Title: “One or Three, Depends on the Patient”: Health Care Professionals’ Recommendations Regarding Alcohol Consumption During Pregnancy

Authors: Kelly D. Coons, Shelley L. Watson

Introduction: Health care professionals play a critical role in the prevention of Fetal Alcohol Spectrum Disorder (FASD), particularly through providing counselling around alcohol use and alcohol consumption during pregnancy. However, research involving families of children with FASD reveals that while a minority of families report that accessing formal support from professionals such as psychiatrists, pediatricians, and family physicians, was helpful, the majority of families feel that medical professionals lack knowledge of FASD. Despite a relatively large body of literature examining knowledge and attitudes regarding FASD internationally, limited research has examined the level of awareness of FASD held by Ontario professionals.

Methods: A secondary data analysis was conducted using data obtained from the 2001-2002 Fetal Alcohol Syndrome Survey for Health Professionals. Ontario-specific data (N=834) were used to examine the awareness of FASD held by various health care professionals (i.e., pediatricians, psychiatrists, midwives, family physicians, and obstetricians/gynecologists). Descriptive analyses and chi-square tests were performed to better understand this sample of health care professionals, as well as their knowledge, attitudes, and practices related to FASD. Participant responses to open-ended questions were also examined to better understand health care professionals' recommendations regarding alcohol consumption during pregnancy.

Results: Although 93.7% of surveyed professionals agreed that they asked all pregnant women in their care whether they were currently drinking alcohol, only 87.9% of respondents recommended complete abstinence from alcohol during pregnancy. Furthermore, only 80.5% of participants acknowledged that they discuss what their patients think "in moderation" means (e.g., a range of 3 to 13 drinks per week). While many participants condoned moderate alcohol consumption, they struggled to provide a consistent definition of what "moderation" meant. Some participants indicated that "we do not know what a moderate level is" and that they were "uncertain if any level is 'safe' at any time of pregnancy." However, other participants indicated that "occasional alcohol use" or alcohol consumption "1-2 times per week" was a moderate level of consumption. In addition to discrepancies in professionals' definitions of moderate alcohol consumption for non-pregnant women, professionals reported many exceptions and situation-specific recommendations regarding best practices and guidelines for pregnant women regarding alcohol use during pregnancy, including that if patients had "no history of alcohol abuse, I say OK in moderation", "occasional drink is fine only after first trimester", "no harm shown for occasional consumption", and "occasional drink for special occasion only".

Discussion: Some professionals still do not believe that alcohol exposure during pregnancy is a significant risk for brain damage and do not agree that abstinence from alcohol during pregnancy is the best recommendation for women. The findings of this secondary data analysis suggest that professionals may not be providing consistent and clear recommendations to all pregnant women or women of childbearing age. Women of childbearing age should be informed of the risks of alcohol consumption during pregnancy to prevent FASD.

References/Citations:
Title: How do Adults with Williams Syndrome Perceive Their Own Levels of Social Vulnerability?

Authors: Marisa H. Fisher, Emma Lough

Introduction: Individuals with Williams Syndrome (WS) display an extreme pro-social drive to engage with other people (Järvinen et al., 2013), and are commonly described as being overly-friendly and trusting, with a lack of social inhibitions (Little et al., 2013). The unique social profile of individuals with WS is thought to make them highly vulnerable and at risk of victimization (Thurman & Fisher, 2015). While specific risks have been associated with victimization of adults with WS, less is known about whether individuals with WS recognize their own vulnerabilities. As the majority of extant research relies on parent reports, it is unclear how individuals with WS perceive their own levels of vulnerability. Their insights are crucial when designing interventions. Thus, the current study compares parent to self-report ratings of social vulnerability of adults with WS.

Method: Participants included 28 adults with WS (22 male) and their parents (25 mothers). On average, adults with WS were 27.7 years (SD = 8.4) and average full-scale IQ was 69.11 (15.28). Parents completed the Social Vulnerability Questionnaire (SVQ; Fisher et al., 2012) online. Participants with WS completed an adapted version of the SVQ (simplified language; visual rating scale) with a research assistant.

