**Title:** Predictors of Age of Diagnosis for Children With Autism Spectrum Disorder: The Role of a Medical Home, Race and Condition Severity

Natacha Emerson, Holly Morrell, Cameron Neece, Loma Linda University

**Introduction:** Early intervention for Autism Spectrum Disorders (ASD) has considerable impact on intellectual and behavioral outcomes. The time sensitivity of successful interventions underscores the need for speedy diagnosis. Having a regular place of medical care, also known as a medical home (MH), may promote the continuity of care necessary for accurate developmental screening of ASD. Diagnosis of ASD has historically been influenced by certain demographic variables, including race and ASD severity. The aim of this study was to determine whether having a medical home, race and ASD severity predicted age at time of initial ASD diagnosis using data from the 2011-2012 National Survey of Children’s Health (NSCH).

**Method:** Participants: Data were obtained from the Centers for Disease Control and Prevention NSCH 2011. The sample consisted of parents or guardians of children between the ages of 0 and 17.

Procedure: The national cross-sectional survey was conducted via random-digit-dialed telephones, both landline and mobile, between February 2011 and 2012.

Measures: Publicly available data files and methodology reports from the 2011-2012 NSCH were used to test research questions. The purpose of the NSCH was to collect information on children's health, including physical and mental health status, access to health care, information on the child's family, neighborhood, and social context. Of relevance to this study, parents provided information on the child's age at time of initial ASD diagnosis, ASD severity and whether the child had a place of regular medical care.

Data Analysis: A hierarchical multiple linear regression analysis was used to examine the relative contributions of race, ASD severity and MH on age of initial ASD diagnosis, controlling for parental education and income. Two- and three-way interactions among race, ASD severity and MH on age of diagnosis were also examined.

Results: There was a significant interaction between race, ASD severity and MH, such that having a MH predicted earlier autism diagnosis for Caucasian children but not for African American children with moderate or severe ASD. In terms of main effects, race, ASD severity and MH all independently predicted age of diagnosis. While we assumed that Caucasian children would be diagnosed earliest, Hispanic and African American children were diagnosed earlier. We also found that condition severity predicted diagnosis age, with moderate ASD being diagnosed earlier than mild or severe forms. Finally, having a MH also independently predicted earlier diagnosis. Neither control variable, parental education or income, independently predicted age of diagnosis.

Discussion: Given well-documented racial disparities in medical practice, results suggest that physician referral practices may differ based on patient race. The historical underdiagnosis of ASD in minority children highlights the possibility that primary physicians may not be recognizing the appropriate warning signs in African American children in the MH. Perceived discrimination by patients may also contribute to delays in diagnosis seeking. Recognizing how bias may infiltrate diagnostic practice and consultation requests may reduce racial disparities and prevent treatment delays. More research is needed to clarify the intrapersonal factors involved in diagnosis seeking. Determining deterrents to diagnosis, whether bias-based or not, is vital to reducing the gap between perception of ASD symptoms and confirmation of diagnosis.

References:


Title: A Tool for Measuring Social-Communication Skills in Preschoolers With Autism Spectrum Disorders

Katie Belardi, University of North Carolina at Chapel Hill; Jessica Dykstra, Frank Porter Graham Child Development Institute; Brian Boyd, University of North Carolina at Chapel Hill; Linda Watson, University of North Carolina at Chapel Hill; Grace Baranek, University of North Carolina at Chapel Hill; Betsy Crais, University of North Carolina at Chapel Hill

Introduction: Social-communication behaviors are viewed as pivotal skills and common intervention targets for children with autism spectrum disorder (ASD; Kasari, 2002; Sigman & McGovern, 2005). The Advancing Social Communication and Play (ASAP; Watson et al., 2009) project is testing the efficacy of an intervention addressing social-communication and play skills in preschoolers with ASD. As part of an intervention development grant, the ASAP research team developed a coding system designed to capture change in preschoolers' social-communication skills over time, based on behaviors exhibited during repeated Autism Diagnostic Observation Schedules (ADOS; Lord, Rutter, DiLavore, & Risi, 1999) administrations. The team's goals were to develop a valid tool tailored to children ages 3 to 5 that yields a single summary score and is sensitive to changes in primarily non-verbal social communication skills.

Methods: Behaviors were selected based on a hierarchy of social-communication treatment targets across three main categories: social interaction (SI), requesting (RQ), and joint attention (JA). A coding manual was created with operational definitions of each category. Each behavior was assigned a weight within and across categories based on previous research on non-verbal communication.

Results: Results from the Institute of Education Sciences Goal 2 development grant serve as pilot data (N=31) and three years of ASAP data (N=~120) will be presented at the conference. Two trained observers were assigned to code ADOS assessments. For the 31 pre- and post-test videos, two observers randomly coded >20% of the videos for reliability.

Inter-rater reliability. Reliability was assessed using intraclass correlations (ICCs) for each of the sub-scales of the social-communication coding system (SI, RQ & JA) and the total score. Due to expected and observed differences in total scores of children receiving ADOS Module 1 versus 2, ICCs also were calculated for the two different module groups. Overall, observers achieved ICCs above .80 for RQ, JA, and total scores across both modules and overall, but were below .80 for SI (.40).

Stability. As expected, social-communication scores were strongly correlated across time points for control and treatment group JA (.85; .84) and total scores (.86, .76), and weakly correlated across time points for treatment group RQ (.12).

Sensitivity to change. A paired t-test indicated significant differences for the total score (p=.04). The number of children showing positive gains for RQ, JA, and total score were 22/32, 18/32, and 20/32, respectively, with higher proportions of the treatment group showing change.

Concurrent validity. The social-communication scores for JA and total score were moderately correlated with the age-equivalents for the receptive and expressive Mullen language scale, receptive r=.54, p=.001 and expressive r=.59, p<.001, respectively. The RQ scores were not significantly correlated with the language age-equivalents.

Discussion: The social-communication coding system developed for this study offers a reliable, sensitive to change, and potentially useful tool to evaluate early social-communication skills in the context of ADOS assessments for children ages 3 to 5 years.

References:


Title: The Agreement Between the Questions About Behavior Function, Motivation Assessment Scale, Functional Assessment Interview, and Brief Functional Analysis of Children With Problem Behaviors

Ashley Fee, Drake University; Maria Valdovinos, Drake University; Nathan Noble, Blank Children’s Hospital

Introduction: Various indirect assessments and direct assessments (functional analyses) have been utilized to measure the function of problem behaviors in clinical settings to provide the most effective behavioral intervention (Delfs & Campbell, 2010). Past literature found a low consistency between indirect assessments and functional analyses when measuring the problem behaviors of children (Alter et al., 2008). The current study involves a comparison of the results from behavioral indirect assessments and direct functional analyses to determine the function of problem behaviors.

Method: Twenty-four children within the age range of 2-12 years were referred for behavioral assessments. Indirect assessments were completed by the legal guardians of children before a direct assessment of function in the clinic. These assessments included the Questions About Behavior Function form and Motivation Assessment Scale (both collect information about potential function of problem behaviors). Additionally, a Functional Assessment Interview (O’Neill, et al., 1997) was completed via telephone before the direct assessment. Hypotheses on the function of problem behaviors were formed from the responses obtained during the FAI (Interobserver Agreement of 70% was achieved). A direct assessment (brief FA) was conducted in a clinical setting to determine the function of the children’s problematic behavior using standard conditions (i.e., control, demand, tangible, Iwata et al. 1994). Following these test conditions, reversal contingency conditions were initiated depending on the test conditions problem behaviors occurred most frequently. The data from indirect assessments and functional analyses were compared based on their agreement with determining the function of behavior. Results: The QABF provided the highest average agreement of 65.0% predicting the function of problem behaviors and the highest agreement when predicting the attention function (70.0%). To a lesser extent, the MAS produced an average agreement of 63.0% in addition to successfully predicting tangible and sensory, or automatic, function along with the QABF (76.0% and 66.0%, respectively). The hypotheses drawn from the FAI produced the most false positives with an agreement average of 57.75% yet yielded the fewest false positives for the escape function of problem behaviors with an agreement of 75.0%

Discussion: The results from these comparisons indicate an inconsistency of agreement between the MAS, QABF, and FAI hypotheses with the exception of being equally compatible in predicting behaviors with automatic function (e.g. stereotypic movements). This outcome reflects the importance of considering the typography of problem behaviors being assessed when completing assessments (Herzinger & Campbell, 2007). Due to these inconsistencies, it is important for clinicians and researchers to use multiple modalities when assessing the function of problem behaviors in children to validate the use of the provided intervention (Northup, et al., 1991). Key References: Alter, P.J., Conrey, M.A., Mancil, G.R., Haydon, T. (2008). A Comparison of Functional Analysis Reference Assessment Methodologies with Young Children: Descriptive Methods and Functional Analysis. Journal of Behavioral Education, 17, 200-219.


Title: Parents' Experiences With Sensory Integration Intervention

Mark Depot, Massachusetts School of Professional Psychology; Tara Jane Bessette, Kessler Institute for Rehabilitation

Introduction: This study explored possible reasons for the popularity of sensory integration (SI) intervention for children with autism spectrum disorder (ASD) despite the current absence of scientific consensus regarding the efficacy of the intervention. This lack of consensus could be attributed to the fact that many studies measuring the efficacy of SI intervention have lacked rigorous methodology, while others have examined isolated sensory-based strategies rather than a true SI approach. Previous studies have explored factors that influence parents' decisions related to interventions for their children with ASD, but no study directly focused on factors related to SI intervention.

Methods: The Parent Experiences with Sensory Integration (PESI) survey was developed for the current study to gather information from parents and legal guardians about their experiences with SI intervention. The survey was distributed online primarily through parent networks in chapters of the Autism Society of America across the United States. There were 77 individuals (67% of total consenting and eligible participants) who completed the survey and are included in the data analysis. Participants were predominately Caucasian, married mothers with college degrees and small families (1 or 2 children) representing a wide range of economic and geographic backgrounds.

This study assessed the relationship between involvement in treatment, perceptions of intervention effectiveness, and other related factors (e.g., source of information about SI, knowledge of SI, and optimism for prognosis). Data were analyzed using parametric hypothesis testing and simple linear regression.

Results: The internal consistency of the sub-scales in the PESI that measured perceptions of intervention effectiveness was good (Effectiveness scale, alpha=0.84; Progress scale, alpha=0.90), while other subscales were generally in the acceptable range. Data analysis revealed three statistically significant relationships of note. First, scores on the Optimism scale significantly predicted Progress scale scores, beta=.416, t(75)=3.958, p<.001. The Optimism scale also explained a small proportion of variance in Progress scale scores, R2=.173, F(1, 75) = 15.664, p<.001. Second, scores on the Knowledge scale significantly predicted both Effectiveness scale scores, beta=.690, t(75)=8.255, p<.001, and the Progress scale, beta=.399, t(75)=3.766, p<.001. The Knowledge scale also explained a significant proportion of variance in the Effectiveness scale, R2=.476, F(1, 75)=68.149, p<.001, and a small proportion of the variance in the Progress scale, R2=.148, F(1, 75)=14.181, p<.001.

Discussion: The current study provided a glimpse of how parents experience SI intervention and what might influence their perceptions of its effectiveness. Although many of the relationships that were explored in this study were not found to be statistically significant, these findings were also meaningful. There had been a number of claims made in the literature about what factors influenced parents' experiences with their children's interventions, and the data in the current study provided evidence to suggest that many of these factors did not play a significant role. These included cost of treatment, family resources, and severity of disability. Future studies should explore these factors and how they influence a child's degree of involvement in SI intervention.

References:


Title: Auditory and Visual Sustained Attention in Down Syndrome

Gayle Graham Faught and Frances Conners, University of Alabama

Introduction: Sustained attention is the maintenance of attention for irregularly occurring events over time. It is predominantly influenced by the right prefrontal cortex and corpus callosum, which are reduced in volume in Down syndrome (DS). This suggests sustained attention might be a cognitive deficit in DS. However, some studies found youth with DS performed at developmental level on sustained attention tasks. Unfortunately, these studies often provided conflicting and inconclusive results and rarely included auditory sustained attention. Given special difficulties in auditory short-term memory (STM) and oral language processing in DS, it is possible that auditory sustained attention is especially problematic. Thus, the current study investigated if sustained attention is a deficit in DS by comparing youth with DS to typically developing (TD) youth matched for cognitive ability on both auditory and visual Sustained Attention to Response Tests (SARTs).

Method: Participants were 20 youth with DS aged 10-21 years and 20 TD youth aged 3-7 years. Both groups were screened for vision and hearing impairments, and the TD group was screened for ADHD. Groups were matched on nonverbal ability, p=.98, and receptive vocabulary, p=.70, as assessed by the KBIT-2 Matrices and PPVT-4, respectively. Groups completed both auditory and visual SARTs in which they pressed a computer key in response to 8 non-targets and resisted pressing a computer key in response to a target. Non-targets were line drawings of animals in the visual SART and spoken names of animals in the auditory SART. The target was a drawing or name of a dog. Animals were presented in 25 continuous blocks over 8 minutes, with 200 non-target and 25 target presentations total. Dependent variables were commission errors (i.e., pressing in response to the target) and omission errors (i.e., failing to press in response to non-targets). Groups also completed auditory and visual STM tasks (digit span and Corsi block span) to determine if sustained attention predicted the pattern of poor auditory relative to visual processing characteristic of DS.

Results: Mixed ANOVAs were run analyzing Group (DS vs. TD) x Modality (auditory vs. visual) on SART commission and omission errors. For commission errors, results revealed no significant main effect of group, p=.81, modality, p=.06, or group x modality, p=.56. For omission errors, results revealed no significant main effect of group, p=.96, modality, p=.15, or group x modality, p=.60. Regression analyses were run to determine if sustained attention accounted for variance in STM beyond the influence of group membership and cognitive ability. For auditory STM, group and cognitive ability accounted for 68.5% of variance, and auditory omission errors added a nearly significant portion of variance beyond that, R2change=.035, p=.05. For visual STM, group and cognitive ability accounted for 49.6% of variance, and visual omission errors added a significant portion of variance beyond that, R2change=.062, p=.04.

Discussion: Youth with DS performed at developmental level on both auditory and visual SARTs, as they performed similarly to TD youth matched for cognitive ability. Further, auditory sustained attention was as sufficient as visual sustained attention in DS. Results suggested neither auditory nor visual sustained attention was a particular deficit in DS. This is surprising given reduced volume in brain regions linked to sustained attention and particularly poor auditory processing seen in DS. Further, sustained attention did not predict the pattern of poor auditory relative to visual STM characteristic of DS, though it did contribute individual differences in STM. Additional research is required to determine the cause of this particular STM deficit in DS. Better understanding of the DS cognitive phenotype could improve this population’s quality of life. Thus, future research should continue to investigate sustained attention and STM in DS.
Sex Differences in Peer Relationships and Social Skill Profiles Among Youth and Young Adults With Autism Spectrum Disorder

Ami Tint and Jonathan A. Weiss, York University

Introduction: There is a growing body of literature indicating that youth with Autism Spectrum Disorder (ASD) frequently experience social isolation and a host of difficulties with peer relationships (Schroeder, Cappadocia, Bebko, Pepler & Weiss, 2014). While research on peer relations among typically developing youth has yielded robust sex differences (Reis, 1998), research to date in the ASD literature is predominantly focused on young males. To better understand the female ASD profile, the current study explored sex-related differences in social skills and peer relations in female youth with ASD compared to male youth with ASD and females with intellectual disabilities (ID) without ASD.

Methods: As part of a larger project on sport participation in youth with ID, 269 caregivers (86.2% female, M age = 49.52, SD = 6.09) of youth and young adults registered with Special Olympics Ontario completed an online survey. Youth ranged in age from 11 to 22 years of age (M = 17.03, SD = 3.06). Approximately 51% of the sample had ASD (male n = 106; female n = 31) with the remaining composed of females with ID without ASD (n = 132). The three groups did not differ according to demographic variables (i.e., youth age, caregiver age, geographical location, caregiver education, and family income), overall adaptive behavior (Waisman Activities of Daily Living Scale; Maenner et al., 2013) or functional cognitive skills (4-item scale; Sterzing, et al., 2012).

Social skills were measured through a brief 4-item scale (Sterzing et al., 2012) which asks parents how often their child ‘joins groups without being told to'; 'makes friends easily'; 'seems confident in social situations'; and 'starts conversations rather than waiting for others to initiate' rated on a 3-point scale with higher scores reflective of better social skills. As a measure of peer relations, caregivers completed the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Three individual items were used in the current analysis: 'Has at least one good friend'; 'Often fights with other children or bullies them'; and 'Picked on or bullied by other children'. Each item was rated on a 3-point ordinal scale: 0 (Not true), 1 (Somewhat true) 2 (Certainly true).

Results: The assumption of homogeneity of variance was violated; therefore, the Brown-Forsythe F is reported. The three groups significantly differed according to social skills, F(2, 207.33)=18.57, p<.001. Games Howell post-hoc comparisons revealed both males and females with ASD had poorer social skills than females without ASD, mean differences = -.46 and -.51, respectively, both p’s <.001. Kruskal-Wallis tests revealed no significant differences between the three groups on the SDQ peer relation items with one exception: 'Has at least one good friend', χ2(2)= 37.47, p<.001. Post hoc comparisons revealed males with ASD had lower scores on the good friend item as compared to females with (p<.05) and without ASD (p<.01).

Discussion: Preliminary findings reveal relevant diagnosis and sex related differences. Results will be discussed in relation to the camouflage hypothesis (Dworzynski et al., 2012) and directions for future research.

Select References:


Title: Parent Implemented Spoken Language Intervention for Boys With FXS: Effects on Generalized Maternal Strategy Use and Child Spoken Language

Sarah Nelson, Lauren Bullard, Nancy Castignetti, Robyn Tempero Feigles, Melissa Mello, Andrea McDuffie, Leonard Abbeduto, University of California Davis

Introduction: Few spoken language interventions target adolescents with intellectual disabilities. Yet spoken language is likely to be an important determinant of later independent adult functioning. One empirically supported approach to facilitating children’s language growth is to teach parents to regularly engage in language rich, reciprocal interactions with their children. Boys with FXS display phenotypic characteristics that include, not only cognitive delays, but also inattention, hyperarousal, perseveration, restricted interests, tangential speech, social anxiety, and escape-maintained challenging behaviors, all of which are likely to interfere with the types of sustained conversational interactions that support language learning. The current study reports Part 1 of the results of a parent-implemented language intervention that targeted the narrative language skills of three adolescent boys with FXS. Narrative language competence enables children to sustain a spoken interaction about a shared topic, talk about a sequence of events in a coherent manner, and use diverse vocabulary and advanced grammatical structures. Using a multiple baseline design across three parent/child dyads, the goal of the intervention was to teach mothers to use three naturalistic language intervention strategies when interacting with their sons within the context of shared story-telling interactions.

Research Questions:

1. Do mothers increase their use of expanding, wh-questions, and time delay relative to baseline during intervention and generalization?

2. Do children with FXS increase their roles in the dyadic story telling and mean length of utterance and number of different words relative to baseline during intervention and generalization?

Method: Three boys with FXS and their biological mothers participated. Each family was loaned a Mac laptop computer, a Bluetooth headset, and an ipad. The intervention consisted of 2 parent education sessions delivered to the mother following baseline, and 12 parent/child coaching sessions. All sessions were delivered by a licensed speech/language pathologist via distance teleconferencing using SKYPE and eCAMM call recording software. Each mother selected nine digitized wordless picture books, which were counterbalanced across baseline and intervention sessions. Data were collected during the first 10 minutes of each coaching session and no coaching was provided during data collection. Mothers also independently completed one weekly generalization session and submitted this session video to the research staff electronically. Mothers later watched the generalization session with one of 2 masters-level speech/language clinicians who provided the mother with feedback about strategy use.

Results: Graphed data will be presented to demonstrate that both mothers and children had a positive response to the intervention. Relative to baseline, mothers increased their use of the three targeted intervention strategies and children increased their mean length of utterance and the number of different vocabulary words they used during shared story telling. Children increased the number of story-relevant utterances they used when telling the story and produced more story-related utterances than their mothers during story retelling.

Discussion: Boys with FXS often tell fractured stories and relate events with elements missing, unexplained, or out of order. They have problems understanding which details of events or experiences are important to remember and relate to a listener. They also have trouble expressing the ideas that are important for telling a story, especially making inferences and predictions. As the result of this intervention, mothers learned a set of strategies they could use to sustain a conversational interaction with their child. Boys increased the number of story-relevant utterances they produced and produced more story-related utterances than their mothers, indicating increased independence in talking about the book as the intervention progressed. The boys also used more complex and varied language. Clinical implications will be discussed.
Title: Parent Implemented Spoken Language Intervention for Boys With FXS: Effects of Parent Coaching on Maternal Strategy Use

Lauren Bullard, Sarah Nelson, Nancy Castignetti, Robyn Tempero Feigles, Melissa Mello, Andrea McDuffie, Leonard Abbeduto, University of California Davis

Introduction: Few spoken language interventions target adolescents with intellectual disabilities. Yet spoken language is likely to be an important determinant of later independent adult functioning. One empirically supported approach to facilitating children’s language growth is to teach parents to regularly engage in language rich, reciprocal interactions with their children. Boys with FXS display phenotypic characteristics that include, not only cognitive delays, but also inattention, hyperarousal, perseveration, restricted interests, tangential speech, social anxiety, and escape-maintained challenging behaviors, all of which are likely to interfere with the types of sustained conversational interactions that support language learning. The current study reports Part 2 of the results of a parent-implemented language intervention that targeted the narrative language skills of three adolescent boys with FXS. Narrative language competence enables children to sustain a spoken interaction about a shared topic, talk about a sequence of events in a coherent manner, and use diverse vocabulary and advanced grammatical structures. In the current study, we were interested in examining fidelity of intervention delivery by the clinician and how the clinician's coaching influenced maternal spontaneous and prompted strategy use.

Research Questions:

1. What is the frequency and distribution of coaching behaviors used by the clinician during parent/child coaching sessions?

2. What is the frequency of parent spontaneous and prompted use of intervention strategies during parent/child coaching sessions?

3. Does parent strategy use during coaching sessions generalize to data collection and generalization sessions?

Method: Three boys (ages 11-12 years) with FXS and their biological mothers participated in the intervention. Each family was loaned a Mac laptop computer, a Bluetooth headset and an ipad. The intervention consisted of 2 parent education sessions delivered to the mother following baseline, and 12 parent/child coaching sessions. All sessions were delivered by a licensed speech/language pathologist via distance teleconferencing using SKYPE and eCAMM call recording software. Nine different wordless picture books were digitized for use on the ipad and their use was counterbalanced and rotated across baseline and intervention sessions. Data were collected during the first 10 minutes of each coaching session and no coaching was provided during data collection. Mothers also independently completed one weekly generalization session and submitted the video of this session to the research staff electronically. Mothers later watched this session with a masters level speech/language clinician who provided feedback about generalized strategy use.

Results: Graphed data will be presented to examine (a) categories of coaching behaviors used by the SLP and (b) maternal spontaneous and prompted use of targeted strategies. By examining prompted use of intervention targets by mothers during coaching sessions, we are able to track whether and how each mother responded to coaching from the SLP. By examining spontaneous strategy use, we are able to track how mothers learned to use the targeted intervention strategies over the course of the intervention. We also examine associations between strategy use during coaching and use of these strategies during data collection and generalization sessions.

Discussion: This study allowed us to examine, on a session-by-session basis, the coaching strategies used by a speech/language pathologist during a parent-implemented naturalistic language intervention. The intervention targeted three strategies: asking open ended wh-questions, expanding child responses to contingently model more advanced language, and use of time delay to prompt more complete child responses. The mothers demonstrated variability in their response to coaching with some mothers needing more direct coaching prior to displaying spontaneous use of the targeted strategies. The clinician was able to adapt her coaching style to the individual needs of each mother. Clinical implications will be discussed.
Title: Parent Implemented Spoken Language Intervention for Boys With FXS: Intervention Effects on Child Use of Grammatical Categories

Nancy Castignetti, Sarah Nelson, Lauren Bullard, Robyn Tempero Feigles, Melissa Mello, Andrea McDuffie, Leonard Abbeduto, University of California Davis

Introduction: Few spoken language interventions target adolescents with intellectual disabilities. Yet spoken language is likely to be an important determinant of later independent adult functioning. One empirically supported approach to facilitating children's language growth is to teach parents to regularly engage in language rich, reciprocal interactions with their children. Boys with FXS display phenotypic characteristics that include, not only cognitive delays, but also inattention, hyperarousal, perseveration, restricted interests, tangential speech, social anxiety, and escape-maintained challenging behaviors, all of which are likely to interfere with the types of sustained conversational interactions that support language learning. The current study reports Part 3 of the results of a parent-implemented language intervention that targeted the narrative language skills of three adolescent boys with FXS. Narrative language competence enables children to sustain a spoken interaction about a shared topic, talk about a sequence of events in a coherent manner, and use diverse vocabulary and advanced grammatical structures. In the current study, we were interested in whether participation in the intervention resulted in boys using more nouns, verbs, adverbs, prepositions, and subordinating conjunctions during both intervention and generalization sessions.

Research Question: Does frequency of grammatical category use by boys with FXS increase during (a) intervention sessions and (b) generalization sessions relative to baseline?

Method: Three boys with FXS and their biological mothers participated in the intervention. Each family was loaned a Mac laptop computer, a Bluetooth headset and an ipad. The intervention consisted of 2 parent education sessions delivered to the mother following baseline, and 12 parent/child coaching sessions. All sessions were delivered by delivered by a licensed speech/language pathologist via distance teleconferencing using SKYPE and eCAMM call recording software. Nine different wordless picture books were digitized for use on the ipad and their use counterbalanced and rotated across baseline and intervention sessions. Data were collected during the first 10 minutes of each coaching sessions and no coaching was provided during data collection. Mothers also independently completed one weekly generalization session and submitted this session video to the research staff electronically. Mothers later watched the generalization session with a masters level speech/language clinician who provided feedback about strategy use.

Results: Graphed data will be presented to display results individually for each participant. Boys increased their use of words in all grammatical categories during intervention and generalization sessions relative to baseline sessions. These increases in vocabulary were also evident in examination of lexical diversity scores.

Discussion: Mother/child interactions centered around shared story-telling and use of three targeted language support strategies by mothers resulted in large increases in child use of different vocabulary words across a wide range of grammatical categories. This new vocabulary allowed children to use more advanced grammatical constructions; that is, during intervention and generalization sessions, boys were able to produce utterances conveying temporal and causal relationships and to answer more difficult wh-questions, such as questions asking "why" a story event happened. Story-telling interactions that took place during the current intervention were scaffolded by the presence of a wordless picture book that functioned as the shared topic of conversation. Future research should address the need to generalize these intervention gains into conversational contexts that are less structured and more abstract.
**Title:** Mediating Effects of Identity on Postsecondary Outcomes for Adults With Autism Spectrum Disorder: A Latent Class Analysis

**T.A. M. McDonald, University of Wisconsin-Madison**

**Introduction:** Postsecondary school outcomes for individuals with autism spectrum disorder ASD, such as education, employment, and psychosocial health, are a great concern to society. Although these individuals demonstrate improvements as they age into adulthood, they continue to experience challenges in gaining postsecondary education and employment (Taylor & Seltzer, 2011). Previous research identifies several factors which predict positive outcomes; however, wide variation exists even for those whom best outcomes are predicted. This poster combines the psychological framework of stereotype threat with the sociological theory of group stigma to examine how variation within group identity and stigma mediate self-esteem, feelings of disability, and postsecondary outcomes of education and employment.

**Methods:** Using peer-reviewed research alongside of first-hand accounts from individuals on the autism spectrum, a questionnaire was designed to identify and explore possible candidate categories relating to autism and identity and to inquire on the meanings of autism constructed by adults with an ASD diagnosis. This questionnaire was included in a nationally-distributed, online survey to specifically assess variation in how individuals identify with the autism spectrum and how this identity relates to measures of self-esteem, perceptions of disability, and stigma in addition to post-secondary education and employment attainment. Over 900 adults with ASD were recruited with the assistance of community providers of services for adults with ASD as well as the disability services offices within colleges and universities across each state.

**Results:** A latent class analysis revealed three distinct styles of identification: 1) Positive and Negative, 2) Positive Difference; 3) Disability which comprised 35%, 27%, and 38%, respectively, of the surveyed individuals. Membership in the Positive and Negative class predicts college education level attainment, lowest feelings of disability, and the highest self-esteem. Membership in the Positive Difference class predicts the least likelihood of being in school or college attendance, increased likelihood of employment, higher feelings of disability, and moderate self-esteem. Membership in the Disability class predicts being currently in school, highest feelings of disability, and lowest self-esteem. These classes remain intact and when predicted by the factors of stigma.

**Discussion:** Individuals with ASD do not have a singular identification style with the autism spectrum. The three distinct styles predict different postsecondary outcomes for being in school, college attainment, and employment, as well as feelings of disability and self-esteem. Individuals in the Positive and Negative class view the spectrum as containing both positive and negative attributes and demonstrate the most positive outcomes in education attainment. However, individuals in the Positive Difference class, who view the spectrum as containing primarily positive attributes, are the least likely to be in school or to have attended college, and report high feelings of disability. Finally, those who view the spectrum as a Disability are most likely to be in school, but otherwise report the most negative, overall, outcomes in feelings of disability, and self-esteem. Although autism severity likely relates to outcomes, this study indicates attitudes play an important role in outcomes for individuals on the autism spectrum. Future research should investigate the degree to which diagnosed autism severity relate to these identification differences.

**References:**


Introduction: For fifteen years, there has been increased emphasis on self-determination for individuals with intellectual disability in research topics and practice questions. According to Wehmeyer’s functional model (Wehmeyer, Kelchner & Richards, 1996) behaviour is self-determined when a person "acts as the primary causal agent in one's life and makes choices and decisions regarding one's quality of life free from undue external influence or interference". Furthermore, the expression of self-determination results from the interaction between individual capacities and opportunities given by the environment.

Wehmeyer and Bolding (2001) have shown that moving from sheltered employment to competitive employment improved self-determination among people with intellectual disability. What is the individual factor that could act on self-determination? Switching, the ability to switch from one cognitive treatment to another, is an executive function linked with self-regulation, a component of self-determination (Hofmann, Schmeichel & Baddeley, 2012, for a review).

The aim of this study was to investigate the interaction between environmental factors and individual capacities on self-determination among teenagers with intellectual disability moving from a less to a more integrated environment.

Methods: Participants were aged from 16 to 20 years old and came from special education institutes in the North of France (N=45).

This study was a longitudinal study. The first point of measure (T1) was when participants still were in their special education institute and before they moved to a more integrated environment. The second (T2) was when they moved to a more integrated environment (3 months after the move).

We assessed intellectual functioning (Ravens) and self-determination (LARIDI, questionnaire made up of four sub-scales: autonomy, self-regulation, psychological empowerment and self-realisation) at the three points of time. Moreover, we assessed switching ability (Wisconsin Card Sorting Test) only at T1.

Results and discussion: We didn't observe significant difference between the self-determination's score and sub-scales' scores measured before and after moving to competitive employment (T1/T2). We could explain theses results by the short delay between the first and the second point of measure (only 3 months). Indeed, in Wehmeyer and Bolding’s study (2001), the average time from the pre-move collection and the post-move collection data was 15 months.

Nevertheless, our results confirmed the link between self-regulation (T2) and switching ability just like the significant correlations shown us (r=-0.426, p=.004). We performed a hierarchical cluster analysis to determine several groups of switching ability (low, n=18; medium, n=17; high level, n=10). The Three-Way Mixed ANOVA analysis corroborated the correlation's results showing a main effect of group (F=3.913, p=.028) with the high switching ability group that tend to have a better level of self-regulation than the low switching ability group (Bonferonni contrast: p=.058). Linear regression analysis showed us that switching score could account for 19.3% of the variance in self-regulation score assessed at T2 (F=10.271, p=.003).

This study didn't allow us to determine the impact of environment on self-determination but permitted to highlight the role played by switching ability in self-regulation. Further researches on this topic are required. The aim is to promote the use of remediation of executive function in clinical practice that could help to improve self-determination in people with intellectual disability.

References:


Title: Parental Perceptions of Social Reciprocity and Parenting Stress in Parents of Children With ASD

Laura B. Kestemberg, Laura De Gennaro, John Carpente, Molloy College

Introduction: Parenting a child with a developmental disability contributes significant stress to a family. Research has shown that parents of children with Autism Spectrum Disorder (ASD) typically report higher levels of parenting stress and higher affective symptoms when compared to parents of typically developing (TD) children and parents of children with other disabilities (DD) (Davis & Carter, 2008). A strong association exists between maternal stress and having a child with ASD (Solomon, Ono, Timmer & Goodlin-Jones, 2008). Maternal stress increased when child symptoms including poor expression of emotion and little social interest were more severe. A child’s poor social skill ability is a good predictor of maternal stress (Osborne & Reed, 2010). This study investigates the relationship between parenting stress and social affect in children with ASD as reported by their parents.

Methods: Participants were recruited from an ongoing international study, "Randomised Controlled Trial of Improvisational Music Therapy’s Effectiveness for children with ASD" (TIME-A; Geretseeger & Gold, 2012). Inclusion criteria within the study require the child to be between the ages of 4 years, 0 months and 6 years, 11 months with a previous diagnosis of ASD. The child is administered the autism diagnostic observation schedule (ADOS; Lord & Risi, 1998). Each parent is asked to complete various assessment measures on the child including the autism diagnostic interview-revised (ADIR; Le Couteur, 1989), the Social Responsiveness Scale (SRS; Constantino & Gruber, 2005), the Pervasive Development Disorder Behavior Index (PDDBI; Cohen, 2003), the Quality of Life scale (QOL adapted from EuroQol Group; 1990), and the Parenting Stress Index-4th edition (PSI 4; Abidin, 2012). The current study compares parent reports on the Parenting Stress Index-4th Edition (PSI-4; Abidin, 2012) and on the Pervasive Development Disorder Behavior Index (PDDBI; Cohen, 2003).

Results: The partial correlations were conducted between the PSI-4 and scores on the PDDBI-Social Approach Domain. When accounting for autism severity (ADOS Comparison Scores), there is a relationship between Social Approach Behaviors (PDDBI-SocApp Domain) and Parenting Stress (PSI-4) (.664*, p=.003). Although the relationship is implied, due to our small sample no causal relationship can be deduced. The results are from data collected at the half-way point of participant recruitment (n=21). Data collected thus far suggest a significant impairment in social approach behaviors in children with ASD. This demonstrates that a parent experiences higher levels of parenting stress when social approach behavior weaknesses are evident. Data collection is ongoing, and further analyses are currently being conducted as clients continue to be assessed for inclusion in the TIME-A study.

