induce sadness. These findings are interesting in light of the fact that a genetic link between musicality and sociability has been postulated (Huron, 2001). Yet, the relationship between the increased sociability and enhanced musicality (i.e., musical interest, ability, and responsivity) is unclear. Thus, the present study sought to address this question by: (1) comparing musical and linguistic expressivity; (2) and by comparing musical and general social-emotional behaviors (approach behavior and emotion sensitivity) in WS and TD controls.

Methods: The Salk-McGill Music Inventory Questionnaire of Music Ability and Interest and the Peabody Picture Vocabulary Test (PPVT-III) were administered to 53 individuals with WS ($M_{age}=28.93, SD=7.01$) and 21 TD controls ($M_{age}=27.74, SD=7.44$). Three questions addressing the frequency of original musical production, musical interest, and emotional expressivity to music were used from the music questionnaire. To parse the potential link between sociability and musicality, the Salk Institute Sociability Questionnaire (SISQ) was administered as a measure of social approach and emotion sensitivity. The use of language for social-emotional purposes was evaluated by the proportion of affective engagement devices (Reilly et al., 2004) used by participants when narrating a story from a picture book (Frog Where Are You?).

Results: (1) Emotion expressivity when listening to music and the use of affective engagement devices were significantly correlated in WS ($r=\cdot595, p=\cdot004$) and TD controls ($r=\cdot548, p=\cdot019$), indicating that greater one expresses emotions to music the more one also tends to do so through language (2) Emotional responsivity when listening to music was significantly and positively correlated with emotional sensitivity in the WS group ($r=\cdot369, p=\cdot009$), but not in the TD group ($r=\cdot151, p=\cdot513$). This finding suggests that emotional responsivity to music and sensitivity to the emotional states of others may be atypically associated in WS.

Discussion: The main finding from this preliminary study suggests that in WS, emotional expressivity to music is significantly associated with socio-emotional behavior in WS but not in TD controls. In contrast, affective expression in auditory modality, i.e., music and language, were associated in both groups. These results suggest that the expression of emotion to music and through language are related. However, the result that emotional expressivity in music correlated significantly with socio-emotional behavior in WS only suggests that sociability and musicality may be more intimately related in this population than is typical. It may thus be that musical activities may provide a tool for individuals with WS to learn to socialize with others and acquire some social-emotional skills (e.g., affective expression and emotion identification).
25. The Vocabulary of Adolescents with Down Syndrome: Just More Words?

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Introduction: There is empirical evidence that children endowed with certain genetic disorders are more liable to demonstrate specific strength and weakness in some areas of speech, language and communication (Fidley, Philofsky & Hepburn, 2007). Studies of children and adolescents with Down syndrome consistently report a profile of relative strength in receptive language and deficits in expressive language (Chapman, 2006). Indeed, it has been demonstrated that receptive vocabulary in adolescents with Down syndrome is quantitatively more important than would be expected given the overall cognitive level (Abbeduto, Murphy, Cawthon, Richmond, Weissman, Karadottir, & O’Brien, 2003; Facon, Grubar & Gardez, 1998). The purpose of this study is to determine whether the vocabulary of individuals with Down syndrome is qualitatively comparable to that of typical children or adolescents with intellectual disability of undifferentiated etiology.

Methods: We compared the vocabulary profiles of 62 adolescents with Down syndrome (of mean age 16.74 years), 62 adolescents with intellectual disability of unknown origin (of mean age 16.20 years) and 62 typically developing children (of mean age 5.32 years) with no known learning impairments. All participants came from a French-speaking family and had no sensory disorders. The French version of the Peabody Vocabulary Picture Test, a receptive lexical test, was administered to all participants. The participants were matched on vocabulary raw score and the transformed item difficulties method was used to detect differential item functioning across groups.

Results: The transformed item difficulties indicated that the groups’ rank-orders of item difficulty were almost identical. It was concluded that, when the overall vocabulary size is held constant, the receptive vocabulary of participants with Down syndrome is not qualitatively specific.

Discussion: The absence of qualitative difference in the receptive vocabulary of adolescents with Down syndrome and that of typically developing children is somewhat puzzling provided the longer life experience of the adolescents. This may be explained by the lexical units of the test, which are purposefully chosen for being widely used in the linguistic community.

Moreover, despite the similarity of item response profiles across the groups of known and unknown cognitive impairment, it would be interesting to conduct comparable analyses with other etiologic groups (e.g., Fragile X, Williams syndrome) in order to determine if the present results would still hold regardless of the origin of intellectual disability.

References:


**POSTER SESSION 1**

**26. Instructional Programming for Early Reading Skills in Adults with Intellectual Disabilities: Consonant Clusters**

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**Introduction:** The literature on reading in persons with intellectual disabilities contains little guidance for teaching early reading skills, particularly for word patterns beyond consonant-vowel-consonant (CVC) words. Although omitting the second consonant in the cluster (e.g., seeing flat and saying fat) is a common reading error among struggling readers, no empirical attention has been paid to this skill in persons with intellectual disabilities. Our previous studies have demonstrated recombinative generalization of onset and rime units within CVC words following multiple-exemplar training (e.g., Saunders, O’Donnell, Vaidya, & Williams, 2003). This study extends this work to words with onset-consonant clusters, such as in the words frat and flat.

**Method:** In a computerized matching-to-sample task, four adults with intellectual disabilities learned to select the printed word that corresponded to a spoken-word sample, from a choice pool of five closely related words. There were four, 25-word sets trained successively. Each word set contained five subsets (one for each vowel) composed to force attention to all consonants within the cluster (e.g., grad, glad, gad, rad, and lad). Comprehensive matching-to-sample tests containing all consonant-cluster words were conducted before and after training of each word set.

**Results:** Over the course of the study, all participants learned to match all consonant-cluster words to the associated spoken words. The results of the comprehensive matching-to-sample tests indicate that, in all participants, accuracy on the trained word sets improved, with accuracy on the untrained word sets relatively unchanged. Furthermore, in most cases, accuracy on the trained word sets remained high over the course of the study.

**Discussion:** All participants initially showed low accuracy in selecting closely related consonant-cluster words to match the corresponding spoken words. They learned to do so with very explicit, computerized instruction. This finding is a promising step in the development of the computer-based instructional programming for early reading skills in individuals with intellectual disabilities, for whom research and teaching historically has emphasized sight-word skills (Saunders, 2007).

**References:**


*Sponsored by NICHD Grant R01 HD04852: Recombinative Generalization of Within-Syllable Units in MR*
POSTER SESSION 1

27. Health Service Utilization in Families of Children with Severe Developmental Disabilities

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Introduction: Many families of children with developmental disabilities (DD) do not receive services reflective of their high level of health care needs (Krauss et al, 2003). In an effort to identify potential barriers to effective care, the current study will examine child characteristics (age, sex, diagnosis, adaptive behavior level), socioeconomic status, community demographics (i.e., size of community), and parenting efficacy as constructs that may relate to families’ health service needs, use, and satisfaction.

Methods: Great Outcomes for Kids Impacted by Severe Developmental Disabilities (GO4KIDDS) is an ongoing research project examining the health, wellbeing and social inclusion of children with severe DD. The current study used information from a GO4KIDDS’ survey completed by parents of children with severe DD across Canada. Parents of children with intellectual disabilities (ID) and with ID and Autism Spectrum Disorders (ID+ASD) were asked about their children's health service needs, use and satisfaction using an adapted version of the Need for Help Questionnaire (Douma, Dekker & Koot, 2006). Children's adaptive level was measured using the Scales of Independent Behavior-Revised (Bruininks et al, 1996) and parenting efficacy was assessed with the Family Empowerment Scale (competency subscale) (Koren, DeChillo & Friesen, 1992). Data collection is ongoing. Fifty-five (47 female) parents of children with DD have completed the survey to date. Parents’ ages ranged from 27-54 years ($M=42, SD=6.99$), and children’s ages ranged from 4-19 years ($M=11.24, SD=3.56$).

Results: Preliminary results suggest that parents of children with ASD+ID report significantly lower parenting self-efficacy compared to parents with ID only, $t(51)=2.45, p=.02$, although the two groups did not differ in terms of overall adaptive or maladaptive behavior. Chi-square tests were conducted to assess a relationship between children's diagnosis and health service needs. A greater proportion of children with ASD+ID required out-of-home respite care compared to children with ID alone (79% vs. 33%). Children with ASD+ID showed a trend for greater need for Behavioral Therapists (72% vs. 50%). Both groups had similar needs for Psychologists, Dentists, Emergency Room Staff and Pediatricians. Further analyses will explore relations among service need, use and satisfaction based on family demographic variables and child characteristics, including specific types of maladaptive behavior.

Discussion: Findings will be discussed in relation to potential predictive characteristics of health service needs and satisfaction in families of children with severe DD.

References:


28. An Evaluation of Clonidine, Methylphenidate, and Exercise on Motor Activity within the Open Field Paradigm in the Fmr1 Knockout Mouse

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Introduction: Fragile X syndrome (FXS), a disorder caused by a mutation on the FMR1 gene, is often associated with Attention Deficit Hyperactivity Disorder (ADHD). Common treatments for the hyperactivity often seen in ADHD involve the use of psychotropic medications such as stimulants and alpha-adrenergic agonists. Exercise has also been proposed as a therapy for ADHD as well. The Fmr1 knockout (KO) mouse has been found to be a strong model for FXS both biologically and behaviorally. Of particular interest to our research, the Fmr1 KO mouse has been demonstrated to show increased locomotion in comparison to wild type (WT) littermates.

Methods: We assessed the effects of clonidine, methylphenidate, and exercise on motor activity in Fmr1 KO mice and WT littermates in the open field test. Two sets of open field tests were conducted using activity monitors once prior and once after intervention. For all interventions, mice were acclimated to the lab for 30 minutes prior to the testing session. For the drug trials, subjects [Fmr1 KO (n=17) and WT (n=11)] were injected with either saline or 0.05 mg/kg clonidine, and either saline or 5mg/kg methylphenidate 30 minutes prior to testing. For the exercise assessment, subjects [Fmr1 KO (n=4) and WT (n=4)] were placed in cages equipped with running wheels and counters for 26 days. All animals were placed in the activity monitor for 30 minutes, during which ambulatory counts were measured.

Results: Ambulatory counts were significantly higher for the Fmr1 knockout mice compared to the WT mice (F(1, 26) = 5.49, p < 0.027) and clonidine (0.05mg/kg) significantly reduced the ambulatory counts of both mice (p < 0.001). When testing methylphenidate, again Fmr1 knockout mice had significantly more ambulatory counts compared to WT mice (F(1, 26) = 5.22, p < 0.031). Methylphenidate (5 mg/kg) significantly increased ambulatory counts of both mouse groups (p < 0.001). With regard to the running wheel, at day 10 the Fmr1 KO mice had significantly fewer rotations on the wheel than the WT (F(1, 6) = 7.31, p < 0.035), although it was observed that the Fmr1 KO eventually increased to the number of rotations that the WT had. Performance in the open field revealed that the Fmr1 KO continued to have significantly higher ambulatory counts than the WT (t(6) = -2.87, p < 0.028).

Discussion: These data show that clonidine reduces motor activity of both strains of mice; however, this effect was delayed in the Fmr1 KO compared to WT mice. With regard to methylphenidate, locomotion was increased for the WT as expected; however, the Fmr1 KO also experienced an increase in locomotion suggesting that it may not be an appropriate model for evaluating the effectiveness of stimulants in reducing hyperactivity. Our results for the running wheel are puzzling. It took the Fmr1 KO mice several days to begin running on the wheel. More research should be conducted to determine what variables influenced activity on the running wheel and if these activities might have impacted behavior within the open field test.

References:


This research was supported by a Drake University Faculty Research Grant and a Department of Psychology Student Research Award.
Introduction: Bullying experiences are common among Canadian children, with 35% of typically developing children reporting victimization. Bullying has been associated with poorer psychosocial adjustment. Research on the autism spectrum disorder (ASD) population has suggested that children with ASD are victimized at higher rates than typically developing peers (Little, 2002), yet a paucity of research has examined differences in types and rates of victimization and perpetration in this population.

The current study is the first to distinguish the differing rates and types of bullying and victimization as they present in children with high functioning ASD and autism. It is hypothesized that higher functioning children with ASD will experience greater amounts of victimization, as well as be more likely to bully others.

Methods: Participants include 115 parents of children diagnosed with ASD aged 12-21 years old and currently attending schools across Canada (82.5% boys and 17.5% girls; mean age = 15.2, SD = 2.5). Most of the parent respondents were female (90%). Children’s diagnoses included Asperger Syndrome (63%), High-Functioning Autism (16%), and Autism (21%). For the purpose of the current study, children with Asperger Syndrome (AS) and high functioning autism (HFA) were grouped together into a high functioning ASD (HFASD) group.

Parents completed an online questionnaire including the PREVNet assessment tool (PREVNet Assessment Working Group, 2008) to assess their child’s bullying and victimization experiences. Bullying and victimization were subgrouped into four categories, including Social, Electronic, Verbal, and Physical.

Results: In the HFASD group, 71% of parents reported their child had experienced some form of victimization within the last month, and 55% reported that the victimization had been happening for more than a year. In the autism group, 52% of parents reported their child experienced some form of victimization within the last month, and 30% reported that the victimization had been happening for more than a year. Additional data will be presented on rates in each of the types of victimization and bullying across the two groups. Independent samples t-tests demonstrated that children with HFASD experienced significantly more physical victimization \(t(59) = 2.51, p < .05\), verbal victimization \(t(90) = 2.53, p < .05\), electronic victimization \(t(65) = 3.68, p < .001\), and social victimization \(t(92) = 2.56, p < .05\) than children with autism.

Discussion: The results of this research contribute to the available research on ASD by further examining the differing experiences among children at different ends of the spectrum and with differing capabilities and levels of functioning. This study can inform school-based bullying prevention and intervention programs by identifying the differing experiences of certain ASD populations so more targeted interventions can be created. The implications of this study will be discussed, and additional analyses will explore correlations among the types of victimization and bullying across all youth (Physical, Social, Verbal, Electronic).

References:

**POSTER SESSION 1**

**30. Patterns of Gaze Fixation During Search for a Target Symbol on Visual Communication Displays**

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**Introduction.** Visual supports in the form of communication boards, schedule boards, color-coded educational materials and the like are commonly used to facilitate learning, comprehension, and communication. These supports are central to aided augmentative and alternative communication (AAC), in which an external aid stores and presents for use visual symbols such as photographs, line drawings, or alphabet letters. For many individuals, AAC provides the primary means for expression of their own ideas and, in some cases, understanding of the ideas of others (e.g., Romski & Sevcik, 1996).

The effectiveness of such visual supports likely depends in part on the efficiency with which the relevant visual information can be perceived, identified, and extracted by the viewer. Given that vision is the channel upon which these supports depend, and the diversity of individuals who use them, it is critical to understand the impact of basic principles of visual processing on the design of visual AAC displays. However, little is known either about the demands placed by aided AAC displays on visual attention nor on the visual processing patterns of individuals who require AAC for communication.

Our program of research involves a systematic examination of the visual processing demands of aided AAC. Our previous studies have revealed replicable influences of display design on responding behavior (accuracy and response time), across populations with and without intellectual/developmental disabilities. The current research examined whether differences in behavioral responses are associated with more or less efficient patterns of visual attention during the search task, using eye-tracking technology that recorded exact point of gaze during the visual search task.

**Methods.** This study reports on initial studies conducted with 6 participants without disabilities between 7 and 9 years of age, which serves as the framework for our planned studies with individuals with intellectual/developmental disabilities. Participants played a series of “computer finding games,” in which the structure of visual displays was manipulated in ways that either facilitated or inhibited the speed and accuracy of search for a target. Facilitative displays were ones in which symbols that shared color and/or shape were clustered in one area of the array; non-facilitative displays were ones in which symbols with shared features were distributed throughout the array (results of studies demonstrating this influence have been reported at previous Gatlinburg conferences). While participants underwent these behavioral tasks, their point of gaze was recorded through ISCAN© eye-tracking technology and summarized through specialized software that provides data on fixation paths for each participant.

**Results.** The patterns of behavioral responding were closely associated with patterns of visual attention within and across all participants. In the clustered displays that facilitated behavioral responding, participants examined fewer of the distracter stimuli and focused attention almost exclusively on the target and the subset of stimuli that shared features with the target. In the distributed displays that impeded behavioral responding, participants examined a greater number of distracter stimuli that did not share any features with the target, and examined those stimuli for longer. These differences were of statistical significance even in this small sample.

**Discussion.** The results of this analysis suggest that certain displays facilitate behavioral responding by narrowing visual attention to a subset of possible targets. The next step is to examine these patterns in individuals with disabilities to map out how their patterns of visual attention resemble or differ from those of these nondisabled participants.

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POSTER SESSION 1

31. Teaching Teachers to Teach Symbolic Play and Joint Attention to Young Children with Autism

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Introduction: Extensive research has shown that both symbolic play and joint attention are delayed or deficient in young children with autism, and predictive of their later language and social development. Kasari, Paparella, Freeman, and Jahromi (2008) showed that these behaviors can be taught by trained graduate students which also resulted in better language and cognitive outcomes as compared to a control group of children with autism. Yet, in early childhood special education classroom settings, teachers seldom focused on these skills in their teaching; when they did, it was usually in the context of developing pre-academic or fine motor skills than for increasing symbolic play and joint attention behaviors (Wong, 2006). The aims of this study were to examine the effects of a teacher-implemented intervention focused on facilitating play and joint attention for young children with autism.

Methods: Thirty-three children diagnosed with autism, ages three to six years (mental ages ranging from 15 to 58 months), participated in the study with their classroom teachers (n=13).

The thirteen preschool special education teachers were randomly assigned to one of three groups:
1) Symbolic play (4 sessions) then joint attention (4 sessions) intervention (SP-JA)
2) Joint attention (4 sessions) then symbolic play (4 sessions) intervention (JA-SP)
3) Wait period (4 sessions) then further randomized to either group 1 or 2 (8 sessions)

In the intervention, teachers participated in eight weekly individualized 1-hour sessions with a researcher that emphasized embedding strategies targeting symbolic play and joint attention into their everyday classroom routines and activities. The main child outcome variables of interest were collected through one-hour classroom observations over three-day periods before (T1), at midpoint (T2), and after the intervention (T3). Using a PDA, children's engagement levels were tracked and then calculated to determine percent time spent unengaged and in a joint engagement state where the child and another individual (teacher or peer) were actively involved with the same object or event. The frequency of symbolic play initiations and joint attention (responses and initiations) behaviors were also recorded.

Results: Analysis of all children's performance during the intervention phase showed different trajectories for each of the key outcome variables with greatest general improvement after the first four sessions of intervention.

<table>
<thead>
<tr>
<th></th>
<th>% Unengaged</th>
<th>% Joint Engage</th>
<th>Initiate SP</th>
<th>Respond JA</th>
<th>Initiate JA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SP-JA</td>
<td>JA-SP</td>
<td>SP-JA</td>
<td>JA-SP</td>
<td>SP-JA</td>
</tr>
<tr>
<td>T1</td>
<td>26.54</td>
<td>25.00</td>
<td>.06</td>
<td>.65</td>
<td>.10</td>
</tr>
<tr>
<td>T2</td>
<td>18.70</td>
<td>17.24</td>
<td>.02</td>
<td>.39</td>
<td>.12</td>
</tr>
<tr>
<td>T3</td>
<td>13.14</td>
<td>12.63</td>
<td>.26</td>
<td>.59</td>
<td>.11</td>
</tr>
</tbody>
</table>

Discussion: Findings indicate that teachers can implement an intervention to reduce unengagement and increase joint engagement, symbolic play, and joint attention of young children with autism in their classrooms. However, issues to be addressed include the addition of a second intervention target, the length of a teacher-implemented intervention, and the relationship between engagement, symbolic play, and joint attention in young children with autism.

Reference:
DOWN SYNDROME AND ALZHEIMER’S DISEASE: LONGITUDINAL STUDIES OF DEMENTIA STATUS AND RISK

Chair: Wayne Silverman, Kennedy Krieger Institute and Johns Hopkins University School of Medicine
SYMPOSIUM 7

Down Syndrome and Alzheimer’s Disease: Longitudinal Studies of Dementia Status and Risk

Chair: Wayne Silverman
Kennedy Krieger Institute and Johns Hopkins University School of Medicine

Estrogen Receptor β Gene Variants and Risk of Alzheimer’s Disease in Women with Down Syndrome
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Qi Zhao1
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Simon Lacks1
Warren Zigman2
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Depressive Symptomatology in Adults with Down Syndrome and Mild Cognitive Impairment
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Predictive Validity of One-Time Evaluations of Dementia Status
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Estrogen Receptor β Gene Variants and Risk of Alzheimer’s Disease in Women with Down Syndrome

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Introduction: Prior studies have suggested that declines in women's estrogen levels play an important role in the pathogenesis of Alzheimer's disease (AD). Because hormone levels are low in postmenopausal women, examination of polymorphisms in estrogen genes may serve as a marker of risk of AD, even when direct measurement of hormone levels may not be informative. In this study we report on the influence of variants in the estrogen receptor β, ERβ. ESR2, the gene for ERβ, is found in high concentrations in human hippocampal formation and entorhinal cortex, suggesting a role in neurobiological mechanisms underlying cognition and memory.

Methods: We examined the association between polymorphisms in the ESR2 and risk of AD in 148 postmenopausal women with Down syndrome (DS), 41 to 78 years of age at baseline. Participants were followed at 14- to 18-month intervals for an average period of 5.4 (±1.8) years. Information from cognitive assessments, caregiver interviews, medical record reviews and neurological examinations was used to classify dementia onset. Genomic DNA was genotyped for 7 single-nucleotide polymorphisms (SNPs) spanning the ESR2 gene. Women were classified as carrying none or one or more copies of the minor risk allele. We used allelic analysis, logistic regression and Cox proportional hazards modeling to evaluate the association of these polymorphisms with age at onset and risk for AD, adjusting for age, level of intellectual disability, body mass index and the presence of an APOE ε4 allele.

Results: Over the course of the study 66 women (45.2%) developed AD. Compared with women without the risk allele, women carrying the risk allele in two SNPs in introns 4 and 5 of ESR2 (rs17766755 and rs12435857) had an earlier onset and an increased risk for AD (RR=2.5, 95% CI: 1.1-4.7 and RR=2.2, 95% CI 1.1-3.9, respectively). Women carrying the risk allele in two other SNPs (rs4986838 and rs1256061) also showed elevated risk for AD (RR=.1.7 and 1.8, respectively), but the difference failed to reach statistical significance.

Discussion: The risk alleles in rs17766755 and rs12435857 are in high linkage disequilibrium with each other and may represent a risk haplotype. Other studies among women in the general population have found significant associations with SNPs in the 3’ untranslated region of ESR2, including rs4986838 (e.g., Luckhaus et al., 2006). All the SNPs studied so far, including those from this study, are located in the introns or untranslated regions of the gene, so they seem unlikely to be the critical pathological variants themselves but point to regions where genes playing a role in the causal pathway reside. Our results support the overall hypothesis that genetic variants in estrogen pathways involved in AD may influence risk in women with DS and suggest that HRT, perhaps most effectively during the perimenopausal period, may delay onset of AD in this vulnerable population.

References:


This research was supported by grants R01AG014673 (Schupf) and P01HD35897 (Silverman) from NIA and NICHD and by NYS through its Office for Persons with Developmental Disabilities.
Introduction: Mild Cognitive Impairment (MCI) in the general population is characterized by declines in cognitive functions without significant impairment of activities of daily living (Gauthier et al., 2006; Petersen et al., 2001). Importantly, the observed declines are insufficient to warrant a diagnosis of dementia. Neuropsychiatric symptoms have not traditionally been part of the diagnostically defining features of MCI. Yet, studies have found that they occur more frequently in individuals with MCI than in cognitively intact elderly individuals (Feldman et al., 2004). The most commonly reported neuropsychiatric symptoms observed include depression, apathy, anxiety and irritability (Gabryelewicz et al., 2004; Hwang et al., 2004). This study examined the prevalence of depressive symptomatology associated with MCI in adults with Down syndrome.