Results: There was a significant difference between how socially vulnerable parents reported their child to be (mean = 67.32, SD = 8.05) and how vulnerable individuals with WS saw themselves (mean = 59.5, SD = 8.57; Mann-Whitney U = 193, Z = -3.26, p<0.001). Specifically, there was a significant difference in five of the six domains on the SVQ (p’s<0.01). In those factors that showed a significant difference, parents consistently reported higher vulnerability levels for their child than the individual with WS reported for themselves, except in the domain of emotional abuse. On this factor, individuals with WS reported experiencing significantly higher levels of emotional abuse (e.g. being picked on, peers making fun of him/her) than their parents.

Discussion: The lower ratings of social vulnerability by adults with WS, compared to their parents, indicate these individuals lack insight into their own behaviors that could lead to victimization. At the same time, the higher ratings for emotional abuse indicate adults with WS have an acute awareness of how other people treat them. Such findings highlight the need for interventions that address self-awareness. For example, if individuals with WS do not see themselves as easy to take advantage of (e.g., many report that they do not talk to strangers and cannot easily be convinced to give away money to others, yet parents report these behaviors as a problem), then interventions addressing these concerns may be ineffective. Rather, interventions should first address ways to teach individuals with WS to recognize potentially vulnerable situations and to then teach them how to handle such situations.

References/Citations:
Title: The Impact of Challenging Behavior on School Function in Children with Down Syndrome

Authors: Elizabeth Will, Deborah Fidler, Lisa Daunhauer

Introduction: Individuals with Down syndrome (DS) are at an increased risk for certain maladaptive and challenging behaviors throughout the lifespan (Dykens, 2007; Feeley & Jones, 2006; Will & Hepburn, 2015). In particular, existing studies indicate specific challenges in the areas of attention, noncompliance, and task avoidant behavior (Dykens, 2007; Feeley & Jones, 2006; Fidler et al., 2005). This pattern of maladaptive behavior is likely to impact the educational experiences of school-aged children with DS, perhaps leading to fewer learning opportunities relative to same-aged peers. However, to date there has been little systematic examination of the presentation of maladaptive behavior in school-aged children with DS, and how this presentation impacts success in the school setting. The purpose of this study was to characterize the profile of maladaptive behavior observed in a sample of school-aged children with DS, and to describe the extent to which maladaptive behaviors are associated with areas of school function.

Method: Participants were 24 students with DS, (mean nonverbal mental age (NVMA)=43.72 months; mean chronological age (CA)=77.36 months). The Leiter-R (Roid & Miller, 1997) was administered as a measure of NVMA. Teachers completed the Behavior Assessment System for Children, version 2 (BASC-2; Reynolds & Kamphaus, 2004) as a measure of teacher-reported maladaptive behavior, and the School Function Assessment (SFA; Coster et al., 1998) as a measure of teacher-reported functional performance in the school setting.

Results: Repeated measures multivariate analysis of variance (RM-MANOVA) was performed to assess the profile of maladaptive subscales of the BASC-2, including Hyperactivity, Aggression, Anxiety, Depression, Somatization, Withdrawal, and Attention Problems, in participants with DS. Three subscales emerged as the most problematic: Aggression, Somatization, and Attention Problems. Significant negative associations between all three maladaptive subscales and SFA domains were found, indicating that higher maladaptive behavior was associated with lower Task Completion and Compliance. Aggression, Somatization, and Attention Problems were regressed on both Task Completion and Compliance in a multivariate multiple regression. Results indicated that these domains collectively accounted for 76% of the variance in School Function outcomes, and Attention Problems $F(2, 17)=5.51; p<.05$, and Aggression $F(2,17)=4.29; p<.05$, significantly predicted collective outcomes for Task Completion and Compliance. Individual parameter estimates revealed that Attention Problems significantly predicted Task Completion ($b=-2.16; p=.004$), but not Compliance; whereas Aggression significantly predicted compliance ($b=-1.09; p=.008$), but not Task Completion. Somatization did not significantly predict either School Function outcome.