Discussion: Results suggest a future therapeutic shift from behavioral interventions to social affect interventions. When providing interventions for the child, clinicians may want to focus on enhancing social reciprocity skills between parent-child dyads. Interventions should not be solely focused on diminishing problematic behaviors. Clinicians may want to focus on parent’s perceptions of his or her child; and not solely be guided by the clinician’s perception. Research suggests that although child interventions for children with ASD show improvement as per parent ratings on the child’s behavior, the parent’s stress level does not decrease (Solomon, Ono, Timmer, & Goodin-Jones, 2008). This indicates the importance of involving parents in the treatment process for themselves not just receiving training or teaching to work with their child (i.e., parent support groups). Future research can include ADOS scores, analyze clinician vs. parent perceptions, and include control groups (TD and other DD). Additionally, researchers can analyze levels of parenting stress in fathers as compared to mothers, as well as cross-cultural approaches to reducing parenting stress.
**Title:** Are Social Cognitive Deficits Relative in Autism? Examination Using a Social Versus Nonsocial Salience Paradigm

Kathryn Unruh, Vanderbilt University; Stephanie Miller, University of North Carolina; Gabriel Dichter, University of North Carolina; Noah Sasson, University of Texas, Dallas; Jim Bodfish, Vanderbilt University

**Introduction:** When left to their own, how do children with autism "spend" their attention and time, and what might this suggest to us in our search for models of pathogenesis and treatment of autism? As parents of children with autism know, these children spend a disproportionate amount of time seeking out and engaging in idiosyncratic and primarily nonsocial patterns of behavior and interest. When viewed from the perspective of experience-dependent brain and behavioral development, such a narrow, nonsocial pattern of behavior and interests likely diminishes social experience, and, in turn opportunities for social learning and development. Does this pattern of autistic development unfold as a result of a predisposition to avoid social stimulation, or a predisposition to approach nonsocial stimulation? In this study we examine if the presence of nonsocial stimuli can alter social information processing in children with ASD.

**Methods:** Preferential viewing tasks can serve as objective measures of salience, with a greater proportion of viewing time to one item indicative of increased salience. The current preferential viewing task used gaze-tracking technology to examine patterns of visual attention to stimulus pairs that varied in social and nonsocial content. Slides included a social image (face) paired with a picture of one of two types of objects: objects found in previous studies to be of high interest to individuals with ASD (HAI images; e.g. trains, electronics) and objects found to be of low interest to individuals with ASD (LAI images; e.g. clothing, furniture). Slides were presented in a passive manner (no instructions) for five seconds each with a one second interstimulus interval. Slides were counterbalanced for content (social+HAI / social + LAI) and for side of the social image (left / right). Participants included both adolescents diagnosed with ASD (N = 33, mean age = 13.9 years) and typically developing (TYP; N = 32, mean age = 14.1 years); groups were matched on IQ and gender. Data was extracted for three variables (1) Preference: proportion of total time spent on each image, controlling for total look time to the array; (2) Prioritization: latency of first look to each image; and (3) Fixation Duration: average length of fixation for each image.

**Results:** Repeated measures ANOVA of the prioritization variables revealed a significant interaction, with individuals with ASD having longer latency to social images than TYP, only when the social image was paired with an HAI nonsocial image \[F(1,63) = 4.3, \ p = .042\]. Analyses of social preference and object preference revealed individuals with ASD spent a greater proportion of time looking to objects, regardless of array type \[F(1,63) = 15.4, \ p = .005\], while TYP individuals spent a greater proportion of time looking to social images \[F(1,63) = 20.1, \ p = .001\]. Fixation patterns differed between groups only for social images, with TYP individuals displaying significantly longer fixations to social images than ASD, regardless of array type \[F(1,63) = 25.7, \ p = .0001\]; object fixation duration did not differ between groups \[F(1,63) = .22, \ p = .794\] or between array types \[F(1,63) = 1.0, \ p = .31\].

**Discussion:** These results suggest that in ASD, deficits in social information processing may be relative and context-dependent, as opposed to being a fixed core feature of the disorder. In this model, social inattention may occur as a secondary byproduct of a positive attention bias to nonsocial information. In ASD, the presence of nonsocial sources of stimulation can significantly increase the latency of look time to social sources of information. In an ecologically valid context, this could translate to either delays in social information processing or to missing critical social information entirely.

*Supported by: NIH R01MH07342*
Introduction: Parents' perceptions and feelings about their young children have been shown to influence both parenting behavior and child problem behavior in families of typically developing children (Bugental & Johnson, 2000; Mullineaux, Deater-Deckard, Pterill, & Thompson, 2009). However, previous research has not examined factors that contribute to parents' positive and negative feelings about young children with developmental delay (DD). Optimism has been identified as a protective factor for parents of children with DD, with optimism predicting increased positive parenting behavior and maternal well-being (Ekas, Lickenbrock, & Whitman, 2010; Ellingsen, Baker, Blacher, & Crnic, 2014). Given that optimism affects both the parenting behavior and overall wellbeing of parents of children with disabilities, the present study sought to examine whether optimism was also predictive of positive and negative feelings in parents of young children with DD.

Methods: This study was part of a larger investigation of family-based early intervention for families with preschool-aged children with DD (McIntyre, PI). Families with children with DD (N = 119) were recruited from early intervention and early childhood special education programs in Oregon. Data were collected through extensive in-home interviews and assessments of family demographics, parent’s life stress (PSI-3), child problem behaviors (CBCL), positive and negative feelings about the child with DD (Parent Feelings Questionnaire) and optimism (Life Orientation Test--Revised).

Results: Hierarchical regression was used to predict parents' negative feelings about the child with DD. Child age, child gender, parent gender, parent education, and annual family income were entered at step 1, child behavior problems were entered at step 2, parenting stress and depression were entered at step 3, and optimism was entered at step 4. The addition of optimism significantly improved the prediction, (ΔR squared = .03, ΔF = 4.09, p < .05), with increased optimism predicting decreased negative feelings. The final R squared for this equation was .44. In a separate hierarchical regression analysis, the dependent variables listed above were also used to predict parents' positive feelings. The addition of optimism at step 4 approached significance (ΔR squared = .02, ΔF = 3.11, p = .08). The final R squared for this equation was .36.

Discussion: Results suggest that optimism uniquely predicts parents' negative feelings about their young children with DD, with increased optimism contributing to decreased negative feelings about the child with DD. As such, optimism may serve as a protective factor for these parents in part by decreasing negative perceptions that could contribute to harsh or negative parenting. Future research should explore whether parent feelings mediate the relationship between optimism and parenting behavior for parents of young children with DD.

Key References:


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Title: The Effect of Parent Perception of Communication on Parent Stress Following Parent-Coached Language Intervention

Nicole Lim, Georgia State University; Rose Sevcik, Georgia State University; Ashlyn Smith, Hussman Institute for Autism; MaryAnn Romski, Georgia State University

Additional parenting demands involved in raising children with developmental disabilities (DD) are linked to increased parental stress (Goudie, Narcisse, Hall, & Kuo 2014). Even though speech and language impairments often co-occur with DD, the literature has not fully addressed how communication impairments might contribute to parental stress. Language interventions have resulted in positive changes in parents' stress levels (Robertson & Ellis Weismer, 1999), but little is known about how being active agents in their children's language interventions impact parents' stress levels. Given that parents' stress might result from their children's communication deficits, it is important to explore how parental stress might be impacted by their active participation in their children's language intervention programs.

Smith et al. (2011) found that within a parent-coached language intervention for toddlers with DD, parents of toddlers with higher expressive language abilities at the start of the intervention perceived their toddler's communication impairments to be less severe, and thus experienced less parent stress after the intervention. This present study expands upon Smith et al.'s (2011) findings using a different population of participants and provides further support for the role that parents' perception of language development play in parents' stress.

Forty-six participants were recruited as part of a longitudinal study that compared the effectiveness of two parent-coached augmented language interventions for toddlers with DD (Romski et al., in preparation). Participants were between the ages of 24 to 36 months, M = 32, and produced less than 10 spoken words. To examine how the parents' perception of their children's language abilities mediated the relationship between their toddlers' expressive language pre-intervention and parents' stress post-intervention, the Parent Stress Index - Short Form (PSI-SF; Abidin, 1995), Parent Perception of Language Development (PPOLD; Romski, 2000) and Sequenced Inventory of Communication Development - Revised (SICD-R; Hedrick, Prather, & Tobin, 2000) were employed. They assessed parents' stress, parents' perception of their children's language development and expressive language, respectively. A repeated measures t test showed that although parent stress decreased from pre to post-intervention, it was not significant, t(45) = 1.26, p = .21, d = .11. Correlations between expressive language pre-intervention and parent stress both pre and post-intervention were negative, though not significant, r(45) = -.22, p = .14, r(45) = -.10, p = .50, respectively. The odds for parent stress to decrease were similar between parents whose children's expressive language scores increased and those whose expressive language scores did not increase, odds ratio = 1.17, 95% CI = 0.15-1.77, p = .51. Regression analysis showed that expressive language accounted for 10% of the variance in parent stress (though not significant), while parents' perception of their children's language development accounted for an additional 21% and 35% (p < .005 and < .001, pre and post-intervention) of variance in parent stress. Parents' perception of the severity of their children's language difficulties accounted for an additional 25% and 38% (p < .001 for pre and post-intervention in parent stress.

These results are generally consistent with Smith et al. (2011). Together, these results indicate that parents' perception of communication abilities of their children has an impact on parent stress and participation in a parent-coached intervention can reduce parent stress.

References:


**Title:** The Occurrence of Anxiety in Children With Autism Spectrum Disorder and Its Relationship With Disturbed Sleep: Does Anxiety Sub-Type Matter?

Fay Fletcher, Monash University; Russell Conduit, RMIT University; Mistral Foster-Owens, Monash University; Nicole Rinehart, Deakin University; Kim Cornish, Monash University

**Introduction:** Up to 84% of children with Autism Spectrum Disorder (ASD) experience increased levels of anxiety, with anxiety disorders being amongst the most commonly reported psychiatric co-morbidities [1]. Similarly, disturbed sleep is reported in parents of children with ASD at a rate which far exceeds that of typically developing children. The contribution of anxiety towards sleep disturbance is nestled within a complex number of causes including biological (e.g. circadian abnormalities), environmental (e.g. sleep hygiene) and behavioural (e.g. hyperactivity) factors. Whilst a number of studies have explored the relationship between sleep and general internalising symptoms (i.e. anxiety and depression combined), few have looked specifically at anxiety [2]. Furthermore, specific subtypes of anxiety (e.g. social phobia, separation anxiety) and their relationship with disturbed sleep is unknown.

**Method:** Participants were 128 children aged 6-12 years; 34 with a diagnosis of Autism Spectrum Disorder and 94 typically developing (TD) children. Caregivers completed the Children's Sleep Habits Questionnaire (CSHQ); a 48 item screening tool used to assess the nature and severity of paediatric sleep disturbance. The Spence Children's Anxiety Scale (SCAS) was also completed, which is a 38 item measure used to assess a wide range of anxiety subtypes including; separation anxiety, fear of physical injury, social phobia, obsessive compulsive, panic attack/agoraphobia & generalised anxiety disorder.

**Results:** Binary logistic regression revealed that both anxiety (p < .001) and sleep disturbance (p < .001) were significant predictors of ASD diagnosis. Within the ASD group, linear regression showed that anxiety was a significant predictor of the severity of parental reported sleep disturbance (p = .010). Finally, in exploring the subtypes of anxiety, the separation anxiety [r(32) = .42, p = .014], obsessive compulsive [r(32) = .39, p = .030] and panic/agoraphobia [r(32) = .49, p = .009] subscales of the SCAS were all significantly positively correlated with global sleep disturbance.

**Discussion:** This study reinforces the presence of sleep and anxiety as core features of the ASD profile. Additionally a relationship between anxiety and the severity of sleep disturbance in children with ASD has been established. Most notably, these results suggest that specific subtypes of anxiety may play a greater role in the anxiety-sleep relationship. Given the daily variation in anxiety in children with ASD, future research should seek to explore the dynamic relationship between fluctuations in anxiety its impact upon subsequent sleep quality.

**References:**


Title: Comparison of Daily Activities Among Youth With Intellectual Disabilities With and Without Autism Spectrum Disorder

Andrea Maughan, Ami Tint, Jonathan Weiss, York University

Introduction: Participation in daily activities can afford youth many benefits, including enhancement of psychological and physical wellbeing. Youth with intellectual disabilities (ID) have lower participation rates than their typically developing peers and the participation of youth with ID and Autism Spectrum Disorder (ASD) may be further limited (Solish et al., 2010). The current study compared participation frequency and level of engagement in the community, school and home environments, as well as caregivers' perceptions of supports and barriers to participation among a sample of youth with ID, with and without ASD.

Methods: 328 caregivers (85.4% female, M age = 49.09, SD = 6.08) of youth with ID registered with Special Olympics Ontario completed an online survey. Youth (61.3% male) were 11 to 23 years of age (M= 16.77, SD = 2.94). Approximately 32% of the sample had ASD. When comparing youth with ASD to those without, the only significant demographic difference (i.e., child age, child sex, geographical location, parent education, and family income) was with respect to child sex, with a greater proportion of males in the ASD group. The two groups did not differ according to overall adaptive behavior (Waisman Activities of Daily Living Scale; Maenner et al., 2013) or functional cognitive ability (4-item scale; Sterzing, et al., 2012).

The Participation and Environment Measure (PEM-CY; Coster et al., 2012) was used as a measure of community, home and school participation. The PEM-CY assesses frequency of participation in 10 community (e.g. classes and lessons), 10 home (e.g. household chores), and five school (e.g. teams, clubs and organizations) domains. Caregivers rate youth’s level of involvement in these activities from minimally involved (1) to very involved (5), and indicate whether particular environmental qualities (e.g. physical and sensory demands) help or hinder their child’s participation.

Results: Overall, youth with ASD were reported to participate less often in community, t(326) = 2.08, p = .039, school, t(326) = 3.95, p < .001, and home activities t(326) = 3.04, p = .003, compared to youth without ASD. In addition, youth with ASD were reported to be less involved in these activities in the community, t(326) = 2.57, p = .011, at school, t(326) = 2.03 p = .043 and at home, t(326) = 4.12, p <.001. Caregivers of youth with ASD rated environments as less helpful in the community t(326) = 3.75, p <.001, school t(326) = 2.81, p = .005, and home t(326) = 2.13, p = .034 domains. Helpfulness of environment was correlated with level of involvement in the community, r =.22, p <.001, school, r =.26, p <.001, and home, r =.26, p <.001.

Discussion: Findings will be discussed in relation to the importance of decreasing barriers to enhance the participation of youth with ASD.

Key References:


Title: Parenting Stress and Its Relationship to Adaptive Skills and Child Behavior Observed During Language Interventions

Evelyn L. Fisher, Rose Sevcik, MaryAnn Romski, Georgia State University

Introduction: Research indicates that parents of children with developmental disabilities experience higher parenting stress compared to parents of typically developing children. These differences are most substantial in aspects of parenting stress relating to child mood and behavior and are associated with the presence and intensity of challenging behaviors (Donenberg & Baker, 1993). Deficits in adaptive skills, and communication skills in particular, are often targeted for interventions which aim to reduce challenging behavior (Reichle, 1993). Limited information is available on the relationship between parenting stress and challenging behavior in young children over time and how early intervention may affect this relationship. The purpose of this study is to examine parenting stress and its relationship to adaptive skills and observed child behavior during language interventions.

Methods: The data described are from two studies of language outcomes in toddlers with developmental delays following augmented or spoken language interventions (Romski et al., In preparation; Romski et al., 2010). One hundred and thirteen parent-child dyads participated in a twenty-four-session language intervention that included parent coaching. Parenting stress and adaptive skills were measured at baseline, using the Parenting Stress Index-Short Form and the Vineland Adaptive Behavior Scales Socialization Domain score, respectively. Parenting stress was also measured at the post-intervention assessment. An observational coding scheme to characterize challenging behavior was developed for the purpose of this study and applied to the baseline and twenty-fourth sessions. Reliability was assessed using Cohen Kappa, and demonstrated substantial agreement among observers.

Results: Consistent with previous studies, we found that the baseline mean Total Parenting Stress raw score for our sample was significantly higher than that of the normative sample ($t = 2.89; p < .01$). Our observational coding scheme indicated that a significant portion of children in our study demonstrated various challenging behaviors, including aggression (19%), self-injury (6%), destructive behavior (44%), disruptive behavior (58%), repetitive behavior (48%), and non-compliance (27%). However, total quantity of challenging behavior was not associated with parenting stress ($r = .07, p = .48$). Higher Adaptive Behavior Composite scores were associated with lower parenting stress ($r = -.33, p < .001$) and challenging behavior ($r = -.21 p = .03$).

Discussion: Our finding of elevated parenting stress in our sample highlights the unique challenges faced by families with children with disabilities and their increased need for support from the broader social context. Children in our sample also demonstrated an array of behaviors observed in both typically developing toddlers and people with developmental disabilities and challenging behavior. The absence of a relationship between these behaviors and parenting stress may indicate that other factors, such as child health, may be more influential on parenting stress during toddlerhood. Finally, adaptive behavior shared variance with both challenging behavior and parenting stress in our study, suggesting that a child’s difficulties in caring for his or her needs in everyday situations may increase both challenging behavior and parenting stress.

Citations:


Title: Diurnal Cortisol Cycles in MECP2-Related Syndromes

Breanne Byiers, Ameante Payen, Frank Symons, University of Minnesota

Introduction: Rett syndrome (RTT) and MECP2 duplication syndrome (DUP) are both neurodevelopmental disabilities caused by mutations to the methyl-CPG binding protein 2 (MECP2) gene, and result in significant impairments in cognition and adaptive behavior, as well as numerous health complications. RTT is associated with loss-of-function mutations in MECP2, meaning that individuals with RTT have decreased levels of the MeCP2 protein. In contrast, DUP is associated with gain-of-function mutations, and higher levels of the protein. MeCP2 is known to bind to corticotropin-releasing hormone (Crh) promoters, and abnormal stress responses, evidenced by elevated serum levels of corticosterone have been demonstrated in the RTT mouse model (McGill et al., 2006). Under conditions of normal HPA axis functioning, most individuals demonstrate a clear circadian rhythm of salivary cortisol, with the highest levels in the morning followed by a steady decline throughout the day, and alterations in this cycle have been associated with a number of psychological and physical health problems (e.g., Bhagwagar, Whale, & Cowen, 2002; Cariion, Weems, Ray, Glaser, & Reiss, 2002). To date, no studies have compared cortisol patterns between individuals with RTT and DUP. It was hypothesized that both groups would show flattened diurnal cycles, and that the RTT group would show overall higher levels of cortisol compared to the DUP group.

Methods: Cortisol samples at four time points throughout the day for two days from 25 females with RTT (mean age = 11.6, SD = 7.2), 8 males with DUP (mean age = 11.38, SD = 6.4), and 5 females with DUP (mean age = 6.6, SD = 5.3). Log transformed cortisol values were regressed on time of day for each participant and each day. Differences in slopes between the two collection days were assessed using criteria outlined by Smyth et al. (1997) in order to categorize participants as having typical diurnal cycles, flattened cycles, or inconsistent patterns.

Results: There were no significant relationships between any of the cortisol measures and age in any of the groups. Typical diurnal cycles were observed in 60% (15/25) of the RTT sample, 63% (5/8) of the DUP males, and 80% (4/5) of the DUP females. Flattened cycles were observed in 28% (7/25) of the RTT females, 38% (3/8) of the DUP males, and 20% (1/5) of the DUP females. Inconsistent patterns were observed in 12% (3/25) of the females with RTT, and none of the DUP participants. Cortisol values were not significantly different between the syndrome groups when examined across the full sample. Relationships between cortisol measures and demographic and behavioral characteristics, as reported by caregivers, will also be discussed.

Discussion: Contrary to our hypotheses, the proportions of each group demonstrating typical, flat, or inconsistent patterns did not vary dramatically from previous reports in normative samples, and there were no clear differences in overall cortisol levels between the RTT and DUP groups. Further research is needed to determine whether cortisol changes in response to stress differs between the two syndrome groups, whether the diurnal cortisol levels in both groups differ from typically developing individuals, and to identify whether there are reliable relationships between diurnal cortisol cycles and demographic and behavioral characteristics in these populations.

Key references:


NICHID Grant No. 44763
Title: Effect of Adapting Early Reading Interventions Based on the Down Syndrome Behavioral Phenotype

Christopher Lemons, Vanderbilt University

Introduction: The behavioral phenotype of Down syndrome (DS) is characterized by a heightened probability of strengths in visual versus auditory processing, deficits in expressive language and speech articulation, and challenges with motivation and persistence. This profile of behavior may be useful for guiding adaptations of reading interventions provided to individuals with DS.

Methods: Two multiple baseline across participant, single-case design studies were conducted to evaluate the effect of adapting two reading interventions (i.e., phonological awareness, decoding) based on the behavioral phenotype. Eleven children and adolescents with DS (6-13 yrs) received intervention (4x/wk) for four months. Participants began the intervention in a non-adapted reading intervention baseline condition. Participants were entered into the treatment phase (i.e., adapted intervention) in a staggered manner. Mastery of targeted skills (e.g., letter sounds, word reading) was assessed daily.

Results: A functional relation was found between the adapted phonological awareness intervention and targeted skills (i.e., phonological awareness, target words). Additionally, three out of five participants demonstrated an increased rate of learning of letter sounds. Results were less consistent for the decoding intervention. Three out of six participants appeared to have increased rates of learning (i.e., target words, phonetically regular words, and sound-symbol correspondences) in the adapted decoding intervention.

Discussion: Adaptations based on the DS behavioral phenotype appeared to enhance the response to a phonological awareness intervention. Similar adaptations applied to a decoding intervention appeared to produce a less consistent effect on learning. Results indicate that adaptations were most effective for students who entered the study with lower reading skills. Implications for future research will be discussed.
Title: The Relationship Between Coping and Well-Being in Hispanic Mothers and Fathers of Children With Autism Spectrum Disorder

Kelcie Willis, Lisa Keylon, Megan Pruitt, Madeline Rhoden, Naomi Ekas, Texas Christian University

Introduction: Parents of children with autism spectrum disorder (ASD) experience higher levels of stress, anxiety, and depression than parents with typically developing children. Coping is one way to increase well-being despite stressful circumstances. In fact, research with parents of children with ASD has shown that cognitive reframing and active coping strategies were associated with higher maternal well-being as opposed to avoidant coping strategies (Benson, 2010). In another study, Hastings et al. (2005) found that mothers used more active avoidance and problem-focused coping than fathers, but few studies have examined gender differences as it pertains to coping. Furthermore, no study has examined how parents of other ethnic backgrounds cope when raising children with ASD. Therefore, the purpose of this study was to examine the coping processes in Hispanic mothers and fathers of children with ASD and to relate these coping strategies to outcomes such as depression and positive and negative affect.

Method: The sample consisted of 78 Hispanic mothers and 44 Hispanic fathers. Parents reported that their child had a diagnosis of ASD and completed questionnaires assessing coping styles (Brief COPE), depression (Center for Epidemiological Studies - Depression), and positive and negative affect (PANAS).

Results: A one-way Analysis of Variance examined gender differences for both coping strategies and well-being. Mothers used significantly more active (F(1, 120) = 18.09, p < .05), emotional (F(1, 120) = 5.14, p < .05), instrumental (F(1, 121)= 18.9, p < .05), planning (F(1, 121)= 13.22, p < .05), and religious (F(1, 121)= 13.72, p < .05) coping. However, there was not a significant difference in depression or positive and negative affect between genders. Partial correlations controlling for parent age examined whether particular coping strategies were associated with well-being and were computed for mothers and fathers separately. Results showed that venting was associated with increased negative affect (mothers: r = .23; fathers: r = .35) and positive reframing was associated with an increase in positive affect (mothers: r = .30; fathers: r = .41) and a decrease in depression (mothers: r = -.24; fathers: r = -.31).

Discussion: The purpose of this study was to examine how Hispanic mothers and fathers cope when raising a child with ASD. Previous research with mainly Caucasian participants found that mothers engage in more coping strategies than fathers, including positive reframing and venting. Furthermore, past research has shown an increase in well-being from positive-reframing and social support coping strategies and a decrease in well-being when parents used active avoidance strategies, such as venting. Our results similarly found not only that mothers engage in more coping strategies overall, but also that venting was associated with a decrease in well-being while positive reframing was associated with better well-being. The findings of this study have important clinical implications with respect to understanding how we might help Hispanic parents cope with the daily stresses of raising a child with ASD. In addition, this study suggests that males engage in coping strategies less frequently than females, thus revealing that males may need a different type of support for coping with a child with ASD. Overall, the implications of this study give us direction to how we might cater to each parent's emotional needs.

Key References:


**Title:** Expressive Drawing Ability and the Self in Children With ASD and FXS

Carrie Ballantyne, University of the West of Scotland

**Introduction:** Children's drawings are thought to be a mirror of a child's representational development. Self-drawings may be seen as advanced forms of the mirror test of self-recognition and have been used to investigate many aspects of development such as aspects of cognitive development, emotional states and personality traits. Studies looking at drawings by children with autism (ASD) have suggested that there is developmental delay in their drawings of human figures (Cox, 1992). Indeed, it is suggested that this is due to their social-cognitive processing.

Individuals with Fragile X syndrome (FXS) display a wide range of social difficulties including social anxiety and similarities to ASD in their social-cognitive processing. Drawings made by non-savant children with ASD have been reported to show similar levels of visual realism to mental-age matched controls, whereas the results are more mixed for those with FXS. However, self-concept and emotional depiction is yet to be compared between children with FXS and ASD. The current study uses children's drawings to examine self-concept and emotional depiction in children with FXS, a comorbid diagnosis (AFXS), and ASD.

**Method:** A FXS group (n = 20), AFXS group (n=15), a high functioning ASD group (HFA; n = 20), a low functioning ASD group (LFA; n = 20) and 40 typically developing children (TD) matched for chronological age and non-verbal mental age took part in the study. To assess children's awareness and conception of themselves, they were asked to draw a picture of a house and their own homes and a picture of a person and themselves. Drawings of the self were coded using McCarthy's standardised scoring procedures with a maximum possible score of 20 and drawings of the houses was carried out in accordance to Lee and Hobson (2006). To assess their emotional expression; children were asked to draw two pictures; one happy and one sad. Pictures were scored on quality and quantity of expression, whether it included content relating to people and a social theme, in accordance to Jolley, O’Kelly, Barlow and Jarrold (2013).

**Results:** Within the awareness and conception tasks both ASD groups produced clearer differences between their own houses and house in general, however produced little contrast between drawings of themselves and others. The two FXS groups did not produce clear contrasts the house condition but did of in the drawing a person task. In drawing emotion expression, the ASD group performed in a similar manner to their MA matched TD counterparts, however they produced fewer overall social scenes. The FXS and AFXS groups' performance is comparable to their MA group only when drawing happy scenes and showed a poorer performance when depicting sad scenes.

**Discussion:** The current study provides insight into children with ASD and FXS representational development which cannot only be accounted for by mental age. Although the FXS groups drawings were of an overall poorer quality to that of the other groups, this did not account for there being a better representation of themselves compared to a standard drawing of a person. Likewise, clear group differences were shown in drawing happy and sad pictures, with the sad pictures including fewer social scenes. These findings add to previous literature and show the complexity of representational drawings across different developmental disability groups.

**Key References:**


Introduction: It is widely accepted within developmental psychology that the parent-child relationship affects the well-being of both members of the dyad. Therefore, negative interactions such as parent-child conflict could potentially have a negative effect on parental well-being. Previous research found that more observed mother-child conflict was related to greater maternal negativity (Crnic, Gaze, & Hoffman, 2005). Also, greater disruptive behaviors of children with autism spectrum disorder (ASD) predicted higher levels of negative daily mood for their mothers (Pottie, Cohen, & Ingram, 2009). Findings from the same study suggested that fewer unsupportive social interactions and more daily social and emotional support predicted higher levels of positive mood for parents. Given that the spouse is likely the most common person to provide such support, it is possible that better marital adjustment could serve as a resilience factor for parents.

Parents of children with ASD report lower marital satisfaction than parents of typically developing children (Brobst, Clopton, & Hendrick, 2009). Previous research has shown better marital adjustment predicted higher levels of maternal positive affect for parents of children with ASD (Lickenbrock, Ekas, & Whitman, 2011). Given these associations, better marital adjustment could potentially buffer the negative impact of daily mother-child conflict on mothers’ well-being.

Objective: The current study examined the role of relationship happiness as a moderator of parent-child conflict and parental well-being for parents of children with ASD.

Methods: Ninety-nine mothers of children (under 18) diagnosed with ASD participated in the study. Parents completed daily diary questions for 14 days. Diary questions included whether parents had a conflict or argument with their child, as well as a scale to indicate how happy they felt in their relationship that day. Mothers completed the Positive and Negative Affect Schedule (PANAS) as a measure of daily parental well-being. Parent-child conflict was measured as total number of days in which parents reported experiencing a conflict with their child. Both relationship happiness and parental well-being were scored as the mean response provided by participants across 14 days.

Results: Analyses were conducted using PROCESS in SPSS. Results indicated that relationship happiness moderated the relationship between daily parent-child conflict and parental well-being, $b = -0.47$, (SE = .18), 95% CI: -.84, -.11. For those with high levels of relationship happiness, conflict with the child had less of a negative effect on maternal well-being than for those with low levels of relationship happiness. Further analyses will be conducted using HLM to examine day-to-day associations between these constructs.

Discussion: Previous research of resilience factors between negative parent-child interactions and parental well-being often neglected to include parents of children with ASD. The current findings provide a specific positive construct, marital adjustment, which could be targeted through intervention to increase well-being for this population.

References/Citations:


**Title:** Say Yes To The Task: The Effect of Parent-Child Interactions on the Compliance Methods of Children With and Without Autism

Molly O'Neill, Megan Pruitt, Lisa Keylon, Madeline Rhoden, Naomi Ekas, Texas Christian University

**Introduction:** Compliance is the action of conforming to complete a requested task and is important to the social-emotional developmental process because it requires an individual to successfully identify the needs of others, suppress one's own wants or needs, and complete a necessary task (Kopp, 1982). Children can respond to a request for compliance using behavior (e.g., putting toys away) and vocalizations (e.g., saying "OK"). The quality of the parent-child relationship is a strong predictor of compliance (Kim & Kochanska, 2012). There is only one study examining parenting behavior as it relates to compliance in children with ASD; however, that study examined parenting and compliance during the same task. In this study, we include parenting behaviors during a playful interaction as an indicator of general parenting quality. The current study is the first to examine children's verbal behaviors during the compliance task.

**Method:** Parents and their child visited our laboratory when children were between the ages of 3 and 5 (ASD n = 24; TD n = 32). During the visit, the dyads were asked to complete several tasks including a free-play and clean-up task. The play period allows parent-child pairs to interact for 10 minutes and was used to assess the quality of the parent-child interactions. The clean-up task prompts the dyads to clean the present toys and was used to assess child compliance and parent discipline methods: Coding schemes for parent-child interaction and compliance were implemented based on previous literature. Children's verbal response practices were coded from the clean-up task. Research assistants participated in coding these episodes and were cross-checked for reliability.

**Results:** For TD children, a significant relationship between parental gentle guidance and child committed compliance was found (r = .36, p = .05). For ASD children, significant correlations were found between child noncompliance and parent gentle-guidance (r = -.55, p = .01), parent control (r = .48, p = .02), parent sensitivity (r = -.64, p = .00), and parent stimulation (r = -.56, p = .01). Within the ASD group, we examined whether IQ affected these associations. For high-functioning ASD children, a significant relationship between parent sensitivity and child noncompliance (r = -.65, p = .02) was found. For low-functioning ASD children, analyses revealed significant correlations between parent sensitivity and child situational compliance (r = .60, p = .04) as well as child noncompliance and parent control (r = .65, p = .02), parent sensitivity (r = -.63, p = .03), and parent stimulation (r = -.74, p = .01). Further analysis of these variables in relationship to child verbal practices will be included following the completion of data coding on the previously collected data.

**Discussion:** The results of this study indicate that parent interaction behaviors have a strong relationship with children's compliance behaviors. For children with ASD, parent's behaviors are especially important to child noncompliance. Although all children are affected by the parent's behaviors, low-functioning ASD children are more sensitive to the parent's behaviors as evidenced by the numerous significant findings. Parents struggling with noncompliance from their children may benefit from emphasizing gentle-guidance, sensitivity, and environmental stimulation in their arsenal of parenting practices.

**References/Citations:**


Title: The Relationship of Public School District Characteristics to Identification Patterns of Students With Developmental Disabilities in Alabama: 2009-2013

David N. Ellis, Abigail Baxter, Lisa A. Turner, University of South Alabama

Introduction: Recent research has documented variability in the rates at which students are identified as having autism spectrum disorders (Sullivan, 2013). Overall the risk of being identified as autistic has increased fourfold (Travers, Tincani, & Krezmien, 2011). Identification patterns are important because the increase in a specific disability is a public health concern and such spikes impact the service delivery system.

It has been reported that there are disparities in identification of children with autism, particularly with regard to race (Magana, Parish, Rose, Timberlake, & Swain, 2012; Travers et al., 2011). It is likely given the rapid growth in this disability category that disparities may be associated with other community or population variables. The current study examines statewide public school data by district to see how identification patterns vary by income level, educational attainment, and racial/ethnic make-up of those living in the district. Further we will study how these patterns and relationships vary across the last 5 years.

Method: We collected the annual Child Count reports from the Alabama State Department of Education for the years 2009 through 2013. The U. S. Department of Education requires annual counts of all students in each state who receive special education services. These reports contain the frequencies of children who receive special education services by district, eligibility category, race, and gender. We have matched each district with U.S. Census data for income, population density, poverty level, racial composition, and household income to characterize the district in which the children live.

Results: In 2013, 135 Alabama school districts reported data on special education classifications. The percent of students identified as having a disability within a district ranged from 5.2% to 17.9%. Of children identified with disabilities, the average percent autism, learning disabilities, and intellectual disabilities was .07, .37, and .09, respectively.

Percent of students identified with disabilities was positively correlated with percent of the population living below poverty (r (133) = .23, p < .01), and negatively correlated with percent of the population having bachelor’s degrees (r (134) = -.27, p < .01).

Multiple regression analysis was used to predict the percent of students with disabilities identified as having autism. The predictors were (1) percent of the population with bachelor’s degrees, (2) percent living below poverty, (3) population density, and (4) percent of the community that was African American. The model was significant, F (4,122) = 13.56, p < .001 and accounted for 30% of the variance. Percent of the population with a bachelor’s degree (Beta = .40) and population density (Beta = .19) were positive predictors, and percent of the population that was African American was a negative predictor (Beta = -.30). Results from the other 4 school years, odds ratios, and comparisons within and across school years will be reported in the poster.

Discussion: Our findings indicate a number of patterns in the identification of students with disabilities in Alabama. There is considerable variability across districts, but to some degree, this variability is related to education, population density, and race/ethnicity. We suspect, in the case of autism, that access to diagnostic clinics may play a role in identification.

References:


Title: Mining a Clinical Database to Understand Communication Development in Individuals With Angelman Syndrome

Emily Dayle Quinn, Vanderbilt University; Charity M. Rowland, Oregon Health & Science University

Introduction: Angelman Syndrome (AS) is a rare neurodevelopmental disorder (incidence = 1:15,000) associated with severe developmental delay, movement and balance disorders, behavioral uniqueness and profound communication impairment. In most cases, a deletion on the maternal chromosome 15 is involved (Williams, 2010). Individuals with AS rely on non-verbal communication and forms of augmentative and alternative communication to communicate (Calculator, 2002 and 2013; Didden et al., 2009). Most studies of communication in this population rely on parental survey data. We describe data on the expressive communication skills of 252 children with AS entered into the Communication Matrix database (www.communicationmatrix.org), which contains over 80,000 assessments of individuals with complex communication needs (CCN).

Methods: The Communication Matrix is a widely used assessment instrument designed to describe the expressive communication skills of individuals with CCN (Rowland & Fried-Oken, 2010). The database currently includes data on 252 children with AS aged 0-21 years residing in the U.S., who were assessed by 252 different professionals (speech-language pathologists, teachers and other educators/therapists). The sample is composed of 57% males and 43% females, of whom 68% are described as having severe cognitive limitations. Complete demographics will be provided in the poster.