Methods: We examined the prevalence of depressive symptoms in 171 adults with Down syndrome, 84 of whom have been non-demented over the course of the study and 87 of whom developed MCI. Diagnostic status of participants was determined at our Case Consensus Conferences. All participants received comprehensive evaluations at approximately 18-month intervals which included informant interviews examining neuropsychiatric symptoms. This study focused on findings from administration of the Reiss Screen for Maladaptive Behaviors (Reiss, 1994), a standardized screening instrument to assess mental health disorders in individuals with intellectual disability. Additional converging results from other instruments will also be examined.

Results: Participants with Down syndrome and MCI showed significantly more evidence of the physical signs of depression including body stress, regressive behavior and sleep problems compared to their peers who remained cognitively intact throughout the course of the study. In addition, they showed increases compared to their own prior status when they were deemed cognitively intact. They also showed more evidence of the behavioral signs of depression including crying spells and sadness.

Discussion: As in the general population, depressive symptomatology is associated with MCI for adults with Down syndrome. Identifying MCI in adults with Down syndrome can be difficult because of their lifelong cognitive deficits and variability in baseline level-of-functioning. An increase in depressive symptoms may then serve as “red flags,” alerting caregivers to the presence of possible declines in cognition that might otherwise go unrecognized. There is sufficient evidence to propose that standardized evaluations of neuropsychiatric symptoms, including depression, could contribute to the precision with which MCI is recognized in adults with Down syndrome.

References:

This work was supported by funds from the New york State Office for People with Developmental Disabilities and NIH grant P01 HD35897.
**Introduction:** Alzheimer's disease (AD) is the most prevalent cause of progressive dementia in old age, and risk is dramatically increased among adults with Down syndrome (DS). Recognition of dementia in this population is complicated by the presence of pre-existing cognitive impairments that vary substantially among individuals. Further, assessments targeting dementia/mild cognitive impairment within the typically developing elderly population have norms and diagnostic criteria that are not applicable for people with intellectual disability (ID). Therefore, we have been evaluating the validity of various instruments designed for classifying dementia status of adults with ID. In the analyses presented here, we examine current and predictive validity of a combination of two measures, the Sum of Cognitive Scores (SCS) of the “Dementia Questionnaire for Mentally Retarded Persons (DMR; Evenhuis, 1995) and a modified version of the Mini-Mental State Exam (MMSE; Folstein, Folstein & McHugh, 1975; see Silverman et al, 2004).

**Method:** A large group of adults with Down syndrome over 45 years of age at enrollment have been assessed at intervals of approximately 18 months employing the same battery of instruments for up to 7 times (Total N = 405). A subgroup of 133 adults with Down syndrome were identified from this larger sample based upon availability of at least 5 cycles of data and the absence of dementia during the first and second cycle of assessment. Their mean age was 50.0 at enrollment, with a mean Stanford-Binet IQ of 38.1. Dementia status was classified for each individual at their third cycle of assessment based on one-time IQ-referenced performance for the DMR-SCS or our modified MMSE. Three groups were then defined for each instrument consisting of adults who were: (a) clearly above their IQ-referenced criteria (No Dementia), (b) clearly below their IQ-referenced criteria (Dementia), or (c) too close to criteria for a confident classification (Uncertain). Longitudinal performance for these three Groups was then examined over the 36 months preceding and 36 months following this Cycle 3 classification.

**Results:** Multivariate Group by Time analyses of variance were conducted for 11 key measures reflecting cognitive or functional status. Results consistently showed that the “Dementia” Group changed more than the “No Dementia” group. Importantly, this was true for the 36 months following assessment as well as the 36 preceding months. Additional analyses considered the combination of the two “standard” scores and provided converging results. For a representative example, analysis of adaptive behavior, as measured by the ABS Part 1, generated a Group X Time interaction of F(8,218) = 5.54, p<.0001. Data for both Groups and individuals will be described, demonstrating the value and limitations of one-time assessments of dementia status for adults with Down syndrome.

**Discussion:** Findings suggest that one-time assessments of dementia status of adults with Down syndrome can be useful in diagnosis. While profiles of decline/stability in performance should remain the gold standard, the need for relatively rapid determination of diagnosis/case classification will become more and more pressing as effective treatments become available, as will impatience with having to wait 6 to 12 months for results of follow-up assessments.

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ADULT SIBLINGS OF INDIVIDUALS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES: NEW PERSPECTIVES

Chair: Julie Lounds Taylor
Vanderbilt Kennedy Center, Vanderbilt University

Discussant: Ann Kaiser
Vanderbilt Kennedy Center, Vanderbilt University
SYMPOSIUM 8

Adult Siblings of Individuals with Intellectual and Developmental Disabilities: New Perspectives

Chair: Julie Lounds Taylor
Vanderbilt Kennedy Center, Vanderbilt University

Discussant: Ann Kaiser
Vanderbilt Kennedy Center, Vanderbilt University

Guilt Among Adult Siblings of Individuals with Intellectual and Developmental Disabilities
Carolyn Shivers
Julie Lounds Taylor
Robert Hodapp
Vanderbilt Kennedy Center, Vanderbilt University

The Impact of Vocational Activities of Adults with Intellectual and Developmental Disabilities on Sibling Well-Being and Relationship Quality
Julie Lounds Taylor
Robert Hodapp
Vanderbilt Kennedy Center, Vanderbilt University

Life Course Patterns of Attainment Among Siblings of Adults with Intellectual and Developmental Disabilities
Marsha Mailick Seltzer¹
Jieun Song¹
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¹Waisman Center, University of Wisconsin-Madison
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**Introduction:** Though the extant research cites guilt as a possible outcome for typically developing siblings of individuals with developmental disabilities, no studies have measured levels or correlates of guilt among siblings. The present study examined the percentage of siblings who reported increased guilt in relation to growing up with a brother or sister with a disability, as well as the factors that were related to increased guilt.

**Methods:** We addressed this question using data from the Adult Siblings’ Questionnaire, a web-based survey of siblings of adults with disabilities developed in conjunction with the National Sibling Consortium. A total of 1,150 respondents included individuals from all 50 states, with an age range of 18 to 85. The sample was over 80% female and primarily Caucasian.

The variable of interest, guilt, was measured by a question asking how participants’ level of guilt has changed as the result of growing up with a brother or sister with a disability. Variables related to the following constructs were analyzed to determine their relationship with sibling guilt:

- **Sibling relationship** (closeness, amount of contact);
- **Characteristics of the brother/sister with a disability** (gender, functional abilities, nature of disability, severity of physical and emotional health problems, service needs);
- **Characteristics of the sibling** (gender, age, physical health); and
- **Caregiving** (amount of future caregiving, knowledge of brother/sister).

Responses to two open-ended questions were coded for qualitative analysis: 1) What would help you now to better support your brother or sister with a disability, and 2) What would have helped you growing up as a sibling of a child with disabilities? Reliability for codes for responses to these questions ranged from .66 to 1.00.

**Results:** Over 50% of siblings reported an increase in guilt as a result of having a brother or sister with a disability. Multivariate analyses showed that guilt was predicted by the following variables:

- **Sibling relationship** – Lower quality sibling relationships predicted increased guilt ($\beta=-.02$, $p<.05$).
- **Characteristics of the brother/sister with a disability** – Fewer brother/sister functional abilities ($\beta=-.01$, $p<.05$), more severe brother/sister emotional health problems ($\beta=.10$, $p<.05$), and higher proportion of unmet service needs ($\beta=.64$, $p<.01$) predicted increased guilt.
- **Characteristics of the sibling** – Females were more likely than males to report increased guilt ($\beta=.42$, $p<.01$).
- **Caregiving** – Plans for higher levels of future caregiving predicted increased guilt ($\beta=.8$, $p<.001$). Analyses of responses to open-ended questions showed that siblings reporting increased guilt were more likely to cite needs for personal support and improvements on the part of their family (e.g. more involvement from other typically-developing siblings, more information from parents).

**Discussion:** These findings suggest that guilt is a relatively common emotion among siblings of individuals with disabilities. Quantitative analyses showed that characteristics of the brother/sister with disabilities, quality of the sibling relationship, and plans for future caregiving were all related to guilt. Qualitative analyses suggested that additional family factors may also be important in the development of guilt.
Introduction: Past research focuses on how psychological well-being and relationship quality differ among siblings of adults with intellectual and developmental disabilities (IDD) compared to siblings of typically developing adults, as well as on how siblings are impacted by the diagnosis, symptoms, and behaviors of their brother or sister with IDD. Extending this research, the present study relates the quality of the sibling relationship to the vocational activities of the brother or sister with IDD. Adults with IDD have low rates of employment and insufficient vocational activities. Given that siblings often assume care for their brothers/sisters when parents are no longer able, siblings may be especially affected by their brother's/sister's lack of vocational activities.

Methods: We included data from 797 siblings who responded to the Adult Sibling Study, a web-based, national survey of siblings of adults with IDD. Siblings were eligible for this study if their brother or sister with IDD was aged 22 years or older. Siblings averaged 40.8 years of age (SD=12.9) and 80% were female. Over 75% held at least a bachelor's degree. Brothers and sisters with IDD averaged 39.5 years of age and were primarily male (58%); most lived with their parents (35.5%) or in a group home (23.3%). Approximately 20% of siblings were their brother or sister's legal guardian. All data were collected by sibling report, including various aspects of the person with IDD: vocational activities (no activities versus any activities); health problems; emotional problems; and functional abilities. Sibling relationship variables included relationship closeness and the physical distance between sibling and brother/sister's residence. Sibling psychological functioning included depressive symptoms and psychological well-being.

Results: Over 12% (n=101) of brothers/sisters with IDD participated in no vocational activities. Siblings whose brother/sister did not (vs. did) have vocational activities lived closer to their brother/sister with IDD, even as they reported lower levels of relationship closeness, t's = 2.48 and 4.05, p's < .05. Although individuals with IDD with no (vs. some) activities had more emotional and physical health problems, fewer functional abilities, were older, and were less likely to have Down syndrome, relations between brother/sister vocational activities and the relationship variables (distance from brother/sister's residence, closeness) remained statistically significant even after controlling for factors that predisposed siblings to have no vocational activities (brother/sister's emotional and physical health problems, older age, fewer functional abilities, no Down syndrome), β's=-.08 and -.08, p's < .05. Siblings of those adults with IDD who had no activities also reported higher depressive symptoms and lower levels of well-being, t's = -2.62 and 2.02, p's < .05.

Discussion: When the brother or sister with IDD has no vocational activities, their siblings seem to be involved in “obligatory” relationships, or relationships characterized by closer physical proximity but less affective closeness. Future research will examine how the vocational activities of the brother/sister with IDD impacts siblings’ willingness to take over care of the brother/sister.
Life Course Patterns of Attainment Among Siblings of Adults with Intellectual and Developmental Disabilities

Marsha Mailick Seltzer¹, Jieun Song¹, Bobbi Wolfe¹, Jason Fletcher²
¹Waisman Center, University of Wisconsin-Madison, ²Yale University
(Mseltzer@waisman.wisc.edu)

Introduction: Adult siblings of individuals with IDD are in line to “inherit” the caregiving responsibility for their brother or sister with the disability, after the parents are no longer able to fill this role. As such, there is great interest in their capacity and willingness to do so. Past research on adult siblings of individuals with IDD has focused on psychosocial outcomes and their relationships with their brother or sister with the disability and their parents. A question that has been raised but not well-answered is whether such siblings have different life course outcomes than their peers who do not grow up with a brother or sister with a disability—do they have different patterns of educational attainment, employment, marriage? Differential patterns of attainment may have implications for their future role vis-à-vis their brother or sister with IDD.

Methods: Using the Wisconsin Longitudinal Study, we examined patterns of attainment in major life course outcomes of adult siblings of individuals with intellectual and developmental disabilities (IDD) and compared them with adults who have no siblings with disabilities. The WLS is a probability sample of all Wisconsin high school graduates who finished high school in 1957. They were studied at age 18, 36, 53, and 64. Some of the data that were collected pertained to their children, and through screening procedures, those who had a child with a IDD were identified. The unit of analysis for the present study is the non-disabled adult children of the WLS respondents who at the most recent point of data collection averaged 38 years of age.

Results: We compared siblings whose brother or sister had IDD (n = 117) to those who experienced the death of a brother or sister before the target sibling was age 25 (n = 286) and to an unaffected comparison group (n = 3932) with respect to educational attainment, employment status, and marital status at age 38 as well as marital history (ever married). Using well-controlled multivariate models, we found that at age 38, siblings of brothers or sisters with IDD had similar patterns to the comparison group in educational attainment and current employment status, but brothers were significantly less likely to be currently married than the controls and more likely never to have married. Sisters whose sibling had IDD did not differ from unaffected controls in marital status or history.

Siblings who experienced the death of a brother or sister also had divergent marital profiles, depending on the cause of death and the gender of the target sibling. Sisters who experienced infant death of a sibling or the long-term illness of a sibling were less likely to be currently married, and those whose sibling died after a long-term illness were less likely ever to have married. For brothers, those who experienced the loss of a sibling due to accidents or suicides were less likely to currently be married.

Discussion: Thus, the life course effects of having a brother or sister with IDD and of experiencing sibling death were felt in the marital domain, but not in education or employment outcomes. Future research should examine the effect of marital instability or single marital status on the ability to take on the caregiving role for an adult sibling with IDD.
S Y M P O S I U M

PEER RELATIONSHIPS IN ADOLESCENTS WITH AN AUTISM SPECTRUM DISORDER

Chair: Gael Orsmond, Boston University

Discussant: Connie Kasari, University of California-Los Angeles
SYMPOSIUM 9

Peer Relationships in Adolescents with an Autism Spectrum Disorder

Chair: Gael Orsmond
Boston University

Discussant: Connie Kasari
University of California-Los Angeles

Impact of Cognitive-Behavioral Treatment for Social Anxiety on Perceptions of Social Belonging in Teens with Autism Spectrum Disorders
Audrey Blakeley-Smith
Susan Hepburn
JFK Partners/University of Colorado School of Medicine

Bullying Across the Years: Reports from Public School Students with ASD
Saara Mahjouri
Connie Kasari
University of California-Los Angeles

Using Video Diaries to Understand Friendship Experiences in Adolescents with an Autism Spectrum Disorder
Gael Orsmond
Ellen Cohn
Boston University

Anxiety and Peer/Social Challenges in High-Functioning Adolescents with Autism
Jeffrey Wood
University of California-Los Angeles
Impact of Cognitive-Behavioral Treatment for Social Anxiety on Perceptions of Social Belonging in Teens with Autism Spectrum Disorders

Audrey Blakeley-Smith, Susan Hepburn
JFK Partners/University of Colorado School of Medicine
Department of Psychiatry, University of Colorado School of Medicine (Audrey.blakeleysmith@ucdenver.edu)

Introduction: Social anxiety is prevalent, but not universal, in persons with Autism Spectrum Disorders (Bellini, 2004). Defined as a physical, cognitive and emotional experience of reluctance or dread in anticipation of social contact, individuals who experience heightened social anxiety often cope with their apprehension by avoiding social situations or developing strategies for minimizing social contact with others. For youth with co-occurring social anxiety and ASD, instruction in social skills is not likely to be sufficient to improve social functioning with peers (Chalfant, Rapee & Carroll, 2007). We hypothesize that an intervention focused on promoting adaptive coping with anxiety in social situations will contribute to improvements in perceptions of social belonging in teens with ASD, as reported by the youth themselves and by their parents.

Methods: 24 adolescents, ages 14-18, with confirmed diagnosis of ASD (7 with Autism, 4 with PDD-NOS, and 13 with Asperger Syndrome) and clinically significant symptoms of social anxiety, and their parents participated in a pilot study of the effectiveness of a cognitive-behavioral treatment package on reducing the severity and interference of anxiety symptoms. The sample included 15 males and 9 females with ASD, accompanied by 18 mothers and 6 fathers, who also participated in the assessment and intervention activities. The majority of participants were Caucasian (66.7%) and approximately 17% were Hispanic. Anxiety symptoms were assessed before and after treatment using the Anxiety Disorders Interview Schedule (ADIS; Silverman & Albano, 1996) and the Screening for Anxiety Related Emotional Disorders (SCARED, Birmharer et al, 2001) with both the youth and a parent as informants in each case. Social Belonging was assessed before and after treatment by administering the Quality of Student Life Questionnaire (Keith & Schalock, 2003) to the youth and to a parent separately in order to obtain independent impressions of quality of life indicators across informants. Treatment included 14 group sessions, comprised of 4-5 teens per group, with some parent involvement within sessions and integrated into practice exercises. The intervention is undergoing manualization and is based upon the Face Your Fears program, developed by our group (see Reaven et al, 2009).

Results: Analyses are ongoing and data will be presented on pre- and post-intervention reports of social anxiety and social belongingness in teens with ASD, provided by the youth themselves and by their parents. Implications for future research and intervention will be discussed.

This study was funded by Autism Speaks (2007-2010); PI = Reaven, Hepburn & Blakeley-Smith. There are no conflicts of interest in this research.

References:


**SYMPOSIUM 9**

**Bullying Across the Years: Reports from Public School Students with ASD**

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**Introduction:** Bullying describes frequent physical or verbal abuse, resulting from imbalanced power (Olweus, 1994). Having disabilities puts children at greater risk of being bullied by their peers (Baumeister, et al., 2008; Mishna, 2003). While evidence indicates that children with autism are more likely to be socially isolated (Bauminger & Kasari, 2000; Chamberlain, et al., 2007), research has not closely examined victims of bullying with ASD across age groups in public schools. METHODS: This study aimed to (1) find whether self-reports of being bullied differ between children and adolescents with ASD (2) investigate the relationship between loneliness and reports of bullying, (3) examine the number of friendships reported in relation to both bullying and loneliness. It was hypothesized that (1) reports of bullying would be higher in adolescence (2) a positive linear relationship between bullying and loneliness exists (3) an inverse relationship between the number of friends reported and bullying and loneliness exists.

**Results:** Forty-three participants, enrolled in fully included general education classrooms in Los Angeles area public schools were included in analyses (Table 1).

**Table 1. Population Means**

<table>
<thead>
<tr>
<th></th>
<th>Grade 1-5</th>
<th>Grade 6-12</th>
<th>Grade 1-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>27</td>
<td>16</td>
<td>43</td>
</tr>
<tr>
<td>IQ</td>
<td>87.2/12.7</td>
<td>88.3/16.3</td>
<td>87.6/13.9</td>
</tr>
<tr>
<td>Title I School</td>
<td>100%</td>
<td>31.2%</td>
<td>74.4%</td>
</tr>
</tbody>
</table>

Participants were administered the Autism Diagnostic Observation Schedule (ADOS) and the Stanford Binet-5. Being bullied, loneliness and friendship number were coded from ADOS responses. One-way ANOVA revealed no statistically significant differences between age groups in the bullied, loneliness and number of friendships variables (frequencies in table 2). IQ was negatively correlated with being bullied in the elementary group and positively correlated in the adolescent group (p<.05). Linear regressions revealed IQ accounted for 20% and 39.9% of variance in being bullied, respectively.

**Table 2. Self-Report Data**

<table>
<thead>
<tr>
<th></th>
<th>Grade 1-5</th>
<th>Grade 6-12</th>
<th>Grade 1-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bullied</td>
<td>Yes=51.9% No=48.1%</td>
<td>Yes=50% No=50%</td>
<td>Yes=51.2% No=48.8%</td>
</tr>
<tr>
<td>Lonely</td>
<td>Yes=40.7% No=59.3%</td>
<td>Yes=60% No=40%</td>
<td>Yes=47.6% No=52.4%</td>
</tr>
<tr>
<td>Number of Friends</td>
<td>1.85 (SD=1.68)</td>
<td>1.69 (SD=1.96)</td>
<td>1.79 (SD=1.78)</td>
</tr>
</tbody>
</table>

While data analysis does not support our hypotheses, it indicates a need to further explore bullying in populations with ASD. Small sample size, no comparison group, and relying only on self-report limited this study. Children who are socially isolated and lack social skills may be more frequent targets for bullies (Nansel et al., 2001). These risk factors, prevalent in ASD, could explain why children and adolescents in our sample reported 51.2% victimization compared to national average, 16.9%, for typically developing school-aged children. Our results indicate that public school children with ASD are more vulnerable to being victimized.

**References:**


Introduction: The increased prevalence of autism spectrum disorders (ASDs) has created an urgent need to understand how to best promote and sustain the social and emotional development of people with an ASD. Adolescents and adults with an ASD show enduring restrictions in their social activities and have limited variety in their discretionary activities. In this project we used a strengths-based mixed methods approach to better understand the friendships of adolescents with an ASD, using visual narratives from videos made by adolescents themselves along with time diary data and a self-report measure of friendship quality. A richer understanding how these adolescents perceive, develop and sustain their friendship experiences holds promise for helping us address participation restrictions.

Methods: Three adolescents with an ASD ages 12-16 participated in study to determine the feasibility of using an adapted version of the Video Intervention/Prevention Assessment (VIA) methodology (Rich et al. 2000). The VIA methods ask adolescents to create visual narratives, through video, focusing on what they perceive as important. Each participant was taught to operate a digital video camera to document their discretionary time use across 4 weeks. They were given a list of video assignments such as: a) tours of their homes and neighborhoods, b) daily activities, c) activities shared with friends, d) interviews with friends about fun times you have had together. At the end of each week of video recording, the participants were asked to create personal monologues by setting up the camera and telling stories directly to the camera, sharing observations and feelings about activities with friends, and reflecting upon their experiences.

Results: The adolescents generated between 4 and 9 hours of video recordings each. Video segments ranged from 2 seconds to 51 minutes in length. The weekly monologues ranged from 1 minute to 25 minutes across participants. Preliminary themes identified through analysis of the video logs include: (1) parental scaffolding of social relationships and control of the video process; (2) siblings and family members as friends; (3) use of technology and media in engaging with friends; (4) discrepancies between understandings of social relationships and observed interactions with friends. The video process captured subtle nuances in their understanding of human relationships and an ability to reflect on these relationships. In some cases, the process itself appeared to serve as a change agent in the adolescent's friendship experience.

Discussion: We will present the challenges and lessons learned related to providing the “just right” support to adolescents with an ASD to share their perspectives. These preliminary findings suggest that adolescents with an ASD can engage in this video research process with success and that we can learn more deeply about their friendship experiences in naturalistic settings.

References:

The experience of heightened anxiety likely has an adverse impact on social functioning, even in the context of clinically impairing autism spectrum disorder (ASD) symptoms. Anxiety in typical populations has been linked with a variety of negative sequelae in decades of experimental and descriptive research, such as reduced social networks and poorer self-esteem (e.g., Neal & Edelmann, 2003). In one sample, Spence, Donovan, and Brechman-Toussaint (1999) found that typically developing children with high levels of social anxiety had poorer social skills when compared to non-anxious children. Their parents reported less assertive and responsible social skills, and researchers observed fewer initiations and social interactions. Teachers also reported fewer prosocial behaviors and more social withdrawal from typically developing children with higher levels of anxiety (Erath, Flanagan, & Bierman, 2007). They also had more difficulty in generating conversation topics during role plays (Alfano, Beidel, & Turner, 2006). Anxiety diverts attention away from relevant stimuli towards threat-related stimuli and cognitions (e.g., Waters, Mogg, Bradley, & Pine, 2008), possibly accounting for the reduced performance in, for example, spontaneous speech and social interaction.

Social anxiety is very common among children and youth with ASD. We have proposed that such anxiety may arise from stress and rejection (Wood & Gadow, in press), and, once present, may exacerbate social deficits and peer relationship problems. Hence, social anxiety—as opposed to just low social motivation and social skill problems—could hypothetically be a contributory determinant of socially avoidant behavior in peer settings for some youth with ASD. Relatedly, some of the speech fluency and coherence deficits often seen in higher-functioning youth with ASD could be exacerbated by social anxiety.