Discussion: Children with DS in this sample demonstrated a specific maladaptive behavior profile, with primary areas of difficulty involving Aggression, Somatization, and Attention Problems. These areas were found to significantly predict Task Completion and Compliance in the school setting. Considerations regarding teacher training around appropriate behavioral expectations for students with DS relative to developmental status and the DS behavioral phenotype may provide critical support for students' success in the school setting.

References/Citations:

Title: The Effectiveness of an Advocacy Program for Latino Families of Children with Autism

Authors: Meghan Burke, Sandra Magana

Introduction: Although the Individuals with Disabilities Education Act (IDEA) embeds many rights for families, parents often struggle to advocate for their children. Latino families of children with disabilities may especially struggle to advocate as special education documents are not translated (Shapiro et al., 2004) and most translators do not effectively communicate everything that is said at individualized education program (IEP) meetings (Hughes et al., 2002). Latino families of children with autism spectrum disorder (ASD, versus other types of disabilities) may encounter even greater difficulties in advocacy, as they are more likely to lack information about autism and related services (Mercadante et al., 2009). The purpose of this study was to adapt and test the effectiveness of an advocacy program for Latino families of children with ASD.

Method: We conducted a quasi-experimental control design comparing parents who participated in the advocacy program (n = 18) to parents who did not participate in the advocacy program (n = 11). The advocacy program was comprised of 36 hours of instruction to empower participants to advocate for their own children as well as other families. There were no significant demographic or pre-survey differences between the groups. Using ANCOVAs, we controlled for pre-survey scores and compared the intervention and control groups with respect to: empowerment (Koren et al., 1992), the quality of the family-school partnership (Summers et al., 2005), special education knowledge (Burke et al., in press), and number of services received (Summers et al., 2007).

Results: After the program, the intervention (versus control) participants demonstrated significantly greater special education knowledge, $F(1, 28) = 37.42, p < .001$. Also, participants in the intervention (versus control) group demonstrated significantly greater empowerment with respect to the family, $F(1, 28) = 13.85, p < .001$; the Service System, $F(1, 28) = 8.18, p = .01$; and Political/Community, $F(1, 28) = 5.82, p = .02$. With marginal significance, intervention (versus control) group participants reported better family-school partnerships on the Family-Focused subscale of the Family-Professional Partnership Scale, $F(1, 28) = 3.61, p = .06$. There were no significant differences with respect to the number of services or scores on the Child-Focused Subscale of the Family-Professional Partnership Scale.

Discussion: This pilot study indicates that advocacy programs may be helpful for Latino families of children with ASD; future research should include randomized control trials and larger samples to determine the effectiveness of advocacy programs. Practitioners should also consider advocacy programs for the Latino families that they serve.

References/Citations:

Title: Functional Analysis Of Challenging Behavior Across Psychotropic Medication Changes in Adults with Intellectual Disabilities: Which Assessments Demonstrated Changes, Which Did Not, and Why

Authors: Maria Valdovinos, Brenna Connley, Lisa Beard, Meara Henninger-McMahon, Elizabeth Schieber, Annette Haas

Introduction: The prevalence of psychotropic medication use in adults with ID has remained relatively constant; however, an increase in polypharmacy, particularly regimens involving the use of antipsychotics and antidepressants, has been observed (Tsiouris et al., 2013; Valdovinos et al., 2003). Complicating the issue is that there does not appear to be a common regimen of medications prescribed (Deb et al., 2015) decreasing the likelihood that any two people are on the same medications or combinations of medication. Previous research has evaluated the effects of individual medications on challenging behavior using indirect measures of behavior (Unwin & Deb, 2011). In light of current prescribing trends, the present study sought to assess challenging behaviors across changes in medication regimens in individuals with intellectual disability (ID) to determine how medication impacts behavior (as opposed to asking about the effects of medication on behavior when compared to placebo) and if there were participant characteristics that might predict which individuals would show changes in assessment outcomes and which would not.