Results: Results reveal that children with AS have a very limited repertoire of communicative intents, with only the following intents scored as mastered for 50% or more of the sample: refuse/reject, request more action, request more object, make choices, request new object, request attention and show affection. Most of these intents are related to the instrumental purposes of rejecting and obtaining. Less than 25% of the children use intentional communication for the following social purposes: greet, offer/share, direct attention, polite social forms. Similarly, less than 25% use intentional communication for the following purposes related to providing/seeking information: answer yes/no questions, ask questions, label, comment. The predominant forms of communicative behavior are body movements, early sounds, simple gestures, vocalizations, visual behavior and facial expressions. Few children use conventional gestures (such as pointing, beckoning, nodding). Very few use any sort of symbolic system to communicate, even at the single-symbol utterance level. Detailed statistics on the communicative behaviors of this sample will be included in the poster.

Discussion: Analysis of the Communication Matrix database replicates findings of previous studies that describe gestures and body movements as primary forms of communication in AS. Our work expands our understanding of AS by providing a detailed breakdown of communication functions, and specifying what behaviors children use to express each function. Merging information from clinical databases like the Communication Matrix with empirical studies of children with AS will help researchers define the variability in the AS population and will assist practitioners in developing appropriate speech-language and communication interventions.

Key References:


Characterising Sleep Profiles in 179 Individuals With Low Functioning Autism Across 100,000 Nights of Sleep

Simonne Cohen, Monash University, Division of Sleep and Circadian Disorders, Brigham and Women's Hospital, Division of Sleep Medicine, Harvard Medical School; Ben Fulcher, Monash University; Kim Cornish, Monash University; Shantha W. Rajaratnam, Monash University; Russell Conduit, Royal Melbourne Institute of Technology; Steven W. Lockley, Division of Sleep and Circadian Disorders, Brigham and Women's Hospital, Division of Sleep Medicine, Harvard Medical School, Monash University

Introduction: Disrupted sleep is one of the major behavioral co-morbidities in Autism Spectrum Disorder (ASD) [1, 2]. Sleep problems exacerbate core ASD symptoms (such as stereotypy) and associated challenging behaviors (such as aggression) [3]. Although commonly observed in clinical practice, the heterogeneity of sleep presentations in ASD has not been formally characterized. We propose that profiling ASD individuals based on the nature of their sleep disruption will help understand symptom and behavioral profiles (or vice versa) and thus lead to better-targeted interventions. The aim of this study was to use cluster analysis to identify subgroups of ASD individuals who experience distinct sleep difficulties and co-morbidities in an attempt to better understand the heterogeneity of sleep profiles in ASD.

Methods: This data has been collected retrospectively from two residential facilities in Boston (USA), which specialize in clinical interventions for individuals with autism ranging from 5-28 years of age. As a part of routine clinical care, sleep-awake behavior is assessed by continuous clinical observations every 30 minutes from 21:00-7:00h (~110,000 of nightly observations). This is a remarkably comprehensive, high quality dataset that extends for the past 5 years and includes data for more than 179 children. Data from 141 selected individuals with a diagnosis of low functioning autism (IQ<70) were analyzed using cluster analysis. A total of 32 sleep variables (e.g., total sleep time, sleep onset) and 24 Metadata variables (e.g., age, sex, medications) were included in the model.

Results: Three distinct clusters were identified based on significantly different sleep and metadata indices. Members of cluster 1 (24% of the entire cohort) had the highest probability of experiencing short sleep duration (77%), moderate sleep stability (70%), disrupted sleep efficiency 1-4 hours into the night (90%) and delayed sleep onset (66%). Members of cluster 2 (23%) had short sleep duration (56%), moderate sleep stability (75%) early sleep onset (56%) and early sleep offset (61%). Members of cluster 3 had long sleep duration (75%), high sleep stability (87%) and high sleep efficiency (74%). Among the three clusters, the probabilities of having poor daily living, communication and socialization skills was highest in cluster 1 (75%, p<0.001) and cluster 2 (76%, p=0.003) but lowest in cluster 3 (47%, p=0.17). Cluster 1 had a higher probability of having additional comorbidities such as ADHD (75% versus 26% and 53%), seizures (68% versus 33% and 53%) and genetic disorder (75% versus 26% and 53%) compared to cluster 2 and 3. There were no differences between clusters with regards to age, gender, ethnicity and medical status.

Discussion: Currently, there is an inconsistent understanding of the nature and prevalence of sleep difficulties in individuals with low functioning ASD. These results propose three heterogeneous sleep phenotypes and suggests that poor sleep is prevalent in a large proportion (46%) of individuals with low functioning ASD. The identification of sleep profile subtypes can facilitate early recognition of sleep problems in ASD and also provide distinct clinical profiles which may lead to more personalized therapies in the future.

References:


Title: Development of an Attention Training Program to Build Cognitive Architecture in Children With Developmental Disabilities

Hannah E. Kirk, Kylie Gray, Stefanny Christina, Kim M. Cornish, Monash University

Introduction: The abilities to concentrate on a task, to switch between tasks, or to inhibit impulsive responding are critical components in the development of attention. Disruption to these processes can lead to increased levels of distractibility and impulsivity, as well as negatively impacting on subsequent cognitive and academic abilities. The high prevalence of attention difficulties in children with developmental disabilities (DD) warrants an extensive investigation of how attention skills can be strengthened. A growing body of literature has shown that changes in attention can occur in typically developing children as a result of cognitive training programs. However utilizing the same programs for children with DD is likely to be ineffective due to requisite cognitive and motor skills often being severely compromised. The present study outlines the development and feasibility of the first application of portable game technology in an intervention program aimed at improving attention deficits resulting from a developmental disability.

Methods: The training program (Training Attention and Learning Initiative; TALI) incorporates tasks that target selective attention, sustained attention, cognitive flexibility and response inhibition. 9 children with DD (Mage=8 years, 5 months) and their parents took part in a focus group, which involved using the program and then providing feedback on their experience. In order to assess the construct validity and sensitivity of the program 90 typically developing children (Mage= 4 years 4 months, 3 years to 5 years) were recruited. Data was collected on the TALI program, in addition to existing measures of attention; Wilding Attention Tasks (WATT; Wilding, Munir & Cornish, 2001) and the Kiddie Continuous Performance Task (K-CPT; Conners, 2001).

Results: Qualitative data demonstrated that children with DD were able to engage with the program and understand the task requirements. Correlation coefficients revealed significant positive correlations between existing measures of attention and performance on the TALI selective attention task, r (85) =.584, p<.001, TALI cognitive flexibility task, r (86) = .438, p<.001, TALI sustained attention task, r (84) = .392, p<.001, and the TALI response inhibition task, r (84) = .351, p<.001. A series of hierarchical multiple regression analyses were used to predict performance on each of the TALI tasks. Child’s gender was entered at step 1 and child’s age was entered at step 2. For each of the TALI tasks the addition of age significantly improved the prediction. In combination the two predictor variables explained 40% of the variance in selective attention performance [adjusted R2=.386, F (2, 87) = 28.96, p<.001], 12.3% of the variance in sustained attention performance, [adjusted R2=.103, F (2, 87) = 6.102, p=.003], 31.3% of the variance in cognitive flexibility performance, [adjusted R2=.298, F (2, 87) = 19.846, p<.001] and 11.8% of the variance in response inhibition performance [adjusted R2=.098, F (2, 87) = 5.847, p=.004].

Discussion: The training program was valid in targeting core attentional networks and sensitive in tracing age related changes within these networks. Importantly the use of the program in children with DD was shown to be feasible. Since validation the efficacy of the training program has been assessed in a trial of 80 children with developmental disabilities.

Key references:


Title: Parenting in Families With Multiple Children With Delays

Kenya Makhiawala and Laura Lee McIntyre, University of Oregon

Introduction: Behavioral parent training programs have been widely used with caregivers to prevent and decrease challenging behavior in young children with developmental delays (Matson, Mahan, & LoVullo, 2009). Mounting evidence suggests that parenting behaviors and family processes may influence the development and maintenance of problem behavior in children with developmental delays (e.g., Floyd, Harter, & Costigan, 2004; McIntyre, 2008). However, parenting in families with multiple children is an area that has yet to be fully explored. Relatively little is known about how parents interact with their child with a developmental delay compared to how they interact with their other children.

Methods: A sample of 14 families with a preschool-aged target child with DD and a sibling between 36 and 96 months were recruited from the larger, ongoing randomized control trial examining the efficacy of a parent training intervention (McIntyre, PI). Data were collected through extensive in-home interviews and assessments, including parent reported child problem behavior (CBCL; Achenbach & Rescorla, 2012), observed problem behavior (measured via videotaped observations), parenting stress (PSI-3; Abidin, 1995), depression (CES-D; Radloff, 1977), and parent inappropriate and positive behaviors (measured via videotaped observations). Target children ranged in age from 2 to 3 years old (M = 37.21 months) while siblings ranged in age from 3 to 8 years old (M = 63.5 months).

Results: All target children had a developmental delay, with half (n = 7) identified with a speech/language delay. Over 40% of siblings (n = 6) were also identified as having a speech/language delay. On average, target children were reported to have slightly elevated problem behavior (CBCL T score M = 58.93, SD = 13.15), while siblings' problem behaviors were reported to be below average (CBCL T score M = 48.50, SD = 11.91). Observed parenting behavior during 15-min observation tasks suggest that parents engaged in significantly more inappropriate interactions (e.g., intrusive play) with the younger target child than the older sibling (t(13) = 3.90, p = .002). There was a trend approaching significance for more parent inappropriate commands (e.g., beta commands) with the target child than with the sibling (t(13) = 1.85, p = .09). Target children exhibited more noncompliance during the clean-up task than their siblings; however, compliance in both groups was low (ranging from 35-45%).

Discussion: Prior research has explored parent-child interactions within the context of parenting a single child; however, very little research has attempted to unpack the relationships between a target child with DD, their sibling, and parenting behaviors. The results suggest that supporting parents in their use of more positive parenting strategies with their young children with developmental delays may be an important area for intervention.

Key References:


Supported by NIH grants R01HD059838 (McIntyre, PI) and R01HD059838-03S1 (McIntyre, PI).
Title: The Effects of Sustained Parenting on Adaptive and Problem Behavior in Children With FXS in Middle Childhood

Steven F. Warren, Nancy Brady, Kandace Fleming, University of Kansas

Introduction: Over the past decade we have conducted a longitudinal study of 55 children with FXS and their biological mothers. Our research has demonstrated that early and sustained maternal responsivity has substantial effects on language development in these children controlling for development, autism and maternal education (Warren et al, 2010; Brady, et al 2014). We have extended our analysis by including maternal behavior management and a variable that combines both maternal responsivity and behavior management into a composite we term “active parenting”. In this presentation we examine the combined and separate effects of both the rate and relative proportion of these variables on measures of adaptive and problem behaviors.

Method: Fifty-five children with FXS (44 boys, 11 girls) and their mothers were visited in their homes at 5 different time points from early through middle childhood. Parent-child observation data was collected during each visit in a variety of contexts. Data coded from the observational contexts were used to examine maternal responsivity and behavior management as well as various child behaviors. We then analyzed the effects of parenting on a range of measures including adaptive behavior and problem behavior.

Results: Rate of maternal responsivity over the early and middle childhood significantly reduced the variance in the intercepts by 5% to 37% for Vineland Adaptive Behavior (VABS) Composite, Socialization, and Communication scores, and Child Behavior Checklist (CBCL) externalizing scores after accounting for autism and gender. Responsivity rate reduced the variance in slopes by 3% to 8% for these same variables. Similarly, rate of active parenting reduced the variance in intercepts by 4% and 12% and the variance for slopes by 12% and 15% for CBCL internalizing and externalizing problem behavior after accounting for autism and gender. Rate and proportion of responsivity reduced the variance in intercepts and slopes for VABS Daily Living scores by 3% each after accounting for autism/gender. Parenting measures and problem behaviors at age 8-9 were significantly correlated.

Discussion: Maternal responsivity specifically and parenting in general has a significant impact on the trajectories of a broad range of outcome measures from early to middle childhood for children with FXS. The positive impact of maternal responsivity on the adaptive behavior of children with FXS in middle childhood may be particularly important given reports in declines in these behaviors in middle childhood and adolescence.

Key References:


Title: The 'Crossed Hands Effect' in Children With Developmental Coordination Disorder (DCD)

Joanne S. Camp, Goldsmiths, University of London; Jannath Begum Ali, Birbeck, University of London, Goldsmiths, University of London; Elisabeth L. Hill, Goldsmiths, University of London; Andrew J. Bremner, Goldsmiths, University of London

Introduction: Representations of the body and limbs develop significantly through infancy and early childhood in typically developing (TD) individuals. Body representations are crucial components of skilled action in the environment, and yet, little is known about their role in atypical motor development. Here we report an investigation of tactile localisation in children with developmental coordination disorder (DCD). When localising touches presented across the hands, TD adults show a "crossed hands effect" whereby identifying which hand received a tactile stimulus is less accurate when the hands are crossed than uncrossed (Shore, Spry & Spence, 2002). This effect has been taken to indicate the use of an external frame of reference for locating touches, and has been demonstrated in children and infants as young as 6 months of age (Begum Ali et al., 2014; Bremner et al., 2008). However, it is not apparent in congenitally blind individuals, suggesting that the use of an external reference frame is reliant on visual development (Röder, Rösler & Spence, 2004). As children with DCD are thought to rely more heavily on vision than TD children for tasks like walking and balance (e.g., Deconinck et al., 2006), we hypothesised that they would show a greater crossed hands effect than controls.

Method: As part of a larger battery of tasks assessing multisensory influences on bodily representation, children with DCD aged 7-11 years are currently completing a tactile localisation task (after Begum Ali et al., 2014). Participants feel a gentle vibrotactile stimulus on one of two fingers, each situated underneath a cuddly toy, and report whether the "penguin" or the "hedgehog" tickled their finger. Four blocks of 20 trials are administered, in which posture (uncrossed, crossed) and view (seen, unseen) are varied systematically. TD control participants were individually matched on the Raven's Coloured Progressive Matrices (RCPM; Raven, 2004), a measure of nonverbal ability. RCPM score and chronological age did not differ between groups.

Results: Preliminary findings (n=15 per group; target ns=20) indicate lower percentage accuracy for the DCD group (M=95.8%) than the TD group (M=98.6%) overall (Mann-Whitney U = 62.0, p=.037). Crossed conditions (M=95.4%) were completed with lower accuracy than uncrossed conditions (M=99.0%), and this applied to both the TD group (Wilcoxon Z=-2.33, p =.020) and DCD group (Wilcoxon Z=-2.22, p =.026). There was neither a significant main effect of View nor any reliable interactions.

Discussion: These preliminary findings demonstrate: a) poorer performance of children with DCD when locating touch than controls matched for nonverbal ability and chronological age, and b) a crossed hands effect in the DCD group. Our next step is to collect data from a younger TD group, matched on fine motor speed, in order to enable comparisons based on motor ability.

References/Citations:


Effective Speech Therapy Method for Students With Down Syndrome Varies By Their Verbal Imitation Level

Tiffany Woynaroski, Stephen Camarata, Paul Yoder, Vanderbilt University

Introduction: Individuals with DS experience lifelong difficulties in making their speech understood. Children with DS have more difficulty making their speech understood than mental age matched peers with other intellectual disabilities. We call this a speech comprehensibility deficit. Comprehensible speech is crucial for access to many educational and vocational opportunities, but surprisingly, essentially no internally valid studies to date have demonstrated that speech therapy method has a causal effect on speech comprehensibility in children with DS. This randomized controlled trial examines the effects of two speech therapy approaches, Easy Does It (EDI) and Broad Target Speech Recasts (BTSR) and evaluates verbal imitation as a moderator of treatment effects on speech comprehensibility of school age children with DS. We predicted BTSR would be superior for high verbal imitators and EDI would be superior for low verbal imitators.

Methods: Fifty-one 5 - 12 year old children with DS were randomly assigned to receive EDI or BTSR treatment. Individual (1:1) EDI or BTSR sessions were administered in the child's school by master's level speech-language pathologists from the research team for 60 minutes, two times per week over a total treatment duration of 6 months. All participants had speech comprehensibility < 75% and ranking < 10th percentile on the Arizona Articulation Proficiency Scale at entry to the study. Treatment groups were non-significantly different on speech comprehensibility and 10 additional pretreatment variables thought to be potentially related to speech comprehensibility gain at Time 1. Transcribers were blind to treatment assignment and were not the children's therapist. Treatment groups were non-significantly different in attendance to scheduled sessions (p = .30), and attrition was < 2%. At pre-treatment and at post-treatment, speech comprehensibility was assessed in two 20-minute conversational samples with an examiner. Speech comprehensibility was defined as the percentage of child utterances for which all word attempts were glossed across the two speech samples. Verbal imitation at pre-treatment was evaluated using a dynamic assessment. Pre-treatment verbal imitation was operationalized as the sum of accurate imitations weighted by number of trials and accompanying performance feedback.

Results: On average across treatment groups and imitation levels, children demonstrated above-chance level gains in speech comprehensibility (M post - pre gain = .10, SD = .12; d = .66). The mean level of gain in speech comprehensibility was nonsignificantly different between treatment groups (p = .4, d = .21). However, BTSR yielded greater gains in speech comprehensibility relative to EDI for the subgroup of students with .46 SD above the mean on verbal imitation scores at pretreatment (∆R² for verbal imitation x treatment interaction in entire sample = .12, t(49) = 2.5, p = .015). There was no subgroup in which EDI > BTSR for gain in speech comprehensibility overall. However, if considering only single word utterances, extremely low verbal imitators (1.41 SD below the mean) showed greater gains in speech comprehensibility with EDI versus BTSR (∆R² for verbal imitation x treatment interaction = .1, t(49) = 2.34, p = .023).

Discussion: Results suggest that the treatment that best improves speech comprehensibility in school age children with Down syndrome varies according to children's verbal imitation skills at the time they enter treatment. Matching the speech therapy approach to the child's profile will reduce the difficulties faced by children with DS. Implication for research, theory and practice will be discussed.
Title: Longitudinal Impact of Sensory Response Patterns on Family Functioning Outcomes in Children With Autism Spectrum Disorders and Developmental Delay

Kathryn Williams, Anne V. Kirby, Grace T. Baranek, John Sideris, Linda Watson, John Bulluck, University of North Carolina at Chapel Hill

Introduction: There are a growing number of reports demonstrating the prevalence of unusual sensory response patterns (hyporesponsiveness, hyperresponsiveness, and sensory seeking behaviors) in children with autism spectrum disorders (ASD), as well as children with developmental delay (DD). Although these patterns have been correlated concurrently with adaptive behavior (Baranek et al., 2013) and family functioning (Kirby, White, & Baranek, in press), the longitudinal effects of these behaviors are less known. Parent-child activity participation and caregiver strain are two important dimensions related to family functioning that may be particularly negatively impacted. This study aims to determine the longitudinal impact of sensory response patterns on these two outcomes related to family functioning.

Methods: Children with ASD (n=57) and DD (n=34), and their families, participated in two data collection time points approximately 1-5 years apart [children's ages: Time 1M(SD)= 5.7(2.4) years; Time 2M(SD)=9.04(2.1) years]. We implemented four sensory measures at Time 1 including two parent questionnaires: the Sensory Experiences Questionnaire (SEQ; Baranek, 1999) and the Sensory Profile (SP; Dunn 1999), and two semi-structured observational measures: the Sensory Processing Assessment (SPA; Baranek, 1999) and Tactile Defensiveness and Discrimination Test-Revised (TDDT-R; Baranek, 2010). At time 2, we utilized two outcome measures related to family functioning: the Home and Community Activities Scale (HCAS; Dunst et al., 2000) and Caregiver Strain Questionnaire (CGSQ; Brannan et al., 1997). We conducted regression analyses to test main effects and group by sensory pattern interactions to determine the differential impacts of sensory response patterns on previously-identified factors of each measure (Kirby et al., in press; Little, Sideris, Ausderau, & Baranek, 2013). We included relevant covariates (i.e., chronological age, gender, IQ, and mother’s education) in all models.

Results: Results revealed a significant group interaction for the relationship between parent-reported sensory seeking behaviors and participation in parent-child household activities measured by the HCAS. As expected, greater seeking behaviors reported at Time 1 were associated with less participation for children with ASD at Time 2 (p<.05). A similar trend was witnessed for observed hyporesponsive behaviors at Time 1 and participation in HCAS faith based activities at Time 2 (p<.05). In the ASD group, greater hyporesponsive scores were associated with lower activity involvement, whereas with the DD group, the pattern was the opposite. On the CGSQ, greater observed hyporesponsive behaviors at Time 1 were associated with lower levels of subjective externalized strain (e.g., anger towards child) at Time 2 (p<.05).

Discussion: The current findings provide a preliminary analysis of the longitudinal impact of sensory response patterns on family functioning outcomes in the areas of activity participation and caregiver strain in ASD and DD groups. Significant group by sensory interactions suggest that families of children with ASD and DD experience the impact of sensory features differently over time. In areas of activity participation, children with ASD and higher levels of sensory behaviors may be participating less in home and community activities over time, whereas early hyporesponsive behaviors appear to have a more beneficial influence on caregivers over time. Future analyses will explore the contributions of educational and therapeutic services as moderators.

Key References:


Title: Examining Narrative Language Structure in Students With Mild Intellectual Disability

Andrea Barton-Hulsey, Valery Mateo, Rose A. Sevcik, MaryAnn Romski, Georgia State University

A narrative is compiled of many individual parts that rely on each other for their ultimate viability (Bruner, 1991). In order for a child to tell a story, he/she must first comprehend the individual events and express those events using language that connects them with meaningful transitions and outcomes. Temporal sequencing skills along with language skills have been found to contribute to narrative ability in children with neurodevelopmental disabilities (Johnels, Hagberg, Gillberg & Miniscalco, 2013). Petersen, Gillam, Spencer, and Gillam (2010) describe the development of narratives as a gradual process that follows a developmental continuum marked by differing levels of complexity in organization (macrostructure), and linguistic features (microstructure). Examining narrative macrostructure provides a context to gain information about specific oral skills related to maintaining a story structure, relating order of events, describing character relationships and overall cohesion.

This study examines the narrative language ability of 102 students between 7 and 11 years of age (mean age= 9.33; male= 56, female= 46) with mild intellectual disabilities who were part of a longitudinal study designed to test the efficacy of reading programs for students with mild intellectual disability. Average standard scores for the Peabody Picture Vocabulary Test were 63.92 (SD=13.84) and for the Expressive Vocabulary Test were 57.21(SD=13.08). The average raw score for the Clinical Evaluation of Language Fundamentals- 4th ed (CELF-4) subtest concepts and following directions was 16.86 (SD= 10.39). This subtest examines the ability to follow complex temporal directions (i.e., point to the first turtle, then the last dog). This poster will describe students' microstructural narrative elements using the Systematic Analysis of Language Transcript (SALT) software and macrostructural elements and an adapted version of the Narrative Scoring Scheme (NSS; Finestack et al., 2012). We will answer the following questions: 1) What is the factor structure of the adapted NSS for students with mild intellectual disabilities?; 2) Are there differences in performance across narrative elements?; 3) Does language comprehension predict narrative ability?

Narratives were elicited using the picture book "Frog Goes to Dinner" (Mercer Mayer, 1969). Utterances were transcribed using SALT. The macrostructural narrative elements of Introduction, Character Development, Mental States, Referencing, and Conflict/Resolution were scored on a 1-5 scale using the NSS. Students evidenced strengths describing the elements of Introduction, Character Development and Conflict/Resolution. Confirmatory factor analysis (CFA) was done to determine if narrative ability was best explained by a one or two factor model. The best fitting model was a 1 factor, 7 indicator CFA explained by each element of the NSS (Model Fit Indices= χ2(14) = 37.122, p = 0.001; RMSEA = 0.127, 90% CI = (0.078 - 0.178); CFI = 0.969).

Transitional language (i.e., "then, next, first") was challenging for students as evidenced by consistently low scores on the element of cohesion. Temporal transitions are important in the production of a sophisticated narrative and may influence scores across all elements of narrative assessment. A hierarchical regression was done to determine the contribution of receptive language as measured by the CELF-4 concepts and following directions subtest.

The full model of MLUm and receptive language skills was statistically significant, R2 = .746, F(1, 99) = 13.504, p < .001; adjusted R2 = .741 in predicting narrative ability. The addition of receptive language led to a statistically significant increase in R2 of .035, F(1, 99) = 13.504, p < .001. Receptive language skills specific to understanding temporal concepts and directions predicted overall narrative composite scores beyond what would be expected by MLUm alone. This poster will further describe the implications of receptive language ability, grammatical complexity, and differences in narrative ability for students with mild intellectual disabilities.
Title: Parental Self-Efficacy and Parenting Practices Predict Child Behavior in Young Children With Developmental Delays

Margaret Rosencrans and Laura Lee McIntyre, University of Oregon

Introduction: It is well established that ineffective parenting practices are linked to negative child behavioral outcomes (e.g., Forehand, Sturgis, & McMahon, 1979). Further, low parental self-efficacy (PSE) has been associated with ineffective parenting practices (Sanders & Woolley, 2005; Wells-Parker, Miller, & Topping, 1990) and negative child behavioral outcomes (Bor & Sanders, 2004). Although children with developmental delay (DD) are more likely to develop behavior problems (e.g., Emerson, 2003), the extent to which these problems are linked to parenting practices and parenting self-efficacy is less established. This study examined associations between PSE, child behavior, and parenting practices in young children with DD.

Methods: This study was part of a larger investigation of family-based interventions for caregivers with young children with DD (R01 HD059838; McIntyre, PI). Caregivers of toddlers with DD (N=72) were recruited from early intervention and early childhood special education programs. Data were collected through in-home interviews and assessments of family demographics, adaptive behavior, parental self-efficacy (Parenting Sense of Competence [PSOC]; Parenting Tasks Checklist [PTC]), child behavior problems (Child Behavior Checklist) and observed parent-child interactions during a 15-min play and clean-up task.

Results: Scores on the Satisfaction scale of the PSOC were positively associated with observed child compliance, r(72)=.23, p = .05, suggesting that higher parenting self-efficacy (satisfaction in the parenting role) is associated with more child compliance. Parenting practices were also associated with child behavioral outcomes. In particular, parents who delivered fewer commands during clean-up had children with higher rates of compliance (r(72) = -.43, p = .00. Parenting self-efficacy was associated with parenting practices such that lower scores on the Self-Efficacy scale of PSOC were associated with providing more positive consequences for inappropriate behavior during a structured play task (e.g., puzzle) r(72) = .27, p = .02. Parents who reported feeling more confident in handling challenging behaviors (higher scores on the PTC Behavior subscale) had children with fewer instances of observed disruptive behavior during play tasks r(70)=.37, p=.002.

Discussion: Findings from the present study indicate that parenting self-efficacy was significantly associated with both negative child behavior and certain parenting practices. Implications for interventions include emphasizing improving both parental competence and use of strategies that reduce child challenging behavior (McIntyre, 2013). Future analyses will report on the extent to which parenting practices mediate the relation between parenting self-efficacy and child problem behavior.

Key References:


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Title: Broad Autism Phenotype and Maternal Attachment: The Impact on Close Relationships

Madeline Rhoden, Megan M. Pruitt, Lisa Keylon, Molly O’Neill, Naomi V. Ekas, Texas Christian University

Introduction: Attachment is the framework through which humans develop intimate relationships, beginning in infancy through interactions with the caregiver and continuing in adulthood through romantic relationships and friendships. Individuals have a secure or an insecure attachment, which means having higher levels of avoidance and anxiety. Adult attachment affects the quality of parenting and may explain several outcomes for parents of children with autism spectrum disorder (ASD). Parenting a child with ASD can be stressful, impacting the overall parenting experience, family dynamics, and parents’ personal relationships. These mothers report lower wellbeing, which is associated with lower parenting self-efficacy (Kuhn & Carter, 2006). Parents in general with higher attachment insecurity are more likely to report lower parenting self-efficacy (Kohlhoff & Barnett, 2013). Mothers who exhibit mild ASD symptoms, known as the broad autism phenotype (BAP), have unique struggles. Among other things, BAP parents are more likely to have inadequate social support (Ingersoll & Hambrick, 2010). Therefore, examining the relationship between BAP and attachment might further explain close relationship difficulties. The current study’s purpose was to examine whether mothers’ BAP characteristics impact their attachment style and whether attachment predicts other aspects of maternal well-being.

Methods: Mothers of children with ASD (n = 52) completed questionnaires online. Questionnaires measured adult attachment style, BAP symptomology, social support, marital satisfaction, parenting self-efficacy and satisfaction, and family impact of the child’s ASD. Data collection is ongoing and expected to reach n = 125 within 30 days.

Results: Mothers with higher total BAP scores reported higher levels of insecurity, including higher avoidance (r = .66, p < .001) and anxiety (r = .39, p < .01), lower marital satisfaction (r = -.46, p < .01), lower parenting satisfaction (r = -.34, p < .05), and less overall social support (r = -.35, p < .05). When examining family impact, high-BAP mothers reported significantly less positive impacts (r = -.30, p < .05) and more negative impacts (r = .31, p < .05). With respect to the impact of attachment style on outcomes, highly anxious mothers reported lower marital satisfaction (r = -.38, p < .05), lower parenting self-efficacy (r = -.41, p < .01), less positive family impacts (r = -.42, p < .01), and more negative impacts (r = .34, p < .05). Highly avoidant mothers reported lower marital satisfaction (r = -.52, p < .001), lower overall social support (r = -.35, p < .05), lower parenting satisfaction (r = -.44, p = .001), less positive family impacts (r = -.33, p < .05), and more negative impacts (r = .38, p < .01).

Discussion: These findings suggest that adult attachment might serve as a mechanism explaining BAP’s impacts on maternal relationships. Seeing that BAP results in social difficulties, it follows that adult attachment would similarly be affected by BAP characteristics. BAP understandably impacts the mother’s social support network, parenting experience such as parenting self-efficacy, and family life perceptions as a result of ASD. This supports the idea that BAP affects the quality of close relationships. Potential interventions for these mothers could focus on improving attachment style.

References:


Title: Interdependent Determinants of Parental Involvement Among Families of Children Receiving Early Intervention Services

Rhett Billen and Vey Nordquist, University of Tennessee

Introduction: Part C of the Individuals with Disabilities Education Act (IDEA) requires that states provide family-centered services to children under the age of three who are at risk for developmental delays. The family-centered service-delivery model, based in family systems perspective, prioritizes the belief that the best way to serve young children with disabilities is to serve and empower the entire family (Dempsey & Keen, 2008). This perspective emphasizes interdependence as a central feature of family relationships, meaning that the thoughts, feelings, and behaviors among individuals within a household are likely to be reciprocally dependent upon one another (Ponnet et al., 2013).

Also rooted in the family systems perspective is the statistical method of accounting for interdependence known as the actor-partner interdependence model (APIM). The APIM provides the opportunity to predict outcomes at both the individual level (i.e., actor-effects) as well as the partner level (i.e., partner-effects). The purpose of this analysis was to examine how mothers and fathers of children receiving early intervention services reciprocally influenced one another's parental involvement. In three separate APIMs, we tested the actor- and partner-effects of parenting self-efficacy, parenting role salience, and couple relationship satisfaction on parental involvement. We hypothesized that in each of these models, actor- and partner-effects would be present for both mothers and fathers.

Methods: The data used in this analysis were taken from a state-wide research project assessing mother-father dyads whose children were enrolled in a state-run early intervention system. Questionnaires were distributed to families by their early intervention service coordinators and returned by mail. The final sample eligible for this analysis consisted of 132 mother-father dyads. Mothers and fathers completed self-report measures of parenting self-efficacy (13 items; alpha = .86 for mothers, .91 for fathers), parenting role salience (10 items; alpha = .74 for mothers, .85 for fathers), relationship satisfaction (3 items; alpha = .96 for mothers, .84 for fathers), and parental involvement (nine items; alpha = .81 for mothers, .85 for fathers). Mplus version 7.2 was used to run structural equation models for each APIM.

Results: Preliminary analyses revealed that for both mothers and fathers, parenting self-efficacy, role salience, and relationship satisfaction predicted a significant increase in parental involvement for the actor-effect pathways. Regarding the partner-effects, father involvement was predicted by mother self-efficacy, mother role salience, and mother relationship satisfaction. However, no partner-effects were found from husbands onto mother involvement. Future analyses will investigate potential mediated pathways among the variables included in this analysis.

Discussion: The hypothesized actor-effects pathways revealed that mothers' self-efficacy, mother relationship satisfaction, and mother role salience predicted significant variance in mother involvement. The same pattern of actor-effects was found for fathers. These findings indicate that parental involvement among mothers and fathers of young children with disabilities is enhanced when mothers and fathers independently feel empowered in their parenting role, enjoy their parenting role, and are satisfied in their couple relationship. However, although significant partner effects were found from mother predictor variables onto father involvement, levels of mother involvement remained independent from father characteristics. These partner-effects reveal that while levels of father involvement with young children with disabilities depend somewhat on certain characteristics of mothers, mother involvement remains uninfluenced by certain father characteristics. Practical and empirical implications of these findings are discussed.

Key References:


Title: The Roles of Toddler Circadian Patterns on Attentional and Behavioral Concerns in Children Born Preterm

A. J. Schwichtenberg, Purdue University; Sharon Christ, Purdue University; Emily Abel, Purdue University; Julie Poehlmann-Tynan, University of Wisconsin-Madison

Introduction: Children born preterm are at elevated risk for developmental concerns and behavioral difficulties (Bhutta, Cleves, Casey, Cradock, & Anand, 2002). With medical advancements preterm infant survival rates are increasing and with it our need to understand the long term developmental cascade associated with preterm birth. Initial birthweight and gestational age are not the only developmental factors that influence child attentional and behavioral development. Early sleep patterns may also play a crucial role. In an at-risk population such as infants born preterm sleep could be particularly salient for later attentional/behavioral concerns. The current study of infants born preterm assesses the roles of toddler circadian sleep/activity patterns on later school-age attentional (i.e., Attention Deficit Hyperactivity Disorder symptoms) and behavioral problems.

Methods: Within a longitudinal prospective design, we used time series modeling to examine circadian sleep patterns at two years of age in 70 infants born preterm. Infant prematurity and family sociodemographic assets were recorded at hospital discharge. Child school-age attentional and behavioral concerns were assessed using parent and teacher reports on the Child Behavior Checklist and the Conners 3 at six years of age.

Results: Sleep data (actigraphy) were assessed via cosinor models with two sinusoidal (sine) waves. The first wave modeled sleep/activity patterns over a 24 hour period and the second wave accounted for a mid-day nap which is common at two years of age. This modeling approach allowed us to compare each child to a prototypical 24 hour circadian pattern. Each circadian pattern included estimates for individual child rhythm characteristics. Child variations from the prototypical circadian pattern (PCP) in sleep/activity were regressed onto school-age concerns using OLS regression with child gender, infant prematurity, and family sociodemographic assets as covariates.

Initial results reveal that sleep variations from the PCP at age two are related to school-age concerns. Toddlers with sleep patterns that closely aligned with the PCP had fewer parent-reported behavioral concerns at school age (p = .01, n = 70) and fewer parent-reported attentional difficulties (p < .01, n = 66). Similar effect sizes were present for internalizing and externalizing problems. Toddler mean activity level adjusted for rhythm was also negatively associated with teacher-reported attention difficulties (p < .05, n = 46) and parent-reported behavior problems (p < .01, n = 70). The behavior problem effect was driven by lower externalizing problems (beta = -5.30, p < .05) and not lower internalizing problems (beta = -2.80, p > .10). Within-child activity variability (range between peak activity and sleep) was also associated with behavior problems (p < .01). This effect was driven more by the association with externalizing problems than internalizing problems. Child gender and degree of prematurity were not statistically significant covariates.