The study sample included 42 youth and their parents who expressed interest in clinical trials for treatment of ASD and comorbid anxiety, ranging in age from 7 to 14 years, recruited through multiple community sources, including school psychologists, teachers, and medical centers in the greater Los Angeles area. Youth were grouped into age groups 7-10 and 11-14 for analyses. All youth had WISC full scale, perceptual, and verbal scores > 70. Diagnosticians, youth and parents rated social anxiety and other anxiety syndromes (e.g., MASC). Parents and youth also made ratings on common peer- and social-functioning measures such as the Loneliness Rating Scale.

In preliminary analyses, multiple correlations showed a significant linkage between the severity of social anxiety symptoms and loneliness, peer relationship problems (victimization), and social functioning challenges in both younger and older age groups. Social relationship problems were not significantly associated with severity of separation anxiety, generalized anxiety, or OCD. Approximately 13% of variance in social functioning was accounted for by the severity of social anxiety disorder. It would appear that high social anxiety may exacerbate social dysfunction in adolescents with ASD, increasing avoidance and timidity, loneliness, and victimization. Social anxiety may be a worthwhile focus in interventions for youth on the autism spectrum.
BIOMARKERS AND BEHAVIORAL INDICATORS OF ANXIETY AND FEAR IN YOUNG MALES WITH FRAGILE X SYNDROME

Chairs: Jane Roberts, University of South Carolina
Heather Cody Hazlett, University of North Carolina-Chapel Hill
Fragile X syndrome (FXS) is the most common cause of inherited intellectual disability and is strongly associated with several co-morbid conditions. Estimates suggest that up to 70% of males with FXS have an anxiety disorder and 50% meet criteria for autism. Likewise, anxiety is the most prevalent psychiatric co-morbid condition in children with idiopathic (non-FXS) autism with 29% meeting DSM IV criteria. Despite the high association of autism and anxiety in FXS, little work has been done to disassociate these two conditions or to trace the developmental pathway and underlying mechanisms in FXS. This symposium represents experimental and standardized behavioral data focused on outcomes and developmental trajectories of fear and anxiety in very young children with FXS that is integrated with multiple biomarkers. Heart activity, salivary cortisol and neuroimaging data will be presented in discussion of potential explanatory mechanisms for these and other clinical manifestations in FXS.

Outcomes Associated with Early Fear in Infants and Preschoolers with FXS
Bridgette Tonnsen
Pat Malone
Jane Roberts
University of South Carolina

Physiological Mechanisms of Fear and Anxiety in Young Children with Fragile X
Jane Roberts
Ashley Robinson
Bailey Tackett
Caroline Clark
University of South Carolina

Early Brain Development in Toddlers with Fragile X Syndrome
Heather Cody Hazlett
University of North Carolina-Chapel Hill
Introduction: Fragile X syndrome (FXS) is associated with several comorbid conditions, including anxiety disorders and autism spectrum disorders. Common characteristics shared by these conditions include problems with peers, social anxiety, social avoidance, gaze aversion, stereotyped behavior, and impulsivity. Despite the poorer outcomes associated with elevated anxiety and autism in children with FXS, no studies have evaluated the emergence of indicators that predict these disorders in the first years of life. Early behavioral traits related to anxiety and autism include atypical social approach and poor adaptability, which are elevated in the FXS phenotype. Within FXS, severity of autistic symptoms has been linked to decreased soothability, increased anger, and increased activity over time (McDonald et al., submitted); and anxiety has been associated with active and passive avoidance including arguing, blank staring, excessive fear, and compulsions (Sullivan et al., 2007). In one of the few studies examining autism and anxiety in FXS, evidence suggests that social avoidance contributes to social anxiety, whereas social indifference contributes to anxiety (Budimirovic et al., 2006; Hernandez et al., 2009).

Although early indicators of anxiety and autism have not yet been studied within FXS in the first years of life, anxiety and internalizing problems have been linked to temperamental fearfulness neurotypical children (Goldsmith & Leary, 2000) and to low extraversion and high negative affect in children with high functioning ASD (Pauw et al., 2010). Schwartz et al. (2009) suggest that affect-related temperament differences in infants later diagnosed with ASD may increase vulnerability to comorbid internalizing problems later in life.

The current study longitudinally examines the relationship between early fear and later anxiety and autistic behavior in infants and preschoolers with FXS using two indicators: behavioral response during a standardized stranger interaction and maternal reports of temperament.

Methods: Two sets of data were drawn from a prospective, longitudinal study of children with FXS. In Study 1 (n=43, 122 observations), behavioral facial and bodily fear response to a stranger were measured during the Laboratory Temperament Assessment Battery. In Study 2 (n=27, 115 observations), parent-reported fear, shyness and sadness temperament indicators were measured using the Rothbart scales (IBQ, IBQ-R, TBAQ, ECBQ). In both studies, outcome measures included the Childhood Autism Rating Scale and DSM-Anxiety scale on the Child Behavior Checklist.

Preliminary Results: Study 1: Preliminary MANOVA analyses were conducted using participants’ earliest stranger response data point. CARS scores varied significantly across levels of facial fear (p=.00, partial $\eta^2=.363$) and approached significance across levels of bodily fear (p=.09, partial $\eta^2=.122$). Participants’ final anxiety scores did not vary across levels of fear behaviors (p’s > .05). Study 2: Within a subset of young participants’ temperament data, anxiety outcomes significantly correlated with early fear (r=.40, p=.00), shyness (r=.32, p=.03), and sadness (r=.27, p=.02). Final CARS score did not correlate with these indicators (p’s>.05).

Final analyses will include two separate multilevel models (MLM) analyzing the relationship between autistic and anxiety outcomes and longitudinal patterns of stranger response and temperament. These results will inform whether patterns of change and stability across multiple early indicators of fear relate to autistic and anxiety outcomes within FXS.
Physiological Mechanisms of Fear and Anxiety in Young Children with Fragile X

Jane Roberts, Ashley Robinson, Bailey Tackett, Caroline Clark
Department of Psychology, University of South Carolina (jane.roberts@sc.edu)

Introduction: Fragile X syndrome (FXS) is associated with a wide range of cognitive and behavioral conditions. Recent evidence suggests that 70% of males with FXS display evidence of anxiety (Bailey et al., 2008) which can greatly compromise developmental outcomes and quality of life. The expression of anxiety is varied but often is evident through social avoidance, specific phobias, compulsions, and extreme shyness (Kaufmann et al., 2008; Sullivan et al., 2007). Recognition of the co-occurrence of anxiety and autism in both idiopathic autism (non-FXS; Simonoff et al., 2008) and FXS-associated autism highlights the importance of investigating the onset and underlying mechanisms associated with anxiety in FXS.

Anxiety is difficult to diagnose in children with neurodevelopmental disorders due to the challenge of eliciting reliable self-reports from individuals with intellectual disabilities and tendencies in clinical practice that symptoms of anxiety might better be explained by a primary diagnosis (i.e., intellectual disability). Thus, studies integrating biomarkers can be extremely valuable to elucidate the expression and etiology of conditions such as anxiety in neurodevelopmental disorders. Given that social and developmental impairment may be exacerbated by anxiety over time, early detection is critical to inform diagnostic and treatment efforts. Our work and others have suggested that atypical social responsivity in FXS is apparent in the first year of life and physiological factors may be the basis for these social abnormalities (Roberts et al., 2009; Roberts, McDonald, & Kelleher, 2010).

Methods: We will present data using a prospective longitudinal design integrating behavioral and physiological methods to examine the relationship among multiple experimental ratings of social responsivity reflecting 119 observations of young males with FXS (infants through middle childhood). Experimental measures include bodily escape and eye contact during informal interactions with an adult examiner. Physiological markers include heart rate, vagal tone and salivary cortisol.

Results: Preliminary data (figure) reflect an increase in avoidant eye contact over the first years of life. Social responsivity appears to vary based on familiarity of the person and length of time spent interacting. The interaction of escape behavior and age indicated that increased levels of social escape predicted severity of autistic behavior as measured by the Childhood Autism Rating Scale (F = 26.84; p <.001, r²=.49)

Discussion: Children with FXS are at very high risk for anxiety disorders which are highly associated with autism and other behavioral diagnoses. Understanding the early behavioral indicators of anxiety and possible underlying physiological mechanisms in the first years of life is critical to guiding diagnostic and treatment efforts.
Introduction: Autism is characterized as an etiologically heterogeneous disorder in which distinct mechanisms may account for the wide range of clinical expression. Neuroimaging studies have yielded important findings to contribute to our understanding of the characteristics of autism, and studies of toddlers with fragile X syndrome (FXS) from our group suggest that the brain volume profiles of FXS and autistic children are significantly different by age 2. We have reported that individuals with FXS show a pattern of brain abnormalities that differs from typical and developmentally-delayed (non-FXS) two year olds, and that autistic two year olds with FXS differ strikingly from autistic non-FXS two year olds (Hoeft, et al., 2008; Hazlett, et al. 2009). Of particular interest to this symposium, we reported decreased amygdala volume in the group with FXS (with and without autism) in contrast to increased amygdala volume in the group with idiopathic (non-FXS) autism. There was a lack of behavioral differences across these two groups, suggesting that atypical amygdala size (either too large or too small) may be one of the neuroanatomical differences associated with autism.

Methods: Our more recent work focuses on the emergence of neuroanatomical differences in high risk infant samples. For this talk, we will report on an ongoing prospective longitudinal study focused on early brain development in infants with FXS using structural brain imaging (MRI, DTI) at 6, 12, and 24 months of age. In this study, we examine how the trajectory and growth of brain development in infants with FXS compares to early brain development in infant siblings (infants with an older sibling diagnoses with autism) who later develop an autism spectrum disorder and in infants with typical brain development. We will present on study hypotheses, design, and features of preliminary data from this new study.

Results: MRI data from the high risk infant siblings and typical controls has been collected. We have not yet collected enough study data to conduct group based analyses but will discuss preliminary data with regard to features of the subject data collected to date. These data will be presented in the context of the neuroimaging findings from our study of toddlers.

Discussion: The ability to distinguish the early brain morphology of FXS may provide important clues to understanding the neurobiological phenotype of this disorder, and help identify brain mechanisms that could be potential targets for intervention. Additionally, using FXS as a model to understand other behaviorally related but more genetically complex disorders, such as autism, can provide new insights about early brain development in other neurodevelopmental disorders.

References:


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TRANSITIONS TO ADULTHOOD:
DIVERSE FAMILY PERSPECTIVES

Chair: Laraine Glidden, St. Mary’s College of Maryland
Transitions to Adulthood: Diverse Family Perspectives

Chair: Laraine Glidden, St. Mary’s College of Maryland

Challenges in Assessing Quality of Life for Adolescents and Young Adults with Intellectual Disability
Kristen Salkas
Frank Floyd
Georgia State University

Changes in the Mother-Child Relationship During the Transition to Adulthood for Youth with Autism Spectrum Disorders
Julie Lounds Taylor¹
Marsha Mailick Seltzer²
¹Vanderbilt Kennedy Center, Vanderbilt University
²Waisman Center, University of Wisconsin-Madison

Transition for Adolescents and Young Adults with Autism Spectrum Disorder: A Cross-Cultural Examination of Transition Planning, Family Involvement and Impact
Bonnie Kraemer
San Diego State University

Continuity and Change in Parent Perceptions
Laraine Glidden
Meredith Powlison
Katherine Painter
Jesse Ludwig
Katherine Grein
St. Mary’s College of Maryland
Current approaches to assessing the quality of life for individuals with intellectual disability recognize the importance of obtaining self-assessments. The first-person perspective uniquely informs us of subjective well being in terms of individual goals and preferences. It improves on measures taken by proxy that may not reflect how individuals really feel (Cummins, 1997). Self-reports are particularly useful from adolescents and young adults because this age group might fail to disclose their feelings to parents and other caretakers. However, it is a challenge to gather self-report information from individuals with intellectual disability because of difficulties designing comprehensible questions and response formats that effectively elicit the information, and because of well-known response biases, including acquiescence and socially desirable responding (Cummins, 1997). The purpose of the present investigation was to evaluate the quality of responses to a structured interview about quality of life in order to identify problems and explore reasonable solutions.

A sample of 108 adolescents and young adults, M age = 24.1 (SD=4.5), Range = 14 – 34 years, with mild and moderate intellectual disability completed a structured in-home interview during a follow-up of a longitudinal study of family adaptation. Quality of Life was assessed with the Lifestyle Satisfaction Scale (Heal et al., 1992), which includes 3 subscales measuring satisfaction with Community, Recreation, and Job. The measure also produces scores on an acquiescence scale. In addition, we classified the interview questions into 3 types of items, namely ratings of: (1) satisfaction with current circumstances, (2) desire for more participation in current activities, and (3) desire for circumstances or activities not currently available. The respondents also completed a measure of self-esteem as a criterion against which to evaluate quality of life scores.

Sixteen of the respondents were identified by the interviewers as giving invalid or unresponsive answers during the interview. Compared to the rest of the sample, these respondents answered questions more positively and showed little variation across items. Interestingly, this situation tended to produce very high alpha coefficients for the subscales.

For the remainder of the sample, the 3 subscales overall showed very weak internal consistency, and only the Community satisfaction scale was significantly correlated with self-esteem. However, when we separated item types within scales, (1) the alpha's improved to acceptable levels in some cases and (2) correlations with self-esteem were more consistent, though not for all types of items. Also, different types of items showed different, often opposite, associations with acquiescence.

The findings suggest recommendations for selecting among items that might be less susceptible to acquiescence. They also raise questions about how to better scaffold questions that ask respondents to report about desired changes they would like to see.


Changes in the Mother-Child Relationship during the Transition to Adulthood for Youth with Autism Spectrum Disorders

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Introduction: The exit out of high school and into adult life is a time of tremendous change for families of individuals with ASD. At high school exit, youth with ASD lose entitlement to all special education services, and enter an adult service world that is plagued by long waiting lists and unprepared to meet their needs. This transition is highly stressful for mothers, who often must assume the role of service coordinator after their son or daughter leaves high school. The present study examined how high school exit impacts family relationships by studying changes in the mother-child relationship during this transition, as well as factors associated with change.

Methods: We used a subsample of mothers of individuals with ASD from our larger, longitudinal study (Seltzer et al., 2003). Four waves of mother-child relationship data have been collected from the mothers, spanning a 7-year period. Mothers were eligible for these analyses if the son or daughter exited high school during the study period; 170 fit this criterion. At the start of the study, the son or daughter with ASD averaged 16.7 years, 76% were male, 64% had an intellectual disability, and 82% were living with their families. The mother-child relationship was measured by: maternal-reported positive affect in the relationship using the Bengtson Positive Affect Index (Bengtson & Schrader, 1982); maternal self-reported burden emanating from caregiving demands (Zarit, Reever, & Bach-Peterson, 1980); and maternal warmth, generated by codes from the Five Minute Speech Sample (Vaughn & Leff, 1976). Multilevel modeling using the HLM program (Raudenbush & Bryk, 2002) was the primary method of data analysis, allowing us to model initial scores for mother-child relationship variables, a trajectory of change prior to high school exit, and a trajectory of change after exit. All analyses controlled for concurrent changes in behavior problems as well as the son or daughter’s residential status.

Results: Mother-child positive affect significantly improved over time prior to high school exit, $B = .20$, $p < .05$, but improvement stopped after exit, $B = -.25$, $p < .01$. Maternal Burden decreased (improved) while youth with ASD were in high school, $B = -.30$, $p < .05$, but increased (got worse) after high school exit, $B = .67$, $p < .01$. There was no change over time in maternal warmth while youth with ASD were in high school, but warmth decreased over time after exit, $B = -.13$, $p < .01$. Slowing of improvement in the mother-child relationship was especially pronounced for mothers of youth who did not have an intellectual disability and mothers of youth who had more unmet service needs while in high school.

Discussion: The slowing (and even stopping) of improvement in the mother-child relationship, together with our earlier findings of slowing improvement in the autism behavioral phenotype, suggest that the years after high school exit might be a time of high risk for youth with ASD and their families. Youth without an intellectual disability seem to be most negatively impacted by exiting, which is likely related to the lack of adult services geared toward their unique needs.

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**SYMPOSIUM 11**

**Transition for Adolescents and Young Adults with Autism Spectrum Disorder: A Cross-Cultural Examination of Transition Planning, Family Involvement and Impact**

Bonnie Kraemer  
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**Introduction:** Autism Spectrum Disorder (ASD) is one of the fastest growing disorders in the United States today (CDC, 2009). Although many more services are being provided for young children with ASD (Lord & Richler, 2006), there exists a gap in specific programming for this population at the high-school level. Moreover, few services exist for this population after they exit the school system and post-school outcomes are often bleak (NLTS2, 2005). Not only are youth with ASD affected by these poor outcomes, but families and the broader family system, are affected as well (Schneider et al., 2006).

**Methods:** This paper will present data from an ongoing study examining the period of transition for youth with ASD (ages 16 to 26) and their families residing in Southern California. Although data collection is ongoing, preliminary analyses on a sample of 70 youth/families indicate that the majority of youth with ASD are male (87%) with a mean age of 19. Current ASD diagnosis varies [24.3% HFA/Asperger Syndrome, 34.3% autism with mild ID, 31.4% autism with severe ID, 10% PDD NOS]. Thirty-six percent have exited school and 20% are living out of the family home. Data presented in this paper will center on how youth with ASD are prepared to exit the school system and enter adult life; post-school outcomes achieved; and family involvement/family impact during this period of the lifespan. Data from a subsample of youth with ASD from Culturally and Linguistically Diverse (CLD) families will also be examined to determine if differences occur.

**Results and Discussion:** Transition programming for youth with ASD (N = 70) is varied, with less focus on vocational exploration/career development compared to activities of daily living and social skills. Families want to be more involved in decisions around vocational planning and placement. Exited young adults with ASD are involved in a variety of post-school options including post-secondary education (32%) and community employment (24%). Twenty-percent are without formal day activities. Most exited young adults continue to live at home (72%), however, families would like to be more involved in researching community living options during high-school and 53% see the young adult moving out within the next 5 years. Nearly 55% of families are satisfied with their involvement in transition planning, although parents of exited young adults are less satisfied with the involvement they had and consider transition less successful than parents of young adults still in school. Many families (53%) feel they do not have knowledge of adult services and that few services are available for their young adults after leaving the school system. They also report frequently worrying about various aspects of transition and heightened stress compared to families of transition age youth with ID with no autism diagnosis (t=4.48; p <.001). Parents who are more worried about transition and report more negative impact on well-being view transition planning/outcomes as less successful (r = -.237, p < .05). Future analyses will examine these issues for a subset of CLD families. Implications for working with, and supporting, families during the transition period will be discussed, particularly in light of differences which may emerge between CLD and not CLD families.

**References:**


Because of requirements of the Individuals with Disabilities Education Act, it is reasonable to target age 14 as an official beginning of the period of transition to adulthood. However, many transitions occur as children with ID/DD move into adulthood, and the process is characterized by its longitudinal nature. Transitions to adulthood last many years, although punctuated by some sudden changes such as the cessation of mandated public schooling at the 22nd birthday. The current presentation is based on a longitudinal study of more than two decades with families rearing birth or adopted sons and daughters with ID/DD (see Glidden & Jobe, 2009) and focuses on a comparison of parental perceptions between two transition period data collections when the sons/daughters with ID/DD were, on average 18 years old—Early Transition, and approximately eight years later when they were 26 years old---Late Transition. Data collection for Late Transition is ongoing, and the current abstract is based on data from 80 parents.

For the most part, Early and Late Transition comparisons were characterized by continuity rather than by change. For example, 84% of the sample was living with their parents during Early Transition, and 80% was still living with their parents eight years later. Parental satisfaction with this residence did not change during this period and was high. The means were in the satisfied to very satisfied range at both times. Parent well-being and perceptions of the target children were also quite similar across the eight years. For example, ratings of health, depression, and subjective well-being (SWB) related to the son/daughter with ID/DD were not significantly different between Early and Late Transition.

The similarity between adoptive and birth mothers that characterized earlier stages of measurement with this sample was reinforced in the current analyses. We found very few adoptive-birth differences and when they were obtained they were sometimes in the direction of better functioning by birth mothers. Moreover, other significant differences generally reflected more positive perceptions at the Late Transition time point. For example, fathers reported higher levels of global and current SWB at Late in comparison to Early Transition, and mothers reported significantly more rewards and fewer worries related to the social interactions of their sons or daughters.

Finally, regression analyses also indicated continuity more than change. For example, for both Early and Late Transition, family income significantly predicted maternal health with higher income associated with better self-reported health. Moreover, at both time points the strongest predictor of maternal depression was the personality trait of Neuroticism, measured approximately 14 years earlier than the Late Transition data collection.

Reference:

HUMAN FETAL EXPOSURE TO PSYCHOBIOLOGICAL STRESS ALTERS DEVELOPMENTAL TRAJECTORIES

Chair: Curt Sandman, University of California-Irvine
Human Fetal Exposure to Psychobiological Stress Alters Developmental Trajectories

Chair: Curt Sandman, University of California-Irvine

In 2004, at this conference, our group presented the first installment of our fetal programming projects. At that time we reported that fetal exposure to psychobiological stress resulted in impaired fetal learning, increased risk for preterm birth and emotional disregulation in neonates. Since then, our cohorts and our projects have matured. Accumulating evidence from our projects and a relatively small number of prospective studies from other laboratories indicate that exposure to prenatal psychosocial and biological markers of stress profoundly influences the developing human fetus with consequences that persist into childhood and very likely forever. In four coordinated presentations, we will review findings from our prospective, longitudinal research program of health and well-being that psychobiological markers of stress and exposure to glucocorticoids and infection during pregnancy, disrupts emotional regulation, impairs cognitive performance and decreases brain volume in areas associated with learning and memory in 6-8 year old children.

Exposure to Psychobiological Stress Exerts Programming Influences on Mother and Child with Consequences for Infant/Child Development

Curt Sandman
University of California-Irvine

The Role of Glucocorticoids in Fetal Programming of Child Development

Elysia Poggi Davis
University of California-Irvine

The Impact of Maternal Prenatal Pregnancy-Specific Anxiety on Infant and Child Neurodevelopmental Outcomes

Claudia Buss
University of California-Irvine

Differences in Magnetic Resonance Imaging (MRI) and Neurobehavioral Testing in Preterm Infants Exposed to Chorioamnionitis

Tamera Hatfield
Deborah Wing
Kevin Head
Tugan Muftuler
University of California-Irvine
Introduction: The studies from our research program provide strong evidence that fetal exposures to both psychosocial and biological stress have significant consequences for later development.

Methods: Two separate mother/fetal cohorts were evaluated with similar prenatal measures of biological and psychosocial stress procedures at regular intervals. Most subjects were followed as infants with serial measures of cognition and temperament at 3, six, 12 and 24 months. All subjects from both cohorts, who differ in age by ~5 years, entered our project to examine the longer term consequences of prenatal exposures to biological and psychosocial stress on laboratory measures of cognition and in a subsample, on brain volume (especially hippocampus and amygdala) as assessed with structural MRI.

Results: In addition to our published findings that fetal exposure to elevated levels of stress and stress hormones increase the risk for adverse birth outcomes exposure to maternal levels of critical placental hormones (CRH) and cortisol can result in precocious and/or delayed neurological development of the human fetus and the neonate. Findings will be presented that fetal exposure to cortisol over the course of gestation is associated with distinctive cognitive performance later in life. We will report that there are “programming” influences on the mother that increases the risk for postpartum depression. When there is a match between prenatal and postnatal maternal depression, motor and mental development is accelerated during the first year of life even when the conditions are unfavorable.

Discussion: There is clear evidence that prenatal adversity has long term consequences for the developing infant and child. Similar to predictions from the Predictive Adaptive Model, we discovered that stability of the prenatal and postnatal environment, even when both represent adversity, confers an advantage for critical survival functions during early development.