Methods: Nine individuals (two female, seven male) were selected. They were between the ages of 21-50 years; had a diagnosis of moderate to profound ID; and displayed challenging behaviors (Aberrant Behaviors Checklist -Community score of >55). Once enrolled, functional analyses (FA) were conducted of each participant’s challenging behavior (Iwata et al., 1994). Two weeks after each medication change, another FA was conducted. The FAs generally consisted of four conditions: attention, control, demand, and tangible with individualized conditions for some participants (i.e., ignore condition if participant engaged in self-injury). Each condition lasted five minutes and all conditions were presented three times in a randomized fashion with a one minute break between conditions. Data were coded and analyzed using Observer® XT.

Results: Of the nine participants in the study, four demonstrated changes in FA outcomes across all medication changes. Additionally, three participant FAs produced changes in outcomes; however, those changes were not consistent across all medication changes, that is, not every medication change yielded different FA outcomes. Finally, there were two participants whose FAs did not reveal any changes in outcomes.

Discussion: For a majority of participants, the outcomes of FAs differed after each psychotropic medication change; however, those who presented with self-injurious behavior characterized as undifferentiated in function did not tend to experience differentiation in FA results after medication changes. These results suggest that function-based assessments would be helpful in determining the effectiveness of psychotropic medications in individuals with ID and potentially allow for more of an integrated approach (behavioral and medication) to treatment of challenging behavior.

References/Citations:


Funding NICHD: 1R15HD072497-01
Title: Measuring the Expectations and Fears Parents Have for Their Children with Down Syndrome

Authors: B. Allyson Phillips, Frances A. Conners, Mary Elizabeth Curtner-Smith

Introduction: The current study developed two questionnaires to examine parental expectations and fears in mothers of children with Down syndrome (DS). Little work has examined parenting children with DS, and measures to assess aspects related to parenting children with DS are limited. Parental expectations and fears are constructs that might influence parenting practices, especially parents of children with intellectual disability. In general, today's society places lower expectations on children with disabilities, and if parents adopt these lower expectations, they may alter how they parent and prepare their child for adulthood (Ferguson & Asch, 1989; Woolfson, 2004). Additionally, individuals with DS have cognitive and sometimes physical deficits that might make parents fearful of negative evaluation and/or physical harm. These fears might result in more overprotective parenting behaviors (Green et al., 2013). This study provides preliminary data for the development of the Parental Expectations Questionnaire (PEQ) and Parental Fears Questionnaire (PFQ).

Methods: The sample was comprised of 35 mothers of children with DS (mean child age = 9.06 years, SD = 2.32). The mothers completed four parent-report questionnaires: a Background Questionnaire, the Parenting Styles and Dimensions Questionnaire, the PEQ, and the PFQ. The PEQ has three domains—school and work, friends and family, and independent living. The PFQ also has three domains—fear of negative child evaluations, fear of physical harm to child, and overprotective parenting behavior.

Results: To gain a preliminary understanding of the reliability and validity of the PEQ and PFQ, we examined five aspects of the data: (1) distribution of scores, (2) Cronbach’s alpha reliabilities, (3) correlations with parenting dimensions, (4) correlations between scale domains, and (5) cross-sectional developmental trajectories. For both questionnaires, the distribution of scores was close to normal for the overall score and the individual domains. For the PEQ, Cronbach’s alpha was .96 for the entire measure and ranged from .83 to .95 for the three domains. For the PFQ, Cronbach’s alpha was .85 for the entire measure and ranged from .52 to .87 for the three domains. As expected, the PEQ positively correlated with the positive parenting dimension of structure (r = .44, p = .016), and the PFQ positively correlated with the negative parenting dimensions of rejection (r = -.35, p = .041) and coercion (r = .44, p = .008). Intercorrelations were high for the three domains of the PEQ (p < .001 for all) and PFQ (p ranges from <.001 to 069). Finally, cross-sectional developmental trajectories were created to assess the ability of child chronological age (CA) to predict parental expectations and parental fears. Child CA was marginally significant at predicting parental expectations, F(1, 33) = 3.48, p = .071, with a decline in parental expectations occurring as children got older. This same pattern was true for each of the three PEQ domains. However, child CA was not significant at predicting parental fears for the total score or individual domains.