Discussion: Previous studies document robust connections between sleep problems and attentional and behavioral difficulties (e.g., Goodlin-Jones, Tang, Lui, & Anders, 2009) but the connections between normative variations in sleep are less clearly understood. The novel approach used in this study to index prototypical circadian patterns provides a holistic approach to the analysis of sleep patterns (not simply amount of sleep or night awakenings), which may prove to be developmentally consequential. The application of these findings may help practitioners and researchers identify which children born preterm are at increased risk for later attentional and behavioral problems.

References:


Title: Exploring the Behavioural and Cognitive Profile of Attention in Autism Spectrum Disorder: A Comprehensive Assessment

Mistral Foster-Owens, Monash University; Russell Conduit, RMIT University; Fay Fletcher, Monash University; Kim Cornish, Monash University

Introduction: A strong association between Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD) has long been acknowledged, with research reporting ADHD to be the second most commonly occurring comorbid disorder [1], and a dual diagnosis of ASD and ADHD recognised in the revised DSM-5 criterion for ASD [2]. Despite a multitude of attention studies the functioning of cognitive attention in children with ASD remains less clear, with a large diversity of attention measures employed between, and inconsistent findings reported across, studies. The present study aimed to comprehensively assess both behavioural and cognitive attention functioning in school-aged children with ASD, without intellectual disability (ID), compared to their age-and-gender-matched typically-developing (TD) peers.

Methods: Thirty-three children aged 6-12 years with ASD, without ID, and 33 TD controls completed a comprehensive battery of cognitive attention tasks. Assessment included the Attention Network Test for Children (ANT-C), three subtests from The Wilding Attention Test for Children (WATT) designed to measure three aspects of cognitive attention separately (selective, sustained and switching attention), and the Digit Span subtest from the Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV). The Wechsler Abbreviated Scale of Intelligence (WASI) was administered in order to obtain a measure of full-scale IQ (FSIQ). Parents of children completed the Conners Parent Rating Scale-3rd edition (Conners 3) designed to measure behaviours relating to ADHD and the most commonly associated co-morbid disorders.

Results: Children in the ASD group had significantly higher parent-ratings of inattention and hyperactivity. No significant difference between groups was seen in immediate auditory-verbal attention span, but TD children demonstrated significantly longer backwards span length than the children in the ASD group. Alerting, orienting, and executive control/conflict attention network scores were calculated for each participant based on the ANT-C. No significant difference was found between the TD and ASD group for alerting, orienting, or executive control/conflict. There was no significant difference between the AS and TD groups performances on the WATT selective and sustained attention tasks but children with ASD make more false alarms than TD children on the WATT switching attention task.

Discussion: The current study has shown that, consistent with previous research, school-age children with ASD, without ID, exhibit higher parent-reported levels of behavioural inattention and hyperactivity than TD children. Comprehensive cognitive attention assessment revealed that children with ASD exhibit deficit functioning in select aspects of the executive control network; specifically working memory and switching attention, but demonstrate intact inhibitory control and alerting, and orienting attention. The select deficits seen in working memory and switching attention have implications at a clinical and classroom level in terms of targeted assessment and intervention to address these difficulties.

References:


Introduction: The life expectancy for individuals with Down syndrome (DS) has increased from 9 years to almost 60 years over the past century. Due to this increase, there is now a critical need to understand the daily lives of adults with DS in middle adulthood (i.e., 30s and 40s) and older adulthood (i.e., 50s and beyond). This study seeks to understand two domains of daily life for adults with DS - leisure activity and employment - and their associations with co-occurring emotional and behavior problems, residence, and caregiver involvement.

Methods: In total, 59 caregivers of adults with DS participated. Caregivers were aged 23-89 years (M = 65.48, SD = 11.85), predominantly Caucasian, and primarily mothers of the adult with DS (76.3%). Caregivers completed a modified version of the Victoria Longitudinal Study activity questionnaire (VLS; Jopp & Hertzog, 2007) to assess the frequency and type of leisure (i.e., active, social, mentally-stimulating, passive) participation of the adult with DS. Taylor and Seltzer’s (2012) vocational index for adults with autism spectrum disorder was used to assess the level of independence in employment and the number of hours the adult with DS worked weekly. Caregivers also completed the Reiss Screen for Maladaptive Behavior (RSMB; Reiss, 1994), and reported on the residence of the adult with and how much time they spent with the adult with DS each month.

Results: Simple linear regressions were used to assess the associations between co-occurring emotional and behavior problems, residence, caregiver involvement, and the leisure activity and employment participation of the adults with DS. Higher co-occurring emotional and behavior problems significantly predicted lower frequency of social leisure activity (F (1,57) = 3.99, R2 = .07, p = .05), and greater caregiver involvement significantly predicted higher frequency of active (F (1,55) = 4.63, R2 = .08, p = .04) leisure, and both social (F (1,55) = 3.64, R2 = .06, p = .06) and overall leisure activity (F (1,55) = 3.53, R2 = .06, p = .07) at the trend level. Fewer co-occurring emotional and behavior problems significantly predicted greater independence in employment (F (1,57) = 2.80, R2 = .05, p = .10) at the trend level, and residence significantly predicted hours worked weekly (F (1,57) = 4.80, R2 = .08, p = .03). In addition, the number of hours adults with DS were employed weekly was negatively associated with frequency of passive leisure activity (r = -.30, p = .02).

Discussion: Co-occurring emotional and behavior problems may hinder participation in social leisure and are related to lower independence in employment. Adults with DS living outside of the family home worked more hours per week, perhaps because residential facilities may be better connected to employment services. Caregivers are often the facilitators and leisure partners of adults with DS; thus, with greater caregiver involvement, adults with DS may have more opportunities for leisure. Findings suggest that when adults with DS are not working, they are often engaged in passive leisure activities (e.g., television). Additionally, interventions and services should teach behavioral regulation skills to adults with DS, and partner with caregivers to support active, social, and mentally stimulating leisure, especially for adults with DS with limited employment. This study was funded by NIA (R01 AG076640, PI: B. Handen).

References:


Title: Students With ASD and Comorbid Internalizing Symptoms: Implications for School-Based Placement and Intervention Decisions

Karrie A. Hilliard, Kerri P. Nowell, Madeline Racine, Sarah S. Mire, University of Houston

Introduction: Students with autism spectrum disorders (ASD) have heterogeneous presentations, including a range of both ASD symptoms and also comorbid disorders, such as anxiety and depression.

Anxiety appears to be particularly prevalent among individuals with high-functioning ASD, perhaps due to a heightened self-awareness of one's own social difficulties (Kim et al., 2000); and diminished social efficacy (Bellini, 2004). When these children are served by schools in inclusion (i.e., general education) settings, they are at risk for isolation and rejection, which could further compound difficulties with internalizing symptoms (Chamberlain et al., 2007). Placement decisions for children with ASD are based on a variety of factors, including federal mandates to educate children in the least restrictive environment (IDEA, 2004) and parents' preference that children learn alongside typically-developing peers (Bitterman et al., 2008). Understanding the factors associated with time spent in inclusion is critical to ensuring that students with ASD are served in the best setting for their unique characteristics.

Building on a previous study by the authors that found an association but no predictive power between parent and teacher reports of externalizing behaviors and time spent in inclusion (Nowell et al., 2014), the purpose of the current study was to investigate whether reports of internalizing behaviors were predictive of time spent in inclusion. It was hypothesized that parent and teacher ratings of internalizing symptoms would predict time spent in inclusion, with non-verbal (NVIQ) and verbal IQ (VIQ) as covariates.

Methods: Data from 414 children were analyzed using the Simons Simplex Collection, which included families with one child between ages 4 and 18 with research-reliable diagnoses of ASD. A hierarchical multiple regression, with non-verbal and verbal IQ scores as co-variates, was conducted with time in inclusion as the dependent variable and the following as independent variables: ADOS-Social-Communication, Child Behavior Checklist (CBCL) Internalizing Composite, and Teacher Rating Form (TRF) Internalizing Composite.

Results: Statistically significant correlations were found between time in inclusion and the following variables: NVIQ, VIQ, CBCL Internalizing Composite. For the co-variates, multiple R for regression was statistically significant, F(2, 411) = 149.3, p<.001, R^2 adj = .42. However, addition of the parent and teacher measures of internalizing difficulties did not result in statistically significant improvement of the model F(2, 409) = 306, p = .34, R^2 adj = .42.

Discussion: When controlling for NVIQ and VIQ, internalizing difficulties were not significantly associated with time spent in inclusion. Findings illustrate the clinical importance of monitoring all youth with ASD for signs of internalizing symptoms (e.g., depression) regardless of educational placement. Limitations and future directions will be discussed.

References:


Title: Remediation of Stimulus Overselectivity With Differential Observing Responses: Determining the Level of Instructional Support

William Dube, University of Massachusetts Medical School; Rachel Farber, University of Massachusetts Medical School; Chata Dickson, New England Center for Children, Western New England University

Introduction: Stimulus overselectivity refers to maladaptive narrow attending that is a common learning problem in individuals with intellectual disabilities. Overselectivity may be manifested as an atypical restriction in the number of stimuli or stimulus features that exert stimulus control in discrimination learning. Differential observing responses (DORs) are responses that explicitly verify observing and discrimination of relevant stimuli. Mandatory DORs may reduce or eliminate overselectivity, but they do so at the cost of additional response requirements and thus seem best used judiciously. This study examined a procedure to estimate the level of DOR instructional support needed to eliminate overselectivity in a discrete-trials task.

Method: Participants were 12 special-education students (age 11-20 years) with moderate to severe intellectual disabilities. The test procedure was three-choice delayed matching to sample. Stimuli were Meyer-Johnson Picture Communication Symbols or unfamiliar black forms. Different stimuli were presented on each trial within sessions, drawn at random from pools of 180 stimuli.

Baseline conditions included 36 trials per session. Two sample stimuli were presented on each trial, and only one of those stimuli appeared in the subsequent comparison array. Participants were selected for this study if initial Baseline accuracy scores were within the range of 50-83%, indicating overselective stimulus control by one sample only (analysis details in Dickson et al., 2006).

In the DOR Intervention condition participants performed a simultaneous compound matching task during the sample observation period within every trial. Comparisons were pairs of stimuli, one pair identical to the sample (correct), and two pairs with one but not both stimuli identical to the sample (incorrect). Because observation and discrimination of both sample stimuli was necessary for high accuracy, accurate compound matching functioned as a DOR. There were no differential consequences for the DOR portion of the trial, and the remainder of the trial was the same as Baseline. After 10 intervention sessions, the Baseline condition was repeated for 10 sessions.

Eight participants with high accuracy during DOR Intervention proceeded to a Level of Support Titration condition. The proportion of trials that included the DOR was adjusted over successive 12-trial blocks, decreasing, maintaining, or increasing following blocks with high (≥89%), intermediate, or low (≤75%) accuracy, respectively. Titration continued until a stable threshold was established.

A final Follow-up condition presented Baseline sessions with the addition of the DOR on the proportion of trials indicated by the Level of Support Titration.

Results: Mean accuracy scores (and SDs) were: Baseline 1, 74% (5.5); DOR Intervention, 91% (5.3); Baseline 2, 76% (6.1). The intervention was highly effective, but a brief 10-session exposure did not produce a clinically significant increase in accuracy after it was abruptly withdrawn. Results of the Level of Support Titration condition were: Threshold of 100% DOR trials for four participants, 50% for two, 25% for one, and 0% for one. The Follow-up results confirmed the titration predictions for five participants, and showed that level of support was overestimated for two and underestimated for one.

Discussion: Results confirmed that intervention via DOR can be very effective for reducing overselectivity in matching to sample. The level of instructional support needed to maintain improvements varied across individuals; the research contributes to evidence-based approaches to individualize special education. Variables for further research in the development of quantitative algorithms for estimating level of instructional support include titration block size, accuracy criteria, and threshold stability criteria.

Reference and Acknowledgement:


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Title: First Concerns Among Latino Parents of Children With Autism Spectrum Disorder

Marianna Rivera, University of Wisconsin-Madison; Sandy Magaña, University of Illinois at Chicago; Eric Robb, University of Illinois at Chicago

Introduction: Autism spectrum disorders (ASDs) are neurodevelopmental disorders that are estimated to affect 1 in 67 children in the U.S. Typically, diagnosis is made at 3 or 4 years although it is believed that reliable diagnoses can be made as early as 2 years. Unfortunately, studies show that African American and Latino children are under-diagnosed and when diagnosed, receive a later diagnosis than White children. It is believed that earlier recognition and diagnosis leads to improved child outcomes due to enrollment in early intervention services to address speech/language, cognitive, social, and self-help skills. There is some evidence that first concerns expressed by parents about their children are important factors in early diagnosis. However, little is known about the first concerns expressed by Latino parents of children with ASD. Our research questions for this study are: 1) what are the first concerns of Latino parents of children with ASD and developmental disabilities (DD)?, and 2) how do first concerns differ between Latino parents of children with ASD compared to parents of children with other DDs?

Method: We analyzed qualitative responses from 27 Latino parents of children with ASD (n=18) and other DDs (n=9). Each of the authors reviewed the transcripts independently and identified themes in response to our 2 research questions. We then met to agree upon working definitions of themes and proceeded to recode transcripts independently. When saturation was achieved, the authors reviewed the coded transcripts and reached agreement.

Results: Five categories emerged from our analysis: communication concerns, behavior or temperament concerns, social concerns, concerns about physical milestones, and sensory concerns. The vast majority of parents expressed first concerns about communication or language challenges of their children regardless of whether they had ASD or another DD. However, parents of children with ASD had more concerns about problem behaviors and social development. Surprisingly, the parents of children with other DD had more concerns about sensory issues than the parents of children with ASD in our sample.

Conclusion: Our findings are consistent with the literature on first concerns (based primarily on White parents of children with ASD). Our results suggest that it is important that pediatricians and health care providers respond appropriately to parent’s first concerns about their children’s development (i.e., conduct screenings, make referrals for evaluation), particularly when there is a concern about language. Children whose parents also express concerns about social and behavioral issues may especially warrant screening for ASD.
**Title:** Attentional Lapse and Inhibitory Control in Adults With Williams Syndrome

Joanna Greer, Northumbria University, Durham University; Deborah M. Riby, Durham University; Colin Hamilton, Northumbria University; Leigh M. Riby, Northumbria University

**Introduction:** Williams syndrome (WS) is a rare genetic developmental disorder occurring in approximately 1:20,000 live births, and is accompanied with mild-to-moderate learning difficulties (Martens, Wilson, & Reutens, 2008). Research exploring the cognitive processing associated with WS has suggested that executive functioning deficits exist across the developmental spectrum, but are inconclusive as to those processes which are more or less impaired. More informative are behavioural and neuroimaging research which highlight a link between inhibitory deficits and the social / behavioural profile in WS (Mobbs et al., 2006). Thus, studies that specifically examined inhibitory functioning are promising in pinpointing the precise executive cognitive processes impaired in WS. Within a framework of executive functions, the current study explored inhibition skills and attentional lapse in older adults with WS (aged 35yrs+) and considered the implications of these deficits within this group.

**Method:** Participants were adults with WS (n = 20; aged 36-61yrs, mean 42:3 yrs), twenty typically developing adults matched for chronological age (mean 42:7 yrs), and twenty typically developing older adults aged 67-83 years (mean 74:8 yrs) to consider attentional changes associated with increasing age. The study employed a Go / No Go paradigm using the Sustained Attention to Response Task (SART; Robertson, Manly, Andrade, Baddeley, & Yiend, 1997) known to assess inhibition and attentional lapse in typically developing and clinical populations, but which has not previously used with this group. Participants had to respond to a frequent non-target stimulus whilst withholding their response to an infrequent target stimulus.

**Results:** Compared to both typically developing control groups, the results indicated atypicalities of attention and inhibition in older adults with WS. Specifically, the WS group reported a) failure to withhold a response (inhibition deficits) compared with the older adult controls (p=.001) but not the aged matched controls (p=.207), b) had problems re-engaging attentional control processes after making an error, with no change in reaction time post error (p<.085) whereas both control groups' reaction time increased (p≤.051), and c) a generalised deficit of concentration and task engagement demonstrated by a significantly lower hit rate to the non-target (p<.001) and overall greater variability in reaction time (p<.001) compared with the control participants.

**Discussion:** The study has provided evidence for an atypical attentional and inhibitory processing profile in older adults with WS, which is not observed in typically developing adults. The deficits identified here support the inhibitory dysfunction previously reported in the WS literature, and mirrors research employing the same methodology in clinical populations with frontal brain injury (Robertson et al., 1997). We conclude that further attention should be paid to the frontally controlled cognitive capacity of older individuals with WS, in order to consider the everyday challenges faced by this group and inform the development of adequate intervention and support for their daily living.

**References:**


Title: A Comparison of Parenting Dimensions Between Mothers of Children With Down Syndrome and Mothers of Typically Developing Children

B. Allyson Phillips, Ouachita Baptist University, University of Alabama; Frances Conners, University of Alabama; Mary Liz Curtner-Smith, University of Alabama

Introduction: The purpose of the current study was to compare the parenting styles--authoritative, authoritarian, and permissive--and dimensions--warmth, rejection, structure, chaos, autonomy support, and coercion--in mothers of children with Down syndrome (DS) and mothers of typically developing (TD) children. Effective parenting is vital for a child's intellectual, physical, social, and emotional development, and not all parenting techniques are equal in their effectiveness in raising a healthy, well-adjusted child. While much work has examined parenting TD children, little work has studied parenting styles and dimensions in parents of children with DS. Instead, most work on parenting has focused on parental well-being. This work shows that parents of children with DS report increased stress, depression, caregiving demands, and child behavior problems compared to parents of TD children. Based on these findings, we expected that parents of children with DS would display more negative parenting techniques than parents of TD children because of their decreased parental well-being and increased caregiving demands.

Methods: The sample was comprised of 35 mothers of children with DS (mean child age = 9.06 years, SD = 2.32) and 47 mothers of TD children (mean child age = 8.06 years, SD = 1.71). The mothers completed nine parent-report questionnaires asking about demographic information (Background Questionnaire), the way in which they parent their child (Parenting Styles and Dimensions Questionnaire; Family Routines Inventory), their child's cognitive and behavioral abilities (Behavior Rating Inventory of Executive Function; Child Behavior Checklist), their own well-being (Beck Depression Inventory 2nd Edition; Parenting Stress Index), and the expectations and fears they have in relation to their child (Parental Expectations Questionnaire; Parental Fears Questionnaire). The Background Questionnaire was always completed first, and the BDI-II and PSI were completed last and in that order. Participants completed the remainder of the questionnaires in a random order.

Results: Two one-way MANOVAs were conducted to examine differences between groups on the three parenting styles and six parenting dimensions. The first MANOVA revealed a significant difference between groups on parenting styles, Wilks' Lambda = 0.89, F(3, 78) = 3.27, p = .026, with the DS group being less authoritative and more permissive than the TD group. The second MANOVA revealed a significant difference between groups, Wilks' Lambda = 0.81, F(6, 75) = 2.89, p = .014, with the DS group using less structure and more chaos than the TD group. To see if the differences between groups on structure and chaos remained after controlling for parental stress, two MANCOVAs were conducted. For both MANCOVAs, there was not a significant difference between groups. Therefore, after accounting for the variance associated with parenting stress, differences in parenting styles and dimensions no longer existed between groups, meaning that group differences in stress accounted for group differences in styles and dimensions. Finally, to analyze how parenting dimensions possibly influence child behavior, three two-tailed Pearson product-moment correlation coefficients were run separately for each group. We found that within the DS group negative parenting dimensions (i.e., rejection, chaos, and coercion) were positively correlated with child behavior problems. These correlations were not significant for the TD group.

Discussion: The results suggested that mothers of children with DS are overall using similar parenting methods as mothers of TD children. All differences that do exist in parenting styles and dimensions can be accounted for by parental stress. As such, parenting interventions for parents of children with DS should be either focused on reducing parental stress in an effort to improve parenting techniques or on educating parents on how to utilize positive parenting techniques despite their stressful life circumstances.
Title: Behavior Problems and Social Outcomes in Adults With Intellectual Disability

Margaret Mehling and Haleigh Scott, The Ohio State University

Introduction: The presence of behavior problems impacts outcomes; however, the mechanism of this relationship is unknown. Specifically, little is known regarding the impact of behavior problems on social outcomes for adults with intellectual disability (ID). Clarification regarding the mechanism by which behavior problems impact social outcomes is important when considering service planning and the resulting impact on quality of life.

A recent study using survey data from the National Core Indicators (NCI) empirically derived three novel factors associated with social outcomes for individuals with developmental disabilities (DD). Analyses indicated that these factors, Personal Control (PC; the extent to which an individual has control of important decisions that dictate major aspects of daily life), Social Determination (SD; the extent to which an individual is making socially relevant choices), and Social Participation and Relationships (SPR; the extent to which individuals participate in their community and form friendships), capture distinct aspects of meaningful outcomes in individuals with DD. (Mehling & Tassé, 2014). The current study uses the NCI to explore the relationship between behavior problems and these social outcomes for adults with ID.

Measure: The NCI is a quality management protocol for the DD service delivery system. The NCI was created by the Human Services Research Institute and the National Association of State Directors of Developmental Disabilities Service as a quality improvement measure to be used across states and over time to assess, with a representative sample, several key outcomes including consumer satisfaction, family satisfaction, health, and safety. Question from the background, friends and family, choice, and community inclusion sections from the NCI survey were used as indicators of the latent constructs Behavior Problems (BP), PC, SD, and SPR.

Participants: Participants were 18,984 adults with ID who participated in the 2009-2010 and 2010-2011 NCI Survey.

Analyses: The Amos software package was used to fit several structural equation models with full information maximum likelihood estimation of missing values and maximum likelihood estimation procedures to evaluate the relationships between the latent variables BP, PC, SD, and SPR.

Results: For the hypothesized model, BP had a significant relationship to PC. PC also had a significant relationship to SPR and SD. These relationships were in the expected direction in that individuals with greater levels of BP experienced lower levels of PC and those with greater levels PC experience greater levels of SD and SPR. The hypothesized model explains 26% of the variance in SPR ($R^2=.260$) and 32% of the variance in SD ($R^2=.324$), in other words, BP and PC contributed a great deal to the explanation of variation in SD and contributed to the explanation of the variation in SPR. Additionally, the overall structural model had a good fit (Mehling & Tassé, 2014).

Discussion: Results indicate that individuals with ID who have behavior problems may have diminished input in important decisions impacting daily life. It is possible that behavior problems become the predominate focus of caregivers and support staff, and service delivery objectives such as working on increasing self-determinism are consequently diminished in importance. However, emergent literature suggests that increases in choice making and self-determinism may serve to ameliorate behavior problems for people with ID (Bigby, 2012). The results of this study may support this idea suggesting that social outcomes at least can be influences via increased control over major life decisions.

Key References:


Title: Cardiac Reactivity to Sensory Testing in Rett, MECP2 Duplication, and Typically Developing Children

Alyssa Merbler, John Hoch, Breanne Byiers, Kelsey Quest, Lisa Spofford, Chantel Barney, Frank Symons, University of Minnesota

Introduction: Rett syndrome (RTT) and MECP2 duplication syndrome (DUP) are both neurodevelopmental syndromes caused by a mutation and duplication, respectively, of the MECP2 gene.1 Autonomic dysfunction is often reported in RTT, documented by reduced heart rate variability and reported cardiac dysfunction, yet there is no known literature on cardiac function in DUP.1 Because of the integral role played by MeCP2 in the nervous system and cardiac tissue,2 an overexpression of MeCP2, as seen in DUP, could also lead to autonomic dysfunction. In this study we examined autonomic reactivity using spectral analysis of sympathetic and parasympathetic activity in females with RTT (n = 11), males and females with DUP (n = 9), and typically developing male and female preschoolers (TYP; n = 16) during a sensory exam which tested 6 stimuli: light touch, pin prick, cool, pressure, repeated touch, and heat.

Methods: Participants were fitted with Polar s810i monitors and Polar soft belts to collect inter-beat interval cardiac data. Sensory testing followed a period of resting neutral baseline activities and a physical movement exam. All participants experienced the sensory stimuli in the same order. Time frequency measures and sample entropy (SampEn) were derived using Kubios and RHRV software.3,4 SampEn, peak frequency and the amount of total power in the most active power band for each participant were analyzed using one-way analyses of variance (ANOVA).

Results: ANOVA results showed differences in average peak frequency and power by group (p < .002, F = 7.5; p < .02, F = 4.3). TYP showed the highest peak value, possibly indicating more involvement of the parasympathetic system, whereas RTT showed a higher power value, indicating more activity in the HR signal. Group differences were found for HR (p < .001, F 11.2), but not HF power (p < .06, F = 3.1). DUP had the highest overall heart rate, followed by TYP and then RTT. SampEn also significantly differed by group (p < .017, F = 4.7). A Linear Mixed Model analysis tested group, sensory test condition, and group by sensory test condition interaction for high frequency power and heart rate. No significant differences were seen by sensory test condition.

Discussion: Groups differed significantly on several measures of cardiac reactivity: overall peak power, overall power in the highest power band, average beats per minute, and average sample entropy across the entire sensory testing protocol. This preliminary work shows autonomic activity may differ by MECP2 status. The differences in sample entropy show that the complexity and regularity of the physiological system may also differ by MECP2 status. This work could provide a method to assess reactivity to environmental stimuli in RTT and other non-verbal populations, as well as provide a biomarker relevant to MECP2 related syndromes.

References:


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**Title:** Prioritizing Skills for Intervention: Specific Externalizing Behaviors as Predictors of Time in Inclusion for Students With ASD

Madeline Racine, Kerri, P Nowell, Karrie A. Hilliard, Sarah S. Mire, University of Houston

**Introduction:** Research suggests that children with ASD display externalizing behaviors, such as aggression, disruptive behavior, and hyperactivity, at some point during their development (1). These children may also exhibit high rates of comorbid disorders such as ADHD and ODD (2) which, potentially, interferes with their ability to make progress in general education classroom setting. Arguments for and against inclusion in mainstream settings have been made within the existing literature; however, there is limited research identifying the student-specific characteristics associated with increased time in general education setting versus time in special education setting. Previous research from the authors found an association between total externalizing behaviors and time spent in inclusion (3). Investigating the specific manifestations of externalizing behavior (e.g., aggression, rule breaking behavior, hyperactivity) may clarify how these influence educational placement. Understanding how externalizing behaviors influence placement may help to target school-based interventions students with ASD. The purpose of the current study was to investigate which specific types of externalizing behaviors were predictive of time spent in general education settings. It is hypothesized that, in particular, parent and teacher reports of aggressive behaviors will predict time spent in inclusion.

**Methods:** Data from 414 children from the Simons Simplex Collection (SSC), a database containing multiple data collected on children age 4-18 with confirmed diagnoses of ASD. The Child Behavior Checklist (CBCL) and Teacher Report Form (TRF) were used to assess externalizing behaviors in children. A hierarchical multiple regression was conducted, with time spent in general education as the dependent variable and Aggression, Rule Breaking, Oppositional Defiance, and ADHD (all from CBCL and TRF) as the independent variables. Based on findings from a previous study, Non-Verbal (NVIQ) and Verbal (VIQ) IQ, together with ADOS-Social Communication scores were used as covariates in the model.

**Results:** Statistically significant correlations (p<.001) were found between time in general education and NVIQ, VIQ, ADOS Social-Communication, TRF Aggression, TRF ADHD. Significant correlations (p<.05) also were found between time in general education and TRF Rule Breaking and TRF Oppositional Defiant. For the co-variates, multiple R for regression was statistically significant, F(3, 410) = 100.05, p<.001, R2 adj = .42. Addition of the measures of externalizing difficulties did not result in statistically significant improvement of the model F(8, 402) = 1.69 p = .098, R2 adj = .43

**Discussion:** When controlling for NVIQ, VIQ, and ADOS Social-Communication, externalizing behaviors were not significantly associated with time spent in general education. This surprising result suggests that social-communication skills (as measured by the ADOS) and problem solving skills (as measured by NVIQ and VIQ) should be prioritized (i.e., above externalizing types of behaviors) when designing school based interventions. Limitations and future directions will be discussed.

**References:**


Title: Characterizing the Daily Life, Needs, and Priorities of Adults With ASD: An Empirical Study of Interactive Autism Network Data

Katherine Gotham, Vanderbilt University; Alison Marvin, Kennedy Krieger Institute; Julie Lounds Taylor, Vanderbilt University; Zachary Warren, Vanderbilt University; Connie Anderson, Towson University; Paul Law, Johns Hopkins University; Jessica Law, Kennedy Krieger Institute; Paul H. Lipkin, Kennedy Krieger Institute

Introduction: A recent study by Pellicano and co-authors (2014) found that individuals with autism spectrum disorder (ASD), their families, professionals, and researchers largely agreed that future priorities for autism research should lie in practical areas that make a difference in daily life. This study replicates and extends those findings from the adult perspective. Using survey data from a large North American sample of adults with ASD and parents/caregivers of the same, we aim to (1) describe the lives of both "high-functioning" and less able adults with ASD in terms of education, jobs, housing, financial support, adaptive skills, strengths and special interests, physical and mental health, treatment and service use; and (2) summarize these stakeholders' priorities for future research.

Methods: Data were obtained from an elective survey created and hosted by the Interactive Autism Network (IAN), an online registry for North American individuals with ASD and their families. The sample included self-report (SR) data from 255 adults with ASD aged 18-71 years (M=38.5, SD=13.1), as well as reports from the legal guardians (LR) of an additional 143 adults with ASD aged 18-58 years (M=25.0, SD=8.2). The vast majority of ASD clinical diagnoses (93%) had been provided in childhood by a doctoral level professional or team. The distinct SR and LR surveys included questions related to those topics listed in Objectives 1 and 2 above, as well as questions on diagnosis, demographics, and past participation in research.

Results: Descriptive data on adult lives: Within the SR subsample, 42% had a bachelor's degree or more education, and 47% had paid employment with various degrees of support, though only 25% held full-time jobs. Twenty percent lived alone. Of the participants with legal guardian report (LR), 75% had achieved a high school degree or less; 22% held paid employment, though most for 1-9 hours per week. Among the LR subsample, 79% had spoken language with 26% of those experiencing ongoing difficulty communicating wants and needs. Over 80% fed, dressed, and toileted without assistance; 25-35% exhibited self-injury, aggression, destructiveness, and/or wandered off. The most common co-occurring health conditions in the SR subsample involved sleep, anxiety, depression, allergies, and gastrointestinal (GI) issues (endorsed by 65-75% of SR). The LR group most commonly reported sleep and GI issues, allergies, anxiety, and ADHD (50-60%). The majority of both subsamples were taking medication for ASD or co-occurring conditions, and 48% of the SR group currently received individual therapy. Practical research priorities of adults with ASD and their families: Both SR and LR groups ranked the following within their top 6 out of 15 presented research priorities of a practical nature to daily life: understanding and acceptance of adults with ASD, current treatment, health care access, and physical and mental health issues. The SR group additionally prioritized employment and education research, and the LR group prioritized federal/state assistance and living situation.

Discussion: It is imperative that information on the current needs, problems, and priorities of adults with ASD and their families is incorporated into decision-making around research initiatives, funding, and public health campaigns that will maximize impact on the next several age cohorts of adults with ASD. Both the self- and caregiver-report subsamples included here are much larger than those typical of extant adult ASD research, and both converge to indicate that more research is needed particularly on treatment, health care access, and co-occurring conditions, as well as vocational and educational opportunities.

Key Reference:

Title: Social Participation and Depression in Parents of Children With Developmental Disability

Darren Olsen, University of Hawaii at Manoa; Frank Floyd, University of Hawaii at Manoa; Marsha R. Mailick, University of Wisconsin-Madison Waisman Center; Jan Greenberg, University of Wisconsin-Madison Waisman Center

Introduction: Raising a child with a developmental disability is associated with high levels of stress for parents, and caregiving demands might cause social isolation for parents beginning when the child is young and possibly extending throughout adulthood. Social participation has been shown to predict psychological health in the general population (Pynnönen, Törmäkangas, Heikkinen, Rantanen, & Lyyra 2012), whereas social isolation is associated with poor health and depression, particularly following retirement and during old age. The purpose of this investigation is to examine whether the risk for depression in later life for these parents is predicted by social isolations during both the early years of childrearing and midlife, as well as concurrently in old age.

Methods: The investigation used data from the Wisconsin Longitudinal Study, which consists of 10,317 individuals who graduated from high school in 1957 and approximately 5,000 of their randomly selected siblings who have been studied throughout the life course into early old age. The current sample were participants who had a child with a disability and completed all measures at multiple time points (N = 140) and a matched comparison group of parents who did not have a child with a disability (N = 2,240). The hypotheses were that (1) parenting a child with a disability would predict depression symptoms in early old age, (2) these parents would experience relatively lower social participation throughout adulthood, and (3) lower social participation would predict more depression symptoms in late life.

Results: This subgroup of parents in the disability group did not show greater risk for depression symptoms in old age, and the groups did not differ in their participation in social organizations and visits with family members at any time point. However, the parents of children with developmental disabilities did report relatively lower levels of social participation with friends both in midlife and in old age. Furthermore, regression analyses demonstrated that depression symptoms in old age were significantly predicted by lower levels of various types of social participation in the early childrearing years and in midlife, as well as concurrently. In some cases, the specific type of social participation predictive of later depression differed for men and women.

Discussion: The results are consistent with a picture in which social isolation for parents during the early childrearing years leads to social isolation throughout adulthood and makes them vulnerable to depression in later life. In turn, the findings also suggest that social participation might be an important resilience factor for parents of children with developmental disabilities, possibly as a source of respite, social support, and role enhancement. Thus, early intervention with families should attend to enhancing the parents' social participation throughout the life course.

Key References:


Sleep Problems in Parents and Its Relation to Their Child With Autism Spectrum Disorder

Paige M. Bussanich, Sigan L. Hartley, Iulia Mihaila, University of Wisconsin-Madison

Introduction: Mothers and fathers of children with autism spectrum disorder (ASD) are at an increased risk for parenting stress and negative affect as compared to parents of children without developmental disabilities and parents of children with other types of disabilities. Parenting stress and negative affect have been shown to contribute to sleep problems in other populations. Additionally, children with ASD exhibit a high rate of their own sleep problems (Hodge et al., 2014), which may further contribute to sleep problems in parents. The goal of the present study was to examine sleep problems in 175 married couples who have a child with ASD and to identify child, parent, and family correlates of sleep problems.

Methods: One hundred and seventy-five married couples (n = 175 mothers; n = 175 fathers) with a child with ASD participated. Parents had a mean age of 39.74 (SD = 5.98) and 85.4% had at least some college education. Children with ASD had a mean age of 7.90 (SD = 2.25), 85.6% were male, and 34.6% had intellectual disability (ID). Parents independently reported on their average sleep per night in past month (in hours), sleep quality overall in past month (4 point scale), use of sleep medication in past 6 months (yes vs. no), and problems keeping up enough enthusiasm to get things done in the past month (4 point scale). In addition, parents independently completed the Child Behavior Checklist, Positive and Negative Affect Scale, and Social Responsiveness Scale. Parents jointly reported on the child with ASD’s difficulty getting to sleep and/or staying asleep in a typical month (7 point scale), use of sleep medication/aid in past 6 months and child with ASD’s age and ID status.