Supported by awards HD28413, NS41298, HD51852
The Role of Glucocorticoids in Fetal Programming of Child Development

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The prenatal period is a time of rapid change during which fetal organs and organ systems are forming and are vulnerable to both organizing and disorganizing influences. Prenatal exposure to glucocorticoids (GCs) is one putative mechanism for these persisting effects on later health outcomes. The role of GCs in shaping developmental outcomes is an important issue because prenatal treatment with synthetic GCs, administered to accelerate fetal lung maturation, is the standard of care for women in preterm labor (NIH Consensus Statement for the use of Antenatal Steroids, 1995) and thus hundreds of thousands of children are exposed each year. The developmental consequences of this treatment are poorly understood. We have recently shown that prenatal exposure to synthetic GCs disrupts HPA axis functioning in healthy full term newborns (Davis et al., 2010). The goal of the present investigation is to evaluate the persisting consequences of prenatal GC exposure for child cognitive functioning and brain development.

Methods: Participants included 6 to 10 year old children (N=132) who were recruited into 4 groups (term/preterm and steroid/no steroid). Neurodevelopment was evaluated with behavioral assessments of cognitive functioning and with structural MRI. Children completed the Perceptual Reasoning Index (PRI) of the Wechsler Intelligence Scale for Children (WISC-IV), a verbal recall task, and an assessment of spatial memory span. Brain development was assessed with structural MRI. Manual segmentation of the hippocampus and the amygdala was performed using a protocol developed by Pruessner et al. (2000).

Results: Children exposed to GCs prenatally had reduced hippocampal volume as compared to children without prenatal GC exposure (p's<.05). Volume of the amygdala was not associated with prenatal GC exposure. Further, children exposed to prenatal GC treatment performed more poorly on memory tasks that rely on the hippocampus (delayed recall and spatial memory span) (p's < 0.05). Groups did not significantly differ in performance IQ as assessed with the WISC IV. Importantly, the effects reported here remained significant after controlling for relevant covariates including total brain volume, gestational age at birth, current age and sociodemographic factors and maternal IQ.

Discussion: These data provide evidence that prenatal exposure to synthetic GCs has persisting consequences for neurodevelopment at 6 to 10 years of age. These are among the first human data to document a programming role of prenatal GCs for neurodevelopment. Our findings add to body of evidence indicating the importance of early exposure to GCs in shaping brain development and emphasize the necessity of considering prenatal influences on individual differences in health and development across the lifespan.
**Objective:** The origins of susceptibility for many neurodevelopmental and neuropsychiatric disorders can be traced back to the intrauterine period of life. The unfolding of all developmental processes from genotype to phenotype is context-dependent, wherein the developing embryo/fetus responds to, or is acted upon by, conditions in the internal or external environment during sensitive periods of cellular proliferation, differentiation and maturation, resulting in structural and functional changes in cells, tissues and organ systems. Due to the rapid developmental changes the brain is undergoing during the prenatal period, it is especially vulnerable to environmental insults during this early phase of development.

**Methods:** Over the past several years our studies at the UC Irvine Development, Health and Disease Research Program have addressed the interface between biological, behavioral and social processes in human pregnancy, with a focus on the impact of maternal psychosocial stress and stress biology on fetal development, birth outcomes, and subsequent newborn, infant, and child developmental and health outcomes. In the context of this presentation, findings from our ongoing longitudinal studies will be presented with a focus on the impact of prenatal maternal pregnancy-specific anxiety, assessed repeatedly over the course of gestation, on infant mental development, infant and child temperament and child brain morphology and cognitive performance.

**Results:** Our studies suggest that high levels of maternal pregnancy-specific anxiety are associated with delayed infant mental development, more difficult infant and child temperament, localized reductions in brain gray matter volume and impairment in executive function.

**Conclusion:** It is well-established that alterations of brain morphology and function are associated with several neuropsychiatric, neurodevelopmental and behavioral disorders. Fetal programming of the brain might affect an individual's susceptibility for these disorders across the lifespan. Pregnancy specific worries during gestation may therefore be a target for interventions that could improve neurodevelopmental outcome in the offspring.

This research was supported by National Institute of Health grants NS-41298, HD-51852 and HD28413.
Objective: Chorioamnionitis has been implicated in brain injury by activation of the fetal inflammatory response system. Additionally, funisitis is often described as the histologic correlate to the fetal inflammatory response. The contribution of chorioamnionitis/funisitis to persistent neurologic change manifested as direct structural alteration and subsequent consequences for child development are not well studied. We sought out to determine if there are differences in brain structure measured by MRI at 6-10 years of age that relate to differences in neurobehavioral testing in children born preterm and exposed to chorioamnionitis.

Methods: 44 subjects, born prematurely, underwent neurodevelopmental testing at 6-10 years of age. A subset (27) of these children underwent MRI. For the subjects that underwent MRI, 11 were exposed to chorioamnionitis and 16 served as controls. For the behavioral testing group, subjects were further subdivided by placental histopathology as funisitis exposed (n=7), chorioamnionitis exposed (n=9), and controls (n=28). Children were evaluated with subtests of 3 standardized, age normalized, measures of cognitive development: the Perceptual Reasoning Index of the Wechsler Intelligence Scale for Children, the Expressive Vocabulary Test, and the Wide Range Assessment of Memory and Learning. For the MRI analysis, cortical surface reconstruction and volumetric segmentation were performed with FreeSurfer image analysis software suite. Comparisons were made to assess differences in cortical thickness with all analyses corrected for multiple comparisons using the Monte Carlo method (p<.05). Subcortical structures were analyzed using univariate analysis with total brain volume as a covariate.

Results: The funisitis group scored lower than the Chorio and Control groups on all tasks. For example, the average WISC performance IQ scores for the Funisitis group was 92.5 as compared to Controls who had an average score of 99. MRI analysis demonstrated widespread regional differences in cortical thickness between groups. Overall, there were more regions where the cortex was thinner among Chorio cases as compared to Controls, including the superior and inferior temporal, superior frontal, precuneus, pars opercularis, and lingual regions. However, a few regions including anterior/posterior cingulate, and superior temporal gyrus were thicker among the Chorio group as compared to Controls. Subcortical analysis revealed that the left lateral ventricle was larger and the right hippocampus was smaller in Chorio subjects than in Controls.

Conclusion: Using MRI, chorioamnionitis appears to have long term widespread regional effects on brain development in children born prematurely. Deficits in these regions are associated with cognitive dysfunction suggesting that chorioamnionitis poses greater risk for adverse developmental outcomes. The neurobehavioral data supports these findings and specifically suggests that funisitis may confer worse cognitive deficits.
POSTER
SESSION 2

THURSDAY, MARCH 3, 2011
5:30-7:30 p.m.
POSTER SESSION 2

1. The Gastrostomy Tube: A Mother’s Blessing and Curse

Karla Ausderau
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Introduction: Research has shown that mothers are frequently able to express at least one benefit when their child initially receives a gastrostomy tube (g-tube) such as a “relief” or a “weight being lifted” (Craig & Scambler 2005). The bio-medical implications and complications of having a g-tube have heavily been discussed in the literature. However, a dearth of research has been done on the delayed more subtle and often expected gains and significant losses a g-tube placement can have, impacting the daily lives of mothers and children. The purpose of this research was to explore mothers’ experiences of feeding and caring for children with a g-tube including its impact on daily life.

Methods: Seven mothers with children, ages 1 to 4 years, diagnosed with developmental and special health care needs participated in a qualitative study. The children all received the majority of their nutrition through a g-tube. The families were selected for participation to achieve maximum variation providing an opportunity for observing and discovering commonalities across a diverse group of experiences. Narrative interviewing techniques were used to collect data with mothers participating in 2 to 4 interviews in their home and/or preferred community settings with each interview lasting an average of two hours. An interview guide focusing on the daily experiences between a mother and child specifically around oral and non-oral feeding opportunities was used to elicit stories. Narrative and thematic analysis building on a phenomenological approach were used to analyze the data.

Results: Analysis revealed the complexities inherent in caring for a child with a g-tube. For all the families, the g-tube was situated within a context of illness and fragility. Through their stories, mothers expressed the gains and unanticipated challenges after the placement of a g-tube including new ways of thinking about mothering in the context of chronic illness. At times, the gains and losses were inseparable and deeply embedded within mothering and family activities. For example, the g-tube was thought of as a life saving device allowing the child and mother decreased social stress during public and family eating, increased control over nutrition and medication, a visual appearance of normalcy, and the ability to attend activities such as school. However, the g-tube also disrupted body integrity, lead to an increase loss of oral feeding experiences for the child and mother, and contributed to a mother’s sense of “failure” at not being able to feed her child by mouth. Mother’s also described the unrealized promises of the g-tube such as a “guarantee” their child would begin to gain weight but not seeing it happen.

Discussion: Findings demonstrated the need to further explore the impact of a g-tube on children's developmental trajectory and mothers' identity and daily lives. Although the g-tube may often be considered medically necessary, the full impact may reach well beyond the narrow bio-medical complications currently considered in the literature. The exhaustive work mothers do on daily basis to care for their child and how that care is not necessarily made easier with the insertion of a g-tube needs to be considered. Children continued to struggle with certain related problems even after the g-tube was placed continuing to impact their overall participation, and engagement. The findings also supported providing an individualized approach to allow mother’s to adapt and modify the child’s care in order to better suit the child and mother’s daily activities creating the possibilities for hidden blessings the g-tube may also provide.

POSTER SESSION 2

2. The Effects of Landmark Instruction on Wayfinding in Persons with Down Syndrome

Megan Benson, Edward Merrill, Frances Conners, Beverly Roskos-Ewoldsen
University of Alabama
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Introduction: Previous research has suggested that individuals with Down syndrome exhibit several brain abnormalities, including volume reductions of the hippocampus (Pennington, Moon, Edgin, Stedron, & Nadel, 2003). Because research has implicated the hippocampus in wayfinding, we predicted that individuals with Down syndrome may experience impairment in navigating their environment (Burgess, Donnett, & O'Keefe, 1998). The current study examined wayfinding ability in persons with Down syndrome, individuals of the same age with intellectual disability not resulting from Down syndrome, and typically developing younger children. Participants were tested with and without instructions to focus on landmark learning, a strategy commonly used to enhance spatial navigation (Cornell, Heth, & Broda, 1989).

Method: Participants with and without ID were matched on the Nonverbal portion of the Kaufman Brief Intelligence Test-II. The wayfinding task required participants to navigate and learn a path through a virtual environment. Participants initially travelled the path by following a series of green lights that identified the correct path. In the landmark instruction condition, participants were told to pay attention to the landmarks in the environment during this learning phase because they would be helpful when traveling the route without the lights. In the no instruction condition, participants were simply told to learn the route. Participants then completed a test phase without the green lights during which errors were recorded. Memory for the landmarks was also assessed.

Results and Discussion: The results indicated that the participants with Down syndrome performed significantly worse on the wayfinding task than both the typically developing participants and those with mixed-etiology intellectual disability, despite having been matched on nonverbal ability. The typically developing and mixed intellectual disability groups did not differ. Landmark instruction did improve wayfinding performance and memory for the landmarks but did not influence the group differences. We concluded that wayfinding may reflect a relative weakness for persons with Down syndrome beyond what would be expected on the basis of nonverbal measures of ability.

References:


3. Long-Term Effects of Maternal Responsivity for Children with Fragile X Syndrome

Nancy Brady, Steve Warren, Juliana Keller, Kandace Fleming
University of Kansas (nbrady@ku.edu)

Introduction: A substantial body of research indicates that cumulative exposure to a stable, highly responsive parenting style throughout early childhood is associated with a variety of child benefits in terms of language, cognitive, emotional and social development. In 2010, we reported that maternal responsivity was significantly related to differences in language and communication by a group of 55 young children with FXS (Warren, Brady, Sterling, Fleming, & Marquis, 2010). Early maternal responsivity predicted the level of four important child language outcomes at 36 months of age after controlling for child developmental level and autism symptomology. We have continued to follow the families in this study and in this poster we present the results extending our analyses to middle childhood.

Methods: Data from all 55 dyads was analyzed and there was little missing data as 52 mother child dyads completed all four assessments. The average age at the first assessment was 28 months. Data was collected for each dyad approximately every 18 months. Performance data were obtained from video observations of book reading, free play, making and eating a snack together, as well as an unstructured interaction. Child data coded from each video included the number of different words (NDW) spoken or signed. In addition, child data from the Peabody Picture Vocabulary Test and the Expressive Vocabulary test completed at the fourth observation provided standard vocabulary measures. Each observation was also coded for maternal attention and communicative behaviors directed toward the child. A principal components analysis was used to determine two factors of maternal behavior. Facilitative interaction (FI) factor consisted of requests for verbal complies, use of gestures, use of recodes and use of comments. Behavior management (BM) factor was made up of zaps (corrections or admonishments), redirecting the child’s attention, and requests for behavioral complies. The two parenting components—FI and BM—obtained when children were approximately 28 months of age were included as predictors for child performance. Growth in child rate of different words was modeled using growth curve analyses with age centered at 56 months (the grand mean). The relationships between early parenting components and the standardized vocabulary measures (PPVT and EVT) obtained at the most recent data point were analyzed.

Results: A linear model was the best model for growth in rate of different words by the children. Child developmental scores and CARS scores were included in the model and each was significantly related to rate of different words at 56 months. Additionally, CARS scores were related to slope (rate of change in different words). FI was significantly related to rate of different words at 56 months with all of these other variables in the model while BR was not statistically significant.

Early FI was significantly related to PPVT standardized scores obtained at the fourth data point (Pearson correlation r=.55 (p<.001, n=47). FI was also significantly related to EVT (r=.33, p.04, n=41). Behavior regulation was not significantly related to either of the vocabulary measures (PPVT r = -.08 and EVT r = -.21).

Discussion: Maternal responsivity measured at a young age continued to play a significant role in children’s later language development. Children whose mothers were more facilitative learned to produce and understand more words over time. Behavior management did not show this relationship.

References:
4. Revisiting Inclusive Recreation: Predictors of Social Acceptance in a Camp Setting

Melissa Collins, Joanne Kersh, Gary Siperstein
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Introduction: A growing body of research focuses on inclusive recreational experiences as a context for promoting the social acceptance of children with a variety of disabilities, including intellectual and developmental disabilities (Siperstein, Glick, & Parker, 2009; Devine & O’Brien, 2007). However, the individual characteristics that may promote or deter social acceptance in these contexts remain largely unexamined. This study explored the determinants of social acceptance of children with a range of intellectual impairments, at an inclusive summer camp.

Methods: A total of 109 pre-adolescents (8 -12 years old; 58% male) from urban school districts in eastern Massachusetts attended a four week inclusive summer day camp. Approximately half (49%) of the children had disabilities, including learning disabilities (n=25), intellectual disabilities (n=19), and autism spectrum disorders (n=7). Importantly, campers were never told who had a disability. At the end of camp, children were interviewed individually and asked to nominate their peers in response to the question, “Which campers do you like to hang out with?” Total nominations received by each camper were used as dependent variables. In addition, to assess campers’ social functioning, counselors completed modified versions of the interpersonal subscale of the School Social Behavior Scales (SSBS; Merrell, 1993) and the problem behavior subscale of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990).

Results: There were significant differences between campers with and without disabilities on indices of both social acceptance (“hang out”) and social rejection (“don’t like”). Campers with disabilities received a mean of 1.67 “hang out” nominations, compared to 3.18 for typically developing campers (t = 3.68; p < .001). With regard to “don’t like” nominations, campers with disabilities received a mean of .67, compared to .24 for campers without (t = 2.22; p < .05).

To further explore these differences, parallel hierarchical regression analyses were performed on the total number of “hang out” and “don’t like” nominations, with predictors entered in the following order: 1) gender; 2) interpersonal skills and problem behaviors; and 3) disability status (with or without disabilities). Total number of “hang out” nominations were predicted by a combination of interpersonal skills (β = .321, p < .01) and disability status (β = .239, p < .05). Interpersonal skills partially mediated the relationship between disability status and nominations received. Ability status explained an additional 5% of the variance above and beyond interpersonal skills. Total “don’t like” nominations were predicted by a combination of problem behaviors (β = .450, p < .001) and disability status (β = -.195, p < .05). Behavior problems did not mediate the relationship between disability status and “don’t like” nominations received. Ability status explained an additional 3% of the variance above and beyond behavior problems.

Discussion: Campers’ social acceptance and social rejection were each determined by a combination of individual social functioning and disability status. Campers who had more developed social skills and who were typically developing were more socially accepted at camp. Campers who exhibited more behavior problems and who had a disability were more likely to be rejected. Interestingly, neither social acceptance nor rejection was exclusively explained by individual variation in social functioning; rather, in both cases, disability status contributed to the variance in sociometric outcomes. Although children were never formally identified as having a disability, their disability status still appeared to be a determinant of social status above and beyond social functioning. These findings suggest the salience of the stigma of disability in determining social outcomes among youth. Implications for promoting the social acceptance of children with disabilities in recreational settings are discussed.
5. Parenting Stress in Mothers of Very Young Children with Williams Syndrome

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Background and Purpose: Williams syndrome (WS) is a neurodevelopmental disorder caused by deletion of ~25 genes on chromosome 7q11.23, typically resulting in intellectual functioning in the borderline to moderate disability range. The relation between parenting stress and having a child with a developmental disability is well documented (e.g., Baker, McIntyre, Blacher, Crnic, Edelbrock, & Low, 1997; Cameron, Dobson, & Day, 1991). Mothers of school-aged children with WS have significantly higher rates of Generalized Anxiety Disorder (GAD) than the general population even though their rates of GAD were comparable to those of the general population prior to their realization that their child was not developing typically (Leyfer et al., 2009). This pattern of findings suggests that caregivers of children with WS are likely to experience high levels of stress. The present study is the first to examine patterns of stress in mothers of very young children with WS and to explore the association of these patterns with DSM-IV anxiety disorder diagnoses.

Methods: The mothers of 27 children with genetically-confirmed WS, aged 1.05 - 4.79 years (M = 3.27 years, SD = 1.00) participated. They completed two measures: 1) The Parenting Stress Index (PSI), 3rd edition, a self-report measure of stress within the parent-child relationship and family system, which yields a Child Domain (CD) stress score, Parent Domain (PD) stress score, and Total Stress (TS) score; and 2) The Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV), Client Version, a semi-structured clinical interview that assesses DSM-IV diagnostic criteria for anxiety and related disorders.

Results: Six mothers (22.2%) met DSM-IV criteria for GAD, a rate significantly higher than that for the general population (p = .007), and 33% met DSM-IV criteria for any anxiety disorder. The authors of the PSI define scores ≥ 85th percentile as in the “critical range” for high stress. The PD scores of 14.8% of the mothers met this criterion, a rate consistent with that for the general population (15%). In contrast, 48.2% of the mothers’ CD scores met this criterion, a rate significantly higher than for the general population (15%; p < .001). A comparison of PSI subscale scores between the anxious and non-anxious mothers showed the largest between-group discrepancies in stress levels for the PD Competence (CO) and Role Restriction (RO) subscales. To investigate the association between parenting stress and anxiety, a logistic regression was conducted using these subscales to predict group membership (anxiety diagnosis or no diagnosis). Results supported the model, [χ² (2) = 7.91, p = .02], with the RO subscale providing a significant contribution to group membership prediction (p = .05). A follow-up logistic regression was conducted to predict anxiety group membership using the RO subscale as a predictor, yielding strong support for the model [χ² (1) = 7.76, p = .01], with RO providing a significant contribution (p = .02).

Discussion: These findings suggest that mothers of very young children with WS are at increased risk both for GAD and for experiencing critically high levels of parenting stress. Further, an association was found between having a DSM-IV anxiety diagnosis and mothers’ feelings of restricted independence or self-identity beyond the parenting role, due at least in part to feeling overwhelmed by their child's needs. Implications of these findings for intervention will be discussed.
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Introduction: Prader-Willi syndrome (PWS) is caused by either the structural loss of material or the absence of gene expression from the paternally inherited copy of chromosome 15 (q11-q13). In addition to a well-described behavioral phenotype that includes hyperphagia, obsessive-compulsive symptoms, disruptive behavior, cognitive delays, research also suggests that some persons with PWS have repetitive behavior and social deficits reminiscent of autism spectrum disorders (ASD). In particular, it appears as though those individuals with the maternal uniparental disomy (m-UPD) subtype of PWS are at greater risk for autistic symptomatology than those with paternal deletions (DEL) of 15q11-q13. These findings are particularly intriguing in light of data implicating maternal duplications of the same chromosomal interval in idiopathic autism, as well as evidence that functional alterations of genes in this region are associated with social deficits found in a variety of neurodevelopmental disorders. The purpose of this research is to examine social competence in individuals with PWS and to further test the hypothesis that m-UPD is a specific risk factor for autistic symptomatology.

Method: To date, parents of 66 participants (26 DEL, 22 m-UPD, 17 ASD) completed the Social Competence Inventory (SCI; Rydell, 1997). For a subset of participants, parents also completed the Vineland Adaptive Behavior Scales and the Autism Diagnostic Inventory-R (ADI-R) (11 DEL, 12 m-UPD, 12 ASD).

Results and Discussion: Participants with PWS and those with ASD evidenced impairment in social competence. No differences were found between groups on Social Initiative Subscale [DEL = 2.83(.58), m-UPD = 2.82(.64), ASD = 2.76(.56)]. Participants with ASD differed from those with both DEL and m-UPD on Prosocial Behavior Subscale (F = 6.07, p < .01). Genetic subtype differences on social competence were not found. Prosocial Initiative scores among those with PWS correlated positively with the Vineland Social (DEL r=.68; m-UPD r=.62) and Vineland Communication (m-UPD r=.82). Social competence among participants with ASD did not correlate with adaptive functioning. These findings indicate individuals with PWS have difficulty initiating social interaction (e.g., making contact with unfamiliar peers) and may be prone to social hesitancy or withdrawal similarly to those with an ASD. However, prosocial behaviors such as generosity, empathy, and helpfulness are more evident in those with PWS than in individuals with ASD. These findings will be discussed in relation to ADI-R diagnostic criteria. These findings give further insight into the social functioning of persons with PWS and indicate need for social skills intervention in this population.
POSTER SESSION 2

7. Caregiver Directiveness Moderates the Relation Between Joint Attention and Subsequent Language in an At-Risk Sample

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The objective of this study was to examine whether and how caregiver directiveness affected the relation between children's joint attention skills and their subsequent language ability in children at risk for language delay. The link between joint attention and subsequent language development is well known (e.g., Dawson et al., 2004), but there is less research on how directive caregiver behaviors may influence this relation. Researchers have generally proposed that caregiver directiveness is detrimental to a child's development because it places a heavy burden on the child's attentional system, making the process of learning new information more difficult for the child. Others argue that directive behaviors can actually provide a helpful learning framework for children to the extent that such behaviors match children's ongoing behavior and attention (Murray & Hornbaker, 1997).

Fifty children enrolled in early intervention for prenatal cocaine exposure were selected. At 18 months, children's ability to respond to joint attention (RJA) was measured with the Early Social Communication Scales (Mundy et al., 2003), and caregiver behaviors were measured during a brief free play interaction with the Maternal Behavior Rating Scales' (Mahoney, 1992) Directiveness scale. Directiveness ratings were converted into quartile groups, which identified caregivers by four increasing levels of proportion on directiveness. The 24-month outcome consisted of teacher reports of receptive and expressive measures of language, from the Receptive Expressive Emergent Language (REEL-2; Bzoch & League, 1971).

Caregiver directiveness moderated the relation between RJA and 24-month receptive $\Delta R^2 = 0.21$, $F(3, 40) = 4.67$, $p = .007$, and expressive language, $\Delta R^2 = 0.25$, $F(3, 40) = 6.85$, $p = .001$. RJA predicted 24-month expressive language for children whose caregivers fell between the 25th and 50th percentile group of directiveness [$R^2 = 0.40$, $F(1, 9) = 6.02$, $p < 0.05$]. For children whose caregivers fell between the 50th and 75th percentile on directiveness, RJA was a significant predictor of 24-month receptive [$R^2 = 0.39$, $F(1, 19) = 12.18$, $p < 0.01$] and expressive language [$R^2 = 0.47$, $F(1, 19) = 16.91$, $p < 0.01$]. RJA was not a significant predictor of subsequent language in children whose caregivers were in the bottom and top quartiles of directiveness.