Discussion: The preliminary results for the PEQ suggest that it is a reliable measure for assessing parental expectations in mothers of children with DS. Further, the decline in expectations as children get older has interesting implications. It is possible that as parents become more aware of a child’s cognitive/physical limitations as the child gets older, their expectations decrease. This decrease in expectations might place the expectations too low for the child or it might establish more practical expectations. The preliminary results for the PFQ do not show as strong a reliability, especially for the individual domains. For both measures, future research is needed with a larger sample size to determine reliability and conduct a factor analysis of the domains.

References/Citations:
Title: Examining the Effects of Poverty on the Healthcare Access Experiences of Children with an Intellectual Disability

Author: Ani Whitmore

Introduction: The effects of poverty, such as the lack of economic resources, adverse health and social-emotional outcomes, and the additional unmet needs have been shown to produce adverse developmental outcomes. Children diagnosed with an intellectual disability (ID) and also living in poverty often experience further negative impacts to their healthcare needs (Aber, Bennett, Conley, & Li, 1997; Boyle, et al., 2011; Gunn & Duncan, 1997). Although the impact of poverty has been examined thoroughly, the dynamic experiences across different levels of poverty has not been researched exhaustively. The purpose of this study was to examine the healthcare access profiles of children with an ID (Mean age, 11.79 years, Standard Error= 0.17) living in various levels of poverty. Data used for this study was taken from the 2009-2010 National Survey for Children with Special Healthcare Needs (NS-CSHCN; CAHMI, 2010). There were two primary research questions for this study: 1) What are the profiles of children with ID for the following healthcare experiences: receiving well-child check-ups, care from specialty doctor, prescriptions medication use, receiving all specialized therapy, the use of medical equipment or home devices, assistive or communication technology, participation in early intervention or special education services, and the quality of parent-doctor decision making process; and 2) Are there differences in the profiles of healthcare experiences based on poverty status?

Methods: The NS-CSHCN was a nationwide telephone survey with the purpose of understanding the health and healthcare needs of children and their families in the United States. The participants were 40,242 parents or caregivers of children 0-17 years old with a special healthcare need from all 50 states and Washington, D.C. Participants' whose child had a diagnosed ID were included in this study. The NS-CSHCN utilized a complex sampling design and sampling weight to estimate the population percentages for each state and national child population by race/ethnicity, sex, and age. Thus, the results of this project will be reported in population percentage estimates. The survey item used to measure poverty levels used the Department of Health and Human Services (DHHS) guidelines, based on household size (CAHMI, 2010). Eight poverty level categories were created, with the range in percentile thresholds of 0-400%. The majority of survey respondents were the child's mother (i.e. biological, step, foster or adoptive) and English was the primary language spoken in the household. Approximately 63% of the children were males and 21% were of Hispanic ethnicity. Furthermore, 55% of children were White, 12% were African American, 12% were Asian, and the remaining 22% were Native American, Alaskan Native, Native Hawaiian, Pacific Islander or Multiracial.

Results & Discussion: Twenty percent of children with ID did not receive at least one of the following: specialized therapy, home healthcare services, communication aids, early intervention or special education services that they needed. Forty percent of children did not receive early intervention services before the age of 3 years and families did not meet the systems of care core outcome that families. Also, 40% of providers are decision-making partners. Seventeen potential reasons as to why these needs we’re not met were also examined. The primary obstacles cited included cost, not having insurance, problems with current healthcare plan, transportation issues and decreased access to school resources. Children living 150-185% below the poverty line experienced all of the 17 obstacles examined at least once, as compared to children living 0-15% of children living 185-400% below the poverty line. The results will be discussed in terms of the varying experiences of children living in poverty, the impact of those experiences on treatment effectiveness and recommendations for decreasing the negative effects of poverty on providing children with ID with appropriate healthcare.
Title: Cross-Sectional Trajectories of Language Development in Youth with Down Syndrome