Results: More than one-third (39.8%) of children with ASD had difficulty getting to sleep and/or staying asleep ‘a few times a week’ or ‘daily’. More than one-fifth (20.2%) of children with ASD took sleep medications/ aids. The child with ASD’s difficulty getting and/or staying asleep was significantly positively associated with severity of ASD symptoms (r = .19, p < .01) and behavior problems (r = .32, p < .01). Overall, 22.5% of parents reported an average of < 6 hours of sleep per night. About one-third (34.4%) of parents reported that their sleep quality overall was ‘fairly bad’ or ‘very bad’, and 10.2% reported taking a sleep medication. In addition, 41.8% of parents had ‘somewhat’ or a ‘very big’ problem keeping up enough enthusiasm to get things done.

Pearson correlations indicated that parental sleep quality overall was significantly negatively correlated with the child’s sleep difficulties (r = -.15, p < .01), severity of the child’s ASD symptoms (r = -.24, p < .01), child ID status (r = -.14, p = .01), severity of the child’s behavior problems (r = -.27, p < .01). Parental sleep quality overall was also significantly associated with parental positive affect (r = .19, p < .01) and negative affect (r = -.16, p < .01).

Discussion: A marked subgroup of children with ASD and their parents experience sleep problems. Parental sleep quality was associated with the child with ASD’s sleep quality as well as their symptoms, behaviors, and ID status. Sleep quality had important connections to parental affect, as it may reduce resources for coping with child-related stressors. Findings indicate a need to consider sleep problems through a ‘family-wide’ lens, as sleep problems of parents and children with ASD are linked.

References:

Title: Reactions to Autism Diagnosis and Cause Interpretations Among Latino and White Families: A Qualitative Analysis

Kristina Lopez, California State University, Long Beach; Sandra Magaña, University of Illinois at Chicago; Fernanda Cross, University of Michigan; Rebecca Paradiso de Sayu, University of Wisconsin-Madison; Lauren Piper, Illinois Institute of Technology

Introduction: Parental perceptions of disability and help-seeking patterns are impacted by cultural beliefs (Dyches, Wilder, Sudweeks, Obiakor, & Algozzine, 2004). Culture has been found to mediate outcomes for individuals with autism spectrum disorders (ASD) by influencing diagnosis and acceptance of ASD (Tincani, Travers, & Boutot, 2009). However, little is known about reactions to ASD diagnosis among Latino families of children with ASD and what they perceive to cause ASD. Improved understanding of Latino caregiver perceptions will contribute to the development of outreach strategies and service delivery for the fastest growing population of children diagnosed with autism.

We aimed to identify and compare qualitative responses to questions regarding reactions to autism diagnosis and explanations of autism causes among Latino and White families raising children with ASD. Our research questions were: 1) How do Latino and White caregivers react to their child's autism diagnosis? 2) How do Latino and White caregivers perceive causes of autism?

Methods: Thirty-eight Latino and 56 White mothers of children with ASD were administered a questionnaire on their experiences with their child's diagnosis and service use. Children were between 2 and 21 years of age (μ=9.48; SD=4.37) at the time of the study. The average age of ASD diagnosis was 3.40 years (SD=1.59). The questionnaire was provided in the language preferred by each participant. Spanish responses were translated into English by a bicultural/bilingual researcher. Six open-ended questions about parent and family reactions to autism diagnosis and beliefs about causes of ASD were the focus of this study. Using NVivo software independent reviews of the transcripts were initially performed to identify codes and working definitions. A second independent review was conducted to further develop the codes. A cross-cultural content analysis (Bernard & Ryan, 2010) was then performed to compare data across the two cultural groups.

Results: In response to research question one, similarities in reactions to diagnosis were found between Latino and White mothers. References to sadness, devastation, depression upon receiving their child's diagnosis dominated the responses in both groups.

Results for our second research question indicated that Latina mothers were more likely to express uncertainty with responses such as "I don't know" about causes of the child's ASD. White mothers were more likely to endorse genetics as causing ASD. One White mother stated, "I believe it is genetic". Additionally, more Latina mothers than White mothers expressed agreement with autism being a message from God. Latinas often reported that their child's autism was a challenge, blessing, or test. One Latina mother stated, "I think that special children need special parents, and I'm glad that God thought that I was going to be a good enough mother for him".

Discussion: The results demonstrate similarities and differences in reactions to diagnosis and beliefs about causes of ASD across the two cultural groups. The similarities in reactions to diagnosis suggest that families raising children with ASD have mutual experiences. The differences in beliefs about causes suggest that Latino families conceptualize autism differently than White families. Implications of these results on the course of treatment families seek and strategies for working with Latinos will be discussed.

References:


Multi-Family Group Psychoeducation for Families of Adolescents With ASD: Outcomes from the Transitioning Together Study

Leann Smith, Jan Greenberg, Marsha Mailick, University of Wisconsin-Madison

Introduction: Autism spectrum disorders (ASDs) are developmental disabilities characterized by difficulties in social communication and repetitive behaviors. ASD affects an estimated 1 in 68 children in the US. However, there are few programs available for children with ASD and their families during the adolescent years. The present study addressed this gap by evaluating, Transitioning Together, a multi family group psychoeducation program for teens with ASD.

Methods: Participants were 41 adolescents with ASD (aged 14-17 years; M=15.44; SD=1.03) and their parents who completed a randomized control stud of Transitioning Together. The average intelligence quotient for the sample was 100.01 (SD=16.85) and the average Vineland Adaptive Behavior Score was 69.96 (SD=9.61); 52.3% of teens had a co-occurring diagnosis of anxiety and the majority were taking at least one medication (75.8%). All adolescents spent at least 50% of their time at school in general education settings. The majority of adolescents were White (87.8%) and male (70%). Over three quarters of parents had a college degree and most were working part or full time (76.9%). Families were randomly assigned to either an initial intervention (n=16) or waitlist control condition (n=25). After randomization, there were no statistically significant differences between the two groups in terms of adolescent age, ethnicity, mental health diagnoses, or medication use or in terms of parental education or employment status. However, the waitlist control group had significantly lower IQ scores than the intervention group. The intervention involved individual 2 family joining sessions, 8 weekly parent and teen group sessions, and ongoing resources and referrals. Parent intervention group sessions involved education on a variety of topics relevant to ASD as well as guided practice in problem-solving. The adolescent social group involved learning activities and games on topics such as sharing interests, goal setting, problem solving, and social planning. Data were collected from parents and adolescents at pre- and post-intervention. Adolescent outcomes included social interactions with peers (maternal report on items from Add Health Study), social engagement (observational rating taken after each session), and autism symptoms (Social Responsiveness Scale; Constantino et al., 2003). Parental outcomes variables included the Center for Epidemiological Studies Depression scale (Radloff, 1977), the Zarit Burden Interview (Zarit et al., 1980), and problem-solving items of Family Empowerment Scale (Koren et al., 1992).

Results: Two (time) by two (group) repeated measures ANCOVA was used to test for differences in change between the two experimental groups, controlling for IQ. There were significantly improvements in adolescents social interactions with peers in the intervention condition compared to controls (F=4.13, p<.05). Further, within the intervention group, there were significant improvements in observed social engagement across intervention sessions (F=8.27, p<.05). No statistically significant differences were observed between groups for change in autism symptoms. In terms of parent outcomes, there was a significant reduction in depressive symptoms (F=4.47, p<.05) and an increase in problem-solving for parents in the intervention group compared to the control group (F=2.84, p=.10). There were no statistically significant differences between groups for change in parental burden.

Discussion: These findings highlight the value of the Transitioning Together program for families of teens with ASD, with benefits for adolescents and their parents.
Title: Early Cognitive and Behavioral Changes Related to Increases in Beta-Amyloid Across a Three-Year Period in Adults With Down Syndrome

Darlynne Devenny, New York State Institute for Basic Research in Developmental Disabilities; Sigan Hartley, University of Wisconsin-Madison; Benjamin Handen, University of Pittsburgh; Julie Price, University of Pittsburgh; William Klunk, University of Pittsburgh; Iulia Mihaila, University of Wisconsin-Madison; Sterling Johnson, University of Wisconsin-Madison; Patty Jo Murray, University of Pittsburgh; Bradley Christian, University of Wisconsin-Madison

Introduction: Adults with Down syndrome are at high risk for Alzheimer's disease (AD); approximately half of adults with Down syndrome in their 60s and beyond exhibit symptoms of AD and nearly all show neuropathology of AD (e.g. Holland et al., 2000). The high prevalence of AD in adults with Down syndrome is due to the presence of an extra copy of chromosome 21, which codes for the amyloid-beta precursor protein (APP) gene. Deposition of beta-amyloid is purported to play a central role in the neuropathology of AD. Beta-amyloid deposition can be detected using the PET tracer Pittsburgh Compound-B (PiB). The overall goal of our ongoing longitudinal study is to document the early developmental course of beta-amyloid deposition in adults with Down syndrome. In this preliminary study, we present data on changes in cognitive functioning and emotional and behavioral problems across a 3-year period and its relation to changes in beta-amyloid as indexed by PiB levels.

Methods: Analyses were based on 32 adults (M = 40 years, SD = 7) with Down syndrome (15 male, 17 female) who completed cycle 1 and cycle 2 of the study, spanning approximately 3 years. Adults with Down syndrome completed a battery of neuropsychological measures and MRI and PET scans at the University of Wisconsin or University of Pittsburgh. Measures assessed verbal learning and memory, visual memory, executive functioning, working memory, visuoconstruction, and language (Hartley et al., 2014). In addition, the Vineland-II and Reiss Screen for maladaptive behaviors were used to assess change in adaptive living skills and emotional and behavioral problems. Tissue ratios were calculated for cortical regions-of-interest (ROI) and normalized to cerebellum. Participants were identified as PiB+ if they were above the cutoff (>1.5) in 6 cortical areas using the iterative outlier approach.

Results: We examined change from cycle 1 to cycle 2 with respect to: 1) neuropsychological measures and emotional and behavioral problems; 2) PiB level and PiB status (PiB+ vs. PiB-), and the association between change in cognition and behavior and PiB level. Overall, the trend was for cognition and memory to decline and PiB levels to increase over the 3 year period. Preliminary findings show that a significant increase in the PiB level in the Precuneus region (t=3.54, p=.002) was correlated with a decrease in the score on a memory test (r=-.41, p=.04) and an increase in maladaptive behaviors (r=.46, p=.02). An increase in PiB level in the Anterior Ventral Region (t=4.47, p<.001) was correlated with a decline on a visuoconstruction task (r=.44, p=.03). Of the participants classified thus far, 16 individuals remained PiB- at cycle 2, 7 who were initially PiB+ remained so, and 2 participants converted from PiB- at cycle 1 to PiB+ at cycle 2.

Discussion: This study provides insight into the rate of change of early accumulation of beta-amyloid and how it might be linked to dementia-related changes in adults with Down syndrome. Findings suggest that across a 3-year period, there was change in beta-amyloid levels and this was related, albeit often at a trend-level, to changes in cognitive functioning, memory, daily living skills, and emotional and behavioral problems. Findings have implications for the early detection, prevention, and treatment of AD in adults with Down syndrome, and may also offer information useful for the general population.

Key References:


Title: Automated Analysis of the Language Learning Environment of Children With Autism Spectrum Disorder

Abbie Wheeden McCauley, Akron Children’s Hospital, Family Child Learning Center; Megan Cook, Ohio State University School of Medicine; Sloane Burgess, Kent State University

Introduction: Communication deficits are a core deficit in children with autism spectrum disorders (ASD), and a child’s expressive language ability by age 5 is a central predictor of long-term developmental outcomes (Garfin & Lord, 1986). Reliable, ongoing assessment of a child’s communicative skills is crucial because if progress on these goals is not seen within 2-3 months, different teaching approaches should be considered (National Research Council, 2001).

Assessment of children with ASD is a particular challenge because many standardized measures are subjective and lack the sensitivity to detect the small improvements often seen in children with ASD. In addition, many measures are only administered pre- and post-, which does not allow for ongoing monitoring or examination of patterns over time. Furthermore, many of these traditional measures of communication (e.g., language sampling; transcription) are expensive and both labor- and time-intensive when used repeatedly over time.

Language Environment Analysis (LENA) is an objective, automated tool that provides detailed repeated assessment of language input and output. This poster describes the use of LENA in an integrated preschool program for children with ASD to track changes over time and to examine the language and social interactions that occur in different educational settings (days when only children with ASD attend programming (ASD-only day) vs. integrated preschool day vs. home).

Method: This study took place in an integrated preschool for children with ASD. Children with ASD attended programming four half-days per week, and typical peers attended three half-days per week. Children’s language was recorded using the LENA Digital Language Processor, which fits in a pocket of a specially-designed vest. LENA recordings were collected six times per month for each child (2 times per month on an integrated preschool day; 2 times per month on a segregated preschool day; and two times per month in the home environment). This recording schedule was followed throughout the school year (September-May). Each classroom recording was approximately 3 hours in length, and each home recording averaged 10 hours. In total, approximately 160 recorded hours (80 classroom hours and 80 home hours) of communication were collected per child (N=25) and quantified using the automated LENA software. Rates of child vocalization, conversational turns, and adult words were examined across setting (home vs. integrated day vs. ASD-only day).

Results: Children with ASD showed improved rates of conversational turns and child vocalizations over the course of the school year. Children’s rate of conversational turns, vocalization count, as well as the rate of adult words were higher on ASD-only days than on integrated days with peers. In addition, LENA results showed that the rate of child vocalizations and adult words during the preschool day were negatively correlated. Recordings from the home environment suggested that children with ASD had more vocalizations than at preschool, but they heard fewer words and engaged in fewer conversational turns.

Discussion: The use of the LENA system allowed for an extraordinary amount of language learning experiences to be collected and analyzed in a rapid, objective fashion. In addition, LENA allowed us to track children’s progress over time as well as examine the role of setting on children’s communication. Such results have important implications for interventionists, teachers, and parents regarding intervention planning and effective educational placements for young children with ASD.

References:


**Title:** Sensory Sensitivity to Food, Anxiety to Food, and Mealtime Problem Behavior in Picky Eating Children With and Without Autism Spectrum Disorder

Eva Trinh, Amy Lemelman, Fred Biasini, University of Alabama at Birmingham

**Introduction:** Many parents of children and adolescents with autism spectrum disorders (ASD) describe their child as a picky eater, experience sensory sensitivity to taste, smell, and texture of food (Baranek et al., 2006; Lane, Molloy, & Bishop, 2014; Nadon et al., 2011; Schoen et al., 2009), present with a higher prevalence of anxiety that may relate to selective eating (Farrow & Coulthard, 2012; Williams et al., 2001), and to have a variety of mealtime problem behaviors (Bandini et al., 2010; Dominick et al., 2007; Suarez et al., 2014; Williams et al., 2000). However, few studies have investigated how these factors may predict mealtime problem behavior such as aggression, self-injury, tantrums, etc. Sensory sensitivity and anxiety to food is believed to increase the occurrence of mealtime problem behavior (Fisher et al., 2014; Norris et al., 2013; Nicely et al., 2014). However, the causal relationship between sensory sensitivity and anxiety is still unclear (Green & Ben-Sasson, 2010). Poor coping skills to experience of anxiety or stress is believed to contribute to the occurrence of general problem behavior (Bronsard et al., 2010; Cermak et al., 2010). Therefore, the purpose of the current study is to examine how the relationship between experiencing more sensory sensitivity to food and a greater occurrence of mealtime problem behavior may depend on having anxiety to foods, having a diagnosis of an ASD, or poorer coping skills.

**Methods:** A total of 25 children reported to be picky eaters by their parents were included in the final study. Nine of the children had a previous diagnosis of ASD and the other 16 were typically developing. All children did not differ on gender, parent age, parent gender, parent marital status, or frequency of mealtime problem behavior. The ASD group (mean age = 9.11 years, SD = 0.72) was significantly older than the typically developing group (mean age = 7.88 years, SD = 0.46; p < .05), however, age was not significantly correlated with the dependent variable so it was unnecessary to include age in moderation analyses as a covariate.

**Results:** Moderation models analyzed through multiple regression found main effects of experiencing more sensory sensitivity to food and having poorer coping skills to predict a greater occurrence of mealtime problem behavior, F(3, 21) = 11.28, p < .001, R2 = .62, Adjusted R2 = .56. However, the relationship between sensory sensitivity and mealtime problem behavior did not depend on having poorer coping skills. In separate moderation analyses, the relationship between sensory sensitivity and mealtime problem behavior also did not depend on having a diagnosis of ASD or the presentation of anxiety to foods(all p's = n.s). The relationship between anxiety to foods and mealtime problem behavior was also examined to investigate whether the relationship depended on having a diagnosis of ASD or poorer coping skills. However, no significant interactions were found (all p's = n.s.).

**Discussion:** The results indicate that feeding therapy with children who present with sensory sensitivity and mealtime problem behavior may benefit from including a coping skills component to help these children better able to cope or express difficulties they have during mealtimes. This area of research is an important focus because parents of children with developmental disabilities report helping and supervising during mealtimes to be the most stressful parenting task (Plant & Sanders, 2007). Therefore, reducing child mealtime problem behavior may create a more positive mealtime environment for the whole family.
**Title:** Sensory Testing and Sensory Experiences in Rett Syndrome: Comparisons Between Parent Report and Direct Observation

Stephanie S. Meyer, Chantel Barney, Alyssa Merbler, Kelsey Quest, Breanne J. Byiers, Frank J. Symons, University of Minnesota, Twin Cities

**Introduction:** Parents of girls and women living with Rett Syndrome (RTT) frequently report delayed or decreased responses to painful stimuli (Downs, et al., 2010; Mount, et al., 2001). Additionally, it has been reported that girls with RTT scored higher on the Sensory subscale of the Autism Behavior Checklist compared to a sample of girls with severe/profound intellectual disability, suggesting possible differences in reactivity to sensory experiences (Mount, et al. 2003). To date, no studies in RTT have examined whether parent reports of sensory experiences correlate with objective measures of behavioral expression during periods of potential discomfort. The purpose of this study was to examine parent reports of sensory reactivity and pain experiences with objectively measured behavioral signs of pain during standardized pain assessments.

**Methods:** Eleven girls and women (mean age = 15.36, SD = 11.02) with RTT and their primary caregivers participated in the study. Caregivers completed the Sensory Experiences Questionnaire (Baranek, 1999) and were asked whether their children felt pain less than, the same, or more than other children. A standardized sensory test with calibrated stimuli and range of motion exam were conducted with each individual with RTT, and videos of the assessments were coded for potential signs of pain or discomfort by independent observers. Relationships between the hyper-reactivity, hypo-reactivity, and tactile subscale scores from the SEQ, caregiver reports of pain experience, and behavioral reactivity during the sensory test and range of motion exam were examined.

**Results:** All of the participants scored outside of the range (+2 SD) of the normative sample on the hypo-reactivity subscale of the SEQ. Three (27%) scored outside of the normal range on the hyper-reactivity, and the social subscales. There was a significant positive correlation between age and hypo-reactivity subscale scores ($r = .75$, $p < 0.05$). Individuals whose caregivers reported that they experienced pain the same as, or more than other individuals, however, showed lower levels of behavioral reactivity during the sensory exam compared to individuals who were reported to experience less pain ($F = 54.3$, $p < 0.05$), and those whose caregivers reported uncertainty about their pain experiences ($F = 48.5$, $p < 0.05$).

**Discussion:** This study extends previous research into pain experiences in individuals with RTT by comparing objectively measured pain behaviors during a standardized sensory test to caregiver reports of pain and sensory experiences in individuals with RTT. The results suggest that parents of individuals with RTT perceive their daughters as being hypo-reactive to sensory experiences, and that this perception increases with age. Limited correspondence between parental report of sensory experiences and behavioral measures of reactivity was observed, however. Future research should seek to replicate current findings in larger samples, and to extend results by comparing in-situ parental ratings of pain behaviors with objective behavioral measures.

**Key References:**


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Title: Inhibiting Location-Based Responses by People With Intellectual Disabilities

Yingying (Jennifer) Yang, Edward Merrill, Frances Conners, University of Alabama

Introduction: Knowing where things are in the environment is an important basic cognitive ability. Previous studies suggested that persons with and without ID can remember spatial locations in a relatively automatic manner (Ellis et al., 1987). Recently studies also indicated that persons with ID can implicitly learn spatial associations. In Merrill et al. (2014), participants looked for a target T rotated 90 degrees among several distracter Ls. They needed to respond which way the target T was facing (e.g., left or right) using the corresponding hand. However, the target could be in different locations (i.e., either left or right visual field) which could also elicit a corresponding manual response. Success in this search task required inhibiting the responses to the location of the target while focusing on the direction the target was facing. For instance, if the target faced left the participant needed to respond with their left hand even if the target was on the right side of the screen. We re-analyzed Merrill et al. (2014)’s data. We were interested in whether the ability to inhibit the pre-potent response may be more difficult for people with ID. Furthermore, we would examine whether the need to inhibit responses impacted implicit spatial learning.

Methods: Three groups participated: people with ID, MA matched TD children, and young adults of 30 each. The learning phase was composed of repeated displays, within which there were two subtypes: compatible displays where the location (visual field) and the facing direction of the target were the same (e.g., both left or both right); and incompatible displays where the target’s location and facing direction were different. Each unique repeated display was repeated 30 times. New displays that the participants never saw before were included in the test phase. There were also compatible and incompatible displays within the new displays.

Results: MANOVAs revealed that people with ID were 180 ms faster (RT) to compatible displays (3473ms) than incompatible displays (3655 ms) in the learning phase. However, this effect was not found in TD children and adults. In the test phase, participants with ID demonstrated significant learning effects to the repeated displays only in the compatible displays (M.D.=639ms), but not in the incompatible displays (M.D.=172 ms, ns). However, in TD children and adults, significant learning effects to the repeated displays were found in both compatible and incompatible displays.

Discussion: Results suggested that people with ID were less able to inhibit pre-potent manual responses based on spatial locations. In addition, both location learning and motor response were involved in implicit spatial learning for people with ID. Importantly, the motor learning component may have been stronger for participants with ID while the cognitive learning component was stronger for the participants without ID.

References/Citations:


Title: The Influence of Family Support on Positive Language Outcomes for African-American Children Participating in an AAC Intervention

Ani S. Whitmore, MaryAnn Romski, Rose Sevcik, Georgia State University

Introduction: Previous research has highlighted the importance of family support for positive outcomes in early augmentative and alternative communication (AAC) interventions (Beukelman & Mirenda, 2013). Family support is a multidimensional concept that has been linked to positive outcomes across all developmental periods (Parette, Huer, & Wyatt, 2002; SRCD, 2013). Similarly, family support is very important when working with young African-American children and their families in the context of AAC. Whitmore, Romski, and Sevcik (2014) conducted an exploratory study that examined how different family characteristics, sources of support and involvement in therapy services were related to positive language outcomes in young African American children participating in an AAC language intervention. The primary results indicated that the types of support utilized by African-American families, as compared Caucasian, Asian, and Multi-racial American families, (i.e. daily integration of communication goals) was significantly related to higher symbol use and functional vocabulary size. The African-American parents' perception of having none to minimal involvement in their child's therapy was not related to positive language outcomes, and further demonstrated the need to ensure their active involvement in their child's therapy. Parette, Huer, and Wyatt (2002) noted that the perception of AAC delivery held by families would affect child outcomes.

Methods: The purpose of this study is to extend the Whitmore, Romski, and Sevcik (2014) study examining the relationship between family supports, parent involvement in therapy services, and positive child language outcomes one-year after the completion of a longitudinal AAC language intervention. The data were collected at three time points (Pre-intervention, Post-intervention, and 12-month Follow-up) (Romski et al., 2010; Romski et al., 2014) for 2-3 years old with developmental disabilities (N=113). Thirty-four percent of the sample was African-American, and the majority of the racially diverse study sample was recruited from a middle-income socioeconomic background throughout the metropolitan Atlanta area. In additional to the observational language measures collected during the (Romski et al., 2010) study, the Sequenced Inventory of Communication Development (SCID) and MacArthur-Bates Communication Development Inventories (CDI) were administered. Families provided demographic information at pre-intervention regarding the household composition, frequency of the child's exposure to others, level of parent involvement in therapeutic activities, and the types of support systems utilized to encourage communication development. Like the previous study, this study compared the African-American families with the rest of the families in the sample, which included Caucasian, Asian, and Multi-racial American families.

Results & Discussion: All of the families reported consistent use of the communication development supports from Pre-intervention to Post-intervention. The Pre-intervention report of the utilization of daily integration of communication goals was significantly associated with positive language outcomes at Post-intervention for both groups; however, for the African-American families a significant inverse relationship between daily communication support was associated with lower MCDI receptive (rpb2= -.76, p=<.05) and expressive (rpb2= -.72, p=<.05) vocabularies at the 12-month Follow-up. A similar pattern was not observed for the other group. For the Caucasian, Asian and Multi-racial families, increased parent involvement in therapy was significantly associated with positive language outcomes from Pre-to-Post-intervention, but this relationship was not observed at the 12-month follow-up. For the African-American families, the lower levels parent involvement was not associated with positive child language outcomes through all three time-points. These results suggest a difference in the level of importance of support systems provided by language interventions to families of different racial backgrounds (SRCD, 2013). The results also suggest the continued need to ensure these families have an active role in their child's therapy to support positive language and communication outcomes and how the effects may change over time.
Title: Parent and Teacher Perceptions of Internalizing Problems in Children With ASD: Effects of Child Age

Hannah LeBlanc, University of Houston; Allyson Tagliarina, University of Houston; Natalie Raff, University of Houston; Hannah Hyatt, University of Texas Health Science Center at Houston; Sarah Mire, University of Houston

Introduction: Youth with autism spectrum disorder (ASD) experience high rates of internalizing problems, such as anxiety and depression. Age has been shown to influence rates of certain types of anxiety (van Steensel, Bogels, & Perrin, 2011) and depression (Mayes et al., 2011) in individuals with ASD. The Child Behavior Checklist (CBCL), a broadband parent rating scale, and corresponding teacher rating scale, the Teacher Report Form (TRF), are often used to assess internalizing symptomology in youths with ASD. Kanne et al. (2009)’s work examining parent and teacher agreement on the CBCL and the TRF for children with ASD revealed low parent-teacher agreement in ratings on Internalizing scales. Furthermore, findings from Raff et al. (2014) identified age-related differences in parent and teacher perceptions of internalizing problems on the CBCL and TRF by comparing preschool age children (2-5 years) to school age children (6-17.9 years).

Methods: Extant data from the Simons Simplex Collection (SSC) were analyzed; school age children (n = 2121) ages 6.0 to 17.9 (M =10.26, SD =3.14) were selected from the sample for examination. The CBCL and the TRF (school age forms) Internalizing Composite, as well as Internalizing Syndrome scales (Withdrawn/Depressed, Anxious/Depressed, and Somatic Complaints) were examined. Descriptive analyses were utilized to characterize internalizing problems of children from four age groups: Early Elementary (6-8 years, n=903), Late Elementary (9-11 years, n=460), Middle School (12-14 years, n=518), and High School (15-17.9 years, n=240). Correlations between teacher and parent ratings of internalizing scales will be obtained for each age group. Forthcoming analyses will also include multivariate analysis of variance (MANOVA) to determine whether CBCL and TRF ratings of internalizing problems differ across age groups and post hoc tests will be conducted to examine differences found between age groups.

Results: Both teachers and parents endorsed the lowest average t scores for the early elementary group (t = 58.44 for parents, t = 59.34 for teachers) and the highest for the high school age group (t = 61.54 for parents, t = 61.51 for teachers), though ratings of late elementary and middle school age groups were similar across child age and rater. Average t scores for all age groups were similar across parent and teacher ratings, though ratings for early and late elementary aged students appeared slightly more discrepant. Further analyses will investigate whether differences between parent and teacher ratings of age groups are significant.

Discussion: Preliminary analyses indicate potential differences in internalizing symptom manifestation between age groups (particularly early elementary and high school) as rated by both parents and teachers. By examining differences in perceptions of internalizing problems and how these may differ depending upon child age, researchers can begin to explore potential contributory factors and ultimately inform anxiety intervention by targeting specific age groups that appear to have the most symptoms.

References:


Title: Latency to Disengage from a Smiling or Non-Smiling Face in Infants With Fragile X

Kelly E. Caravella, Alexis Brewe, Jane E. Roberts, University of South Carolina

Introduction: Fragile X Syndrome (FXS) is the most common inherited cause of developmental disability affecting approximately 1 in 3,600 individuals (Hagerman et al., 2009). Additionally, it is the most common single gene cause of autism spectrum disorder (ASD), accounting for 2-6% of all cases of diagnosed ASD. Previous research has found that infants with FXS exhibit a longer latency to disengage visual attention from a toy, than their typically developing (TD) peers and that latency to disengage is correlated with autism symptom severity (Roberts et al., 2012). In contrast to a hyper attention to non-social objects, a common phenotypic characteristic in individuals with FXS is social gaze avoidance. Therefore, this research aims to expand this body of work by examining latency to disengage from faces in infants with FXS within an "in vivo" standardized experimental session.

Methods: These data represent findings from an initial subset of participants for whom we have coded data. Participants include 9 infants with FXS and 11 TD infants. These infants are part of a longitudinal study examining the emergence of autism in infants at high risk for developing ASD. At 12 months, all infants participate in a lab-based measure of attention to social (examiner) versus non-social (toy) stimuli (LabTAB, Gagne et al., 2011). While the focus of this experiment is designed to assess interest in the non-social stimuli, it is clear that participants direct their attention to the examiner as well despite the examiner not actively engaging with the child but serving to facilitate completion of the experiment with a neutral but generally positive demeanor. Videos were coded by a reliable coder (>80%) for 3 variables; 1) Looks to the examiner, 2) Subsequent looks away from the examiner, 3) Examiner’s facial expression (neutral, smiling, or exaggerated social response). Latency to disengage from the examiner’s face was coded as Time of Looking Away - Time of Initiation of Looking, averaged over each instance of looking throughout the activity. Time is measured in seconds.

Results: The total time looking to the examiner did not differ between the two groups (F = .94; p = .30). One-Way ANOVAs suggest that 12-month-old infants with FXS do not differ from their typical peers in their latency to disengage when the examiner is displaying a neutral face (F = 1.14; p = .30). However, there is a difference in latency to disengage when the examiner displayed a positive facial expression, including smiling or a more engaged social response (i.e. raising eyebrows with mouth open) (p < .05, F = 13.61). In these instances of positive facial expression, infants with FXS disengaged their gaze from the examiner more quickly than (m = 1.68, sd = .33) TD infants (m = 2.33, sd = .16).

Discussion: These findings are novel as there is no published work examining gaze patterns to a communicative partner in infants with FXS, and how social cues from facial expressions impact their behavior. Infants with FXS may find positive facial expressions more aversive than neutral faces, therefore decreasing their latency to disengage. These findings have the potential for impact on social development in infants with FXS, as they are disengaging more quickly from a communicative partner who is providing a positive social response to their gaze. Therefore, their premature disengagement could lead to missed opportunities for social engagement and learning. We anticipate having at least 5 more infants in each group by conference presentation time.
Title: Spelling Error Patterns by Individuals With Intellectual Disability

Susan J. Loveall, University of Kansas; Frances A. Conners, University of Alabama

Introduction: Individuals with intellectual disability (ID) often struggle with phonological aspects of reading, but perform relatively better on orthographic aspects. Both are important subskills of word reading, yet there is little research on orthographic processing in individuals with ID. The leading approach to understanding orthographic processing is the self-teaching hypothesis (Jorm & Share, 1983). The self-teaching hypothesis proposes that knowledge of word-specific orthographic structures is acquired as a result of phonological decoding; this in turn results in more efficient word recognition. A previous study in our lab (Loveall & Conners, 2013) tested the self-teaching hypothesis with individuals with ID, in comparison to typically developing (TD) children matched on verbal mental-age, using two conditions. In one condition (word-analysis), participants decoded nonwords; in the second condition (word-supply), participants repeated nonwords. Participants were tested three days later on orthographic learning using multiple choice and spelling tests. While both groups were able to self-teach and demonstrated orthographic learning of targets, participants with TD performed significantly on better on spelling. The purpose of the present study was to conduct an in-depth analysis of spelling errors made in the word-analysis condition to determine how the groups differed in spelling ability.

Method: The sample consisted of 18 individuals with mixed- etiology ID and 19 with TD who were matched on verbal mental-age. For participants with ID, age ranged from 13.17 - 33.83 years (M = 19.97; SD = 4.99), and verbal mental-age ranged from 6.25 - 10.67 years (M = 8.87; SD = 1.30). For TD participants, age ranged from 7.25 - 9.67 years (M = 8.04; SD = .73), and verbal mental-age ranged from 6.25 - 12.67 (M = 8.72; SD = 1.72). Spelling was scored using the Spelling Sensitivity Score (Masterson & Apel, 2010; 2013), which scores individual word elements as omissions, illegal substitutions (i.e. "t" for "f"), legal substitutions, (i.e. "ph" for "f") or correct spellings.

Results & Discussion: Descriptive statistics revealed that, over all word elements, the group with ID made 5% omission errors, 18% illegal substitution errors, and 6% legal substitution errors. The group with TD made 2% omission errors, 10% illegal substitution errors and 9% legal substitution errors. Results of a 2 x 3 (Group x Error Type) mixed ANOVA revealed a main effect of error type was significant, Wilks Lambda = .47, F(2, 34) = 19.18, p < .001, partial eta squared = .53, with both groups making the most errors by illegal substitutions, followed by legal substitutions and omissions. The main effect of group was marginally significant, F(1, 35) = 3.26, p = .08, with the TD group making fewer errors overall. There was also a significant interaction, Wilks' Lambda = .72, F(2, 34) = 6.58, p = .004, partial eta squared = .28. Independent samples t-tests were then used to compare groups on the three error types. Results of the t-tests revealed that the group with TD had significantly fewer illegal substitutions than the group with ID, t(23.85) = 2.16, p = .04. The TD group also had fewer omissions and more legal substitutions, though these comparisons were nonsignificant. These results are consistent with previous research indicating phonological processing difficulties in ID, suggesting that poor performance on spelling may be caused by less accurate phonological abilities.

References:


Title: The Influence of Mindfulness Practice on Self-Perceived Stress, Impact of Stress, and Child Behavior Problems for Parents of Children With Development Delays

Keith P. Klein, Allyson L. Davis, Cameron L. Neece, Loma Linda University

Introduction: Evidence suggests that parents of children with developmental delays (DD) report higher levels of parental stress compared to parents of typically developing children (Baker et al., 2003). Such elevated levels of stress are concerning, as they have been linked with various negative outcomes for parents. Additionally, evidence suggests that parental stress exacerbates child behavior problems, which in turn, intensifies parental stress (Neece et al., 2012). Recognizing this cyclical relationship, Neece (2013) evaluated the efficacy of Mindfulness-Based Stress Reduction (MBSR) for parents of children with DD. Outcomes suggested that MBSR was effective in reducing levels of stress, as well as depression and improving quality of life. Results also indicated parents' reported significant reductions in child behavior problems following the 8-week intervention.

Additional evaluation is needed, however, in order to understand the mechanisms associated with the outcomes resulting from MBSR. Previous studies evaluating MBSR found that greater frequency of meditation was associated with positive gains, including decreases in anxiety, improvements in health, and decreases in distress (Carmody & Baer, 2008). Therefore, the aim of the current study is to replicate the findings of Neece (2013) using a new sample to evaluate changes in self-perceived stress, impact of such stress on one's life, and changes in parent-reported child behavior problems over the course of the MBSR intervention, as well as expand upon these finding by evaluating the influence of time spent in meditation practice on changes in these outcomes.

Method: The current study involved data from the second wave of the Mindful Awareness for Parenting Stress (MAPS) Project, a randomized controlled trial examining the efficacy of MBSR, which included parents of children with DD. Participants' perception of stress, its impact, and perceptions of child behavior problems were measured using the Subjective Units of Distress Scale (SUDS) used in Neece (2013) and minutes of mindfulness were reported weekly via a mediation log. Current analyses presented included only the immediate treatment group (N = 22); however, final analyses will also include data from participants in the waitlist-control group (N = 25), resulting in a final sample of N=47.