This study provides preliminary evidence that a temperate level of directiveness may be helpful for the language development of children at risk for delay. Understanding what factors are most salient for improving the language competencies of a high risk sample may lead to more appropriate interventions that will help advance these children's school readiness skills.

References:


8. Teaching Young Adults with Intellectual and Developmental Disabilities to Respond Appropriately to Lures from Strangers

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Introduction: Young adults with intellectual and developmental disabilities (IDD) are particularly vulnerable to being taken advantage of. Parents have indicated concern for the individual’s safety as a major barrier to allowing young adults with IDD to attend post-secondary education, obtain a job, or live independently. Learning self-protection skills could enhance independence and quality of life for individuals with IDD. To address one aspect of this parental concern and need for training, young adults with IDD and their parents participated in a safety training to teach appropriate responding to lures from strangers. This study evaluated the effectiveness of a 2-phase training to teach 5 young adults with IDD to respond appropriately to lures from strangers.

Method: A multiple baseline design across 5 young adults (ages 20-23) with mild to moderate intellectual disabilities (IQ 46-68) was used to evaluate the effects of a behavior skills training (BST; instruction, modeling, rehearsal, feedback) intervention.

In Phase 1, behavior skills training (BST) was used to teach participants to say “no”, walk away, and tell an adult in response to a lure from a stranger. Participants rehearsed the safety responses through 5 role-plays during daily classroom sessions.

Once criterion was met, Phase 2 training was conducted in situ; participants completed 5 role-plays in community settings every 1-2 days.

The safety skill of walking away from the stranger was measured during baseline, generalization, and maintenance through in situ assessments. For each in situ assessment, the participant was left alone in a community setting; a confederate stranger approached the participant, presented a lure, and waited for a response. Participants were unaware they were being tested.

Results: Prior to training, participants did not walk away from confederate strangers. Skills were quickly acquired during Phase 1 role-play, with participants meeting criterion within 3-4 sessions. In situ assessments conducted during Phase 1 and prior to the start of Phase 2 indicated that participants still did not always walk away from the confederate stranger. During Phase 2, participants again quickly met criterion and independently walked away during 80% of role-play scenarios within 3 in situ training sessions. Generalization increased throughout Phase 2. All participants walked away after completing Phase 2 and skills maintained up to 3 months after training.

Discussion: This study extends the literature to teaching young adults with IDD to respond appropriately to lures from strangers, decreasing the risk of being taken advantage of.
**POSTER SESSION 2**

**9. Maternal and Child Contributions to Socio-Emotional Development in One- and Two-Year-Olds**

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**Introduction:** The dynamic processes occurring between young children and their environment are critical to later development (Sameroff, 1998). Interactions between young children and their caregivers should be supported to benefit the child and parent (Heckman & Rubinstein, 2001). Factors associated with early child development are being investigated by a cross-disciplinary, cross-institutional research team in a six year long study, Conditions Affecting Neurocognitive Development and Learning in Early Childhood (CANDLE). One aim of CANDLE is to examine factors that contribute to socio-emotional development from the 2nd trimester of pregnancy through the child's third year of life. This purpose of this study is to identify maternal and child factors that contribute to socio-emotional development in 12 and 24 month old children.

**Method:** This CANDLE cohort includes 114 African American mothers and their children who participated in data collection within one month of the child reaching 12 months and 24 months. Women with low risk, healthy, single gestation pregnancies between 16 and 39 years were included in this sample. Measures used in this study include: Brief Infant-Toddler Social and Emotional Assessment (BITSEA); Brief Symptom Inventory (BSI); Parent Child Interaction (PCI) Teaching Scale. The BITSEA is a parent-report measure of social-emotional problem behaviors and developmental competencies for children ages 12 months to 35 months 30 days and yields Problem and Competence total scores. Competence scores are used in this study; low Competence scores indicate possible deficits in social skills. The BSI assesses psychological symptom patterns across nine dimensions and three indices of distress for adults and adolescents. Depression dimension T scores are used in this study; higher scores indicate more distress or symptomatology. PCI Teaching Scale scores are based on an observed mother-child interaction in which the mother teaches the child to play with a novel toy. PCI caregiver subscales include sensitivity to cues, response to distress, social-emotional growth fostering behavior, and cognitive growth fostering behavior. PCI child subscales include clarity of cues and responsiveness to caregiver.

**Results:** Multivariate analysis showed that BITSEA Competence at 12 months was best explained by the child's birth weight, child gender, maternal age at the time the mother enrolled in CANDLE (2nd trimester), maternal depression, maternal education, and the PCI cognitive growth fostering subscale (p = .009). BITSEA Competence at 24 months was best explained by the mother's PCI response to distress subscale at 12 months (p = .01). The significant contribution of the child's birth weight to BITSEA Competence at 12 months did not hold for 24 month olds. Maternal education increased from the 12 to 24 month visit as the respective proportion of mothers with less than high school education was 26% and 16%.

**Discussion:** Younger mothers reported their 12 month olds had fewer competencies than older mothers. Low birth weight and male gender were associated with fewer competencies. The positive association between socio-emotional competence as measured by the BITSEA and the PCI cognitive growth fostering scale scores rather than the social emotional growth fostering subscale may be related to instrument, i.e., type and number of items in each subscale and interactions between maternal age and education. Younger mothers had less formal education. The association between maternal response to distress at 12 months and social emotional competencies at 24 months requires further examination at 36 months with additional data.

**References:**


The study of intentionality focuses on how children come to understand the intentions of others (Meltzoff, 1995). Research indicates that typically developing children begin to understand intentionality at about 18 months (Bellagamba & Tomasello, 1999; Meltzoff, 1995) and that understanding of intentionality improves with age (Bellagamba et al., 2006; Huang et al., 2006). One population that may exhibit unique performance on intentionality is children with Williams Syndrome (WS). Research by Tager-Flusberg and colleagues indicates a relative sparing in the social-perceptual skills and a relative weakness in the social-cognitive skills in WS (Tager-Flusberg & Sullivan, 2000), and understanding intentionality involves both of these dimensions. In one study, children with WS exhibited heightened levels of emotional responsivity and were more likely to imitate the emotional displays of their social partner (Fidler et al., 2007); however, their knowledge of their social partners’ emotions did not inform their social decision making. This suggests that children with WS may have difficulties taking the perspectives of others, despite being responsive to affective cues. This current study explores how the presence of affective verses non-affective cues are related to performance of young children with WS on an intentionality task and how age (chronological, mental, non-verbal mental age) is related to task performance.

Participants were 25 children with a confirmed diagnosis of Williams syndrome. Participants had a mean age of 45.5 months (range 26-77 months), a mean verbal mental age of 31.20 months (range 16.50-45.50 months), and a mean non-verbal mental age of 27.83 months (range 16-68.5 months). The intentionality task, adapted from Meltzoff (1995), examines children’s ability to read an adult’s intentional action on an object. Each child was shown 5 or 6 different presentations of novel toys that involved either: 1. a successful completion of a target action or, 2. a failed- attempt at completing the target action (at least 3 failed-attempts were shown). There were two types of administrations, affect and no affect. Two coders coded child responses for performance of the target action, imitation of the failed attempt, or some other action.

Results showed that children who received affective cues during administration of the target acts or failed attempts performed more target actions on the target administration ($M = .67, SD = .24$) than children who did not receive affective cues ($M = .49, SD = .41$). However, children who received affective cues also imitated the failed attempt more ($M = .44, SD = .42$) than children who did not receive affective cues ($M = .18, SD = .24$). Children who did not receive affective cues performed slightly more target actions on the failed attempt administration ($M = .43, SD = .32$) than children who did receive affective cues ($M = .36, SD = .29$). Correlation analyses indicate that developmental status is negatively associated with imitation of the failed intentional actions. However, this pattern was not found in the children who did receive affective cues. These findings add to the growing literature on intersubjectivity in WS, and suggest that emotional cues may not facilitate understanding the actions of their social partners in certain circumstances.

References:


POSTER SESSION 2

11. Peer Relationships and Extracurricular Activities of Children with Williams Syndrome: A Preliminary Study

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Introduction: The development of friendships and positive interpersonal relationships is important for social development. Individuals with Williams syndrome (WS), a developmental disorder caused by a microdeletion of ~25 genes on chromosome 7q11.23, are often characterized as being overly friendly and socially disinhibited. Despite their interest in social engagement, they also almost always have difficulty with pragmatics. These behaviors might be expected to make it difficult to have sustained positive social interactions. A very common concern among parents of children with WS is that although their child would like to have friends, he or she has difficulty making and maintaining friendships. The purpose of the present study was to provide an initial description of parents’ perceptions of their children's peer relationships, reasons why they think development of meaningful friendships is difficult for their child with WS, and the extracurricular activities in which their child is engaged.

Methods: The participants were 81 children with WS age 9.06 – 16.96 years ($M = 12.40$, $SD = 2.33$). Mean KBIT-2 Composite IQ was 71.62 ($n = 63$, $SD = 14.75$, range: 47 – 106). The Anxiety Disorders Interview Schedule for DSM-IV: Parent version (ADIS-P) was administered to each child’s parent(s). Responses to the Interpersonal Relationships section were analyzed to provide a preliminary examination of the child’s peer relationships and the extracurricular activities in which the child was engaged.

Results: Most parents (87.7%) reported that their child either preferred to spend most (64.2%) or some (23.5%) of his/her free time with other children; only 12.4% preferred spending time alone. Nevertheless, the majority has trouble both making (58.0%) and keeping (67.9%) friends. As a result, a large proportion of parents (79.0%) reported that their child had fewer friends than most children. When parents were asked what they thought made friendships difficult for their child, many gave more than one reason. The most common reason mentioned was the child's developmental disability (68.3%); the next most common reasons, social communication issues (28.6%) and lack of acceptance by peers (23.8%), were often given in conjunction with mention of the child's developmental disability. Parents reported that the most common activities engaged in with friends were active play (e.g., playing outside; 70.3%) and/or excursions (e.g., going to the mall or movies; 35.4%).

Parents also were asked to list the types of extracurricular activities in which their child was engaged. Most children (74.1%) participated in at least one extracurricular activity. Of the children who were not currently engaged in any extracurricular activity, 61.9% had participated in the past. The most common extracurricular activity was involvement in a community group (e.g., Girl/Boy Scouts, 4-H; 46.2%), followed by sports (general and/or special needs; 57.4%), lessons (e.g., music, dance; 20.0%), religious group/activity (20.0%), and student organizations (e.g., band, chorus, drama club; 17.0%).

Discussion: The results of this preliminary study confirm the concerns previously raised by parents of children with WS. Despite involvement in a variety of extracurricular activities and the desire to spend time with other children, most children with WS have considerable difficulty making and/or keeping friends. The most common reason for these difficulties, as reported by the parents, was the child's developmental disability; social communication problems, which are very common for individuals with WS, was the second most common reason, and many parents named both these problems. Possible correlates of these difficulties (e.g., performance on the Children's Communication Checklist -2 Social Relations scale, Behavior Rating Inventory of Executive Function Behavior Regulation Index) will be considered and implications for intervention discussed.
12. Autism IEPs: Factors Involved in the Parental and Professional Satisfaction of the IEP Process

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Introduction: Previous research has found that parental satisfaction with both the process and the outcomes of the IEP is highly related to professional etiquette and the parents’ level of education (Miles-Bonart, 2002), as well as the quality of ongoing academic achievement data that has been shared previously with parents (Green & Shinn, 1994). Parents of children with physical or health impairments reported having significantly less satisfaction with their child's IEPs than other areas of special education (Miles-Bonart, 2002), a finding consistent with reports that the more complicated a child’s educational needs, the less likely parents of children with autism were to report satisfaction with their child’s special education program (Bitterman et al, 2008). Such satisfaction levels among parents of children with autism were also found to be inversely related to the amount of time that a child had been in special education (Spann, Kohler, & Soenksen, 2003).

Discussion: While there is a considerable amount of literature on parental satisfaction levels regarding the IEP, there has not been a study that examined three very significant questions: (1) What factors explain parental satisfaction with their child’s IEP and professional’s satisfaction with a student’s IEP? Are they the same? (2) Are there autism-specific factors related to a child’s autism that affect the level of professional and/or parental satisfaction with the IEP? Do factors such as severity, level of needs, cognitive development level, age, or level of verbal ability affect the perception of appropriate services? (3) Does former parental or professional training in the IEP process affect parental or professional satisfaction about later IEPs?

Methods and Results: This session will share the results of a dual-state survey completed by parents of children with autism and special education professionals. Forty questions, using a Likert scale format and multiple choice options, measured educational level, training in IEP formulation, perceptions of the child’s ability, satisfaction with the process, participation and outcomes of the IEP. The results will have implications for parent training organizations, looking to maximize impact on parental involvement; special education professionals working to increase parental involvement while minimizing conflict; and researchers who look for factors involved in successful implementation within a school setting.

References:


13. Factors Affecting the Receipt of Educational and Therapeutic Services for School-Aged Children with Autism Spectrum Disorder

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Introduction: Extant research suggests child, family and comprehensive treatment model (CTM) characteristics affect access to and receipt of school-based services for children with autism spectrum disorder (ASD) (Thomas et al., 2007). Speech language therapy (SLT), occupational therapy (OT) and applied behavior analysis (ABA) are types of services families of children with ASD often utilize. The purpose of this multi-state study was to examine factors affecting the receipt of both in-school and out-of-school services for school-aged children with ASD. The research question was: How are the types and dosage of services children receive in private and school settings related to (1) child characteristics (i.e., age, cognitive ability, autism severity); (2) family characteristics (i.e., race, ethnicity, SES, state of residence, stress level); and (3) participation in a CTM (LEAP or TEACCH) or a “business-as-usual” (BAU) treatment approach?

Methods: Families of children with ASD (n=117), ages 3 to 5, from four states participated in the study. Measures included the Mullen Scales of Early Learning (MSEL), ADOS, and Parenting Stress Index. Further, information on the type and dosage of service (i.e., # of minutes per session and # of hours per month) was gathered. Zero inflated negative binomial or poisson regression models were used, where appropriate, to examine the relationship between services used and child, family and CTM characteristics. These analyses are appropriate for count data that are overdispersed and/or contain an excess of zeros.

Results: There was a significant interaction between child age and MSEL score for private OT services (p= .024), with older and more cognitively able children receiving more services. In contrast, children with higher ADOS severity scores (i.e., more severe symptoms) received more school-based OT (p=.048). Parents with higher SES levels were more likely to use private ABA therapy (p=.038). Hispanic children received a smaller dose of SLT (p=.000) and OT (p=.000) in comparison to White families at school. Parents with lower stress levels were more likely to utilize private OT services (p=.031) for their children. In terms of state differences, families in Colorado received a larger dose of SLT in school than those who lived in North Carolina (p=.000) and Florida (p=.025). Finally, children in LEAP received a larger dose of in-school SLT than those in TEACCH (p=.003) and BAU (p=.048) classrooms.

Discussion: Based on this multi-state study, a number of child, family and geographic variables can differentially affect access to and receipt of services for children with ASD. In addition, the types of treatment models children are enrolled in can affect the dosage and use of services. Our findings further elucidate factors influencing service use in childhood. This is important because early receipt of high quality services may result in symptom improvement across the lifespan of individuals with ASD.

**POSTER SESSION 2**

**14. FMRI of Story Listening Reveals Atypical Activation Patterns in Comparison to Typically Developing Individuals Matched for Chronological and Mental Age**

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**Introduction:** In adolescents and young adults with Down syndrome (DS), research generally points to a profile where verbal abilities are impaired relative to nonverbal abilities. Functional neuroimaging studies suggest that abnormalities in neural circuitry may be the basis of cognitive impairment in persons with DS. We used functional magnetic resonance imaging (fMRI) to investigate brain activation during a narrative comprehension task in 11 individuals with DS. We compared these findings in activation to typically developing controls matched for chronological (CA) and mental age (MA) to determine whether previously identified differences in narrative comprehension were the result of immature or qualitatively different patterns of neural activation. Our hypothesis was that individuals with DS would show patterns of activation that were qualitatively different from both CA and MA controls.

**Methods:** Eleven healthy persons with trisomy 21 DS (aged 12 – 26), 13 CA controls (aged 12 to 26), and 12 MA controls (aged 5 to 6) completed fMRI scanning on a passive story listening paradigm. MA controls were matched on nonverbal mental age to a subset (n=6) of the DS group who had completed cognitive testing. This block-design paradigm involved presentation of simple stories contrasted with presentation of pure tones. FMRI scans were acquired on a Bruker 3T scanner using a T2* weighted gradient echo EPI sequence (TR = 3000 ms, TE = 38 ms), and was analyzed using a random effects general linear model approach. Between groups comparisons were conducted to identify significant differences in group activation.

**Results:** As seen in Figures 1 and 2, significant differences were seen between groups such that the DS group activated more strongly in superior and medial frontal regions and anterior and posterior cingulate regions, while the MA group activated more strongly in primary auditory cortex (AC), superior and medial temporal gyrus (STG & MTG), and right inferior frontal gyrus (IFG) (p< .05, corrected). Similarly, the DS group was noted to show significantly more activation than the CA group in superior and medial frontal regions and posterior cingulate regions, while the CA group activated more strongly in bilateral AC, STG, MTG and precentral gyrus, as well as left IFG (p< .05, corrected).

**Discussion:** Individuals with DS demonstrate different patterns of activation when compared to both CA and MA controls. These differences appear to reflect atypical neural activity as opposed to immature patterns of activation.

POSTER SESSION 2

15. Innovative Communication Intervention for Older Nonverbal Children with ASD

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Introduction: Many children with autism have limited expressive language at the time of diagnosis, and 30-50% of children remain nonverbal in spite of intensive intervention. (Anderson, et al., 2007). Very little is known about why some children learn to use spoken language and others do not even with intensive interventions. School aged nonverbal children are often excluded from intervention trials and there is very limited information on effective interventions for this subgroup of children. In an effort to develop an effective intervention for 5 to 8 year old nonverbal children, two research teams are developing and testing an integrated intervention based on procedures shown to be effective for nonverbal younger children.

Methods and Results: Thirty-two children will be seen in a 6-month intervention involving the combination of Enhanced Milieu Teaching (Kaiser, 1993) and Joint Attention/Symbolic Play Intervention (Kasari et al., 2006). Interventions are provided twice per week for one hour, for two phases of 24 sessions each. The study design involves a Sequential Multiple, Alternating Randomized Trial (SMART). Children are randomized to two treatment conditions, then treatment response is determined based on observational criteria after the first phase (session 24). Nonresponding children are re-randomized for treatment adaptations. Twelve participants have completed the 48-session treatment protocol. At session 24, 60% of these children were designated as treatment responders and 40% were nonresponders. Growth curve and criterion response data will be displayed for each participant. Treatment responders demonstrated at least a 25% gain in their productive use of social communication on 6 out of 10 observational and standardized assessment measures. Participants who did not show gains were re-randomized to receive an alternative treatment or the same treatment at greater intensity; treatment responders continued in the initial treatment protocol. Participants completing the second phase of treatment show consistent evidence of treatment response. Variations in treatment response appear to be related to severe speech apraxia and receptive language skills at treatment entry.

Discussion: The results of this hybrid intervention addressing the foundations of communication and teaching functional social communication in context appear promising for this population. Further steps in validating the outcome of the intervention will be discussed.

References:


Introduction: Prader-Willi syndrome (PWS) is a genetic disorder associated with intellectual disabilities, compulsivity, hyperphagia, and increased risks of life-threatening obesity. Atypical food-related behaviors in people with PWS are well-documented, but research has yet to focus on the developmental differences in food perception and phenotypic variability associated with the two major genetic subtypes of PWS. The current study examined differences in brain activity associated with processing of food stimuli in persons with PWS as measured by event-related potentials (ERPs).

Methods: Visual ERPs were recorded from 24 individuals with PWS, 9 children (M age = 8.71 +/- 1.79 years) and 15 adolescents and young adults (M age = 23.21 +/- 5.49 years) using 128-electrode nets. Stimuli included color photographs of foods that represent key aspects of hyperphagia in PWS, including foods that varied in composition (single food, proper combinations, unusual combinations) and availability for consumption (offered on a plate or discarded in a trash can). Stimuli were presented using a passive viewing paradigm. Participants were asked to view the pictures and consider whether they would like to eat such foods; no behavioral responses were required.

Results: While participants of all ages discriminated between offered and discarded foods at the perceptual level (within the first 200 ms after stimulus onset), age differences were present in the later affective responses (LPP). Adolescents and adults, but not children discriminated among foods of different composition, and only in the discarded condition. Perception of food also differed by genetic subtype: participants with paternal deletions analyzed food stimuli in terms of composition regardless of presentation context, while those in the UPD group focused more on presentation differences (offered vs. discarded). Additionally, compared to participants with the UPD subtype, those with the deletion subtype generated larger ERP amplitudes in the LPP range, possibly reflecting greater arousal by the food images.

Discussion: Results extend our prior finding of genetic subtype differences among adults with PWS with regard to perceptual analysis of food stimuli (Key & Dykens, 2008) by including children and adolescents with PWS, and by adding the dimension of perceived availability of food (offered vs. discarded foods). Furthermore, this is the first study to demonstrate age-related differences in responses to food stimuli in persons with PWS. There may be a developmental progression in food categorization abilities in PWS beginning with a basic discrimination of offered versus discarded foods that is present even in children, while a more detailed analysis of food composition is performed by adolescents and young adults. Differences in food perception in PWS may thus be associated with genetic subtypes and age; these findings suggest the need for more nuanced interventions that target hyperphagia and life-threatening obesity in PWS.

References:

17. Does the Effect of a Parent Training Program on Parent Responsivity Vary by Parental Depression Severity?

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Introduction: As children are diagnosed with autism spectrum disorders at earlier ages, the question of effectiveness of parent-delivered interventions becomes paramount for this population of young children. One frequently-used treatment that is designed to increase parental responsivity (a putative facilitative variable) in families with children with autism spectrum disorders (ASD) is More Than Words (Sussman, 1999). Parental depression may affect the degree to which parental responsivity increases due to More Than Words sessions because of depression's effect on energy level, attention deployment, and goal-directedness. This hypothesis is salient because mothers of children with ASD have been found to report more severe depressive symptoms than mothers of children with intellectual disabilities without autism and parents of typically developing children (Olsson & Hwang, 2001). To examine this possibility, the following research questions were examined in the current study: (a) Does More Than Words (MTW) increase parents’ use of responsive strategies compared to a business-as-usual control group? (b) Are effects of the MTW treatment on parent responsivity moderated by pretreatment levels of depression?

Method: A multi-site, randomized controlled trial was used to examine research questions. A total of 63 participants were randomized to MTW treatment or control groups. Thirty-seven children and their primary caregivers had analyzable data to address the current research questions. Twenty children were randomized to the control group, and 17 were randomized to the MTW intervention. Parent responsivity was measured pretreatment (Time 1) and post-treatment (Time 2) in a parent-child free play session in a clinic setting. Responsivity was coded from these sessions using a partial interval coding system. Parent depression was measured at Time 1 using the Center for Epidemiologic Studies Depression Scale (CES-D), a self-report measure.

Results: Preliminary analyses revealed no group differences pre-treatment on any variables examined. First, an independent samples t-test with unstandardized residualized gain scores of parent responsivity from Time 1 to Time 2 as the dependent variable revealed a main effect of treatment favoring MTW on parents’ use of responsive strategies \(t(35) = -1.763, p = .0435, 1\text{-tailed}\). Second, depression level at Time 1 was not found to be a significant moderator of parents’ gains in responsivity \(t(32) = -.327, p = .746\).

Discussion: Parent-mediated interventions are often implemented in populations of very young children with developmental disabilities, including children with ASD. When parents are interventionists, parental and child outcomes are equally important. The current data suggest parents are able to incorporate strategies taught to them despite some parents’ report of severe depression.