Authors: Gayle G. Faught, Frances A. Conners, Edward C. Merrill, Leonard Abbeduto

Introduction: Language develops atypically in Down syndrome (DS) from infancy to adulthood. Receptive vocabulary is consistently found to be commensurate with cognitive level across the lifespan. Productive and receptive syntax are often found to be below cognitive-level expectations, although it is unclear whether this is true at all levels of ability (Abbeduto, Warren, & Conners, 2007). The syndrome-specificity of the language profile of DS has not been fully explored. The purpose of this study was to better understand how language develops relative to nonverbal cognitive ability in DS from school-age years to adolescence. We compared youth with DS to those with mixed-etiology ID and TD children using Thomas et al.'s (2009) innovative cross-sectional developmental trajectory analytical approach.

Methods: This study was part of a larger study investigating cognitive predictors of language impairment in DS. Participants included 36 youth with DS (M age=15.73, SD=3.05), 23 youth with mixed-etiology ID (M age=15.94, SD=2.45), and 50 TD children (M age=6.68, SD=2.73) matched for nonverbal MA. MA was measured with the Leiter-R Brief and ranged from 4.5 to 9 years in each group. Among other measures, groups completed three language measures: PPVT-4 for receptive vocabulary, TROG-2 for receptive syntax, and a narrative task for productive syntax. To compare groups’ performances at onset of ability (MA=4.5) and over increasing ability (MA=4.5-9), we performed cross-sectional developmental trajectory analyses as described by Thomas et al. This method adapts the SPSS ANCOVA function, using MA as the covariate. It specifically tests group differences in intercept and slope, with the former indicated by group main effects and latter indicated by group x MA interactions.

Results: For receptive vocabulary, there was no main effect of group, F(2,102)=2.519, p>.05, η2=.047, and no group x MA interaction, F(2,102)=.976, p>.05, η2=.019. Thus, groups did not differ at onset or over increasing ability. There was a main effect of MA, F(1,102)=76.684, p<.001, η2=.429, indicating receptive vocabulary improved with increasing ability in all groups.

For receptive syntax, there was a main effect of group, F(2,103)=10.906, p<.001, η2=.175, but no group x MA interaction, F(2,103)=1.478, p>.05, η2=.028. Follow-up tests revealed TD outperformed DS and ID at onset of ability. Groups did not differ over increasing ability. There was a main effect of MA, F(1,103)=54.708, p<.001, η2=.347, indicating receptive syntax improved with increasing ability in all groups.

For productive syntax, there was no main effect of group, F(2,96)=.539, p>.05, η2=.011, and no group x MA interaction, F(2,96)=.267, p>.05, η2=.006. Thus, groups did not differ at onset of ability or over increasing ability. There was a main effect of MA, F(1,96)=14.657, p<.001, η2=.132, indicating productive syntax improved with increasing ability in all groups.

Discussion: Overall, language improved with increasing nonverbal ability at a similar pace in DS, ID, and TD. Further, receptive vocabulary was commensurate with cognitive level at onset and remained so with increasing ability. The same was true for productive syntax, which has been found to improve in DS, though at a strikingly slow pace. However, receptive syntax was poorer than cognitive level at onset of ability and remained so with increasing ability in both DS and ID. Poor receptive syntax can compromise comprehension despite relatively strong receptive vocabulary in DS; thus, language intervention should specifically aim to improve this domain in DS.

References/Citations:
Title: Heightened Attention to Non-Social Images is Not Driven by Feature Salience in Children with Autism

Authors: Robin Shafer, Kathryn Unruh, John-Paul Noel, James Bodfish

Introduction: Circumscribed interests are one form of the diagnostically relevant restricted, repetitive behavior observed in autism spectrum disorders (ASD), and they are characterized by an intense, narrow interest in a given subject area or object type. It is not known how circumscribed interests in ASD may be influencing or influenced by the social deficits that are also characteristic of ASD. Eye-tracking studies have assessed attention to social and non-social stimuli in ASD and have shown that individuals with ASD show a preference for looking at non-social images (e.g., objects) over social images (e.g., faces); however, there is little understanding of what is driving attention to non-social stimuli relative to social stimuli in individuals with ASD. Our study aimed to determine if low-level features of the images could be driving the preferential looking to non-social stimuli (in particular, stimuli that are of high interest to people with ASD) over social stimuli in ASD.