Results: Two-level multilevel modeling was used to test the hypotheses. Parents' reports of stress, the impact of stress, and child behavior problems decreased significantly over the course of the intervention ($\beta = -.23, p < .05; \beta = -.18, p < .01; \beta = -.20, p < .01$). The average time spent in meditation was not significantly associated with initial levels of stress, the impact of stress, or child behavior problems ($p > .05$). The average time spent in meditation also did not have a significant effect on the rate of change in self-perceived stress or the impact of stress on daily life ($p > .05$). However, time spent in meditation did significantly influence reports of child behavior problems, such that increased meditation time was related to more rapid decreases in child behavior problems ($\beta = .003, p < .05$). These results will be re-analyzed using the complete sample.

Discussion: The current study showed that MBSR is an effective intervention for both parents and their children. Based on preliminary analyses, the time spent in meditation did not significantly impact initial levels of the studied variables or the rate of change in reports of stress, but there was a significant effect for decreases in child behavior problems. In future studies, weekly reports of time spent in mindfulness and reports of stress and child behavior problems should be analyzed in a time-varying covariates model in order to examine how these trajectories co-vary over time. Limitations to the study and directions for future research will be discussed.
Title: Language and Cognitive Abilities of 48-Month-Olds With Williams Syndrome

Celenia L. DeLapp, Carolyn B. Mervis, University of Louisville

Introduction: Although the onset of language is delayed for almost all children with Williams syndrome (WS), findings from previous small-sample and/or wide age-range studies have suggested that once language production begins children with WS show the same patterns of development as do typically developing (TD) children (see review in Mervis & Becerra, 2007). In the present study, we considered the relation between expressive vocabulary size and syntactic complexity at age 48 months for a large sample of children with WS. We also considered the relations between the children’s performance on these parent-report measures and on standardized assessments of intellectual and vocabulary abilities.

Methods: Participants were 50 children (20 girls, 30 boys) with WS aged 48.00 - 48.99 months (Mdn: 48.5). All had genetically-confirmed classic deletions of the WS region. Parents completed the 680-word Vocabulary Checklist and the 37-pair Early Sentence Checklist of the MacArthur-Bates Communicative Development Inventory: Words and Sentences [CDI; Fenson et al., 2003]. The child’s expressive vocabulary (EV) was the number of words on the CDI Vocabulary Checklist that the parent indicated the child produced spontaneously (not in imitation), and the child’s syntactic complexity (SC) score was the number of B. (more complex) sentences the parent marked on the CDI Early Sentence Checklist. Thirty-five of the children (15 girls, 20 boys) also completed the Differential Ability Scales II: Early Years (DAS-II), the Peabody Picture Vocabulary Test-4 (PPVT-4), and the Expressive Vocabulary Test-2 (EVT-2).

Results: EV ranged from 9 - 667 words (Mdn: 426.5, IQR: 189 - 576) and SC ranged from 0 - 37 (Mdn: 7.0, IQR: 0 - 30). Eight children (EV range: 9 - 103 words) were not yet producing novel word combinations. EV and SC were very strongly positively correlated (rs = .92, p < .0001). Based on the CDI dissociation norms for the relation between EV and SC, the median percentile for the 41 children who had an EV ≥ 101 words (the smallest EV covered by the norms) was the 50th (same as for TD children), with an IQR of 22.5 - 65 and a range from <5 - 90.

For the 35 children who completed the standardized assessments, EV ranged from 9 - 664 and SC from 0 - 37. Median DAS-II standard scores (SSs) were: Verbal cluster: 76.0 (IQR: 57 - 86), Nonverbal Reasoning cluster: 79.0 (IQR: 65 - 90), Spatial cluster: 51.0 (IQR: 48 - 59), and GCA ("IQ"): 63.0 (IQR: 51 - 73). Median SSs for the vocabulary assessments were: PPVT-4: 85.0 (IQR: 74 - 95) and EVT-2: 79.0 (IQR: 68 - 96). EV was strongly correlated with all SSs (p ≤ .001). The smallest correlation was with DAS-II Spatial cluster SS (rs = .54); the remaining correlations ranged from .82 (with Nonverbal Reasoning cluster SS) - .90 (with Verbal cluster SS and with GCA). Correlations between SC and the DAS-II and vocabulary SSs were similar.

Discussion: For 48-month-olds with WS, expressive vocabulary size shows a similar relation to syntactic complexity as has been previously found for TD children. Expressive vocabulary as measured by the CDI is strongly correlated with EVT-2 SS, providing further validation for the use of the CDI in children with WS. More generally, parent-report CDI measures were strongly correlated with both verbal and nonverbal intellectual abilities for children with WS as measured by standardized assessments administered to the children, providing further evidence that language abilities are strongly related to nonverbal abilities for children with WS. WS-specific percentiles for CDI EV and SC for 48-month-olds will be provided and further implications of the findings will be considered.

Funding: NICHD grant #R37 HD29957 and NINDS grant #R01 NS35102
Introduction: Parents of children affected by developmental delays (DD) have been shown to experience elevated levels of parenting stress compared to parents of typically developing children (Baker et al., 2003; Emerson, 2003; Oelofsen & Richardson, 2006; Neece, Green, & Baker, 2012). Recent studies have suggested that higher levels of parenting stress can adversely impact children's behavior and development, such that higher levels of parenting stress are often associated with more behavior problems and less developmental progress (Ayoub, Vallotton, & Mastergeorge, 2011; Baker et al., 2003; Neece, et al., 2012). Despite the awareness of these factors, the specific mechanisms through which parenting stress influences child behavior and development remain unclear.

The overall child-rearing process involved in parenting a child with DD may be one potential medium through which parenting stress influences both child behavioral and developmental outcomes. Recent studies have pointed to a need to increase understanding of parenting variables such as the parenting experience, the parent-child relationship, and parenting behavior as possible mediators to the relationship between parental mental health and child behavior and development (Anthony et al., 2005; Crnic et al., 2005; Hastings, 2002). Given that disruptions to these areas of the parenting process may impact developmental and behavioral outcomes among children with DD, it is critical that investigators examine the influence of parental mental health on the parenting process, and, in turn, its effect on behavior and development. Therefore, the aim of the current study was to examine specific components of the parenting process as potential mediators of the relationship between parental mental health and child behavioral outcomes.

Method: The current study involved data from the Mindful Awareness for Parenting Stress (MAPS) Project, which included 46 parents of children, ages 2.5 to 5 years old, with DD. These parents participated in a randomized controlled trial examining the efficacy of MBSR in reducing parental stress and subsequent child behavior problems. Parenting stress was measured using the Parenting Stress Index (PSI, Abidin, 1990) and child behavior problems were assessed with the Child Behavior Checklist (CBCL, Achenbach & Rescorla, 2000). In order to examine the parenting process, the Alabama Parenting Questionnaire (APQ, Frick, 1991) will be used as a measure of parenting behavior, the Parenting Relationship Questionnaire (PRQ, Kamphaus & Reynolds, 2006) to examine the parent-child relationship, and the Parenting Satisfaction Scale (PSS, Guidubaldi and Cleminshaw 1994) to inform the overall experience of parenting.

Results: In the overall sample, the mean age of the child was 3.4 years (SD = 0.97) and the majority of the children enrolled had an autism spectrum disorder diagnosis (80.0%). Based on preliminary analyses, changes in parenting stress significantly predicted changes child behavior problems (β = .33, p < .01). Subsequent analyses will include a multiple mediation analysis using bootstrapping to investigate the mechanisms through which parental mental health impacts the behavior and development of children diagnosed with DD. We anticipate that the parenting experience, the parent-child relationship, and parenting behavior will mediate the relationship between parenting stress and child outcomes. Discussion: Preliminary analyses show that changes in parenting stress significantly predicted changes in child behavior problems, such that lower levels of parenting stress at post-treatment predicted decreased child behavior problems. If our hypothesis is supported and the specific components of the parenting process that will be included in the future analyses significantly mediate this relationship, then we will better understand potential targets for interventions aimed at reducing child behavior problems among children with DD. Limitations to the current study and future directions for research will also be discussed.
Title: Assessing Early Communication Behaviors in Infants Using the Communication Complexity Scale (CCS)

Brenda Salley and Nancy C. Brady, University of Kansas

Introduction: Prelinguistic communication behaviors, such as gestures and vocalizations, are important developmental milestones to later language and emerge with considerable variability in typically and atypically developing young children (Carpenter et al., 1998). Accurate description and evaluation of these skills are critical, both for revealing the presence of delays or disordered development and for linking individuals to appropriate intervention services. Many existing measures rely on parent report or intensive direct observation and coding. Methods: The Communication Complexity Scale (CCS; Brady et al., 2012) has been developed as an alternative (specifically to describe the early communication status of individuals with severe intellectual and developmental disabilities) that can be scored independent of context, yielding an overall score for complexity communication level. In the present study, we examine the utility of the CCS for characterizing early communication behaviors and age-related differences in complexity of communication for typically developing infants.

Participants: Typically developing infants (6, 8, 10 or 12 months of age), recruited as part of a larger study, had no identified delays and were mostly Caucasian (n=18; African American n=2; Other n=2) and non-Hispanic (n=21). The ongoing study currently includes 120 infants and coding for the CCS is complete for a subset of infants (n=22), with preliminary data reported here for 6-month-olds (n=8; M=187.5, SD=6.9; 2 females) and 12-month-olds (n=14; M=366.9, SD=7.9; 6 females).

Methods: Infants were administered a structured measure of early communication behaviors (Early Social Communication Scales, ESCS; Mundy et al., 2003), which involved presentation toys intended to elicit nonverbal communication behaviors during interaction with the examiner. For the current study, a subset of ESCS activities (3 wind-up mechanical toys; 3 hand-operated toys; 2 turn taking) were coded offline by trained observers using the CCS scoring system (scores range from 0-12). For each toy episode, the highest observed communication level for joint attention (JA) and behavior regulation (BR) functions were scored. JA and BR summary scores were obtained for each infant by averaging the highest three communicative acts. Average inter-rater reliability was 75% (range 59-87%). Parents completed questionnaires about their infant’s early communication development (Communication and Symbolic Behavior Scales Infant-Toddler Checklist, CSBS; Ages and Stages Questionnaire, ASQ).

Results: Age related differences were observed for infants’ communication complexity scores. A 2 (Age: 6 months, 12 months) X 2 (communication function: JA, BR) mixed factorial design revealed a main effect of age [F(1, 20)=9.384, p=.006, partial η2=.32] and communication function [F(1, 20)=11.368, p=.003, partial η2=.36] and an interaction effect [F(1, 20)=12.049, p=.002, partial η2=.38]. The 12 month cohort displayed higher BR levels (M=6.91, SD=1.90) than the 6 month cohort (M=3.55, SD=1.25), but JA levels were not significantly different (6 month M=6.50, SD=0.93; 12 month M=6.86, SD=1.02). Associations between CCS communication scores and parent report measures were significant: JA level was correlated with the CSBS Speech Composite (r=.48, p=.02); BR level was correlated with the CSBS Symbolic Composite (r=.41, p=.04), Total Composite (r=.43, p=.04) and ASQ Communication Scale (r=.44, p=.03).

Discussion: Preliminary results support the usefulness of the CCS for characterizing individual differences in early communication complexity in infants. This study represents the first application of the CCS for typically developing infants and results will have implications for considering the clinical utility of this measure and for evaluating profiles of atypical communication development.
Title: Health and Well-Being Among Non-Affected and Premutation Siblings of Individuals With Fragile X Syndrome

Anne Wheeler, RTI International, Carolina Institute for Developmental Disabilities, University of North Carolina-Chapel Hill; Melissa Raspa, RTI International; Ellen Bishop, RTI International; Donald Bailey, RTI International; Sigan Hartley, University of Wisconsin-Madison; Leann Smith, University of Wisconsin-Madison

Introduction: Research on the impact of fragile X syndrome (FXS) on families has primarily focused on outcomes for the parents, especially mothers (Hunter et al., 2008; Roberts et al., 2009). Results have repeatedly shown increases in depression, anxiety, and stress among parents of children with FXS; with some studies suggesting a greater impact for parents with genetic vulnerabilities related to their own FMR1 premutation status (Hartley et al., 2012; Seltzer et al., 2012). Potential stressors related to behavior challenges in the individual with FXS, as well as the possibility of future caretaking demands may increase vulnerabilities for those siblings who carry a premutation. However, to date there have been no studies directly examining the impact of having a sibling with FXS on children with and without an FMR1 premutation. This study used survey methodology to gather parent perceptions of well-being for their children with and without a premutation.

Methods: As part of a large national survey, 405 caregivers of at least one tested, non-affected child or a child with a premutation answered questions about the quality of life, health, mood, and diagnostic history of each of their children. Outcomes for children with and without a premutation were compared based on the number of siblings with and without FXS. Respondents chose to complete a web-based survey or a phone interview—most completed the survey via the internet.

Results: Preliminary results confirm previous findings that parents report lower quality of life, poorer health and mood, and more co-morbid conditions in their premutation children than non-affected offspring. In families with no children with FXS, children with the premutation were reported to have more difficulties with interacting, listening, adapting, and had more co-morbid conditions than in children with the PM who had one or more sibling with FXS. However, QOL, Health, and Mood were reported to be higher in PM children without any siblings than in PM children with non-affected siblings or with siblings with FXS. Additional descriptive findings will be reported along with results from regression analyses examining predictors of well-being (including aggression and autism in the siblings with FXS, differences in age between sibling, and maternal well-being) in PM vs. non-affected siblings of children with FXS.

Discussion: Individuals with an FMR1 premutation are at risk for a number of physical, cognitive, and emotional conditions, and the risk for these conditions may increase with stressful experiences. However, little is known regarding the impact of having a premutation and growing up in a household with one or more siblings with full mutation FXS. Results from this study suggest children with a premutation may experience greater challenges than their non-affected siblings.

Key References:


Title: Early Social Communication in Infants With Fragile X Syndrome, Infant Siblings of Children With Autism, and Typically Developing Infants

Laura J. Hahn, University of South Carolina, University of Kansas; Nancy C. Brady University of Kansas; Lindsay McCary, University of Wisconsin-Madison, University of South Carolina; Lisa Rague, University of South Carolina; Jane E. Roberts, University of South Carolina

Introduction: Little research in fragile X syndrome (FXS) has examined the development of early communication skills despite the fact that language impairments are one of the phenotypic features of individuals with FXS (Abbeduto et al., 2007; Roberts et al. 2002; 2001; 2009). Past studies on communication development in FXS suggests that delays in language skills can be traced to deficits in early social communication behaviors (i.e., gesture use; Flenthrope & Brady, 2010) and social communication functions (i.e., dual and triadic orientation; Marschik et al., 2014; Roberts et al., 2002). Understanding early communication can help to understand the roots of language deficits and identify areas for targeted language interventions in this population. The purpose of the present study was to describe differences in social communication during the first year in infants with FXS, infant siblings of children with autism (ASIBs), and typically developing infants (TD).

Methods: Participants were 13 infants with FXS, 20 ASIBs, and 17 TD infants between 9 and 12 months. Social communication was coded using the Communication Complexity Scale (CCS; Brady et al., 2012) during the administration of four play tasks from the Autism Observation Scale for Infants (i.e., free play 1 and 2, peek-a-boo, and imitation; Bryson et al., 2008). The CCS describes levels of early social communication between an individual and communication partner using an ordinal scale with 12 different levels from pre-intentional, intentional nonsymbolic, and intentional symbolic communication. The highest communication act infants performed during each of the four tasks of the AOSI was coded.

Results: Results indicated significant group difference on social communication level, Wilks's lamda = .61, F(8, 88) = 3.09, p = .004, eta2 = .22. Infants with FXS had significantly lower communication levels than ASIBs or TD infants during the free play and imitation tasks, but infants with FXS had similar levels of communication during peek-a-boo. No between group differences were observed between ASIBs and TD infants. As a follow-up analysis we examined within group differences on social communication levels for the four tasks and found that infants with FXS used a significantly higher level of social communication during peek-a-boo than the other three tasks, F(3, 36) = 6.96, p = .001, eta2 = .37. In contrast, ASIBs and TD infants showed no significant within group differences on social communication level across the four tasks.

Discussion: The present study adds to the growing literature of identifying profiles of early communication behaviors in FXS (Flenthrope & Brady, 2010; Marschik et al., 2014; Roberts et al., 2002). Considering the cognitive impairments associated with FXS, it is not surprising that infants with FXS would have lower levels of social communication than ASIBs and TD infants. However, of great interest is our finding that during peek-a-boo infants with FXS had similar levels of social communication as their peers and they used a higher level of communication than they did in the other 3 tasks. It is possible that the dynamic nature of social games, like peek-a-boo, help to stimulate communication in infants with FXS more so than a general play context. Language interventions that include a strong social play component may be particularly effective for promoting language development in FXS.

Key References:


Title: Disability and Bullying Among High School Students in Ohio

Quynh Wells, Ohio State University, Vanderbilt University; Tim Sahr, Ohio State University; Courtney Frantz, Ohio State University; Emily Yang, Ohio State University, Nationwide Children’s Hospital; Yiping Yang, Ohio State University; Susan Havercamp, Ohio State University

Introduction: Rates for bullying have decreased since the early 1990’s and is currently 19.6% nationwide (1). However, youths with disabilities may be at much higher risk for being bullied because of their mannerisms, difficulties with mobility, speech patterns, or special care needs. Several states such as Maine, North Dakota, and Rhode Island all reported students with disabilities (SWD) were about twice as likely to be victimized compared to students with no disability (ND; 2-4). In the present study, we examined current rates of bullying in high school students with and without disabilities in Ohio. We hypothesize that SWD will be more likely to be victims of bullying compared to ND. Additionally, we expand on previous research by looking at the proportion of SWD in those that are bullied. We hypothesize that of those bullied, SWD will be disproportionally represented.

Method: The Youth Risk Behavior Survey (YRBS) is a biennial national survey of public high school students. This study used secondary data from the 2013 Ohio YRBS. 3 items are studied. Regarding bullying, students were asked, "During the past 12 months, have you ever been bullied on school property?" Regarding disability, students were asked, "Do you have any physical disabilities or long-term health problems? (Long-term means 6 months or more)" and "Do you have any long-term emotional problems or learning disabilities? (Long-term means 6 months or more)." The survey was completed by more than 1,455 randomly selected students in 44 public and private schools throughout Ohio in Spring 2013. 48.7% (SE=2.2%) were male, 22.2% (SE=1.0%) reported having a disability, 12.5% (SE=1.0%) reported having physical disabilities or long-term health problems (PDLT), and 13.7% (SE=1.0%) reported having long-term emotional problems or learning disabilities (EPLD). To test for differences between disabled and non-disabled students, Pearson’s chi square tests were used. Analyses were conducted on weighted data to take non-response into account to provide more accurate estimates of population parameter.

Results: Students with disabilities (SWD) were more likely than students without a disability (ND) to be bullied, (21.7% vs. 12.3%), p<.001. PDLT was more likely than ND to be bullied, (15.8% vs. 12.3%), p<.001; and EPLD was more than twice as likely than ND to be bullied, (26.7% vs. 12.3%), p<.001. EPLD was almost twice as likely as ND to be bullied, (26.7% vs. 15.8%), p<.001. Over a third (34.4%) of bullying victims were SWD, one in five (21.6%) victims had PDLT, and one in four victims (25.8%) had EPLD.

Discussion: This study supports and expands on previous findings from other states that also found that SWD were twice as likely to be bullied. Although rates for bullying have decreased in the last 25 years, this study found SWD are disproportionally victimized (22.2% are SWD but make up 34% of those bullied, 12.5% of youths have PDLT but make up 21.6% bullied, and 13.7% of youths have EPLD but make up 25.8% bullied). This vulnerability can help policymakers, schools, providers, and parents focus their support and bullying interventions to protect students with disabilities who are most at-risk.

Key References:


Title: Anxiety and Eye Gaze in Males With Fragile X

Emily K. Schworer, University of South Carolina; Jessica Klusek, University of South Carolina; Laura J. Hahn, University of South Carolina; Joseph Schmidt, SR Research, University of South Carolina; Jane E. Roberts, University of South Carolina

Introduction: Social anxiety is associated with the fragile X syndrome (FXS) phenotype as reflected in gaze aversion and poor eye contact. However, research on the role of eye gaze in social anxiety in FXS is limited. To elucidate the role of eye gaze and social anxiety, experimental procedures can contribute to our understanding of the often subtle changes in eye gaze that occur in response to social situations. Eye-tracking experiments indicate that women with elevated anxiety fixate longer on eye regions of a computer generated face than women with lower anxiety when presented faces with both a direct gaze and averted gaze (Wieser et al., 2009). Increased neural processing has also been associated with repeated exposure to eye gaze indicating elevated sensitivity to eye gaze in adolescents and young adults with FXS (Bruno et al., 2014). Utilizing the procedure by Wieser, we aimed to investigate the response to direct and averted gaze and its relationship to anxiety in adolescent males with FXS using an eye tracking experiment designed to mimic eye contact provided by a social partner.

Methods: Participants were 11 adolescent males with FXS, aged 16-23 years. Participants were presented with 64 trials of female faces that were animated to open their eyes and either look directly at the participant (direct gaze condition) or avert their gaze to the left or right (averted gaze condition; Wieser et al., 2009). This task was designed to simulate face-to-face social interactions and investigate reactions to different patterns of eye gaze. Participants were instructed to look at the eye region of the face until the eyes opened with no directions for their response after the opening of the eyes. The latency to look away from the eye region after the eyes opened was measured. Anxiety was measured using the Child Behavior Checklist (CBCL) utilizing raw scores of these subscales: anxiety problems, anxious/depressed, internalizing behavior. We anticipate having an additional 5 participants included in the final presentation.

Results: No significant differences were observed between disengaging from the computer animated eyes in the direct and averted gaze conditions. However, moderate correlations were found between the time it took to disengage from the eyes during direct gaze and anxiety problems \( (r = .39) \), anxious/depressed \( (r = .50) \), and internalizing behavior \( (r = .43) \). In addition, correlations were observed between the time it took to disengage from the eyes during an averted gaze and anxiety problems \( (r = .60) \), anxious/depressed \( (r = .57) \), and internalizing behavior \( (r = .57) \).

Discussion: These preliminary data suggest that the direction of gaze (direct or averted) of an animated face does not affect the latency of disengagement in male adolescents with FXS with both conditions eliciting the same response. However, an association between increased time to disengage looking at the eyes in both conditions (direct or averted) was associated with elevated anxiety and internalizing behavior. Thus, the response of quick disengagement of eye contact may be attributed to underlying social anxiety and social impairments associated with FXS.

Key References:


**Title:** Improving the Discriminative Validity of the Social Responsiveness Scale for Autism Spectrum Disorder by Taking Emotional/Behavioral Problems into Account

Alexandra Havdahl, Center for Autism and the Developing Brain/Weill Cornell Medical College, Lovisenberg Diaconal Hospital, Norway; Vanessa Hus Bal, University of California San Francisco; Catherine Lord, Center for Autism and the Developing Brain/Weill Cornell Medical College; Somer L. Bishop, Center for Autism and the Developing Brain/Weill Cornell Medical College

**Introduction:** Parent-completed screening questionnaires are commonly used to help identify and differentiate children with ASD from children with other clinical disorders, both for the purpose of clinical assessment and inclusion in research samples. Previous findings suggest that non-ASD specific emotional/behavior problems (EBP), such as aggressive behavior and mood problems, contribute substantially to elevated scores on ASD screening tools, lowering their specificity (Charman et al., 2007; Hus et al., 2013). Hus et al. (2013) suggested that taking non-ASD specific behavior problems into account might be necessary to appropriately interpret scores on ASD screeners. In a recent study (manuscript in preparation), we found that adjusting cutoffs depending on level of EBP helped increase the accuracy of proposed ASD screening profiles on the Child Behavior Checklist (CBCL, Achenbach & Rescorla, 2000; 2001). The present study examines the utility of this strategy for improving the accuracy of an ASD-specific screener, the Social Responsiveness Scale (SRS; Constantino & Gruber, 2005).

**Method:** The sample included 285 children with ASD and 175 children with non-ASD disorders (e.g., ADHD, language disorders, intellectual disability) ages 4-18 years who completed the parent version of the SRS as well as the CBCL/1.5-5 or CBCL/6-18 during the same assessment. All children underwent a comprehensive clinical evaluation, which included administration of well-validated standardized diagnostic instruments for ASD and cognitive testing. Analyses of receiver operating curves (ROC) and of sensitivity, specificity, and likelihood ratio, were used to examine the discriminative validity of the SRS for clinical diagnosis of ASD. The sample was stratified into high and low EBP depending on whether T score (gender and age adjusted) on the CBCL subscale Aggressive behavior and/or Affective problems was above or below the clinical range (≥ 70).

**Results:** Due to similar results for SRS raw and T scores, results are only reported for raw scores. ROC analysis in the total sample resulted in an AUC score in the moderate range (AUC=.72). The cutoff of 85, recommended for use in clinical populations, resulted in 70% sensitivity and 64% specificity.

The prevalence of high EBP was 37% in the total sample, with no significant differences between the ASD and non-ASD groups (X2=1.61, p=.204). The SRS had an AUC score of .78 for children with low EBP, and .67 for children with high EBP. There were significant differences between the EBP groups in sensitivity (X2=23.65, p<.001) and specificity (X2=48.59, p<.001). Whereas a cutoff of 85 correctly identified 86% of children with ASD in the high EBP group, 59% of children with ASD were identified in the low EBP group. Conversely, the difference in specificity was substantial, with only 28% of children with non-ASD disorders correctly excluded in the high EBP group, compared to 81% in the low EBP group.

The cutoff maximizing the sum of sensitivity and specificity (Youden index), with sensitivity close to 80%, differed widely between children with high and low EBP. Compared with a common cutoff of 85, application of EBP-level specific cutoffs resulted in improved specificity for children with high EBP (from 28% to 50%, sensitivity 77%), and sensitivity for children with low EBP (from 59% to 77%, specificity 67%). Overall discriminative validity was only increased for children with high EBP.

**Discussion:** Consistent with previous reports, sensitivity and specificity of the SRS for ASD varied considerably depending on level of EBP. Cutoff adjustment depending on level of EBP was associated with some improvement in discriminative validity for ASD. However, given that the SRS showed only moderate overall accuracy even in children with low EBP, the use of EBP-level specific cutoffs had limited effect.
Introduction: In typically developing (TD) populations documented gender differences regarding language ability and prosocial tendencies, as well as levels of disruptive behavior and school outcomes, are known and accepted by researchers (Tosolt, 2010). While prevalence rates of intellectual and developmental disabilities (IDD's), including, but not limited to, autism spectrum disorders (ASD's), indicate that males are more likely to be diagnosed with the aforementioned disabilities, a dearth of research regarding gender differences in this population exists (Rivet & Matson, 2011). Recent studies indicate that for individuals with ASD, girls may present with more communication difficulties and less restricted, repetitive behaviors in the presence of comorbid intellectual delays; whereas in ID populations girls and boys show similar patterns of challenging behaviors, coupled with impairments in emergent language skills (Einfeld et al., 2010). The current study examines gender differences related to diagnostic symptomology, social skills, behavioral challenges and school placement using both parent and teacher reports.

Methods: Participants included families from two longitudinal projects of child development. The combined sample (N=369) includes children between the ages of 4 and 7. The total sample includes three diagnostic groups: children with ASD, without ID, (N=166, M grade = Kindergarten), developmental delay (DD), (N=83, M grade = first grade), and typical development (TD, N=120, M grade = first grade). Participants were recruited via schools and local regional center or service providers. All children with ASD received evaluations to confirm the diagnosis and all children received cognitive testing to confirm DD status (DD vs. TD). Data reported here are from mothers, although ongoing analyses include teacher reported data as well.

Results: A factorial ANOVA revealed a significant main effect of gender on social skills (F(1, 342) = 6.01, p<.05). Results showed that TD males and females had the highest level of social skills (M=101.5, SD=17.4 and M=99.5, SD=15.4 respectively) and females with ASD had the lowest level of social skills (M=71.2, SD=15.3), even lower than boys with ASD (M=79.9, SD=13.8). There was also a significant main effect of diagnostic group on social skills (F(2,342) = 67.32, p<.001), suggesting that children with ASD (M=78.3, SD=14.4) had lower social skills scores than those with either DD (M=82.9, SD=17.2) or TD (M=100.6, SD=16.5). There was no significant interaction between the two factors. A second factorial ANOVA revealed a significant main effect of diagnostic group on behavior problems (F(2,342) = 49.97, p<.001), suggesting that children with ASD (M=65.0, SD=11.0) had the highest level of behavior problems than those with either DD (M=57.4, SD=9.9) or TD (M=51.3, SD=9.4). There was no significant main effect of gender on behavior problems or the interaction between the two factors. Within the ASD group alone, individual T-tests revealed significant gender differences with boys showing higher restricted repetitive behaviors (t=1.94, p<.05), and social skills (t=3.78, p<.001) where males had significantly less impaired social skills (M=78.42, SD=14.28) as compared to females (M=67.85, SD=15.74).

Discussion: Preliminary analyses reveal some significant gender differences based on delay status (ASD, DD, or TD). Importantly, there were significant differences in parent reported social skills between males and females with ASD, DD, or TD. We hope additional analyses of behavioral, communication and classroom variables will elucidate further variation both between and within status groups.

Key References:


Title: Active Parenting Mediates the Effect of Stereotypy in Children With FXS

Nancy Brady, University of Kansas; Steven F. Warren, University of Kansas; Kandace Fleming

Introduction: Over the past decade we have conducted a longitudinal study of 55 children with FXS and their biological mothers. We have previously reported some on the positive effects of parenting on these children's later language development (Brady, Warren, Fleming, Keller, & Sterling, 2014; Warren, Brady, Sterling, Fleming, & Marquis, 2010). Parenting is more challenging when children show problem behaviors. The purpose of this study was to examine how parenting interacts with children's problem behaviors to effect communication. The study was motivated in part by reports in the literature of a wide range of behavior problems in children with FXS.

Method: Children with FXS (44 boys, 11 girls) and their mothers were visited in their homes at five different time points from early through middle childhood. Parent-child observation data was collected during each visit in a variety of contexts to measure parent-child interaction. Data coded from the observational contexts allowed us to measure three common problem behaviors: aggression toward people, self-injurious behavior (SIB) and stereotypy, as well as the communication observed within these mother-child interactions.

Results: The relationship between percent time spent in stereotypy and total communication at the end of middle childhood controlling for nonverbal IQ (NVIQ) was examined using a multiple mediator model with two potential mediators: rate of zaps and maternal responsivity rate. Zaps are admonishments such as "stop that" or "no!" issued by the mother. Maternal responsivity is a composite of facilitative parenting strategies such as commenting and labelling. Both variables were significant mediators and there was an additional significant indirect effect of stereotypy on total communication through both maternal responsivity rate and zap rate.

Discussion: Results indicate that "active parenting", as indicated by being generally responsive but also responding negatively (with "zaps") to children with high rates of stereotypy leads to significantly higher communication rates.
Title: Initial Reliability for the RCADS and MASC-2 in Youth With ASD

Aaron Kaat and Luc Lecavalier, The Ohio State University

Introduction: Approximately 40% of youth with autism spectrum disorder (ASD) meet diagnostic criteria for a comorbid anxiety disorder (van Steesel, Bogels, & Perrin, 2011). However there is a dearth of information on the best way to assess anxiety in this population. This is a significant concern, as individuals with ASD may have different "atypical" presentations of anxiety in addition to the traditional "typical" presentations (Kerns & Kendall, 2012). Two potential measures used in the general population that are starting to be used among those with ASD are the Revised Child Anxiety and Depression Scale (RCADS) and Multidimensional Anxiety Scale in Children--Second Edition (MASC-2). This study sought to evaluate the psychometric properties of these instruments in youth with ASD.

Methods: Forty-five youth between 8 and 16 years old, inclusive, with a previous ASD diagnosis and an IQ above 55 participated in this study. Parents and youth independently completed the RCADS and MASC-2. Youth also completed the ADOS-2, an abbreviated WISC-IV, and the Comprehension Test and Unexpected Outcomes Test from the Emotion Recognition Scales. Initial reliability for the RCADS and MASC-2 was evaluated, including internal consistency, inter-rater reliability, and test-retest reliability.

Results: Internal consistency for the total scores on both the RCADS and MASC-2 were good. Most subscales also had acceptable internal consistency. Test-retest reliability for parents was excellent. Inter-rater reliability, however, was poor. The average parent-child correlation was $r=.25$. There were no statistically-significant moderators of parent-child agreement, but several demographic characteristics had small to medium moderating effects. IQ had the greatest potential as a moderator, with no relationship between parent and child report for those with lower IQs, but a better correlation between raters for those with higher IQ scores. Generally there were no significant differences in anxiety severity across raters; however, youth consistently rated their OCD symptoms as more severe than their parents.

Discussion: Consistent with previous research, anxiety was a major concern for youth in this sample. Up to 51% had clinically significant anxiety by parent report. Overall, the reliability of the RCADS and MASC-2 was appropriate within but not across raters. Inter-rater reliability in this study was worse than a recent meta-analysis on internalizing symptoms (Stratis & Lecavalier, 2014), but is broadly consistent with research in the general population. Although more research is necessary, this study suggests that the MASC-2 and RCADS have appropriate psychometric properties for clinical and research purposes, but poor inter-rater reliability suggests against using one informant exclusively. New measures also should be developed to capture "atypical" presentations of anxiety.

Key References:


Title: Comparison of Language Profiles in Toddlers With Autism Spectrum Disorder, Language Disorder, and Developmental Delay

Rose Nevill, The Ohio State University; Darren Hedley, Nationwide Children's Hospital; Natalie Fields, Kent State University; Jonathan Wilkins, Nationwide Children's Hospital, The Ohio State University; James Mulick, Nationwide Children's Hospital, Ohio State University; Eric Butter, Nationwide Children's Hospital, The Ohio State University

Introduction: Toddlers with Autism Spectrum Disorder (ASD) have been found to exhibit general language delay, better expressive than receptive language skills and delayed verbal relative to nonverbal skills on direct clinical language assessments1, 3, 4. Parent report measures, on the other hand, have shown toddlers with "broad-spectrum" ASD to have stronger receptive over expressive skills4, 5 and toddlers with core autism to have stronger expressive skills2. We examined language profiles based on results from parent surveys of functional communication and direct clinical assessments of language development in a clinical sample of toddlers with ASD, Language Disorder (LD), and Developmental Delay (DD) to determine whether further distinctions between the respective language profiles of these groups can facilitate differential diagnosis in toddlers.

Methods: Seventy-five toddlers aged 17-39 months diagnosed with ASD, LD, or DD were assessed by an interdisciplinary team using the ADOS-2, Mullen (MSEL), the Preschool Language Scales (PLS-5; Auditory Comprehension, AC, Expressive Comprehension, EC), and the Vineland Adaptive Behavior Scales (VABS) - Parent Survey Communication domain. Between group analyses were ran to compare profiles on each measure. Binary logistical regression modeling was used to evaluate the contribution of a) expressive-receptive b) verbal-nonverbal profiles and c) functional expressive-receptive communication based on clinical assessments and parent-report as predictors of diagnosis. We were particularly interested in the contribution of interaction variables to the models. Age equivalent scores were used in all analyses to control for floor effects.