References:

**POSTER SESSION 2**

18. Self-Teaching of Reading in Individuals with Intellectual Disabilities

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**Introduction:** The first step to aid in reading interventions for individuals with intellectual disabilities (ID) is to identify underlying strengths and weaknesses in their ability. Previous research has suggested that individuals with ID perform worse in several areas of reading compared to mental age matched peers (see Conners, 2003 for a review of the literature); however, it is unclear how they compare on measures of orthographic processing. Orthographic processing, the visual aspect of reading, involves how letters tend to fit together to form words in one's language. The leading approach to understanding orthographic processing in word identification for typically developing (TD) children is the self-teaching hypothesis (Jorm & Share, 1983; Share, 1995; 1999). The self-teaching hypothesis suggests that word-specific orthographic representations are acquired as a result of phonological recoding. By sounding out words, individuals incidentally pick up on the orthographic layout of those words, achieving orthographic learning. The present study is a first test of the self-teaching hypothesis for children with ID.

**Method:** The sample consisted of 18 children with ID and 19 children with TD who were matched on verbal mental age. Of the 18 participants with ID, the age range was 13.17 – 33.83 years (M = 19.97; SD = 4.99), and the verbal mental age range was from 6.25 – 10.67 years (M = 8.87; SD = 1.30). Of the 19 participants with TD, the age range was 7.25 – 9.67 years (M = 8.04; SD = .73), and the verbal mental age range was from 6.25 - 12.67 (M = 8.72; SD = 1.72). Participants completed learning tasks under two nonword exposure conditions. In one condition participants were to phonologically recode nonwords (word-analysis), and the other condition they were provided the pronunciation of a nonword (word-supply). If performance on two orthographic measures, multiple choice and spelling tests, was better in the word-analysis condition than in the word-supply conditions, it would indicate that the participants were able to self-teach and would support the self-teaching hypothesis. The multiple choice and spelling tests were completed approximately three days later.

**Results and Discussion:** A 2 (Group) X 2 (Nonword Exposure Condition) mixed multivariate analysis of variance revealed a statistically significant effect of group on the combined dependent variables $F(2, 34) = 9.41, p = .001$; Wilks’ Lambda = .64; partial eta squared = .36. Within-group analyses revealed a significant effect of nonword exposure condition $F(2, 34) = 12.11, p < .001$; Wilks’ Lambda = .58; partial eta squared = .42. There was no group by nonword exposure condition interaction $F(2, 34) = .88, p = .43$. The results indicate that both groups were able to self-teach. This study has important implications for reading instruction. Specifically, instruction in phonological recoding may have a double benefit for individuals with intellectual disabilities. With more phonological recoding instruction they may be better at recoding and also gain orthographic knowledge in the process.

**References:**


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Introduction: Research consistently indicates that mothers of children with developmental disabilities (DD) experience considerable stress, mental health problems, and family dysfunction (Herring et al., 2006), often as a result of the emotional and behavioral problems that occur at high rates in children and adolescents with DD (Brereton, Tonge, & Einfeld, 2006). One factor that may influence the relationship between child behavior problems and family distress is social support, which has been found to be predictive of successful adaptation in families of children with DD (Weiss, 2002). The objective of this study is to test whether the relationship between child behavior problems and family distress is moderated or mediated by parent’s ability to be socially included in community activities.

Methods: As part of a Canadian online survey of parents of children with developmental disabilities, 100 parents (88% mothers) of children and youth 6-19 years of age (M = 11.00 years, SD = 4.11; 70% male) completed brief measures of demographics, child behavior problems, family distress, child and parental health, and the frequency of parent participation in social events. Sixty percent of children were noted to have an Autism Spectrum Disorder in addition to an intellectual impairment, and 83% of parents were married/common law. Data collection is ongoing.

Results: Our preliminary standard multiple regression analysis revealed an overall model that accounted for 40% of the variance in parent distress. Children’s aggressive behaviors, parents’ mental health, and the degree to which parents participated in social and recreational activities were all significant unique predictors of parent distress, after controlling for child age and parent marital status. Further analyses will examine whether parent social participation acts as a mediator or a moderator of child aggression on family distress.

Discussion: Results will be discussed in relation to interventions for families of children with developmental disabilities who are experiencing distress. Possible avenues for future research examining the relationship between parent social participation and family distress will also be discussed.

References:


Data for this study were collected as part of the CIHR Team: GO4KIDDs: Great Outcomes for Kids Impacted by Severe Developmental Disabilities, Nominated Principal Investigator: Adrienne Perry, York University. (www.go4kidds.ca)
20. Early Psychopathology, IDD, and Service Involvement as Predictors of Mental Health Among At-Risk Adolescents

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Introduction: Children of adolescent mothers are generally considered to be at risk for a variety of intellectual and developmental disabilities (IDD). Less is known, however, about how these children fare as they reach later adolescence and prepare for the transition to adulthood. The present study will describe the socioemotional adjustment of 18-year-old children who were born to adolescent mothers with an emphasis on the processes that enabled them to overcome the turbulent lives that they experienced as children and become well-adjusted adolescents.

Method: Participants were 95 18-year-olds (49.5% female) who were born to teenage mothers and assessed prospectively from the prenatal period through adolescence. The sample was comprised of 66% African-American, 27% Euro-American, and 7% Latina participants. The average estimated IQ for the teen mother sample was 87, with 17% having IQs below 70 and few with IQs greater than 100. Children showed high rates of Intellectual and Developmental Disabilities (IDD) over time; for example, over 30% of the sample could be classified as learning disabled or mildly intellectually disabled at age 8. The Youth’s Inventory 4 (yI-4) was used to assess symptoms of psychopathology when the adolescents were 18 years of age.

Results: Throughout childhood and early adolescence, children displayed elevated rates of IDD and socioemotional maladjustment, especially in the domains of learning disabilities, intellectual disability, and symptoms of ADHD and Disruptive Behavior Disorders, in which sample prevalence rates were often between two and three times the expected population-based rates. Results based on 18-year data, however, indicated that the prevalence of adolescents with clinically significant problems in the domains of ADHD, Conduct Disorder, Major Depressive Disorder, and Generalized Anxiety Disorder were not elevated in comparison to yI-4 population-based norms. Specifically, only 2 - 10% of the sample reported clinically significant levels of ADHD, Conduct Disorder, Major Depressive Disorder, or Generalized Anxiety Disorder problems. Prevalence rates tended to be similar between sexes, except for Generalized Anxiety Disorder in which more girls than boys had problems (14.6% vs. 6.3%). Crosstabs indicated that children's yI-4 scores generally were not related to their levels of clinical problems during earlier assessments or to mothers’ prenatal levels of internalizing or externalizing problems. There were, however, some significant relationships between earlier IDD and formal systems involvement (e.g., therapy, use of psychotropic medications, involvement with juvenile justice system) and 18-year yI-4 scores. The poster will provide in-depth information on processes that contributed to adolescents’ “recovery” after experiencing high levels of problems in childhood.

Discussion: Although having an adolescent mother is generally considered a serious risk factor for children's cognitive, intellectual, and behavioral development, our data suggested that most children were able to successfully navigate this risk by the time they reached late adolescence. Results will be discussed in terms of pathways that promoted positive mental health in adolescents with or at risk for IDD.
POSTER SESSION 2

21. Adherence to Treatment in a Behavioral Intervention Curriculum: The Effects of Parent Perception

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Introduction: Sub-optimal adherence has been a well-documented problem in the medical and behavioral health literature for the past 60 years (e.g., Meichenbaum & Turk, Nock & Ferriter, 2005) but has received only cursory attention in developmental disabilities and applied behavior analysis research (Allen & Warzak, 2000; Moore & Symons, 2009). Behavioral research in developmental disabilities intervention research typically includes measures of treatment integrity (observed behavior) but not treatment adherence (in the absence of oversight). Existing models of adherence in medicine and behavioral health suggest the construct of perception to play an important role in an individual's decision to adhere to a recommended treatment.

Method: A survey was sent to parents of children with ASD (N=61) who participated in a behavioral skills training curriculum in conjunction with their child's early intensive behavioral intervention (EIBI) program. Seventeen survey items were arranged in four sections: (a) Using the Skills (adherence), (b) Family characteristics, (c) Child characteristics, and (d) Characteristics of the parental relationship. Specific items related to parent perception, family supports, and the marital relationship were included based in part on the work of McWilliam (2001), Remington (2010), and Solish and Perry (2008) suggesting their importance in parent engagement during EIBI programming.

Results: 21 (34%) surveys were returned. Three independent variables were significantly correlated with reported adherence (agreement with spouse on implementation of interventions, perceived effectiveness as a behavior change agent, confidence in the intervention to produce meaningful change) and were included in a linear regression as a single factor. The full model explained 53% of variance in reported adherence (p<.001), with the single factor contributing significant unique information to the model (p<.002). Parents reported adherence in 5 of 6 skill categories below the level of observed integrity they achieved during training (80% of opps).

Discussion: Our findings lend support to the construct of perception as an important common thread in existing models of adherence, and suggest the need to address perception in the context of behavioral skills instruction for parents of children with I/DD. A behavior analysis of adherence is warranted to describe the stimulus conditions and contingencies associated with adherence and non-adherence, including the role of perception as a contextual factor.

References:


**Introduction:** Repetitive, stereotypic behaviors are extremely common in neurodevelopmental disorders. Deer mice (*Peromyscus maniculatus*) develop repetitive behavior early in life that is spontaneous (i.e. does not require drugs or lesions), modifiable by experience, and reflects substantial individual differences. Evidence from our laboratory indicates that high levels of stereotypy are associated with an imbalance of neuronal activation between the direct and indirect pathways of the basal ganglia. This imbalance seems to be driven by decreased activation of the indirect pathway that allows direct pathway activation to over-excite the cortex. Striatal neurons of the direct and indirect pathways express heteromeric complexes of receptors with any one receptor able to antagonize or facilitate the function of the others. These receptor complexes include dopamine D1 and adenosine A1 receptors on direct pathway neurons and dopamine D2, adenosine A2A, and glutamate mGluR5 receptors on indirect pathway neurons. In these studies we evaluated the effects of drugs that alter the heteromeric receptor complexes on striatal direct and indirect pathway neurons to elucidate their individual and combined roles in modulating the repetitive behavior in deer mice.

**Methods:** To increase indirect pathway activation, we administered a D2 antagonist, A2A agonist, and mGluR5 agonist alone and in combination. To decrease indirect pathway activation we injected a D2 agonist, A2A antagonist, and mGluR5 antagonist alone and in combination.

**Results:** Consistent with our hypothesis that repetitive behavior in deer mice is a result of reduced indirect pathway functioning, we found that increasing indirect pathway activation by administration of a D2 antagonist, A2A agonist, and mGluR5 agonist cocktail significantly reduced repetitive behavior. Single drug administration had no significant effects on behavior. Conversely, reducing indirect pathway activation with a D2 agonist, A2A antagonist, and mGluR5 antagonist cocktail appears to increase repetitive behavior in deer mice, based on our preliminary results. Again, single drug administration had no significant effects.

**Discussion:** Our results provide additional evidence for the role of reduced activation of the indirect basal ganglia pathway in repetitive behavior. In addition, pharmacological targeting of heteromeric receptor complexes better mimics cellular functioning and as our results suggest will be more effective than monotherapy for altering repetitive behaviors. Finally, our results point to striatal receptor heteromers as novel potential therapeutic targets for development of efficacious pharmacotherapies for repetitive behavior. Such therapies are sorely needed given the lack of pharmacological agents with demonstrated efficacy that are available clinically.
POSTER SESSION 2

23. Predicting MCHAT Scores from the BITSEA at 12 and 24 Months

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Introduction: Recently, socioemotional assessment measures have been developed to identify early behavioral and social competence delays. The Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006) is a parent report of broad socioemotional problems and social competency delays for children ages 12-35 months. Correspondingly, the rise in rates of identified Autism Spectrum Disorders (ASD) necessitates incorporation of ASD-specific items in recently developed scales. The BITSEA addresses this diagnostic need by incorporating 9 ASD-specific behavioral problem items (A-BP) and 8 ASD-specific competency items (A-C). While the Modified-Checklist for Autism in Toddlers (MCHAT; Robins, Fein, Barton, & Green, 2001) is commonly used to identify 16-30 month toddlers at risk for ASD, there are no norms for the BITSEA A-C and A-BP. This study examines 12- and 24-month BITSEA correlations with 24-month MCHAT scores. By calculating sensitivity and specificity, accurate screening for ASD as measured by the MCHAT is also investigated.

Methods: Data were collected as part of a longitudinal cohort study, Conditions Affecting Neurocognitive Development and Learning in Early Childhood (CANDLE), funded by the Urban Child Institute, Memphis, TN. CANDLE examines maternal and infant characteristics associated with early childhood development. This CANDLE sample included 127 mothers and their children who participated at 12 and 24 months.

Results, Correlation: The 12-month BITSEA A-C (r=-.259, p=.003) and Total Competence (C; r=-.341, p=.000) correlated with the MCHAT at 24 months. However, only the 12-month BITSEA Total Behavior Problems (BP; r=.285, p=.001) correlated with MCHAT scores at 24 months. Contrastingly, 24 month BITSEA correlations are stronger for A-BP (r=.340, p=.000) and Total BP (r=.324, p=.000) than A-C (r=-.238, p=.007) and Total C(r=-.117, p=.190). Thus, 12 month BITSEA C correlated more strongly with the MCHAT than 24 month BITSEA.

Results, Sensitivity and Specificity: As a 12 month predictor of 24 month MCHAT scores, the BITSEA Total C scale yielded .65 sensitivity, but declined to .20 sensitivity at 24 months. However, as a predictor of 24 month MCHAT scores, the BITSEA Total BP scale yielded .60 and .65 sensitivity coefficients at 12 months and 24 months, respectively. As a 12 month predictor of 24 month MCHAT scores, the BITSEA Total BP scale yielded a .59 specificity, then improved to .67 at 24 months. As a 12 month predictor of 24 month MCHAT scores, the BITSEA Total BP scale yielded .71 specificity, but improved to .87 at 24 months.

Discussion: Adding to the body of research on early ASD diagnostic instruments, these results provide some support for the premise that social skill deficits are early correlates of ASD diagnostic measures, but less so as the child ages. As one of the earliest screeners, the BITSEA's contribution to ASD diagnosis needs further evaluation.

References:


Introduction: Maternal responsivity is a complex set of behaviors clearly linked to cognitive, social, and communication outcomes of typically developing children and those with disabilities.1,2 Recent evidence indicates that physiological variables may underlie or mediate early parental behavior with increased negative intrusive parenting associated with elevated cortisol and lower modulation of heart activity. 2 Fragile X syndrome (FXS) is a genetic condition associated with intellectual disability and low language development. Findings suggest that maternal responsivity predicts language outcomes in young children with FXS.¹ To date, however, no studies have examined the relationship between physiological arousal and maternal interaction in mothers of children with FXS. Given research on maternal interaction and physiological arousal in mothers of typically developing children, a multi-system approach incorporating behavioral and physiological variables is critical to understand these complex parenting behaviors. The current work extends the previous research to examine the relationship between maternal responsivity and physiological arousal in mothers of young boys with FXS.

Methods: Data for the current analyses were accessed from the first wave of an ongoing longitudinal study on families with children with FXS. Out of 55 potential mother-child dyads, data for 29 dyads contained both behavioral and physiological data. All boys had FXS and were between 40 and 76 months. One mother had full mutation FXS and the other 28 were carriers. Behavioral data include 10 minutes of extant maternal responsivity coded from a naturalistic observation in the home. Video files of the mother-child interaction were coded for the mother’s behaviors and communications to determine scores for two categories of maternal responses: maternal responsivity and behavior management. Physiological data include heart activity that were collected at the time of the mother-child interactions, but not edited or analyzed until this point. Graduate student training to edit and analyze the heart activity has been completed (first author), and the behavioral and physiological data are now being synchronized and analyzed. We will present synchronized data for heart activity and maternal responsivity indicators by December.

Results: Analyses are limited to descriptive data for maternal responsivity ($M = 55.90, SD = 21.08$) and behavior management scores ($M = 19.90, SD = 8.92$) at this time. Final analyses will be conducted by the end of December using a linear regression model to examine the relationship between maternal responsivity and physiological arousal.

Discussion: Maternal interactions can have critical implications for the development of children with disabilities. Thus, we need to use a multi-systems approach to best understand the mother-child relationship in young boys with FXS to direct treatment efforts and optimize outcomes.

References:


**25. Age and Genetic Subtype Differences in Behavior Problems in Prader-Willi Syndrome**

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**Introduction:** Prader-Willi syndrome (PWS) is characterized by a host of complex behavior problems such as repetitive, compulsive behavior, oppositionality, temper tantrums and skin picking. PWS is caused by a lack of paternally imprinted genes in 15q11-13 either through deletions or maternal uniparental disomy (mUPD). Several studies have compared behaviors in PWS across those with larger (Type 1) versus smaller (Type II) deletions, and mUPD, but with inconsistent results. There is general agreement that those with mUPD have increased rates of autism symptoms and more severe psychiatric problems such as psychosis. Findings are more controversial regarding deletion size, especially if those with Type I versus Type II deletions have more severe behavior problems. We hypothesized that behavioral differences across deletion sizes may be more apparent over time, and tested this idea using both cross-sectional and longitudinal approaches.

**Methods:** Questionnaires and a test battery were initially administered to 88 individuals with PWS aged 5-50 years and their caregivers as part of a larger longitudinal study in PWS. The battery used standardized measures that tapped salient behavioral problems in PWS, and includes the Hyperphagia Questionnaire, Yale-Brown Obsessive Compulsive Scale, and CBCL. Caregivers completed an interview assessing their child adaptive skills (Vineland Adaptive Behavior Scales), and participants with PWS were administered the K-BIT-2 to assess overall cognitive abilities. Many of these 88 participants \( n = 63 \) have returned for their 2-year follow-up assessments, though evaluations are ongoing for both longitudinal and new participants.

**Results:** No significant cross-sectional differences were found between deletion types. Significant differences emerged, however when data were related to age. In the Type I group only, advancing age was associated with reduced hyperphagic severity \((r = .48)\), CBCL total and externalizing domains \((r's = .44 \text{ and } .50)\), and adaptive skills and IQ's. Those with Type II deletions evidenced relatively stable behavior over time. In contrast to those with deletions, participants with UPD manifested significant age related increases in thought problems, non-compliant behavior, obsessions and hoarding \((r's = .48, .52, .45, \text{ respectively})\). Participants with UDP also had an increased rate of psychiatric hospitalizations \((55% \text{ UDP versus } 20% \text{ deletions}; \chi^2 = 6.53, p < .01)\). Longitudinal analyses to date support these cross-sectional findings, and further suggest age-related gains in cognitive skills in those with UPD only.

**Discussion:** Despite scant longitudinal research, clinical lore has held that PWS behaviors are consistent over time. We find robust differences across genetic subtypes that are age-related, and specifically propose a dramatic behavioral mellowing over time in those with Type I deletions. As well, those with UPD indeed seem more vulnerable to severe psychiatric problems, yet at the same time, may show gains in some of their cognitive problem-solving abilities. Although longitudinal assessments of this PWS cohort are still underway, this poster will summarize longitudinal findings to date, as well as implications of these data for intervention.
26. Impact of the Self-Determined Learning Model of Instruction on the Self-Determination of Adolescents with Intellectual Disability

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Introduction: Higher levels of self-determination have been linked with positive adult outcomes for individuals with intellectual disability. However, there are very few interventions for which a causal relationship between the intervention and increased self-determination has been established. The Self-Determined Learning Model of Instruction (SDLMI) is a model of instruction based on the principles of self-determination that teaches adolescents to employ self-regulated problem-solving strategies to achieve self-selected goals. The purpose of this study was to evaluate the efficacy of the SDLMI for increasing self-determination in a sample of adolescents with cognitive disabilities (i.e., intellectual disability and learning disabilities).

Methods: A group-randomized, modified equivalent control group time series design was implemented over two years. Study participants were 312 high school students with cognitive disabilities receiving special education services across 39 high school campuses. Participants were randomly assigned to a treatment or control group. The treatment group received intervention in Years 1 and 2 and the control group received intervention in Year 2, but no intervention in Year 1. Participants completed two measures of self-determination (The Arc's Self-Determination Scale (SDS) and the AIR Self-Determination Scale (AIR)) at the beginning of Years 1 and 2 and at the end of Year 2. Structural equation modeling (SEM) was used to examine the relationship between the SDLMI and self-determination. Because adolescents were nested within campuses standard procedures for controlling for the hierarchical structure of the data were followed in performing the SEM analyses. In evaluating the estimated models, first, measurement invariance was examined across the two groups (i.e., treatment and control). Next, within- and between-group differences in latent self-determination scores over time were evaluated. Finally, a cross-lagged panel model was estimated to assess the impact of the SDLMI over time across groups. Differences in the impact of the SDLMI for adolescents with intellectual and learning disability were also evaluated.

Results: Strong metric invariance was established in the measurement of the latent self-determination constructs over time across the control and treatment group. When comparing the latent self-determination means, the intervention group showed significant improvements on both the AIR and SDS from baseline to the final measurement point (i.e., end of Year 2). The intervention group improved from .00 to .30 standard deviation units on the AIR (d = .14) and from .00 to .24 standard deviation units on the SDS (d = .23). The control group showed slight, but nonsignificant, increases in self-determination (.01 standard deviation units on the AIR, and .04 on the SDS). The cross-lagged panel model suggested that the autoregressive paths from baseline to the second time point for the intervention group were equivalent to the autoregressive paths from the second time point to the final time point for the control, indicating a similar effect of the introduction of the SDLMI in the control and treatment group. Finally, those with learning disabilities in the intervention group showed larger increases in self-determination by the third time point as opposed to those with intellectual disability.

Discussion: The results of this study provide evidence of the efficacy of the SDLMI for increasing adolescent self-determination. Adolescents who received intervention showed significantly higher self-determination scores, and this effect was replicated in two, randomly assigned groups over two years. Further, research is needed, however, on the differential impact of the SDLMI on adolescents with intellectual and learning disability and the factors that contribute to these differences (i.e., within-student factors and teacher, school, familial factors).
POSTER SESSION 2

27. Utility of the GARS-2, SRS, and SCQ for Adolescents with Autism and Hearing Loss

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Introduction: Statistics from the Annual Survey of Deaf and Hard of Hearing Children and Youth estimates that 1 in 81 children with hearing loss (specifically, 8-year-olds) also have a co-morbid diagnosis of Autism (Gallaudet Research Institute, 2008). However, despite an incidence rate of nearly twice which is believed to be the national prevalence rate, there remains paucity in available resources, interventions, and knowledge about deaf children and teenagers with Autism Spectrum Disorders. Of the limited research available only one study has ever reported the utility of using psychological tests and measures with Deaf children or adolescents. Ropper (2003) suggests no significant difference in Autism symptomatology between Deaf adolescents (n=10) and hearing adolescents with a diagnosis of Autism using the Autism Behavior Checklist (ABC) and the Interaction Assessment (IA) from the Autism Screening Instrument for Educational Planning, 2nd edition (Krug et al., 1993). Finding no differences between deaf children and hearing children is surprising as individuals with hearing loss often score significantly different than their hearing peers on psychosocial, intelligence, and developmental measures. Diagnosing Autism in children with hearing loss is further complicated by the fact that the characteristics of autism (deficits in socialization, communication, and differences in behavior) are also the core characteristics of hearing loss. Additionally, findings from research in affect recognition, theory of mind skills, and language development suggest similar developmental trajectories in children with autism as well as children who have hearing loss. Therefore, one is left to question whether or not current screeners for autism are adequate in identifying autism in children with hearing loss as well as question what does autism look like in adolescents with hearing loss.

Method: As part of dissertation data collection by the first author (Szymanski), parents of deaf children (n = 31) and adolescents (n = 21) were recruited via a national mailing to schools who reported serving Deaf children with Autism within the United States on the Annual Survey of Deaf and Hard of Hearing Children and Youth. Parents interested in participating were asked to complete and return via postal mail the Gilliam Autism Rating Scales-2, Social Responsiveness Scale, Social Communication Questionnaire and brief background questionnaire designed by the researchers. This sample of deaf children and adolescents is the largest ever-studied population of children with both hearing loss and autism.