Methods: We used gaze data from a paired-preference viewing task, whereby; typically developing children and children with ASD were presented with images of faces paired with either an image of an object of high interest to individuals with ASD (HAI) or an object of low interest to individuals with ASD (LAI). Gaze data was analyzed in relation to the low-level visual features of the image (color, intensity, and orientation).

Results: Our results indicated that low level features of the images were most predictive of look time to the HAI images for the typically developing children, but not for the children with ASD. There was very little relationship between the low-level features of the LAI images and faces for both the typically developing children and the children with ASD.

Discussion: These results suggest that preferential looking to non-social stimuli in ASD is likely due to more cognitively directed attention rather than stimulus-driven attention.

References/Citations:
Title: Parent-Child Relational Outcomes Following Participation in Cognitive Behavioural Therapy for Children with Autism Spectrum Disorder

Authors: Andrea Maughan, Carly Albaum, Jonathan Weiss

Introduction: Parent involvement in child-focused cognitive behavioural therapy (CBT) has shown to benefit children with Autism Spectrum Disorder (ASD; Sofronoff, Attwood & Hinton, 2005). There is evidence that parenting behaviours and aspects of the parent-child relationship change following interventions for typically-developing children (Silverman et al., 2009). This research has yet to be conducted with families of children with ASD. Given the significant role of the family dynamic in healthy child development, it is critical to better understand how to promote strong parent-child relationships in these families. The current study examined changes in parenting approaches and the parent-child relationship, following participation in CBT for children with ASD.

Methods: Participants included 34 children with ASD (94.1% male), 8 to 12 years of age (M = 9.50, SD = 1.13), with at least average IQ (M = 103.48, SD = 14.06, Range: 79-140) and their caregivers (76.5% female). Families were involved in an ongoing randomized controlled trial targeting child emotion regulation. Data was collected one week prior to starting the intervention, and one week following intervention completion. Parenting approaches were assessed using two self-report scales: 1) The Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1993) examines negative parenting during discipline situations with subscales of hostility, laxness and over-reactivity; and 2) the Interpersonal Mindfulness in Therapy Scale (Duncan, 2007), measures approaches to mindful parenting, with subscales of awareness/attention, non-judgment and non-reactivity. The observer-coded Autism-Specific Five-Minute Speech Sample (Benson et al., 2011) assesses the parent-child relationship using the following criteria: frequency of critical/positive comments, warmth, emotional over-involvement, quality of relationship, and initial statement. Child externalizing and internalizing problems were measured via parent report on the Behavior Assessment System for Children, Second Edition (Reynolds & Kamphaus, 2004).

Results: After completing the intervention, there were significant improvements in non-judgment (t(32) = -2.23, p = .03) and frequency of positive comments (t(13) = -2.53, p = .02), with AFMSS coding ongoing. Improvement in child internalizing symptoms was correlated with improvement in parent hostility (r = .40, p = .03) and laxness (r = .46, p = .01). Improvement in child externalizing symptoms was related to improvement in overall parenting approach (r = .42, p = .05). Improvement in child emotional self-regulation was associated with improvement in parent laxness (r = .47, p = .01), overall parenting approach (r = .55, p = .01), and non-judgment (r = .44, p = .01).

Discussion: Findings will be discussed in relation to the importance of the parent-child relationship in families of children with ASD, and the effects of CBT on these relational outcomes.