Results: Children with ASD showed significantly lower scores than children with LD on the VABS communication domain, Mullen receptive scale and age equivalent, Mullen Early Learning composite, and PLS Total score. Two binary logistical regression analyses were conducted (Model 1: VA, NVA [Step 1], VA*NVA [Step 2]; Model 2: AC, EC [Step 1], AC*EC [Step 2]) with diagnostic classification as the dependent variable to explore the contribution of unique language profiles to diagnosis. Interaction effects significantly improved the models offering support to the notion of unique language profiles in ASD from LD and DD.

Discussion: Children with ASD showed greater deficits on communication measures using both parent report and direct clinical assessment than children with LD and DD. These findings continue to support the use of multiple formats of assessment to identify the etiology of language delays in toddlers and the need for rule out ASD in children with significant receptive language delays in early childhood.

References:


Title: A Cross-Country Comparison of Caregiver Burden in Fragile X Syndrome

Melissa Raspa, RTI International; Pat Sacco, RTI Health Solutions; Emil Loefroth, Novartis Pharmaceuticals; Ellen Bishop, RTI International; Donald B. Bailey, RTI International

Introduction: A growing body of research demonstrates the family impact of having a child with fragile X syndrome (FXS). Studies of mothers show that raising a child with FXS can result in increased levels of stress, depression, anger, and anxiety. Child behavior problems often exacerbate these negative outcomes. Recent survey data show high caregiver burden, with families reporting moderate levels of financial impact as well as an impact on employment due to increased caregiving demands. However, the majority of studies to date have focused on families living in the United States (U.S.). Little to no data is available on the outcomes of families living outside the US. This study examines the family impact of FXS using survey data from Canada, the United Kingdom (U.K.), and Portugal.

Method: Families in Canada, the U.K., and Portugal were invited to participate in an online survey designed to assess child behavior problems, health care utilization, and caregiver outcomes. Families completed the Aberrant Behavior Checklist as well as items to assess resource utilization, including visits to health care professionals and medical tests or procedures, and those related to caregiver burden, such as financial and employment burden, caregiving hours, caregiver injuries, and caregiver mental health. A total of 122 families have participated in the survey across the 3 countries.

Results: Patterns of health care utilization, child behavior problems, and family impact will be presented to examine cross-country differences. In addition, we will examine the predictors of caregiver burden to determine if variations exist across countries. Comparisons will be made to comparable data on U.S. families.

Discussion: These findings will provide additional evidence on the impact of FXS on families. Having a better understanding of the similarities and differences across countries will enable clinicians and practitioners to provide individualized services and supports to families and individuals with FXS.

References:


Title: Sensory Descriptions of Foods Made by Selective Eaters With and Without Autism Spectrum Disorder: The Role of Sensory Sensitivity and Communication Ability

Amy Lemelman, Eva Trinh, Sarah O'Kelley, Fred Biasini, University of Alabama at Birmingham

Introduction: Food refusal and selectivity is a significant problem observed in pediatric populations and can result in poor nutrition and growth. Selective eating is highly prevalent among young children with Autism Spectrum Disorders (ASD), more so than those with typical development (TD) (Bandini et al., 2010). Sensory sensitivity has been shown to be related to selective eating in children with typical development (Coulthard & Blissett, 2009). Further, sensory sensitivities are more likely to occur in children with ASD than children with typical development (Ben-Sasson et al., 2009). The goal of the present study was to explore the role of sensory sensitivity in selective eating in children with ASD and children with TD.

Methods: The current sample includes data collected from children (ages 8-12 years) with ASD (n=9) and children with TD (n=13). All children were considered "picky eaters" by their caregivers. Prior to coming into the lab, caregivers completed a food preference inventory regarding their children's eating habits. From these personalized lists, 14 foods were randomly selected to display during testing (7 that the child eats/accepts and 7 that the child does not eat/rejects). Children were presented each pre-selected food individually on white paper plates and asked to describe what attributes made the foods desirable or undesirable. Caregivers filled out a variety of questionnaires, including the Short Sensory Profile (SSP), the Texture Problems Measure, and the Vineland Adaptive Behavior Scales, Second Edition (VABS-II).

Results: Qualitative descriptions of foods made by children were coded into five categories: Taste, Smell, Texture, Visual, and Other descriptions. Descriptions from children in the TD group more often included references to the textural properties of foods, t(21) = -3.27, p = .004, than children with ASD. Within the ASD group, children included more references to the olfactory properties of food than children in the TD group, t(21) = 2.07, p = .050. Children who had higher VABS-2 Communication scores reported more textural references in their descriptions of foods, r(23) = .52, p = .010. Consistent with previous literature, children in the ASD group were rated as having more overall sensory sensitivity than children in the TD group, t(21) = -4.55, p = .000. Children who had more aversions to various textural properties of food, as stated on the Texture Problems Measure, were reported to have greater sensory sensitivity in the Taste/Smell domain of the SSP, r(23) = -.78, p = .000.

Discussion: Although children with ASD had more overall sensory sensitivity than children with TD, our findings indicate that children in both groups focused on different sensory properties of foods when asked to describe them. However, it appears that adaptive skills, specifically expressive communication ability, plays a role in how children perceive and describe food properties. Results from this research will help caregivers and clinicians understand differences in how children perceive the sensory properties of foods, which could potentially impact how pediatric feeding disorders are treated from both a cognitive and behavioral standpoint.

Key References:


Executive Function in Down Syndrome

Andrew S. Tungate, University of Alabama; Susan J. Loveall, University of Kansas; Frances A. Conners, University of Alabama; Laura J. Hahn, University of South Carolina; Lauren M. Alvis, West Virginia University

Introduction: Down syndrome (DS) results from trisomy of chromosome 21 and is associated with a host of cognitive difficulties, including difficulties in executive function (EF). The term EF refers to several cognitive processes involved in organizing and controlling goal-oriented behavior. Difficulties in EF make schoolwork, socializing, and daily activities more difficult. Researchers are beginning to identify a unique profile of relative strengths and weaknesses in EF skills associated with DS, including difficulties in working memory and planning/organization, and no significant impairments in emotional control and shifting. In the present study, we examined whether this profile is consistent from ages 6-18, or whether it changes throughout this age period.

Method: The study included 66 participants with DS, age 6-18 (M= 11.3 SD= 3.3, 44% male) whose parent or primary caregiver completed the Behavioral Rating Inventory of Executive Function (BRIEF). The BRIEF consists of 86 questions organized into eight EF scales: Inhibit, Shift, Emotional Control, Initiate, Working Memory, Plan/Organize, Organization of Materials, and Monitoring. The Behavior Rating Index (BRI) is computed from the first three scales, and the Metacognitive Index (MI) is computed from the last five scales. The General Executive Composite (GEC) is a combination of the BRI and the MI. We used chronological age-standardized T-scores, which are based on a mean of 50 and SD of 10. Higher scores indicate greater difficulty.

Results: As a group, participants scored significantly above their age-norm level on all scales and indices (p's < .05), suggesting difficulties in all areas of EF. This was expected because age-based norms were used. However, there were significant differences across scales, F(7,455) = 21.43, p < .001. Based on mean T-scores and percent of participants in the clinically elevated range (>65), areas of relative weakness include: Working Memory (M= 62.9, SD= 10.8, 36.4% elevated), Planning/Organization (M= 61.7, SD= 10.4, 34.8% elevated), Shifting (M= 62.1, SD= 9.4, 39.4% elevated), and Monitoring (M= 62.4, SD= 11.2, 40.9% elevated). Areas of relative strength include: Emotional Control (M= 52.3, SD= 9.9, 7.8% elevated) and Organization of Materials (M= 52.32, SD= 9.9, 13.6% elevated). There was a non-significant trend for raw scores to increase with age, but T-scores remained stable across the age range. One exception, however, was that Planning/Organization seemed to improve with increasing age, especially in terms of the percent elevated (6-9 years: 54%; 10-13 years: 27%; 14-18 years: 17%).

Discussion: These data replicate previous research that identified relative challenges in working memory and planning/organization but relative strengths in emotional control for children with DS (Danhauer et al., 2014; Lee et al., 2011). The present study used chronological-age based norms whereas the previous studies used mental-age based norms from the BRIEF preschool version. These findings extend past findings by adding Shifting and Monitoring as relative difficulties for children with DS as they continue into adolescence, and Organization of Materials as a relative strength. In general, the EF profile seems relatively stable across childhood, but Planning/Organization may be an early relative weakness that becomes more manageable toward adolescence. More research is needed on how the DS EF profile emerges and changes with age.

References:


**Title:** The Family Impact of Autism Spectrum Disorder and Intellectual Disability on the Accessibility of Community-Based Services: Results of the National Survey of Children With Special Health Care Needs, 2009-2010

Chandni Parikh and Ann Mastergeorge, University of Arizona

**Introduction:** Children with special health care needs (CSHCN) have or are at increased risk for developing a chronic physical, developmental, behavioral, or emotional condition that requires extensive use of health services more than those required by children in general (McPherson et al., 1998). Approximately 11.2 million children under the age of 18 years are estimated to have special health care needs (U.S. Department of Health and Human Services, 2013). The families with CSHCN face a unique set of challenges that impacts different aspects of family functioning, financial burdens, and the family-work interface (Ghandour et al., 2011). In the present study, we examine the experiences of caregiving and financial burdens of families with a child with ASD or intellectual disabilities (ID) as associated with the accessibility to community-based services.

**Method:** The current data comes from the 2009-2010 National Survey of CSHCN, a population-based study that assess the health care experiences of CSHCN. Interviews were conducted with 40,242 parents who have at least one child less than 17 years of age with special needs. This analysis compared responses of CSHCN who were diagnosed with an ASD (N =3675) or ID (N = 2638). The outcome variable assessed the families with CSHCN who can access community-based services based on difficulties with accessing care. Parent-reported financial problems and the reduction or cessation of employment due to CSHCN were given binary codes. The number of hours family members spent providing and coordinating health care for CSHCN was coded using 4 categories.

**Results:** Each explanatory variable from the logistic regression of having a child with ASD or ID and the financial burden, hours spent providing care, and the reduction of work life significantly explained the probability of families with CSHCN accessing community-based services (p < 0.01). The Nagelkerke R-square indicated that the model explained 14.5% of the variance. For the three significant predictors in CSHCN with ASD, the odds ratios are: if the family with CSHCN with ASD have no financial burden, controlling for no employment cessation and are providing more than 11 hours per week of care, they are 0.34 times less likely to access community-based services; if the employment of the family with CSHCN with ASD is not impacted, controlling for no financial burden and more than 11 hours per week of care is provided, they are 0.69 times less likely to access community-based services; and if the family with CSHCN with ASD provide less than an hour of care, controlling for no financial burden and no employment cessation, the family is 2.4 times more likely to access community-based services. Similar results were produced for the CSHCN with ID.

**Discussion:** The effective promotion of health and health services for CSHCN across the lifespan requires the integration of familial factors and family centered care. With the growing prevalence of CSHCN with ASD or ID, it becomes critical to provide quality care and community-based resources that factor in varying familial dynamics associated with having CSHCN.

**References:**


Examining the Social Participation of Children With Intellectual Disabilities and Autism Spectrum Disorder in Relation to Peers

Azin Taheri, Adrienne Perry, Patricia Minnes, Queen University

Introduction: Participation in social and physical activities promotes physical, emotional, and social well-being for children with or without disabilities (e.g., Geisthardt et al., 2002). However, despite the benefits, individuals with disabilities are often excluded from taking part in social activities (Bigby, 2012). Lack of opportunities to participate in activities may prevent exploration of various areas of development (King et al., 2003). Most of the research on activity participation has focused primarily on higher functioning children with disabilities. However, children with severe Developmental Disabilities are often excluded from this type of research because of their complexities and level of functioning. Therefore, the purpose of this study was to report and compare the social participation of children with Intellectual Disabilities (ID) and Autism Spectrum Disorder (ASD) in relation to a Typically Developing (TD) sample.

Methods: The GO4KIDDS project explores the health, well-being, and social inclusion of Canadian school-aged children (4 to 19 years) with severe ID and ASD. A total of 186 parents of children with ID and 232 of those with ASD completed the Basic Survey. In addition, 210 parents of TD children completed the TD Survey. The surveys include a brief version of The Activities Questionnaire (Solish et al., 2010), which examines the frequency of participation of seven types of activities. In addition, there are three questions regarding the child's number of friends, type of friends, and quality of these friendships.

Results: One-way ANOVAs revealed that social participation for all activities and total number of activities were significantly different among the three groups. In addition, post hoc analyses revealed that the TD group participated more often in each of the six types of activities than the ID and ASD group. Ninety-nine percent of the TD group have friends, whereas, 82% of those with ID and 64% of those with ASD have friend(s) ($\chi^2 = 89.45$, $p < .001$). In addition, a greater number of children in the ID group had one or more friends than those in the ASD group ($\chi^2 = 17.46$, $p < .001$). The majority of the TD group have average to excellent quality of friendship, while the majority of the ID and ASD group have very poor to average quality of friendship ($\chi^2 = 216.73$, $p < .001$).

Discussion: Children with ID and ASD in this study were reported to participate in fewer social activities than their TD peers; in addition, those with ASD were participating in fewer activities than those with ID. Although majority of children were reported to have friends, those with ASD had fewer friends that those with ID and their TD peers. Furthermore, those with ID and ASD had very poor quality of friendships. These findings indicate the importance of finding ways to encourage and provide opportunities for children with disabilities to become more involved in social activities and build friendships.

References:


Title: Face Processing in the Broad Autism Phenotype

Benjamin Feldman and Anastasia Dimitropoulos, Case Western Reserve University

Introduction: The Broader Autistic Phenotype (BAP) consists of milder Autistic Spectrum Disorder (ASD) characteristics that occur in some relatives of individuals who have ASD. The core ASD deficits in communication, socialization, and stereotyped/repetitive behavior have been found to manifest themselves separately in the BAP. Due to the strong hereditary nature of ASD, the autistic symptomatology expressed in ASD family members meeting criteria for the BAP can serve as endophenotypes in the study of ASD. Many of the social problems experienced by people with ASD stem from deficits in facial processing. Since the BAP consists of mild socialization impairment, face processing has also been studied in ASD relatives, in particular parents, with mixed results of subclinical similarity and dissimilarity to ASD. Lacking in these face processing studies has been: the examination of typical ASD face processing strategies, as well as measures of both face identity and emotion recognition. The present study sought to explore the effects of BAP level on face processing deficits in parents and siblings of individuals with ASD. We aimed to assess if family members with high BAP levels (BAP+) could be distinguished from those with low BAP levels (BAP-) on face processing tasks.

Methods: 178 biological parents and siblings of individuals with ASD (Mean IQ=109.63) were assessed on: IQ (Wonderlic-WPT-Q), the Let’s Face It Skills Battery (LFI), the Broad Autistic Phenotype Questionnaire (BAPQ), and the Social Communication Questionnaire (SCQ). Specifically, the LFI evaluates 10 areas of face processing involving face discrimination, emotion recognition, and non-face objects. The BAPQ measures an overall BAP level as well as three sub levels of: aloofness, pragmatics, and rigidity. All assessments were conducted on-line.

Results: Results suggest that, as a whole, relatives of ASD children performed at normal levels of face processing. When BAP level was considered, BAP+ and BAP- parents and siblings performed similarly. However, when BAPQ specific areas of Aloofness, Pragmatic Language, and Rigidity were considered, the Rigidity level of the ASD family members exposed significant differences on face discrimination, Pillai’s Trace V=.80, F(5, 139)= 2.41, p<.05, as well as non-face discrimination, Pillai’s Trace V=.072, F(2, 150)=5.86, p<.01.

Discussion: The evidence suggests that BAP level differentially effects ASD family members and may contribute to mild social skill difficulties that mimic those difficulties typically found in their biological relatives who have an ASD diagnosis. These findings give further insight into the investigation of endophenotypes of ASD as expressed in the BAP, as well as the need to examine the influence of the family environment.
**Title:** Emergence of Anxiety in Preschoolers With Fragile X Syndrome and Idiopathic Autism Spectrum Disorder

Jessica Scherr, Laura J. Hahn, Debra Reisinger, Lisa Rague, Jane Roberts, University of South Carolina

**Introduction:** Idiopathic autism spectrum disorders (IASD) and fragile X syndrome (FXS) are highly comorbid -90% of individuals with FXS display at least one symptom of ASD (Hagerman, 2002). In addition, both IASD and FXS are comorbid with social anxiety (Bellini, 2004; Cordeiro et al., 2011), which compounds the effect of each individual disorder and negatively influences social, academic, and behavioral functioning. Few studies have compared behavioral factors of social anxiety in these two populations. It is critical to examine how early comorbid factors emerge in children that are at risk for later comorbid disorders, such as social anxiety, IASD, and FXS, given the pervasiveness and negative outcomes associated with these disorders. The present study seeks to examine how social anxiety emerges in childhood in these two populations as compared to typically developing children (TD) in order to gain an understanding of early distinguishing factors that will help aid in differential diagnosis and individualized treatment.

**Methods:** A total of 119 participants (FXS = 55, IASD = 22, TD = 39) between the ages of 2 and 5 years participated in this study. Of the preschoolers with FXS, 20 participants (34.5%) received elevated total score ratings (e.g. mild to severe symptoms of autism) on the Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Renner, 1986). To control for autism symptoms across groups, the CARS total score will be used as a covariate in final models. The Stranger Approach episode from the Laboratory Temperament Assessment Battery (Goldsmith & Rothbart, 1996) was used to elicit behavioral indicators of social anxiety. The behaviors of facial fear, escape, distress vocalizations, and bodily fear were coded from video recordings. Behavioral variables were measured by duration in seconds that was spent in each level of the behavior. Intensity composites were created for each behavioral variable to create an average measure of social anxiety across levels. Higher intensity scores indicate more social anxiety for each behavior.

**Results:** Results indicate that children with IASD display more facial fear compared to the FXS group (M = 17.93 and 6.34 respectively; t[78] = -3.56, p =.003) and the TD group (M = 7.45; t[59] = -2.91, p =.01). The IASD group displayed more bodily fear than both the FXS (t[78] = -9.97, p <.001), and the TD group (M = 40.84, 6.02, and 12.04 respectively; t[59] = -6.90, p <.001). Escape behaviors between the FXS and the IASD groups were not different. However, the TD group displayed more escape behaviors than both the FXS (t[95] = -2.808, p =.01) and the IASD groups (M = 66.89, 50.91, and 51.84 respectively; t[59] = 2.20, p =.03). No group differences were observed on measures of distress vocalizations across groups.

**Discussion:** Few studies have examined how comorbid symptoms of anxiety emerge in preschoolers with IASD and FXS. Experimental behavioral measures to evaluate social anxiety demonstrate a sensitive way to identify factors associated with comorbid symptoms that go beyond traditional parent/self-report measures. Our results suggest that children with IASD display more behavioral indicators of social anxiety than children with FXS and TD children. This study provides evidence that early behavioral profiles in groups at risk for comorbid disorders can be detected and disassociated. This information contributes to the development of targeted early intervention to alter the development of anxiety.

**References:**


Title: Predicting Quality of Life of Adults With Autism Spectrum Disorder

Jinkuk Hong, Marsha Mailick, Leann E. Smith, Jan S. Greenberg, University of Wisconsin-Madison

Introduction: The construct of quality of life (QoL), subjective measures of health and wellness of individuals, represents a multidimensional outcome that has been widely used for various populations. QoL provides a comprehensive perspective to understand how satisfied adults with autism spectrum disorder (ASD) are in various domains of their life, and complements a unidimensional approach to understanding outcomes during adulthood. In this study, we examined investigated determinants of QoL for adults with ASD as well as congruence between adults perceptions of QoL and the perceptions of their mothers.

Methods: To measure how both mothers and their adult child with ASD assess adults' quality of life, the World Health Organization Quality of Life Instrument, Abbreviated Version (WHOQOL-BREF) were collected from 196 mothers (aged from 47 to 95) of adult child with ASD, and 67 adults with ASD (aged from 24 to 55). Four domains of BREF QoL - physical health, psychological health, social relationships, and environment - were compared among mothers' reports, mothers' proxy reports for their adult child with ASD, and reports of adults with ASD themselves. Further, using regression analyses, we explored the extent to which maternal characteristics (depression, expressed emotion) and adult's characteristics (age, gender, level of independence in activities of daily living) predict each domain of BREF quality of life of adults with ASD.

Results: Overall, both mothers of adult children with ASD and adults themselves rated the quality of life of adults with ASD fairly well, comparable to or higher than reported studies of individuals with similar disabilities. Mothers' proxy reports of adult child's QoL and adults' own reports showed varying degrees of correlations, ranging from .38 (psychological health) to .70 (physical health). Correlation analysis showed that in addition to adaptive behavior of adults with ASD, mothers' psychological distress, executive functions, and expressed emotion were related with adults' rating of their own quality of life, correlations ranging from .26 to .43 (p < .05).

Results of regression analysis suggest that, for mothers' own assessment and their proxy assessment of their adult child with ASD, maternal depression and expressed emotion (criticism) were significant correlates (p < .05) for all four domains of BREF. Adults' level of independence in activities of daily living was also a significant predictor of BREF domains. However, none of these variables were significantly associated with BREF domains of adult's own assessment of their QoL (p > .05).

Discussion: We have found that both mothers and their adult child with ASD rated quality of life of adults with ASD relatively satisfactory. We also found that maternal well-being and executive function were associated with adults own rating of their quality of life. Methodologically, this finding warrants further investigation for measuring QoL, including reliability and validity of measures among this specific population. In practice, identifying the sources of satisfactory ratings of their quality of life will provide important clues for intervention to improve quality of life of individuals with ASD or similar developmental disabilities.

We also found that maternal well-being and executive function were associated with adults own rating of their quality of life.

References/Citations:

ResearchMatch: Streamlining Patient Engagement and Recruitment

Catherine Gregor, Paul Harris, Kathleen Edson, Chad Lightner, Nik Nik Hassan, Jason Tan, Leslie Boone, Vanderbilt University

Introduction: ResearchMatch launched in 2009 as the nation’s first disease-neutral, online volunteer recruitment & engagement platform. The service matches individuals interested in research with researchers looking for volunteers. Currently, over 67,000 volunteers, 2,000 researchers, and 97 institutions use ResearchMatch to streamline the connection between researchers and volunteers.

Methods: To date the system has proven itself to be an effective tool for study enrollment across a diverse field of therapeutic areas and populations, with one of the key factors in its success being the evolution of condition-specific data queries and patient engagement strategies. There are a myriad of conditions that are known to affect human health in today’s society and studying a given condition requires precise inclusion and exclusion criteria in order to identify the correct patient population. To that end, we at ResearchMatch have consulted with patients, researchers, advocacy groups, foundations, and other community stakeholders to create a condition-specific matching tool within the larger ResearchMatch system. This tool allows researchers to ask participants a series of targeted questions to help better identify a suitable match for both parties involved, thereby speeding the path to discovery.

Results: This poster describes ResearchMatch as a national pathway for patient enrollment, recruitment and retention and explains how partnering with various stakeholders can enhance collaboration between participants and researchers, often times resulting in improved outcomes for both sides. It is hoped that this will in turn help multiple diverse populations obtain access to researchers and clinical trials with the overall goal of increased education, awareness and access to research initiatives.
Cognitive-Behavioral Therapy Skills in Williams Syndrome

Nathan Dankner and Elisabeth Dykens, Vanderbilt University

Introduction: Individuals with Williams syndrome (WS) are known to be at high risk for anxiety. Cognitive-behavioral therapy (CBT) has been used to treat anxiety in typically developing populations for decades with great success, but the literature on use of CBT in ID is limited and nonexistent with regards to WS specifically. The current study sought to assess the level of certain skills thought to be crucial for success in CBT in addition to whether these skills could be learned through a training intervention.

Methods: Thirty adults with WS were assessed for level of core CBT skills at baseline. One group then received a brief training intervention adapted from previous research while the other group received a control intervention. Skill level was assessed again after the interventions were administered.

Results: As a whole, participants scored above chance on a measure distinguishing thoughts, feelings and behaviors. Qualitative analysis of a measure assessing cognitive mediation showed sophisticated understanding of this concept in some participants. There was no longitudinal effect of the intervention across groups, but a number of individuals showed improvement as a result of the CBT training intervention.

Discussion: This study indicates that at least some individuals with WS possess baseline abilities with regards to CBT skills that would allow them to participate and succeed in therapy. The null findings with regards to longitudinal learning do not necessarily indicate that individuals with WS are unable to learn or improve upon CBT skills, and may be a reflection of the brief nature of the intervention combined with the context in which it was administered (a weeklong camp setting). Future directions include collecting follow-up data in order to determine if any effects of the intervention manifested themselves at a later time.

References:


Title: Epidemiological Rates of Autism Spectrum Disorder Among Children With Intellectual and Developmental Disabilities

Bridgette L. Tonnsen, Medical University of South Carolina, University of South Carolina; Catherine C. Bradley, Medical University of South Carolina; Andrea D. Boan, Medical University of South Carolina; Amy Cohen, Medical University of South Carolina; Jane Charles, Medical University of South Carolina; Laura A. Carpenter, Medical University of South Carolina

Introduction: Characterizing the prevalence and characteristics of autism spectrum disorder (ASD) among children with intellectual disabilities (ID) is critical to implementing appropriate early treatment, particularly given the poorer psychosocial and family-related outcomes associated with comorbid ASD within ID (Totsika et al., 2011). Although previous studies suggest elevated rates of ASD within ID, the majority have examined specialized samples (e.g. clinical referrals) or participants who consented to in-person interviews or direct assessment, resulting in variable prevalence estimates across samples. In addition, due to the relatively small proportion of children who met criteria for ASD in each study, limited information is available regarding the specific demographic, psychoeducational and medical features of children with ID and comorbid ASD, with no large scale studies of ASD prevalence among children with ID in the United States. The current study addressed these needs by examining the prevalence of ASD in a population-based sample of children with ID who were identified through the South Carolina Autism and Developmental Disabilities Network (SC ADDM). The primary goals of the present study were to (1) establish ASD prevalence rates among children with ID identified through population surveillance, (2) examine longitudinal trends in these rates within ID, and (3) compare profiles of children with ID with and without ASD across demographic, psychoeducational, and medical domains.

Methods: Data were collected through SC ADDM, one of multiple surveillance sites funded by the United States Centers for Disease Control to identify children with ASD through screening and record abstraction across multiple educational and clinical venues (Van Naarden Braun et al., 2007). In South Carolina, cases were abstracted if any ASD symptoms or related behaviors were noted in their record, with or without a formal ASD diagnosis, or if the child’s IQ score was 70 or lower. These methods incorporate both previous diagnoses of ASD and undiagnosed cases that are identified by expert clinicians using DSM-IV criteria (interrater reliability = 90%).

Results: Between 2002 and 2008, 1,818 8-year-old children were identified with ID (IQ<70) through SC-ADDM. Preliminary analyses indicate 38% of these children also met DSM-IV criteria for ASD. Higher prevalence rates were observed among males, children with lower intellectual abilities, and children with low birth weight. Final analyses will examine longitudinal trends in ASD prevalence rates within ID, as well as demographic and psychoeducational features associated with comorbid diagnoses.

Discussion: The present study is the first large-scale domestic surveillance of ASD among children with ID. In addition to documenting the relative risk for ASD among children with ID, our results will inform longitudinal trends in ASD prevalence and phenotypic features that predict elevated risk. This work is critical to informing public health programs that facilitate timely, accurate, and effective diagnoses and treatment for the over 5 million estimated children with ID in the United States.

Key References:


Funding: This work was supported by the Centers for Disease Control and Prevention, Enhancing Public Health Surveillance of Autism Spectrum Disorders and Other Developmental Disabilities through the Autism and Developmental Disabilities Monitoring (ADDM) Network.
Introduction: Although parents may recognize some symptoms of an Autism Spectrum Disorder (ASD) early in their child's life, many children receive a diagnosis other than ASD when first evaluated by a professional. The purpose of this study was to examine the relationship between the first parental concerns and the initial diagnosis of children who were eventually diagnosed with an ASD.

Method: Participants included 172 children (85% Male, 15% Female; 61.4% Hispanic, 21.6% White, 17.1% Other) from a large ethnically diverse urban area who were involved in a larger study regarding factors related to ASD prevalence. According to parent report, all children in the sample were eventually diagnosed with an ASD. During parental interviews when the participants were between three and nine years of age, researchers asked for information about the initial diagnosis of the participants as well as the initial concerns that the parents had about their children that caused them to seek a professional.

Results: The initial diagnosis for approximately 67% of the sample was an ASD. The initial diagnoses for the remainder of the participants included Speech/Language Delays (15.1%), Socio-Communicative Disorder (5.8%), General Developmental Delay (3.4%), ADHD (1.2%), Intellectual Disabilities (2.3%), and Other Issues (5.2%). Of the portion of the sample initially diagnosed with an ASD, nearly half (48.7%) reported multiple areas of concern by parental report, with another 22.6% reporting concerns related to Impairments in Communication. Parents, whose children were initially diagnosed with Speech/Language Delays and then eventually diagnosed with an ASD, also reported multiple concerns (57.7%) and concerns specific to Impairments in Communication (23.1%) as most common. On average, parents first noticed developmental concerns when their children were less than twenty four months; however, the average age for initial diagnosis was 53 months.

Discussion: While many parents reported multiple concerns, the results indicate that the area of concern most commonly present on its own in children eventually diagnosed with an ASD is Impairments in Communication. This supports previous evidence related to early symptoms of ASD. Further analyses of age at first concern, age of initial diagnosis and area of concern when multiple concerns were reported will also be presented to examine the most frequent and co-occurring concerns within this population. Implications for early identification will also be discussed.
Title: Identifying Functional Behavioral Phenotypes of Problem Behavior in Genetic Syndromes.

Ashley Robinson, Patricia Kurtz, Louis Hagopian, Kennedy Krieger Institute, Johns Hopkins University School of Medicine

Introduction: A range of literature suggests individual topographies of problem behavior are more common in specific genetic syndromes when compared to others. While a plethora of research exists on behavioral phenotypes of genetic syndromes, little is known about the role of phenotype-environmental interactions in the development and trajectory of problem behavior. A literature review conducted by Tunnicliffe and Oliver (2011) examined environmental influences on problem behaviors specific to behavioral phenotypes of genetic syndromes and showed that exogenous factors affected phenotypic problem behavior across a number of syndromes. With the growing reliance on medication to treat phenotypic problem behaviors in genetic syndromes, a more systematic review of the operant properties of these behaviors, in addition to an examination of successful behavioral treatments, is warranted. The purpose of the current study is to look collectively at a large number of cases in an attempt to identify functional behavioral phenotypes through functional assessment and treatment of problem behavior in individuals with Fragile X Syndrome (FXS), Down Syndrome (DS), Cornelia de Lange Syndrome (CDLS), and Rett Syndrome (RS).

Methods: The present study included data for 68 individuals (46 male, 22 female) between the ages of 2.9 and 38.2 years (M = 12.74; SD = 6.55). All participants received either inpatient or outpatient services for the assessment and treatment of severe problem behavior and were diagnosed with FXS (n = 11), DS (n = 39), CDLS (n = 11), or RS (n = 7). Behavioral assessments, including preference assessments and functional analyses, were conducted and results categorized. Data were also collected on components of final treatment packages and percent reduction of problem behavior, an indicator of treatment success.

Results: Preliminary findings suggest patterns in topography of problem behavior and function of problem behavior specific to behavioral phenotypes of genetic syndromes. Further, behavioral treatments resulted in a significant reduction of phenotypic problem behavior in a large percentage of cases. A comparison of the findings within and across genetic disorders will be presented in addition to assessment and treatment graphs.

Discussion: The results of this study highlight the importance of clarifying functional behavioral phenotypes of genetic syndromes in an effort to better understand the operant properties of phenotypic problem behavior. Our findings show that behavior that is phenotypic in nature can be significantly reduced through the implementation of behavioral interventions, providing support for targeted interventions that extend beyond prescribed medication. Further, connections will be drawn between characteristics of genetic syndromes and findings from the current study in an attempt to explain the relationship between environmental consequences and the occurrence of phenotypic problem behavior. Implications for interventions and directions for future research will be discussed.

References:

Title: Topographies of Self-Injurious Behavior and Stereotypy in Young Children With and Without Global Developmental Delays

Adele F. Dimian, University of Minnesota; William E. MacLean, University of Wisconsin Waisman Center; Raymond T. Tervo, Mayo Clinic; Frank J. Symons, University of Minnesota

Introduction: Self-injurious behavior (SIB) and stereotypy occur frequently among children and adults with intellectual/developmental disabilities and pose significant challenges for families and can be difficult to treat. Attention is increasingly directed toward understanding the development of SIB and stereotypy in early childhood. Recent studies have focused primarily on the overall prevalence of SIB and stereotypy in very young children with developmental delay without regard to the specific topographies exhibited (e.g., MacLean, Tervo, Hoch, Tervo, & Symons, 2010). The purpose of this study was to compare topographies of SIB and stereotypy using the Repetitive Behavior Scale - Revised (RBS-R) across samples of young children with and without global developmental delay (GDD).

Methods: Parents completed the RBS-R for their children between the ages of 13 and 81 months. Children with GDD (n = 78, mean age = 39.32 months, sd = 13.17 months, male = 74%) were recruited from a neurodevelopmental clinic while the typically developing (TYP) children were recruited from a university child care center (n=49, mean age = 36.51 months, sd = 14.69 months, male = 61%).

Results: Overall, 52.56% of parents for the GDD sample and 28.57% of parents of TYP children endorsed at least one item (score greater than 0) on the RBS-R SIB subscale. For the stereotypy subscale, the frequencies were 83.33% and 42.86% for the GDD and TYP groups, respectively. The GDD group had significantly higher RBS-R scores than the TYP group for every SIB and stereotyped behavior subscale item (all p's < .05). For SIB, 'hits self against surface/object yielded the greatest absolute difference between the two groups while the 'sensory' item produced the largest difference among the stereotypy subscale items. Cross-sectional data analyses based on four chronological age groupings (13-24, 25-36, 37-48, and > 48 months) revealed that differences between the two groups were relatively small until 37-48 months of age. At that point, the groups diverged with greater mean scores for the children with GDD for both SIB and stereotypy; whereas scores decreased for the TYP group. It was noteworthy that 'bites self' was not reported for any children in the TYP group - a behavior that became increasingly evident among older children in the GDD group.

Discussion: Inclusion of a group of typically developing children provided important information regarding the occurrence of SIB and stereotypy in early childhood and indicated that nearly all topographies were evident among children with and without GDD. However, differences in severity of the various topographies of SIB and stereotypy were evident with more severe ratings associated with the GDD group. Better understanding of the emergence and trajectory of repetitive behaviors in both typical and atypical development is needed to inform early detection and intervention.

Reference:


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Title: Classifying Sensory Patterns in a Community Based Sample

Lauren Little, Evan Dean, Winnie Dunn, University of Kansas Medical Center

Introduction: Although recent research has focused on sensory subtypes in autism spectrum disorder (ASD) (e.g., Ausderau et al., 2014; Lane et al., 2014), children with other developmental disabilities and those with typical development also display variability in sensory features (Dunn, 2014). If we can uncover the extent to which sensory features may classify children in a community based sample that includes children with and without disabilities, we may have a better understanding of sensory features in the larger population, which can inform our understanding about sensory features across diagnoses. Therefore, this study addressed the following research questions:

1. What are the sensory subgroups present in a large community based sample, including children with developmental and intellectual disabilities as well as typical development?

2. To what extent do sensory subgroups differ by child characteristics (i.e., diagnosis, chronological age) within a community based sample?

Methods: This study included n=1092 children ages 3-14 years (n=764 typically developing; n=102 ASD; n=85 ADHD; n=42 LD; n=99 other). We measured sensory processing patterns (i.e., sensitivity, avoidance, registration, seeking) using the Sensory Profile-2nd Edition (Dunn, 2014). We used latent class analysis in Mplus (Muthen & Muthen, 2009) to determine the number of latent classes. We used ANOVA to determine the extent to which latent classes differed on age and chi-square test to investigate the diagnostic groups within each subtype.