Results: Overall, approximately 50% of Deaf Adolescents (n = 12) with a previous diagnosis of Autism did not have scores on the SRS, SCQ, or GARS-2 that were considered to be indicative of a diagnosis of Autism. This contradicts findings of Roper et al., 2003 whose Deaf Autistic Adolescent sample scored higher (more Autistic like) than the normative group of hearing children with Autism on the ABC and IA. Significant differences were found on the SRS, SCQ, and GARS-2 based on the child’s degree of hearing loss (more significant impairments were found in those with the most severe hearing loss) which also contradicts previous literature (Rosenhall et al., 1999). Additionally, approximately half of current sample (n = 11) of Deaf Adolescents with a previous diagnosis of Autism did not meet DSM-IV diagnostic criteria for a diagnosis of Autism or PDD-NOS based on parental report.

Discussion: Due to conflicting findings from previous research and the current research, questions remain as to whether Deaf adolescents with Autism and hearing adolescents with Autism in deed have the same characteristics as reported by Roper et al., 2003. Furthermore, because over half of the sample did not meet diagnostic criterion for a DSM diagnosis of autism, despite carrying a diagnosis of autism, one must question the accuracy of diagnosis for these adolescents. One can also suggest that environmental surroundings and cultural influences may contribute to a separate phenotype of autism in children with hearing loss not yet researched.

References:


**POSTER SESSION 2**

**28. Perceptions of Self and Family Among Adolescents with Developmental Disabilities**

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**Introduction:** Having a positive sense of one's self and family is important for the social, emotional, and academic success of adolescents (Harter, 1990). Research shows that for typically developing children, the parent-child relationship, as well as the support received from friends and family, can contribute to both an adolescent's sense of self-worth and family cohesion (Asonibare & Olowonirejuaro, 2006; Laursen, Furman, & Mooney, 2006). However, few studies have explored the factors that contribute to the family functioning and social-emotional well-being of youth with developmental disabilities (DD).

**Methods:** For this study, we explored predictors of global self-worth and family cohesion for adolescents with DD at age 18. Predictor variables were adolescent cognitive functioning, family socio-economic status, perceived parent-child relationship, perceived support from family, and perceived support from friends.

The sample consisted of 68 adolescents and their families who participated in a longitudinal investigation of children with early-identified disabilities and their families in the Northeast. The present investigation uses data collected during home visits when the adolescents were 18 years old. Analyses focused on testing predictors of the criterion variables of adolescent global self-worth and adolescent perception of family cohesion. Global self-worth was measured using the global self-worth subscale of the Self Perception Profile for Learning Disabled Students (Renick & Harter, 1988) and family cohesion was measured using the Family Adaptability and Cohesion Evaluation Scales (Olson, Portner, & Bell, 1982). Adolescent cognitive functioning was assessed by the Stanford-Binet Intelligence Scales (Thorndike, Hagen, & Sattler, 1986). As a measure of the parent-child relationship, adolescents completed the Supportive Parenting Scale (Simons, Lorenz, Conger, & Wu, 1992). The friends and family subscales of the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988) were used to measure adolescents’ perceived support from friends and family. Cronbach's alphas for all measures were above 0.7.

Two parallel hierarchical linear regressions were conducted for the criterion variables of adolescent global self-worth and family functioning with the predictor variables entered in the following blocks: 1. adolescent cognitive functioning, 2. family socio-economic status, 3. adolescent's perception of the parent-child relationship, 4. perceived support from family, perceived support from friends.

**Results:** Results revealed that beyond cognitive functioning and socio-economic status, adolescent perception of the parent-child relationship was a significant predictor of adolescent global self-worth (with more positive views of the parent-child relationship associated with higher global self-worth) and adolescent perception of family cohesion (with more positive views of the parent-child relationship associated with higher family cohesion). Perceived support from friends, but not from family, was a significant predictor of global self-worth (with increased support from friends associated with increased global self-worth) while perceived support from family, but not from friends, was a significant predictor of adolescent perception of family cohesion (with increased support from family associated with higher levels of family cohesion).

**Discussion:** This study contributes to our understanding of the role of family and peer relationships in adolescent perceptions of self and family. Adolescents’ views of the parent-child relationship contributed both to their view of themselves as well as the family as a whole. Social support from peers emerged as a key predictor of adolescents' perceptions of self-worth, while social support from family members contributed to their perceptions of the quality of family interactions on the whole. These findings point to the differing contributions of peer and family support to various aspects of well-being among adolescents with DD.
29. The Kindergarten Transition: Impact of Preparation Activities on Socio-Behavioral Outcomes for Children with and without DD

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Introduction: The transition from preschool to kindergarten is an important early childhood developmental milestone, with early school adjustment related to later school outcomes (Hamre & Pianta, 2001). This transition presents challenges to children with developmental delays (DD) and their typically developing (TD) peers, as well as their families and teachers. To date, no prior research has investigated the impact of transition practices on kindergarten outcomes for both populations of children with and without DD. The primary aim of the current study was to examine the relation between transition preparation activities and child socio-behavioral outcomes in kindergarten among children with and without DD.

Methods: Caregivers of 104 children with and without developmental delays (DD n = 52; TD n = 52) were recruited from inclusive preschool programs in the Northeastern United States in the spring of their child’s final year of preschool. Data were collected at three time points across the transition period (i.e., preschool, kindergarten entry, and late fall). Caregivers, preschool teachers, and kindergarten teachers completed questionnaires assessing child social skills and problem behaviors (Social Skills Improvement System) as well as concerns and involvement during transition (Family Experiences and Involvement in Transition; Teacher Perceptions of Transition). Kindergarten teachers completed an additional questionnaire assessing student-teacher relationship quality (Student Teacher Relationship Scale). Caregivers also completed follow-up phone interviews at Time 1 regarding child adaptive behavior (Vineland Adaptive Behavior Scales) and at Time 2 regarding transition concerns and involvement.

Results: Students with DD (M = -0.26; SD = 0.92) had lower Transition Outcomes Composite scores (i.e., summary scores reflecting social skills, problem behavior, and student-teacher relationship quality in kindergarten) than TD students (M = 0.31; SD = 0.71), (t(1,54) = -2.55, p = .014). The overall involvement of families and kindergarten teachers did not correlate with transition outcomes scores in either group. However, overall preschool teacher involvement in transition practices was significantly correlated with TD child outcomes, (r = -.42, p = .048), but not DD child outcomes. Results of hierarchical linear regression analyses demonstrated that the involvement of preschool teachers in kindergarten transition preparation activities did not predict unique variance in kindergarten outcomes for children with or without DD. However, preschool child behavioral variables, specifically adaptive behavior (R2 Δ = .21, p = .013) and problem behavior (R2 Δ = .24, p = .002) significantly predicted kindergarten outcomes for children in the DD group, but not the TD group. Overall, the model explained 46.1% of the variance in transition outcomes for children with DD.

Discussion: Our results suggest that higher adaptive behavior and lower problem behavior in preschool predicts positive kindergarten transition outcomes for children with DD, consistent with previous research (e.g., McIntyre, Blacher, & Baker, 2006). Best practices in kindergarten transition programming for children with and without disabilities will be discussed.

Reference:
30. Parental Concerns About the Sexuality of Adolescents with Disabilities

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Although attitudes toward the sexual rights of individuals with disabilities have become more positive, there remains reluctance by society and professionals to address the various issues surrounding the sexuality of adolescents with disabilities (Lumley & Scotti, 2001). Research shows that adolescents with disabilities are often misinformed about sexual development and that parents of adolescents with disabilities frequently have not had discussions with their children about sexuality (Isler et al., 2009). To our knowledge, no studies have been done to examine the extent to which parents of adolescents with developmental disabilities are concerned about issues regarding their child's sexuality.

The current investigation explores this topic through interviews with 131 mothers and 78 fathers of 131 adolescents (68 male, 63 female) with disabilities (41 Down Syndrome, 50 Motor Impaired, 40 Developmental Disabilities of mixed etiology). The sample is drawn from the age 18 time point of the Early Intervention Collaborative Study, a longitudinal investigation of children with early-identified disabilities and their families (Hauser-Cram et al., 2001). Parents were asked about their current and future concerns regarding their adolescent's sexuality, friendships, acceptance in the community, ability to find and hold a job, protection against harm, medical care, and living situation. For each item, parents were asked to indicate both their current and future anticipated level of concern on a four-point scale ranging from no concern to major concern.

About a third of parents had at least moderate current concerns about their adolescent's sexuality. No significant differences were found between mothers' and fathers' level of concern. For both parents, future concern regarding sexuality was higher than current concern. For mothers, 31.3% reported moderate to major current concern, while 45.8% reported moderate to major future concern. For fathers, 26.9% reported moderate to major current concern, while 44.2% reported moderate to major future concern. Hierarchical linear regression models were conducted to determine whether characteristics of the adolescent related to the extent of mother and father current and future concerns regarding their child's sexuality. Predictor variables were entered in the following order: family income, adolescent gender, adolescent cognitive functioning (Stanford-Binet Intelligence Scales), and adolescent behavior problems (Child Behavior Checklist). Results indicated that lower adolescent cognitive functioning predicted significantly higher current and future concern among mothers, as well as higher future concern among fathers. Higher adolescent behavior problems predicted significantly higher current and future concern among mothers, as well as higher current concern among fathers. Fathers also had greater future concerns about daughters than sons whereas the extent of mothers' concerns did not differ by their child's gender. In addition to standard rating scale responses, some parents offered additional comments about their concerns regarding their adolescent's sexuality. Qualitative data coding revealed that comments fell into six categories: (1) inappropriate behaviors; (2) safety and/or being taken advantage of; (3) relationship formation; (4) knowledge/understanding of sexual development; (5) effects of hormonal development; (6) pregnancy and use of birth control.

Findings point to the need to address concerns of parents, professionals, and adolescents with disabilities themselves, regarding their sexual needs, health, and development.
EARLY ADOLESCENCE AND DEVELOPMENTAL DISABILITIES

Chair: Bruce Baker, University of California-Los Angeles

Discussant: Jan Blacher, University of California-Riverside
SYMPOSIUM 13

Early Adolescence and Developmental Disabilities

Chair: Bruce Baker, University of California-Los Angeles
Discussant: Jan Blacher, University of California-Riverside

Friendships in Adolescents with and without Intellectual Disabilities
Lisa Christensen
Leigh Ann Tipton
Bruce Baker
University of California-Los Angeles
University of California-Riverside

The Sibling Relationship of Young Adolescents with and without Intellectual Disabilities
Gazi Begum
Jan Blacher
University of California-Riverside

Academic Engagement in Early Adolescents with and without Intellectual Disabilities
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Bruce Baker
University of California-Los Angeles
Introduction: Research suggests that adolescents with intellectual disabilities (ID) tend to have fewer friends than adolescents with typical development (Heiman, 2000; Vaughn & Ebaum, 1999; Frostad & Pijl, 2007) and may spend less time with friends outside of school (Abells, Burbidge, & Minnes, 2008; Geisthardt, Brotherson & Cook, 2002; Gur-alnick, 1997). The quality of these friendships may also be different, with less emphasis placed on reciprocity, closeness and trust (Matheson, Olsen & Weisner, 2007). Nevertheless, investigators have yet to examine adolescents' perceptions of their friendships and how these may differ from parent reports of friendship quality. Furthermore, the relationship between early social skills and friendship quality remains unclear for adolescents with ID.

The current study aimed to (1) compare the friendships of adolescents with and without ID, (2) examine how adolescents' reports of their friendships differ from their mothers' descriptions, and (3) examine the role of social skills in predicting friendship quality among adolescents with and without ID.

Methods: Participants were from the NICHD-supported longitudinal Collaborative Family Study jointly conducted by principal investigators at UCLA, UCR and Arizona State University. Scores from the Social Skills Rating System (SSRS; Gresham & Elliot, 1990) at ages 5, 9 and 13 were used as measures of early and current social skills. Mothers and their adolescent children were separately administered semi-structured interviews when the adolescent was 13 years of age. Both mothers and adolescents were asked to describe the adolescents' friendships. A coding system was developed to address demographic information about the adolescents' friends, whether or not the adolescent had a best friend, and the quality of his/her friendships. Data collection is still ongoing. However, preliminary analyses were conducted with the current sample of (TD = 59; ID = 26).

Results: Preliminary results suggest that adolescents with ID were less likely than adolescents with TD to have same age and same gender friends ($\chi^2 = 3.81, p<.10$ and $\chi^2 = 3.74, p<.10$, respectively). Fewer adolescents in the ID group had a best friend according to their mothers' report ($\chi^2 = 3.41, p<.10$). However, when the adolescents' reports were used, adolescents with ID more frequently reported having a best friend than adolescents with TD ($\chi^2 =3.84, p<.10$). Significantly fewer adolescents with ID spend time with friends outside of school and ($\chi^2 = 13.47 p<.001$) and their friendships were rated as significantly lower in warmth/closeness and positive reciprocity ($t = 3.57, p<.001$ and $t =2.37, p<.05$) according to both reporters. Social skills at age 9 and 13 years appear to explain variance in warmth/closeness and positive reciprocity above and beyond group status (TD vs. ID).

Discussion: Results suggest that adolescents with intellectual disabilities differ from adolescents with typical development in both the demographic characteristics of their friends and the quality of their friendships. There is some concordance between adolescents and their mothers in their descriptions of friendships. However, adolescents with ID are more likely than their mothers to report that they have a best friend. Early social skills appear to predict friendship quality above and beyond group status, highlighting social skills as a target for early intervention for adolescents with intellectual disabilities.
SYMPOSIUM 13

The Sibling Relationship of Young Adolescents with and without Intellectual Disabilities

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Introduction: Family studies primarily focus on the parent-child relationship (Baker, McIntyre, Blacher, Crnic, Edelbrook, & Low, 2003; Crnic & Lyons, 1993; Stack, Serbin, Enns, Ruttle, & Barrieau, 2010). There is limited research on the sibling relationship, and most of it focuses on how the sibling with a disability affects his/her typically developing (TD) brother and/or sister. There is much less known about how TD siblings contribute to the development of individuals with disabilities. The purpose of this paper is twofold: 1) to examine differences in the sibling relationship for young adolescents with and without intellectual disabilities and 2) to examine how the sibling relationship impacts the adjustment of young adolescents with and without intellectual disabilities.

Method: Participants were 70 mothers and their corresponding 12-year old adolescents with (N=23) or without intellectual disability (N=47). At age 9, children with WISC-IV and Vineland scores of 84 or lower were labeled ID. Children with a WISC score of 85 or higher were labeled TD. At age 12, mothers completed the Sibling Relationship Questionnaire, the Child Behavior Checklist, and the Social Skills Rating System.

Results and Discussion: Group differences on the SRQ were analyzed. A significant interaction was found between disability status and type of dyad F(1,61)= 5.68, p<.05). Specifically, for TD adolescents, mothers reported more warmth for opposite sex dyads (.27) than same sex dyads (-.35). However, for ID adolescents, mothers reported more warmth for same sex dyads (.21) than opposite sex dyads (-.44). There was also a significant interaction between disability status and birth order F(1,58)= 6.09, p<.05). Specifically, for TD adolescents, mothers reported more status/power differences when the sibling was younger (.72) than when the sibling was older (-.43). For ID adolescents, birth order did not matter for status/power (-.30 vs. -.34). For TD adolescents, conflict was a statistically significant predictor of internalizing behavior problems, after controlling for warmth, rivalry, and status/power (t= 2.30, p<.05). For ID adolescents, conflict was a statistically significant predictor of externalizing behavior problems, after controlling for warmth, rivalry, and status/power (t=2.54, p<.05). While the direction of effect cannot be determined from these analyses, future longitudinal analyses will address this.

References:


Academic Engagement in Early Adolescents with and without Intellectual Disabilities

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Introduction: Academic engagement, defined by student attendance, compliance with rules, homework motivation, and relationships with teachers (Zyngier, 2008), has not been extensively studied in adolescents with intellectual disabilities (ID). DeBaryshe, Patterson & Capaldi (1993) found a relationship between academic engagement and achievement in typically developing (TD) boys, and Aunola, Stattin & Nurmi (2000) found a relationship between academic achievement strategies, school adjustment, and behavior problems in a sample of TD adolescents. Understanding academic engagement may therefore help psychologists design interventions to improve early adolescents’ academic achievement and behavior problems.

The present paper addresses four questions: (1) Do parents of adolescents with ID or TD conceptualize academic engagement differently? (2) Do the adolescents themselves with ID or TD conceptualize academic engagement differently? (3) Do parental education and parenting style predict academic engagement in youth with ID and/or TD? (4) Does academic engagement predict behavior problems in youth with ID and/or TD?

Method: The paper draws upon data from the Collaborative Family Study at adolescent age 13. Adolescents were classified as having ID if they had a score below 85 on the WISC and on the Vineland Adaptive Behavior Scales. The sample consists of 32 early adolescents with ID, and 79 early adolescents with TD. Data collection and coding are nearly complete.

Academic engagement was measured using parent and adolescent responses to semi-structured interview questions as well as teacher ratings of their relationships with students on the Student Teacher Relationship Scale (Pianta, 2001). During the semi-structured interview, parents and adolescents answered questions about adolescents’ behavior, relationships with teachers, involvement in extracurricular activities, and motivation for homework. These responses were then rated by trained coders on a scale from one to five. Parental education was measured using mother’s report of their highest grade completed in school. Parenting style was rated using parent interview codes for parental warmth, monitoring, and intrusiveness. Parent and teacher ratings on the Child Behavior Checklist (parent and teacher versions; Achenbach & Rescorla, 2001) were used to assess adolescents’ behavior problems.

Results: Preliminary analyses of the parent interview data indicate that parents rate their adolescents’ engagement in classroom activities and homework, as well as their relationships with teachers, similarly in both the ID and TD groups. In both groups, parents who demonstrated higher levels of warmth during the interview also reported higher levels of academic engagement in their adolescents. However, parent-reported academic engagement was only significantly correlated with parent-rated behavior problems in the ID group.

Discussion: Academic engagement may look fairly similar in adolescents with and without ID. However, disengagement from school may be less associated with behavior problems in the ID group because their parents perceive school as a more distinct domain than in the TD group. Alternatively, adolescents with ID may disengage from school in more passive ways (i.e., daydreaming during class, not turning in homework) that are less disturbing to adults.
PARENT STRESS, HEALTH, AND INTERVENTIONS

Chair: Nancy Miodrag, Vanderbilt Kennedy Center, Vanderbilt University

Discussant: Julie Lounds Taylor, Vanderbilt Kennedy Center, Vanderbilt University
SYMPOSIUM 14

Parent Stress, Health, and Interventions

Chair: Nancy Miodrag, Vanderbilt Kennedy Center, Vanderbilt University
Discussant: Julie Lounds Taylor, Vanderbilt Kennedy Center, Vanderbilt University

Comparison of Hospitalization in Mothers of Children with Down syndrome, Spina Bifida, and from the Tennessee Population
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Holly Stone
Robert Hodapp
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Factors Associated with Parenting Stress in Parents of Children with Angelman Syndrome
Sarika Peters
Nancy Miodrag
Vanderbilt Kennedy Center, Vanderbilt University

Transitioning Together: A Pilot Intervention for Parents of Adolescents with Autism Spectrum Disorders
Leann Smith
Marsha Mailick Seltzer
Jan Greenberg
Waisman Center, University of Wisconsin-Madison

A Comparison of Resiliencies of Families Raising a Child with Autism or Fetal Alcohol Spectrum Disorder
Shelley Watson
Stephanie Hayes
Elisa Radford-Paz
Laurentian University
Comparison of Hospitalization in Mothers of Children with Down Syndrome, Spina Bifida, and from the Tennessee Population

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Introduction: Chronically elevated stress, which can produce deleterious effects on various bodily systems, has consistently been reported in families of children with developmental disabilities. Although parents of children with Down syndrome (DS) and with spina bifida (SB) are challenged by their children’s caregiving and health needs, we know little basic information about maternal health and hospitalization. Using large-scale population data, we examined the frequency, cumulative length of stay, timing, and correlates of (non-delivery related) in-patient hospital stays for mothers of children with DS, SB, and no DD after the birth of the target child.

Method: Participants included mothers of children with DS (n = 1,358), with SB (n = 573), and of Tennessee children with no DD (n = 11,008; a 1% sample of TN births). Target children in each family included the child with either Down syndrome or with spina bifida or, in population families, a randomly chosen child in each family. Data on birth and in-patient hospitalizations were gathered from official Tennessee State Birth Records (1990-2007) and Hospital Discharge records (1997-2007). By linking records within and across multiple registries, we were able to examine frequencies of maternal hospitalization, timing, and correlates.

Results: One or more in-patient hospitalizations were experienced by a greater proportion of mothers of children with SB (14.5%) compared to mothers of children with DS (9.6%) or with no DD (9.1%), \( \chi^2(2, N = 12,939) = 18.44, p = .001 \). There was also a trend for significant group differences in total cumulative length of hospital stays, \( \chi^2(2, N = 1,217) = .056, ns \), with mean cumulative lengths of stay approximately 5.27 to 7.74 days for those mothers who were hospitalized in each group. The timing of in-patient hospitalizations was similar across the groups, \( F(2, 1,214) = 0.096, ns \); when mothers in any group were hospitalized, such hospitalizations occurred at a mean of approximately 4-1/2 years after the target child’s birth.

Certain maternal characteristics were linked to the presence of in-patient hospitalizations. In all three groups, fewer mothers were hospitalized when they had higher levels of education. In both the DS and population groups, clear step functions emerged; in the DS group, maternal hospitalizations occurred in 13.4% of non-high-school mothers, 9.5% of those with high school degrees and some college, and 6.9% of those with BA degrees or beyond (in the population group, hospitalization occurred in 10.4% of the no HS; 9.6% of the high school and some college; and 6.7% of the BA-and-beyond groups). In the SB group, hospitalization percentages differed from the highest educated to the other groups (BA = 4.3% were hospitalized, compared to 16.9% of mothers without HS and 16.3% with HS and some college).

Discussion: The frequency of maternal in-patient hospitalization is greater for mothers of children with spina bifida than for mothers of children with either Down syndrome or in the general population. Mothers’ educational levels are related to maternal hospitalizations, and additional maternal, child, and family variables will be examined in terms of the presence, amount, or timing of maternal in-patient hospitalizations.
Factors Associated with Parenting Stress in Parents of Children with Angelman Syndrome

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Introduction: When predicting the relationship between parenting stress, child behavior, age, and adaptive functioning, researchers have demonstrated syndrome-specific relationships. This study focuses on the factors associated with parenting stress and family quality of life in Angelman Syndrome (AS). AS is a neurogenetic disorder characterized by severe intellectual disability, nearly absent speech, seizures, sleep disturbance, and behavioral features such as: hyperactivity, a low threshold for laughter, and repetitive behaviors. There are four known molecular mechanisms of AS: 1) maternal, de novo deletions of 15q11-q13 (70%), 2) paternal uniparental disomy (3-5% of cases), 3) imprinting defects (3-5%), or 4) mutations in the UBE3A gene on the maternally derived chromosome 15 (5-10% of cases). The factors associated with parenting stress and family quality of life have not been investigated in detail in this population.

Methods: Participants were 129 children and adolescents (age range= 11 months-30 years; mean age=5 years, 9 months) with AS who are part of an ongoing natural history study of AS. Parents completed the Parenting Stress Index (PSI), the Family Quality of Life (FQOL) scale, and the Aberrant Behavior Checklist (ABC). Participants were given the Bayley Scales of Infant and Toddler Development to assess their cognitive, language, and motor skills, and parents were interviewed using the Vineland Adaptive Behavior Scales (Interview Edition) to assess the adaptive behavior of the participant with AS.

Results: The results are presented from the baseline visit to the study. The results of the PSI revealed that 48% of parents were in clinically significant range for the Child Domain scale (including all of parents of children with imprinting center mutations), while only 10% of parents scored in the clinically significant range for the Parent Domain scale. 21% of parents scored in the clinical range for the Total Stress scale. Parents of individuals who were not deletion positive were more likely to report elevated levels of stress with the PSI Child Domain, ($X^2 = 14.13; p<.001$), and lower levels of satisfaction with family emotional well-being ($F=4.72; p=.01$). When examining partial correlations, controlling for age, the subscales of the ABC (irritability, lethargy, stereotyped behavior, hyperactivity) were all significantly correlated with Child Domain scores of the PSI and with Total Stress ($r$ range =.26-.63; all $p<.01$). A higher cognitive level was associated with higher reported levels of stress in the Child Domain ($r=.29; p<.001$); but the child’s level of language and adaptive behavior were unrelated to parenting stress. Child age was also unrelated to parenting stress. When testing a regression model, we found that high levels of Hyperactivity ($B=.234; t=2.59; p<.01$), and Irritability, and low satisfaction with Emotional Well-being in the family (from the FQOL) ($B= -.387; t= -4.92; p<.001$) are significant predictors of Total Stress ($R^2=.25$).

Discussion: In this study of AS, the primary source of parental stress is related to the severity of the child’s behavior (irritability and hyperactivity), and is mediated by emotional well-being of the family. Results point to within-group variability in AS, such that parents of non-deletion patients and parents of patients who are cognitively higher-functioning are at risk for higher levels of stress (associated with greater severity of challenging behaviors). Targeted treatment of externalizing behaviors in AS will be essential to alleviate levels of parental stress and promote well-being within the family. Clinical and further research implications will be discussed.
SYMPOSIUM 14

Transitioning Together: A Pilot Intervention for Parents of Adolescents with Autism Spectrum Disorders

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Autism spectrum disorders (ASDs) are developmental disabilities characterized by difficulties in communication, difficulties in social interaction, and repetitive behaviors. ASD affects an estimated 1 in 110 children in the US. However, there are few programs available for children with ASD and their families during the adolescent years. The paucity of evidenced-based programming during this transition period is especially concerning given that past research has shown adolescence to be a time of notably high stress for families. The present study addressed this gap by developing and evaluating the feasibility of pilot education and support program for families prior to the transition out of high school.

For the present study, 10 families of adolescents with ASD (aged 15-18 years) participated in an 8-week multi-family group intervention program entitled Transitioning Together. For each week of the intervention, mothers, fathers, and other parent figures attended parent group sessions which lasted approximately 1.5 hours. While parents attended the parent group sessions, the adolescents with ASD participated in a social group with other adolescents. Parent group sessions involved education on a variety of topics relevant to ASD as well as guided practice with problem-solving for individual family problems. The session topics included: (a) autism in adulthood, (b) transition planning, (c) problem-solving, (d) structuring the family environment, (e) addressing risks for adult independence, (f) community involvement, (g) risks to parental health and well-being, and (h) legal issues. Parent sessions typically began with 15 minutes of socializing to promote group cohesion, followed by approximately 30 minutes of teaching on a topic and 45 minutes of discussion and problem-solving. The adolescent social group involved activities such as interactive games, cooking, and skits.

Variables related to feasibility and acceptability were measured at the conclusion of each group session as well as during exit interviews with each parent. Each week parents reported how useful they felt the session was (1=not at all useful to 5=extremely useful) and their overall level of satisfaction with the session (1=very dissatisfied to 5=very satisfied). Weekly session data was averaged to create total scores for usefulness and satisfaction. Measures of parental knowledge and attitudes were collected pre- and post-intervention.

In terms of feasibility, all families remained in the program for the full eight weeks and the majority of parents (78%) felt the number of sessions was appropriate. Overall, parents were highly satisfied with the weekly sessions and felt that sessions were useful. There were significant positive changes in parental knowledge and attitudes from pre- to post-intervention, particularly for mothers. After completing the intervention, both mothers and fathers reported having a better understanding of their son or daughter's disability \((F(1,19)=4.17, p < .10)\). Additionally, mothers reported improvements in anticipating the adolescent's behavior problems from pre to post-intervention \((F(1,9)=5.00, p = .05)\). Following the intervention mothers also endorsed higher levels of being happy or proud of their son or daughter both when at home \((F(1, 9)=6.00, p < .05)\) and when in public \((F(1,9)=6.00, p <.05)\).

These findings suggest that, despite high levels of stress, parents of teenagers with ASD are (a) willing to participate in an 8-week family-based intervention and (b) find receiving education and support in a multi-family group context to be beneficial. This project is the first step in the development of a comprehensive intervention to improve child functioning and reduce family distress during the transition years.
**SYMPOSIUM 14**

**A Comparison of Resiliencies of Families Raising a Child with Autism or Fetal Alcohol Spectrum Disorder**

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**Introduction:** Families of children with Autism Spectrum Disorders (ASD) experience higher rates of stress and distress as compared to families of children with other disabilities and typically developing children (e.g., Blacher & McIntyre, 2006; Estes et al., 2009). Little research has addressed families of children with Fetal Alcohol Spectrum Disorder (FASD) and available literature is primarily anecdotal rather than scientific (O’Malley & Streissguth, 2005). Current trends in family disability research have shifted from traditionally negative, deficit-based models of coping to those which highlight positive, strength-based constructs of family functioning, such as family resiliency (Watson, 2008). Family resilience focuses on the positive factors that contribute to a family’s ability to recover from crisis, such as, the experience of hope. Hope is characterized by having positive expectations for the future and working toward their attainment, and includes both agency and pathways thinking (Snyder, 2002).

**Methods:** A mixed methods study was conducted, including 25 families of children with ASD and 25 with FASD. Employing a basic interpretive approach (Merriam, 2002), informed by the Family Adjustment and Adaptation Response (FAAR) model (Patterson & Garwick, 1994) and hope theory (Snyder et al., 1991), qualitative interviews were conducted. Caregivers completed the Parenting Stress Index (PSI-SF; Abidin, 1995) and the Hope Scale (Snyder et al. 1991).

**Results:** Data are still being collected, but preliminary results show that there is a significant negative correlation between total hope and total stress \[ r(42) = -.398, \ p = .000 \] when combining families of children of FASD and ASD; however there are also significant differences between these families. When looking at the families of children with ASD, the Parental Distress (PD) subscale of the PSI-SF which measures stress related to the parents’ perception of their own parenting competence is negatively correlated with both agency thinking \[ r(18) = -.698, \ p < .01 \] and overall hope \[ r(18) = -.655, \ p < .01 \]. This finding suggests that as hope and agency thinking increase, the experience of parental distress decreases. Similar experiences are reported by families of children with FASD, except that their overall stress levels are significantly higher \( M = 49.92, SD = 22.44 \) than families of children with ASD \( M = 50.89, SD = 23.98 \), \( t(40) = 2.97, \ p < .01 \).

It is also valuable to note that the Difficult Child subscale of the PSI-SF, which relates to the parent's view of the child's behaviour as stressful, is not significantly correlated with hope in either families of children with FASD or ASD, suggesting that the relationship between parental distress and hope is not influenced by the perceived severity of the difficult behaviours.

Interview data reveal that both families of children with FASD and ASD describe similar stressors and strains, but that there are unique differences between the two diagnoses. Both types of families describe the challenges in accessing a diagnosis, especially in less severe forms (e.g., FAE and Asperger’s). Families of children with FASD report extreme fear for the future of their child, discussing suicidality and legal problems while families of children with ASD have more optimism regarding positive life outcomes.

**Discussion:** Understanding what families do in order to transform from a family in crisis to a functioning family with a disability is important when implementing family support programs. Quantifying and qualifying the experience of families is important in order to develop a deeper understanding of the process of accessing a diagnosis and interventions in order to facilitate family adjustment.
BIO-BEHAVIORAL APPROACH TO SEVERE BEHAVIORAL PROBLEMS IN DEVELOPMENTAL DISABILITIES

Chair: Stephen Schroeder, University of Kansas

Discussant: Frank Symons, University of Minnesota
Bio-Behavioral Approach to Severe Behavioral Problems in Developmental Disabilities

Chair: Stephen Schroeder, University of Kansas
Discussant: Frank Symons, University of Minnesota

Aggression, self-injury and stereotyped behavior remain some of the most debilitating behavior problems for people with developmental disabilities. They are the major barrier to social integration in the community. They are multiply caused and multiply affected. The papers in this symposium investigate methods of integrating our knowledge of behavioral and biological variables in assessing and treating these behaviors across the life span.

Observing Non-Verbal Signs of Pain in Relation to Instances of Self-Injury Among Individuals with Intellectual Disabilities
Andrea Courtemanche
Stephen Schroeder
Jan Sheldon
James Sherman
University of Kansas

Differential Effects of Aripiprazole on the Form and Function of Problem Behavior
Stacy Danov¹
Raymond Tervo¹,²
Stephanie Meyer¹
Frank Symons¹
¹University of Minnesota
²Gillette Children’s Specialty Healthcare

Mass Screening for Severe Problem Behavior Among Infants and Toddlers in Peru
Liliana Mayo
Rosa Oyama
Judith LeBlanc
Stephen Schroeder
Nancy Brady
Merlin Butler
R. Mathew Reese
David Richman
Georgina Peacock
Jessica Foster
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Centro Ann Sullivan del Peru
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Kansas University Medical Center
Centers for Disease Control and Prevention
Nationwide Children's Hospital

A Biobehavioral Approach to Assessment and Treatment of Severe Problem Behavior Among Persons with Intellectual Disabilities: Beyond Scratching the Surface
Deborah Napolitano
Holly Brown
University of Rochester
Hillside Children's Center
Differential Functional Properties of Self-Injurious Behavior in Autism Spectrum Disorders, Cornelia de Lange and Smith-Magenis Syndromes
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SYMPOSIUM 15

Observing Non-Verbal Signs of Pain in Relation to Instances of Self-Injury Among Individuals with Intellectual Developmental Disabilities

Andrea Courtemanche, Stephen Schroeder, Jan Sheldon, James Sherman
University of Kansas

Introduction: Self-injurious behavior is a devastating chronic condition among people with intellectual disabilities for which there is no cure. There have been over 10 different hypotheses as to why individuals with intellectual disabilities engage in self-injury. One hypothesis suggests that these individuals who engage in self-injury have altered or diminished pain perception and that pain may be a cause of self-injury (Sandman, 1990/91). The purpose of the present study was to assess how frequently individuals diagnosed with an intellectual disability who engage in chronic self-injury display non-verbal signs of pain in relation to their self-injury.

Methods: Four participants (ages 28-50) with severe and profound IDD were videotaped for five one-hour sessions each in their group homes during times they were likely to engage in self-injury. Continuous recording measures were then used to code videotapes for the frequency of self-injury and the frequency and duration of expressions of non-verbal pain-related behaviors using the Non-Communicating Children's Pain Checklist-Revised (Breaux, et al., 2004). Sequential analyses (i.e. Yule's Q) were conducted to determine sequential dependencies between pain-related behaviors and self-injury.

Results: All participants readily displayed non-verbal pain-related behaviors before, during and after SIB. For some participants, non-verbal pain-related behaviors were positively correlated with self-injury, while other participants had strong negative correlations. The strength of the correlation varied with environmental context and the frequency of self-injury displayed.

Discussion: Our data suggest that, under certain circumstances, pain may be observed as an antecedent and a consequence of self-injury among adults with IDD, using the NCCPC-R. These results support the findings of Symons, et al.(2009) and they raise questions about the blunted nociception hypothesis of SIB.

References:


Differential Effects of Aripiprazole on the Form and Function of Problem Behavior

Stacy Danov1, Raymond Tervo1,2, Stephanie Meyer1, Frank Symons1
1University of Minnesota, 2Gillette Children’s Specialty Healthcare

**Introduction:** Integrating behavioral and medication treatment approaches may be a more effective and comprehensive approach to support individuals with IDD and severe behavior problems. Conducting a functional analysis of problem behavior before and during a medication trial may foster their integration. Doing so creates the opportunity to examine directly the frequency of a behavior, changes in topography and behavioral function. The purpose of this preliminary clinical study was to conduct a functional analysis of severe problem behavior for 4 children with IDD during a double blind randomized single subject medication trial of aripiprazole to test whether (a) problem behavior was reduced and (b) whether this reduction was related, in part, to the function (i.e., maintaining behavioral mechanism) of the problem behavior.

**Methods:** This study took advantage of a standard of care medication evaluation. Four children ages 6-12 with a range of IDDs were evaluated because of issues related to severe problem behavior. The medication evaluation was based on an AB double blind, placebo-controlled randomized treatment (active medication) design series. Weekly functional analyses using a multielement design (Iwata et al., 1982/1994) were conducted to estimate any medication effects on the frequency of problem behavior in relation to specific behavioral mechanisms (positive, negative social reinforcement). Weekly behavioral rating scales were completed (Aberrant Behavior Checklist, Behavior Problems Inventory, Nisonger).

**Results:** 3 out of 4 participants showed decreases in problem behavior in the aripiprazole phase compared to placebo during the functional analysis. For Cali, problem behavior decreased by 62.5% from placebo to treatment; the primary behavior topography of negative reinforcement decreased by 71.93% from placebo to treatment. For Stan, problem behavior only occurred during the primary behavior topography of negative reinforcement and decreased by 71.93% from placebo to treatment. For Fay, problem behavior decreased by 48.6% from placebo to treatment; the primary behavior topography of negative reinforcement decreased by 57.78% from placebo to treatment. For the same three participants there was a reduction in the ABC–Irritability subscale (20.66% for Cali, 38.9% for Stan, 50.35% for Fay). There were no statistically significant effects based on randomization tests.

**Discussion:** This study examined the effects of aripiprazole for four children with IDD as indexed by changes in directly observed frequency, form, and function through visual analysis of functional analysis data, changes in observed frequency through statistical analysis (i.e., randomization tests), and changes in reported frequency of problem behavior and related information through rating scales. Based on descriptive visual analysis and behavioral rating scale data, there were differential positive effects of the medication for three of the four participants. This clinical study further demonstrates how functional analysis may be a useful adjunct during a medication trial by specifying reinforcement-dependent changes in behavior.

**References:**


Mass Screening for Severe Behavior Problems Among Infants and Toddlers in Peru

Liliana Mayo, Rosa Oyama, Judith LeBlanc, Stephen Schroeder, Nancy Brady, Merlin Butler, R. Mathew Reese, David Richman, Georgina Peacock, Jessica Foster, Janet Marquis
Centro Ann Sullivan del Peru; Life Span Institute, University of Kansas; Kansas University Medical Center; Centers for Disease Control and Prevention; Nationwide Children’s Hospital

Introduction: Severe behavior problems among people with IDD are a major barrier to integration in the community. Recent research suggests that these behaviors often begin very early in life and might be prevented by early identification and intervention (Rojahn, Schroeder, & Hoch, 2008). The current presentation discusses a method of mass screening for early signs of severe behavior problems among infants and toddlers in Peru, a third world country where only 2% of people with IDD receive services.

Methods: A Parental Concerns Questionnaire (PCQ) which asks 15 questions, each related to a risk factor for severe behavior problems, based on past research in IDD, was used by veteran parents to interview 319 new parents who had been solicited by TV, radio, and public service announcements across the country. Of these, 262 were recruited and enrolled in a longitudinal study in which they will be followed for 12 months, to see if at-risk children actually will develop severe behavior problems. An extensive initial interdisciplinary evaluation was given to each child. Consumer satisfaction questionnaires were given to the parents as to their attitude toward the screening method.

Results: Data from the Interdisciplinary evaluations are currently under analysis and will be presented at the conference in March. Preliminary inspection of 50% of the sample suggests a very high hit rate (c.95%) by the screening instrument (PCQ). Consumer satisfaction was 98%, suggesting that the method was tolerated well by parents.

Discussion: The PCQ is a brief and efficient method to screen infants and toddlers at risk for severe behavior problems. The data also suggest that parents suspect these problems at a very early age. Early intervention thus seems a feasible strategy to intervene before these problems become deeply ingrained as children develop.

Reference:

Supported by Fogarty International Grant No. 1R21HD060500-01A1
A Bio-Behavioral Approach to the Assessment and Treatment of Problem Behavior in Persons with Intellectual Disabilities:
Beyond Scratching the Surface
Deborah Napolitano, Holly Brown
University of Rochester, Hillside Children’s Center

Introduction: Individuals with Intellectual Disabilities (ID) are 3 to 4 times more likely to have co-morbid psychopathology; however, there is a paucity of research to inform the nature and course of the problem or the development of preventative and intervention programs. Additionally, the prevalence of challenging behavior (e.g., aggression, SIB, property destruction) in persons with ID ranges from 6-30% (Allen, Lowe, Moore., & Brophy, 2007) and approximately 20% to 45% of individuals with ID are prescribed psychotropic medication. In order to treat challenging behaviors, it is important to understand that a variety of factors, including setting events (e.g., psychiatric disorders, genetic disorders) may contribute to persons with ID displaying problem behavior. Antipsychotics are often the treatment prescribed for problem behavior in persons with ID, however they are indicated only for psychiatric disorders. The over-use of antipsychotics in persons with ID may be due to previous notions of aggression associated with psychotic disorders (Tsiouris, J. A., 2010). Formal functional behavioral assessment may improve clinical outcomes for persons with ID who display problem behavior (Didden, 2006). Because of the complex needs of these individuals, the assessment and treatment approach is ideally informed by an interprofessional approach.

Methods: Some characteristics and benefits of an interprofessional approach to care include: a plan that reflects the contributions of all team members, innovative solutions to complex problems, and improved quality of care for complex problems (Patel, Pratt, & Patel, 2008). Interprofessional teams can inform assessment and treatment of problem behavior, including the functional analysis process, in a variety of areas. Some examples include when there are signs of medical concerns (e.g., constipation), psychiatric disorders (e.g., anxiety), or SIB.

Results and Discussion: Three case examples and supporting data will be presented to demonstrate the utility of an interprofessional bio-behavioral approach to assessment and treatment of problem behavior. First, the effects of medication changes on high-intensity aggression in a 17-year-old diagnosed with an autism spectrum disorder will be discussed (Marshall et al., 2003). Next, an evaluation of hypothesized negative side effects of a medication on the increased intensity of aggression in a 13-year-old boy with a severe intellectual disability through the use of a functional analysis will be described. Finally, an evaluation of the function of repeated statements and an innovative treatment approach to address problem behavior displayed by a teenager, with a complex history of setting events, will be presented.

References:
### Introduction

Self-injurious behavior (SIB) in intellectual and developmental disabilities is a destructive behavior disorder that is prevalent in individuals with more severe intellectual disabilities, in autism spectrum disorders, and in select genetic syndromes, such as Cornelia de Lange and Smith-Magenis Syndromes (Rojahn, Schroeder, & Hoch, 2008). This suggests that there is a gene-behavior relationship, at least in such genetic syndromes. It would therefore be of interest to investigate whether SIB in Cornelia de Lange, Smith-Magenis syndromes have different topographies and functions of SIB.

### Method

**Participants.** The study will involve 25 individuals with SIB for each group: Autism Spectrum Disorder, Cornelia de Lange syndrome, and Smith-Magenis syndrome. We will attempt to match the groups in terms of age, gender and degree of intellectual disabilities. Participants will be recruited via parent and advocacy organizations. The assessment instrument will be provided to parents and guardians via an internet-based survey (Survey Monkey). **Assessment Instruments.** *Questions About Behavioral Function* (QABF; Vollmer & Matson, 1995) is a 25-item informant based functional assessment instrument with five subscales, (1) social positive reinforcement via attention, (2) negative social reinforcement, (3) automatic positive or negative reinforcement, (4) pain attenuation or physical discomfort reduction, (5) socially mediated access to tangibles. *Behavior Problems Inventory* (BPI-01, Rojahn, Matson, Lott, Esbensen, & Smalls, 2001) is a 49-item informant based behavior-rating instrument with 14 SIB, 24 stereotypic behavior, 11 aggressive/destructive behavior items. For group comparisons the most frequent and severe form SIB topography will be analyzes (based on the BPI-01) for each participant.

**Results Data Analysis:** We are still in the process of collecting data. The main data analyses will involve a comparison of the functional profiles of SIB across groups by a multiple analysis of variance with the scores of the five QABF subscales as the multiple dependent variables. Should the groups differ in terms of key demographic variables (e.g., levels of intellectual disabilities) a multiple analysis of co-variance will be conducted to control for that. To test for differences in SIB topographies we will use $\chi^2$ tests.

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| 8:45-10:15 A.M.  | Symposium 1 Contessa A  
The Science and Art of Home-Based Interventions Targeting IDD: Progress and Problems (J. Nicholson/J. Farris)  
Symposium 2 Contessa B  
Health Care Disparities and Diagnosis for Latinos with Autism Across the Lifespan (S. Magaña)  
Symposium 3 Magnolia  
Psychological Well-Being in Caregivers of Children and Adolescents with Autism Spectrum Disorders and Intellectual Disabilities (J. Weiss) |
| 10:30 A.M.-10:45 A.M. | Opening Remarks: Elisabeth Dykens, Ph.D.  
Contessa A & B |
| 10:45 A.M.–12:15 P.M. | Plenary Session 1: Ronald Dahl, M.D.  
Contessa A & B  
"Adolescent Brain Development: A Window Into Vulnerabilities and Opportunities" |
| 2-3:30 P.M.      | Symposium 4 Contessa A  
Williams Syndrome: From Pixels to Parents (E. Dykens/M. Lense)  
Symposium 5 Contessa B  
Children of Adolescent Mothers During Late Adolescence (K. Weed)  
Symposium 6 Magnolia  
Novel Approaches to Understanding and Treating Autism: The Biological and Behavioral Interchange (B. Corbett) |
| 3:45-4:45 P.M.   | NIH Session Behind Closed Doors: What Really Happens at an NIH Study Section |
| 4:45-5:30 P.M.   | NIH Session Tips and Tricks for Successful NIH Funding with Q&A |
| 5:30-5:45 P.M.   | NIH Session And Now, the Rest of the Story |
| 5:45–7:45 P.M.   | Poster Session 1 Reception sponsored by Brookes Publishing |
| 8:45-10:15 A.M.  | Symposium 7 Contessa A  
Down Syndrome and Alzheimer’s Disease: Longitudinal Studies of Dementia Status and Risk (W. Silverman)  
Symposium 8 Contessa B  
Adult Siblings of Individuals with Intellectual and Developmental Disabilities: New Perspectives (J. Louwds-Taylor)  
Symposium 9 Magnolia  
Peer Relationships in Adolescents with an Autism Spectrum Disorder (G. Orsmond) |
| 10:30 A.M.–12 P.M. | Plenary Session 2: Cheryl Sisk, Ph.D.  
Contessa A & B  
"Pubertal Hormones Shape the Adolescent Brain" |
| 1:30-3 P.M.      | Plenary Session 3: Bruce Compas, Ph.D.  
Contessa A & B  
"Coping with Stress: Insights from Intervention Research and Youth with Acquired Neurocognitive Problems" |
| 3:30–5 P.M.      | Symposium 10 Contessa A  
Biomarkers/Behavioral Indicators of Anxiety/Fear in Young Males w/Fragile X (J. Roberts/H. Hazlett)  
Symposium 11 Contessa B  
Transitions to Adulthood: Diverse Family Perspectives (L. Glidden)  
Symposium 12 Magnolia  
Human Fetal Exposure to Psychobiological Stress Alters Developmental Trajectories (C. Sandman) |
| 5:30-7:30 P.M.   | Poster Session 2 Reception sponsored by Noldus Technology |
| 8:45–10:15 A.M.  | Symposium 13 Contessa A  
Early Adolescence and Developmental Disabilities (B. Baker)  
Symposium 14 Contessa B  
Parent Stress, Health, and Interventions (N. Miodrag)  
Symposium 15 Magnolia  
Bio-Behavioral Approach to Severe Behavioral Problems in Developmental Disabilities (S. Schroeder) |
| 10:30 A.M.–12 P.M. | Plenary Session 4: Laurence Steinberg, Ph.D.  
Contessa A & B  
"A Social Neuroscience Perspective on Adolescent Risk-Taking" |
| 12 P.M.          | Closing Remarks: Elisabeth Dykens, Ph.D.  
Contessa A&B |