Results: Latent class analysis results showed that a four class model was the best fit for the data (BIC=5950.42; Entropy=.919). Class 1 (slightly heightened sensory experiences) is characterized by sensory processing scores (sensitivity, avoidance, registration, seeking) within 1 SD of the mean; while Class 2 (expected sensory experiences) shows all scores near the mean. Class 3 (heightened sensory experiences) showed all sensory processing scores close to 2 SD above the mean, while Class 4 (decreased sensory experiences) showed all scores 1.5 SD below the mean. Across classes, those with decreased sensory experiences (Class 4) were significantly older than the others (mean age=108.92 months) (p<.05). Children with typical development were found in each class, including 4% in the heightened sensory experiences group and 16% in the decreased sensory experiences group. Children with ASD, ADHD, and learning disabilities were also found across classes. Specifically, children with 43% of ASD and 39% of ADHD in the expected sensory experiences group.

Discussion: These results suggest that sensory processing patterns may be used to classify children with typical development as well as children with various conditions. Sensory classification with children across diagnostic categories increases insights about the variability of sensory features across child development. By understanding sensory classifications, we create opportunities for tailored treatment approaches that allow intervention to support individualized sensory patterns within participation versus other approaches (e.g., focus on cognition).

References:


Title: Sensory Subtypes in Preschool-Aged Children With Autism

Scott Tomchek, University of Louisville, University of Kansas Medical Center; Lauren Little, University of Kansas Medical Center; Winnie Dunn, University of Kansas Medical Center

Introduction: Research suggests that sensory processing differences can help identify clinically meaningful subtypes, or distinct profiles, of children with ASD. Although previous studies have used the Short Sensory Profile to determine subtypes in ASD, a recent study found that the factor structure of the measure includes a hyporesponsiveness factor in children with ASD (Tomchek et al., 2014). Given the hyporesponsiveness is highly prevalent in children with ASD (e.g., Ben-Sasson et al., 2009), this factor needs to be considered in subtyping efforts. Studies have investigated sensory subtypes across a wide age range and have not considered other child characteristics in the analysis (Lane et al., 2014).

The inclusion of child characteristics (i.e., communication and adaptive behavior) along with sensory processing patterns in a subtyping analysis may allow for a broader understanding of subtypes in ASD. Therefore, we addressed the following research questions:

1. What are the subtypes in a sample of young children with ASD aged 3-6 years as measured by sensory processing, communication, and adaptive behavior?

2. To what extent do unique subtypes significantly differ with regard to child characteristics (i.e., sensory processing, adaptive behavior, communication)?

Methods: Participants included 400 children 3-6 years (mean=49.57 mos.; SD=10.5 mos.). Data was collected from children referred for evaluation received comprehensive evaluations at a university affiliated tertiary diagnostic center. A Latent Profile Analysis was run to develop a model of groups of subjects who clustered on these variables. The Short Sensory Profile (McIntosh et al., 1999) was used as the measure of sensory processing. Additional domain specific developmental measures were used to assess performance in adaptive and communication abilities.

Results: The four profile solution was supported (BIC=5672.7; Entropy=.78). Subtype 3 had the largest number of children (n=200) was characterized by young age, increased hyporesponsiveness, and limited language. A slightly older subtype 2 (n=42) was characterized by increased adaptive skills, high levels of language and high sensitivity. Subtype 1 (n=63) showed increased sensory pattern scores, and they were less adaptive. Lastly, subtype 4 (n=94) was young, showed minimal sensory features, and had high adaptive skills. The four subtypes significantly differed from one another on receptive and expressive language (all p<.05) as well as adaptive behavior (all p<.01), with the exception of subtypes 1 and 3 that did not differ from one another.

Discussion: Distinct subtypes in the current study were defined by sensory processing, age, and developmental performance. These findings have relevance to the variable presentation of individuals with an ASD and allow for interpretation of phenotypes that include sensory patterns with other child characteristics. These phenotypes likely have implications for assessment and intervention. Additionally, findings may have implications for research studies investigating the etiology of ASDs and the variable responding of individuals to intervention programs.

References:


**Introduction:** Fragile X syndrome (FXS) is the most common inherited genetic cause of intellectual disability and the primary known genetic cause of autism spectrum disorders (ASD). FXS is characterized by problems modulating social and emotional behaviors, particularly during periods of stress. Elevated baseline and suppressed hypothalamus-pituitary-adrenal axis (HPAA) regulatory responses are correlated with social and emotional dysfunction in FXS with the most frequent impairments presenting as extreme shyness, social withdrawal, social anxiety and ASD. The HPAA is clearly documented to measure stress response systems through secretion of cortisol (Foley & Kirschbaum, 2010). Cortisol salivary markers allow for examination of underlying physiological mechanisms of stress response and allow for within and across group comparisons. The purpose of this study was to compare cortisol indices of baseline and stress response regulation in children with FXS (ASD ruled out) and children who are typically developing (TD), along with a subsample of children with idiopathic ASD (non-FXS), from 9 to 36 months of age. Identifying physiological trajectories may inform targets for interventions particularly in children with FXS or idiopathic ASD.

**Methods:** This sample represents findings from participants at 9, 12, 24 and 36 months of age from a larger ongoing study on the emergence of ASD--from whom we have preliminary data--and a past longitudinal study on early development and family adaptation in FXS. Participants included children with FXS (n=36, 71% male) and who are TD (n=48, 60% male) along with a subsample with idiopathic ASD (n=10, 90% male). All children with ASD scored positive on the Autism Diagnostic Observation Schedule, Second Edition at 24 months of age. Cortisol stress levels were measured in three conditions: a pre-assessment baseline, a post-assessment reactivity, and the change between baseline and reactivity. Cortisol levels were analyzed by radioimmoassay and log transformed for normality.

**Results:** Preliminary analyses indicate that children with FXS under the age of 12 months had significantly higher baseline cortisol levels compared to TD same age peers (9mo t(1, 36)=2.17, p<.05; 12mo t(1, 36)=3.73, p<.05). Significant differences in baseline and change cortisol levels were not evident between children with FXS and TD between 12 to 36 months of age. Although at 36 months, children with FXS were approaching significantly higher baseline levels compared to TD peers (36mo t(1, 16)=2.01, p=.05). The subsample of ASD-only participants had significantly lower baseline rates than children with FXS and TD at 9 months (F[2, 29]=8.94, p<.01, eta2=.38), and they had lower rates than children with FXS at 12 months (F[2, 43]=3.73, p<.05, eta2=.22). Growth modeling will be presented to examine the trajectory of stress responses from infancy to early childhood. We will also include additional samples and participants to examine difference in stress response in children with FXS-only and FXS+ASD.

**Discussion:** These findings suggest developmental trajectories of salivary cortisol vary by age and group with children who have FXS presenting higher initial stress response patterns at 9 months of age with attenuation at 12 months of age and a potential return to elevation around 3 years of age. In contrast, children with ASD-only demonstrated reduced initial stress response compared TD children at 9months and were also significantly lower than FXS at 9 and 12 months. These preliminary findings add and extend upon prior research to focus on infancy and HPA activation across relevant groups.

**References:**

Title: Raising Expectations for Life After High School: Learning from Parents about What Matters Most

Carly L. Blustein, Vanderbilt University

Introduction: Expanding access to meaningful employment has been a long-standing emphasis of policy and legislative initiatives focused on youth and young adults with disabilities. Indeed, improving employment outcomes was a central feature of early conceptualizations of transition and special education. Although frameworks for high-quality transition services and supports have evolved over the last 25 years, equipping youth to secure a good job in their community after high school or college has endured as an essential outcome of education in the United States. Yet most available indicators suggest that a relatively small proportion of youth and adults with intellectual disability and autism nationally access paid work employment in their local communities or attend postsecondary programs.

The expectations of families have a powerful influence on the post-school aspirations and outcomes of young people with intellectual and developmental disabilities. Recognizing that parent expectations are among the most prominent predictors of employment and postsecondary educational outcomes for people with IDD (Carter, Austin, & Trainor, 2012; Doren, Gau, & Lindstrom, 2012), my team and I launched a large-scale project to understand the expectations parents hold related to competitive employment, college, and other community outcomes; the student-, family-, and community-level factors that shape those expectations; and the avenues through which parents recommend we equip them to pursue inclusive experiences for their sons and daughters with IDD. This project is novel in its focus on understanding (a) how parent expectations might evolve from early childhood through adulthood, and (b) the various factors that might shape those expectations.

Method: As part of TennesseeWorks, a systems-change grant based in the Vanderbilt Kennedy Center focusing on increasing employment outcomes for young adults with IDD, under the guidance of principal investigator (PI) Dr. Erik Carter, I crafted a survey of seven sections (i.e., five measures and two demographic sections) with approximately 80 multiple choice and short-response items. In January 2014, I began recruiting parents to complete a series of measures addressing (a) demographic and background information about their son or daughter with IDD; (b) parent expectations for work, college, and residential inclusion for their son or daughter; (c) employment-related preferences and perceived barriers; (d) prior career preparation experiences; (e) parent familiarity with available resources and programs; and (f) parent views on the need for targeted resources and desired venues for accessing this information. I recruited parents whose sons and daughters are reflective of diverse geographic locales, disability categories (ID, autism), and ages (birth to late adulthood). Our final recruitment efforts yielded a sample of more than 2,000 respondents (N=2,288).

Results/Discussion: The recruitment window closed in September 2014, so I am still in the early stages of data analysis at the time of the proposal and will have more robust findings by the conference date. However, preliminary analyses have already provided tremendous insight regarding the extent to which school and community factors play an integral role in shaping the importance and perceived likelihood of postsecondary outcomes for their children with IDD. Additionally, I will share how this information can inform resource development, professional development offerings, policy revisions, and guide the work of researchers, schools, and community agencies.

References/Citations:


Title: An Opportunity and Need to Treat Maternal Depressive Symptoms in Early Intervention Programs

Maria Martinez, University of North Carolina-Chapel Hill; Samantha Meltzer-Brody, University of North Carolina-Chapel Hill; Marcia Mandel, Early Intervention Branch, Women’s and Children’s Health Section, Division of Public Health, Department of Health and Human Services; Anne Wheeler, RTI International; Grace Hubbard, University of North Carolina-Chapel Hill; Roger Mills-Koonce, University of North Carolina- Greensboro; Todd Schwartz, University of North Carolina-Chapel Hill; Yui Matsuda, University of North Carolina-Chapel Hill; Anne McKechnie, University of North Carolina-Chapel Hill; Dore LaForett, University of North Carolina-Chapel Hill

Objective and Methods: The prevalence of maternal depressive symptoms and Major Depressive Disorder (MDD), known barriers in the uptake of services, is presented for a sample of mothers with children enrolled in EI services due to developmental delays and/or emerging autism spectrum disorders. Characteristics associated with depressive symptoms and receptiveness to intervention were examined. 106 mother-child dyads receiving EI services in a southeastern US county participated in the study. Parents completed consent and interview procedures in their dominant language (82% in English and 18% in Spanish).

Results: The majority (71%) of participants had a male child receiving EI services. Thirty-six percent of the sample endorsed clinically significant depressive symptoms (CES-D mean = 13.90, SD = 11.89, range = 0-48) with 20% meeting diagnostic criteria for current Major Depressive Disorder (MDD), whereas 44% met full criteria for a past major depressive episode. Suicidal ideation was also higher than expected compared to population norms. Parenting stress was high and self-efficacy ratings were low compared to the general population. We found maternal depression severity (CES-D) was significantly associated with clinically meaningful child social-emotional/behavioral problem scores as measured with the Brief Infant-Toddler Social and Emotional Assessment (BITSEA) (r = .46, p<.01). Participants endorsed high receptivity to an intervention nested within EI services.

Discussion: This novel study found a high prevalence of depressive symptoms among mothers of children receiving EI services. Elevated depression symptoms coupled by chronic stress and inadequate support place families at high risk for low uptake of EI services. Depression intervention as part of EI is needed, well received by parents, and will improve uptake of services as well as child outcomes.

Key References:


IAN Research: Parental Depression History: Report October 2008
http://www.iancommunity.org/cs/ian_research_reports/ian_research_report_oct_2008


Title: Lateral Preference in Williams-Beuren Syndrome Is Associated With Cognition and Language

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Introduction: Williams-Beuren syndrome (WBS) is a neurodevelopmental disorder presenting with intellectual disability associated to a specific neurocognitive profile caused by a heterozygous deletion of 26-28 genes in chromosomal band 7q11.23. Functional lateralization happens in paired organs of the body, including hands, legs, eyes and ears, being represented in the cerebral hemispheres. Lateral preference refers to the skewed use of one side of the body over the other. In WBS, a high prevalence of left-handedness and an association between mixed handedness and cognition has been reported. The aim of this study was to further explore lateral preference in WBS individuals and its putative association with cognition, psychopathology and the three main domains of the WBS neurobehavioral profile: sociability, visuo-spatial skills and language. We also explored possible correlations with some molecular variants, including deletion size and parental origin of the deleted chromosome

Method: Subjects were 69 individuals (40 males and 29 females, age range 5 to 47 years old) with WBS confirmed by molecular testing. Lateral preference (hand, foot, eye and ear) was measured in situ with several instruments. Wechsler intelligence scales were used for IQ. A battery of tests and parental interviews assessed other neurobehavioral features: sociability (Adolphs’ approachability task), visuospatial construction (Rey Osterrieth Complex Figure), narrative skills (wordless picture book Frog where are you?) and behavior (Child Behavior Checklist). Molecular genetic analyses in all the subjects were completed as previously reported [28].

Results: 55% of the subjects showed right-handedness, while 26% showed left hand preference and 19% showed mixed preference in hand use. The proportion of subjects with left preference increased when we measured foot, ear and eye laterality. Left preference for foot and eye was present in 32% of subjects, whereas ear left preference was present in 37%. Mixed lateral preference was 19% for foot and hand preference and decreased for ear and eye preference. Only 26.5% of the subjects evaluated showed homogeneous laterality of hand, foot, ear and eye, being right preference the most common. We found significant correlation between handedness (p=0.003), footedness (p=0.002), and earedness (p=0.029), but no significant for eyedness (p=0.133), with general IQ. As with general IQ, consistent lateral preference showed significantly higher scores in VIQ than mixed lateral preference in the same three groups: handedness (p=0.006), footedness (p=0.001) and earedness (p=0.009).

We analyzed the possible association with the three main domains of the behavioral phenotype of the syndrome; sociability, visuo-spatial skills and language (table 4). No significant differences between groups (consistent or mixed laterality) were found in any of the task for each lateral preference except for the narrative task. Subjects with consistent handedness (right or left) performed better in the narrative task than subjects with mixed handedness (p=0.029).

We did not find any significant difference among the groups classified by molecular variants (deletion size and parental origin of the deletion) with respect to lateral preference.

Discussion: Our results indicate that laterality is poorly defined in a significant proportion of WBS individuals, as reported in other neurodevelopmental disorders, and reinforce the idea that strength in hand preference is related to language. Theoretical implications will be discussed.

This work was supported by grants from the Fondo de Investigación Sanitaria (FIS) (PI10/02512 & PI13/02481), the European Commission (Aneuploidy project) and the Generalitat de Catalunya (SGR09/1274). Débora Pérez-Garcia is supported by a FIS predoctoral fellowship (FI11/00656).

C. Holley Pitts, Carolyn B. Mervis, Jill L. Adelson, University of Louisville

Introduction: The Expressive Vocabulary Test-2nd Edition (EVT-2; Williams, 2007) measures expressive single-word vocabulary. In the present study, we focused on the performance of a longitudinal sample of children with genetically-confirmed classic-length WS deletions aged 4 - 17 years. Multilevel modeling was used to address the longitudinal stability of EVT-2 SS. Possible sex differences and effects of maternal education level and child nonverbal reasoning abilities were considered.

Method: 64 children (36 girls, 28 boys) completed the EVT-2 4 to 8 times (M: 5.13) over a mean of 4.83 years. Mean chronological age (CA) at first assessment was 6.92 years (range: 4.01 - 14.26). CA was centered on the rounded grand mean of 9 years (M: 9.45). 50 of the children's mothers had a bachelor degree; 14 mothers did not. Nonverbal reasoning abilities were measured by the Kaufman Brief Intelligence Test-2 Nonverbal (NV) standard score (SS). For each child, mean NV SS across assessments was computed. Mean NV SS was centered on the rounded grand mean of 85 (M: 85.26, SD: 11.50, range: 53.71 - 110.57). EVT-2 SS was centered on the general-population mean of 100 (SD: 15, range: 20 - 160).

Unconditional Quadratic Model Results: EVT-2 SS was modeled as a function of CA, and the best fitting model of the change over time was quadratic rather than linear. The estimated mean intercept of -15.93 was significant (p < .001), indicating that the predicted SS of 84.07 at 9 years was significantly lower than the general-population mean of 100. The instantaneous growth rate (-0.90) was significantly negative (p < .001). The curvature parameter (0.07) was significantly positive (p = .01). The growth rate of EVT-2 SS varied across time with an overall decline and positive acceleration. For a child of average growth, EVT-2 SS was 90 at age 4 years, 84 at 9 years (intercept), and 81 at age 17 years. The instantaneous growth rate varied across individuals; some children had an increasing growth and some had a decreasing growth at age 9 (p = .04). The curvature parameter did not vary across individuals (p = .32).

Level-2 Model Results: Sex, maternal education, and mean NV SS were included as level-2 predictors of the intercept and slopes. Significant predictors (maternal education, mean NV SS) were retained within the intercept, producing the best model fit. No significant predictors were detected for the instantaneous growth slope (ps ≥ .18) or curvature parameter (ps ≥ .53). Mean NV SS was significantly related to the intercept (p < .001). A 1-point increase in mean NV SS yielded an average increase of 0.72 points for age 9 EVT-2 SS, after controlling for maternal education. Maternal education also was a significant predictor of the intercept (p = .017). A child whose mother had a bachelor degree had a predicted age 9 EVT-2 SS that was 5.12 points higher than a child whose mother did not, after controlling for mean NV SS. For a child with mean NV SS of 85, predicted age 9 EVT-2 SS was 85 for a child whose mother had a bachelor degree and 80 for a child whose mother did not. 62% of between-person variability in the intercept was explained by maternal education and mean NV SS. However, there was significant residual variability in the individual intercepts (p <.001).

Summary and Discussion: On average, EVT-2 SS declined 9 points from age 4 - 17 years. However, there were significant individual differences in the intercept and instantaneous growth slope. Maternal education and nonverbal reasoning abilities were significantly related to the intercept. Implications of these findings will be considered.

Funding: NICHD grant #R37 HD29957 and NINDS grant #R01 NS35102.
Introduction: Individuals with Autism Spectrum Disorders (ASD) have a primary impairment in social functioning that has been shown to manifest in early infancy with reduced eye contact, atypical gaze behaviors, and atypical attention disengagement (Elsabbagh, 2013). Social gaze is important for early development because of its role in establishing social engagement and the formation of attachment relationships. Infants with fragile X syndrome are at high risk for developing ASD, as are infants with an older sibling with a diagnosis of ASD. Investigating these early deficits in visual attention in infants at high risk for ASD can help characterize the infant phenotype of FXS, its relationship to autism symptomology, and to help develop targeted early interventions. Our primary research question focused on the prediction of ASD symptoms at 24 months based on visual attention regulation at 12 months and its distinctness across groups at high risk for ASD.

Methods: Participants included 3 groups of 12-month-old males: 1) FXS (n=23), 2) those with an older sibling with autism (ASIBs; n=20), and 3) typically developing infants (n=25). The Laboratory Temperament Assessment Battery (LabTAB) was used to measure attention to social (mother/examiner) and nonsocial stimuli (toy) and the latency to disengage. The experiment was videotaped and coded with a kappa of > 0.80 in Observer XT 10.5. Autism symptoms were assessed with the Childhood Autism Rating Scale at 24 months of age (CARS) given our focus on ASD symptoms and not ASD diagnostic categorization. Additionally, the Autism Diagnostic Observation Scale, Toddler Module (ADOS-T) was obtained in a subset of individuals and will be utilized in the final presentation to further examine the relationship of attention to autism symptoms. Finally, the Mullen Scales of Early Learning will be pulled in to examine how developmental levels between FXS and ASIBs impacts the results and differentiates the two groups.

Results: Infants with FXS and ASIBs both directed their attention more to the non-social stimulus than to the social stimulus compared to TD infants. (F(1,66)=13.41, t=3.66, p<0.01). There were no significant group differences between the FXS and ASIBs (p>0.05). Additionally, infants with FXS and ASIBs took significantly longer to disengage from the non-social stimulus compared to the TD infants (F(1,65)=4.97, t=-2.23, p=0.03) with no significant group differences found between FXS and ASIBs (p>0.05). Latency to disengage at 12 months was not related to autism symptomology at 24 months in either FXS or ASIBs (p>0.05). Individual group analyses for FXS and ASIBs were conducted to examine how autism symptomology predicts attention within each group. For infants with FXS the model of autism symptomology predicting attention to the non-social stimuli was approaching significance (F(1,18)=4.27, p=0.053, R2=0.14). In contrast, for ASIBs, autism symptomology was not a significant predictor of attention to the non-social stimuli (p>0.05).

Discussion: Results suggest that 12 month infants with FXS and ASIBs, both at high-risk for ASD, direct their attention more towards a non-social stimulus and take longer to disengage attention from the non-social stimulus compared to TD infants. However, infants with FXS and ASIBs were not distinguishable highlighting the potential overlap in behavioral features presumably rooted in ASD mechanisms. When examining both FXS and ASIB attention individually in relation to autism symptomology at 24 months, we found trends showing that early attention in infants with FXS predicts autism symptomology at 24 months, whereas this relationship did not appear in our ASIB infants.
Title: Protective Factors of Support, Coping, and Positive Perceptions for Mothers of Children With Intellectual and Developmental Disabilities

Elizabeth Halstead, Bangor University; Gemma Griffith, Bangor University; Richard Hastings, Warwick University

Background: Psychological protective factors and risk factors are thought to be important in understanding wellbeing in parents of children with intellectual and developmental disabilities (IDD) (Olsson and Hwang 2008). Child behaviour problems and coping are considered predictors of wellbeing in parents of children with IDD (King et al.1999; Saxby & Morgan, 1993). Dunn et al. (2001) states the relationship between stressors and negative outcomes is moderated by social support and coping styles. Furthermore, the level of support experienced by mothers of children with IDD has a moderating effect on the relationship between child behavioural problems and parental stress levels (Plant and Sanders, 2007). As negative parental outcomes have been explored in previous literature, this study aims to investigate the relationship between child behaviour and positive parental outcomes with moderating protective factors, such as support, coping and positive emotions.

Method: Participants included 136 mothers (mean 39.42 years) of school aged children with IDD, who participated in a larger survey (Hastings et al. 2005). Families were recruited through Special Educational Needs schools (North Wales and North West England). The children with IDD (mean 10.04 years) included diagnostic labels of ASD/Asperger’s (n=57 children), Down’s syndrome (n=25), cerebral palsy (n=16), ADHD (n=8), and other IDD (n=50). Measures included a demographic questionnaire, measures of child behaviour, parental coping, support, positive perceptions and positive/negative individual parental outcomes (e.g. anxiety, life satisfaction).

Results: Following preliminary analysis of correlations, a moderated multiple regression analysis was conducted. A significant relationship was found between reported challenging child behaviour and positive emotions in mothers (b=-.01, 95% CI [-.00, 01], t=2.00, p<.05) and between reported challenging child behaviour and life satisfaction in mothers (b=-.01, 95% CI [-.00,02], t=2.30, p<.05), when support is a moderator. Problem based coping and wishful thinking coping, along with positive perceptions, were not significant. A simple slope analysis explored the significant interactions (Aikin and West, 1991).

Discussion: This study suggests social support acts as a protective factor between child behavioural problems and positive outcomes in mothers of children with IDD. This relationship differed depending on social support level, for example it was found that when social support is low, as child behaviour problems increase, positive emotions and life satisfaction in mothers decreased. When support was high this relationship was not significant. Contradictory to previous literature, coping and positive perceptions were not protective factors. Future research could explore differences between mothers and fathers in families and how protective factors contribute to adaptation over time.

References:


**Title:** A Study of Developmental Disabilities Using Linked Population-Based Health and Education Records from Birth to 10 Years

Veronica Smith, University of Alberta; Anat Zaidman-Zait, University of Tel Aviv; Bozena Zdaniuk, University of British Columbia; Mari Pighini, University of British Columbia

Among the challenges to behavioral scientists conducting research in intellectual and related developmental conditions are small sample sizes, the difficulty in recruiting prior to diagnosis (e.g., autism spectrum disorders), and the lack of socio-demographic and cultural heterogeneity of the samples. One solution to these challenges is to conduct population-based studies using linked administrative databases, including birth, medical, and educational records. The present study comes from an ongoing project comparing the health, developmental, and educational trajectories of children within the same birth cohort whose health and educational records were linked. The paper describes the birth and medical related characteristics of the children, the socio-demographic characteristics of the birth mother, and educational outcomes to the fourth grade.

**Method:** In the universal health care system of British Columbia, Canada, health data on all citizens are entered into the BC Linked Health Database (BCLHD) and identified through a random number individually matched to the personal health number (PHN) in order to maintain individual anonymity and confidentiality. Files were made accessible to the research team for data on the 1996/97 two-year birth cohort, matched across the BCLHD, educational (EduData), and the Vital Statistics data bases by year/month birth date, gender and three-digit postal code. The final inclusion criterion was for children to be continuously registered with the Medical Services Plan (MSP) between 1996/7 and 2004, yielding a final longitudinal cohort of 71,698. The following four cohorts were identified by using the International Classification of Diseases, 9th Revision (ICD-9): autism (n = 338), attention disorders (n = 2004), intellectual disability (n = 171), developmental delay (n = 3272) and no diagnosis (n = 65,913). Those with a diagnosis received it in the first 7 years of life.

**Results:** A number of interesting trends were revealed within the demographic data. These included: 1) slightly (but significantly - Chi Sq sig at p<.05) higher percentage of Neonatal Intensive Care (NICU) children than non-NICU children across all disability groups in contrast to non disabled; 2) children with disabling conditions were more likely to be in the lowest socio-economic quintiles; 3) the male gender was more common in all disabling conditions with the highest proportions found in autism and disorders of attention; 4) when entering school the majority but not all of the children with disabling conditions (except disorders of attention) were also marked with "special needs status" by reporting teachers (71%); 5) the Early Development Inventory (Janus & Offord, 2007) completed by teachers at kindergarten entry found children with autism and intellectual disability less skilled than children with developmental delay and disorders of attention in the following domains of development: physical development and social competence. Emotional maturity was lowest for children with autism and language skills were lowest for children with intellectual disability; 6) foundational skill testing in grade four revealed that fewer children with disabling conditions completed the assessment, of those that did, children with autism were more likely to fall 'within expectations' in reading and writing and were more likely to achieve equivalent scores on the numeracy assessment with children without disability.

**Discussion:** These data corroborate and extend findings from other research and provide an opportunity to demonstrate the potential of the use of linked, universal data to generate detailed, longitudinal health profiles of at-risk and comparison children.

**References:**


**Title:** Predictors of ADHD and Autism Symptomatology Among Children Born Prematurely

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**Introduction:** Advances in obstetrics and neonatology over the past thirty years have led to increased survival rates for babies born prematurely and with low birth weight (Fanaroff, Hack, & Walsh, 2003; Schwartz RM, 1994; Wilson-Costello, Friedman, Minich, Fanaroff, & Hack, 2005). However, neurodevelopmental sequelae have increased concurrently (Wilson-Costello et al., 2005), as babies who previously would not have survived face serious complications. There are still relatively few studies examining what factors predict these outcomes and the findings have been mixed. This study examined the independent perinatal, demographic, and maternal predictors of child autism and ADHD symptomatology at ages 5-9 (M=6.85), which will help identify which premature babies are most at risk and therefore warrant heightened monitoring and intervention.

**Methods:** Participants included 231 mother-child dyads in which the child had been born very prematurely (<32 weeks gestation) at UAB Hospital between 1996-1999. Data at follow up was collected via psychological assessment and parent report. To identify predictors of neurodevelopmental outcomes, we ran two separate backward stepwise regressions, with Conners' ADHD Index T-score, and Social Communication raw score as continuous outcome variables. Perinatal predictors included the infant’s gestational age at delivery, birth weight whether the mother smoked while pregnant, indicated (versus spontaneous) preterm birth, chorioamnionitis, Cesarean Section, intraventricular hemorrhage grade III or IV (IVH 3/4), neonatal respiratory distress syndrome (RDS), necrotizing enterocolitis, sepsis, systemic inflammatory response syndrome (SIRS), bronchopulmonary dysplasia (BPD), chronic lung disease (CLD), and periventricular leukomalacia (PVL). Demographic predictors included the child’s race, gender, mother’s age at time of delivery, maternal marital status at delivery, family monthly income, and the mother’s education level. Maternal predictors included depressive symptomatology, stress, and symptoms of psychopathology.

**Results:** For the first analysis, the overall model explained 24% of the variance in autism symptomatology ($F(6,230)=13.24, p<.001$). Higher maternal stress ($β=.27, p<.001$) and psychopathology ($β=.17, p<.05$) were the only independent predictors of the child's symptoms of autism. The presence of a grade III or IV intraventricular hemorrhage approached significance ($β=.11, p=.056$). For the second analysis, the overall model explained 23% of the variance in ADHD symptoms ($F(6,230)=12.59, p<.001$). As with autism symptomatology, higher maternal stress ($β=.31, p<.001$) and psychopathology ($β=.23, p<.01$) both independently predicted the child’s symptoms of ADHD. Being unmarried at the time of delivery ($β=-.12, p<.05$) predicted higher ADHD symptomatology as well. Further examination of maternal stress and psychopathology in this sample revealed that 12.6% of mothers (n = 29) in the sample scored at or above the 85th percentile on the Parenting Stress Index, indicative of high levels of stress (Abidin, 1995). Only 5.2% (n = 12) of mothers reported high levels of global distress on the Symptom Checklist-90, indicative of significant psychopathology.

**Discussion:** The majority of mothers appear to fare well by the time their prematurely-born infant reaches school age. However, a subset of this population is experiencing significant stress and psychological distress, which is associated with higher levels of child autism and ADHD symptomatology. These findings indicate the need to monitor the well-being of parents of children with developmental disabilities within this sample. Additionally, it highlights the need for familial supports as a key component of intervention to promote positive outcomes for both the child and the family as a whole.
**Title:** Parenting Stress and Early Intervention

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**Introduction:** Parents of children with Autism Spectrum Disorder (ASD) experience greater parenting stress than parents of children who are typically developing (TD) and parents of children with other disabilities (Hayes & Watson, 2013). In a meta-analysis of parenting stress literature, Hayes & Watson (2013) confirmed these findings and suggested future research should attempt to explain increased parental stress in this population and identify strategies that promote family resilience. Consistent with these aims, the study detailed below investigates the relationship between parenting stress following an initial diagnosis of ASD and an early intervention program emphasizing the transactional nature of child development.

**Methods:** Through collaboration between Vanderbilt Kennedy Center’s Treatment & Research Institute for Autism Spectrum Disorders (TRIAD) and Tennessee Early Intervention System (TEIS), 60 families are receiving support services following an ASD diagnosis by TRIAD psychologists. All families participate in two home-based sessions that include consultation and training on evidence-based practices for young children with ASD. Half of these families participate in an additional 12-visit series providing education and support guided by the Early Start Denver (ESDM) Curriculum.

At pre-test, primary caregivers complete a Parenting Stress Index - Short Form (PSI/SF). Primary caregivers and clinicians complete the Clinician Global Impression (CGI) index to rate the severity of child problem behavior. Clinicians track procedural fidelity throughout treatment. All primary caregivers who participate in the two-visit series complete the PSI/SF again at the end of that series. The primary caregivers who participate in the 12-visit series (n=30) complete the PSI/SF after all 14 visits. Parents and clinicians complete the CGI to rate the severity of child problem behavior and child improvement at the end of each respective series.

When data collection of the PSI/SF is complete, initial descriptive analyses are conducted to determine the means and rates of parenting stress for all families as well as the families in each support series (two-visit and 12-visit). To assess differences between families in each group at pre-test (PSI/SF), a t-test will be conducted. Following these descriptive analyses, a t-test will be conducted to determine statistically significant differences between the support series groups at the post-test (PSI/SF). Chi-Square will also be conducted to determine if there is a difference in status on the PSI/SF (normal, borderline, or clinically significant range) depending on the support series group in which a parent participated.

**Results:** Preliminary data suggest that TRIAD consultants were able to apply the training model designed for each service (two-visit and 12-visit) with over 95% fidelity. Additional data indicate that consultants were able to cover over 90% of the ESDM curriculum across the 12 visit model, and parents were able to demonstrate over 70% of the strategies covered. Data regarding the CGI suggest that both consultants and caregivers observed minimal to moderate levels of improvement after two visits and moderate to significant levels of improvement following 12 visits. Results regarding the T-tests and Chi-Square will be presented upon completion of data collection.

**Discussion:** If the analyses reveal a difference in reported parental stress across groups, then regression equations will be computed using existing child clinical data to determine which child characteristics are associated with parent stress and parent responsiveness to intervention. This study will also highlight how centers can bank clinical data into large-scale databases to aid in clinical program evaluation.

**Key References:**


A Comparison of Post-Operative Analgesic Dosing Between Girls With Rett Syndrome and Girls With and Without Developmental Disability Undergoing Spinal Fusion Surgery

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Introduction: Individuals with Rett syndrome (RTT) live with myriad chronic health issues (e.g., seizures, scoliosis, chronic constipation, etc.) and may be at risk for having pain unrecognized and poorly managed because of severe motor and communicative impairments.1 Alternatively, there is evidence from a single case of the possibility of reduced post-operative analgesic need.2 The goal of this preliminary investigation was to compare post-operative analgesic management among a sample of girls with RTT compared to girls with and without developmental delay all of whom underwent spinal fusion surgery.

Methods: The medical records of 8 girls with Rett syndrome (mean age=13.2 years, SD=1.9), 10 girls with developmental disability (cerebral palsy [CP]; mean age=13.4 years, SD=1.8), and 10 girls without developmental disability (idiopathic scoliosis; mean age=13.4, SD=1.8) were reviewed. Data related to demographics, medication concentration and dose, route of administration, pain assessments, and level of arousal were recorded from medical records. Medication dosages were converted to control for weight and hydromorphone was converted to a morphine equivalent.

Results: The RTT sample received significantly smaller total opioid doses post-operatively (M=1.53mg/kg, SD=0.72) compared to girls without RTT (M=2.45mg/kg, SD=0.97; p=.02). The difference in total opioid doses between RTT (M=1.53mg/kg, SD=.72) and the CP group (M=2.55mg/kg, SD=1.06) was marginally significant (p<.07). The RTT group received significantly fewer opioid patient controlled analgesic (PCA) bolus doses (given by proxy; M=42.6, SD=17.8) compared to the no developmental disability sample (M=105.0, SD=53.4; p<.01). Girls with RTT also received on average smaller total doses of acetaminophen, codeine, diazepam and hydroxyzine.

Discussion: This study highlights possible discrepancies in post-operative pain management specific to girls with RTT. It is important to determine whether this discrepancy in post-operative pain management is due to differences in clinical management of girls with RTT or whether girls with RTT may have a reduced analgesic requirements.3 Further investigation is warranted to determine best practice for post-operative analgesic management.

Key References:

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