References/Citations:
Title: The Agreement between the Child Behavior Checklist and Aberrant Behavior Checklist-Community in Assessing Challenging Behaviors in Children with Developmental Disabilities

Authors: Katelyn Canepa, Nathan Noble, Maria Valdovinos

Introduction: Many indirect assessments and direct assessments have been used to measure challenging behaviors to inform behavioral treatment (Medeiros, Rojahn, Moore, & van Ingen, 2014). In determining accuracy of indirect assessments for measuring behavior, research has found low validity for behavior-rating scales to assess children due to social-emotional instabilities in development (Myers, 2013). Despite this low validity, rating scales are still commonly used. Two examples include The Aberrant Behavior Checklist-Community (ABC-C) and Children Behavior Checklist (CBCL). Both scales are broadband assessments designed assess the severity of problem behavior (e.g., stereotypy, aggression, etc.), and also measuring treatment effectiveness (Warnick, Bracken, & Kasl, 2008). Though there is no existing literature correlating these two assessments, Myers (2013) suggests a comparison method based on named constructs (i.e., hyperactivity sub-scale on ABC-C would be equivalent to attention problem sub-scale of CBCL). This current study involves a comparison of the ABC-C and CBCL measures of externalizing behavior and these measures ability to predict responses to behavioral treatment informed from brief functional analyses (BFA) outcomes.

Methods: Eight children between the ages of 2-12 years were referred for behavioral assessments. The ABC-C and CBCL were completed by the children’s caregivers before a direct assessment (BFA) of challenging behaviors (e.g., elopement, biting, hitting, etc.) were conducted. Operationally-defined behaviors were recorded during conditions designed to mirror everyday scenarios in which challenging behavior might be likely. Based on the occurrence of challenging behaviors, treatment conditions were developed targeting conditions in which behaviors happened most often. The data from the CBCL’s externalizing domains (i.e., attention and aggression problems), including DSM-oriented scales (i.e., Autism Spectrum, ADHD, Conduct & Oppositional Defiance Problems) and all ABC-C sub-scales (i.e., Irritability, Lethargy, Stereotypy, Hyperactivity and Inappropriate Speech) were compared. Participants were categorized according to the degree of change experienced from the initial assessment conditions in the BFA to the corresponding treatment conditions. Participants that experienced decreases in behavior of at least 50% or more in treatment conditions were considered to be responders to treatment and those who experienced less than 50% decreases in behavior were considered non-responders.

Results: All participants experienced some degree of behavior reduction in treatment conditions of the BFA. However, our analyses showed that for those with a decrease of greater than 50% (four out of seven participants), there was high agreement between the CBCL’s externalizing domains with DSM-oriented scales (i.e., Autism Spectrum, ADHD, & Oppositional Defiance Problems) and all ABC-C subscales. For those individuals with behavior decreases of less than 50%, there was poor agreement between the CBCL and ABC-C subscales.

Discussion: Our data suggest that particular externalizing behaviors, as captured by the CBCL and corroborated by outcomes on the ABC-C, may be more amenable to behavioral interventions. Future research should be conducted to determine what, if any, characteristics of challenging behavior predict response to behavioral treatment versus some other form of treatment (e.g., pharmacological).

References/Citations:
Title: Sustained Volunteering in Special Education Advocates

Authors: Samantha Goldman, Meghan Burke, Carrie Mason, Robert Hodapp

Introduction: For children with intellectual disabilities, their most important "everyday environment" involves their neighborhood schools, particularly the special education services provided by those schools. Yet given the complexity of laws such as the Individuals with Disabilities Education Act (IDEA), parents of children with intellectual and developmental disabilities often require extra support in navigating special education law. The field of special education advocacy has emerged to meet these needs, along with several models for training.

Currently, however, little is known about the types of advocacy activities in which special education advocates engage; how much trainees advocate after completing such programs; and the correlates of sustained special education advocacy. In addition, the differences between trainees who advocate after program completion and those who do not are not well understood. Building from psychological studies of the functions of volunteering, as well as preliminary examinations of advocacy in special education, this study asked four questions: (1) What do sustained volunteer special education advocacy activities look like over time? (2) Do existing measures of volunteering apply to volunteer advocates? (3) Are greater amounts of advocacy correlated with role identity, motivation, and satisfaction? and, (4) After completing the training, do differences exist between graduates who volunteer as advocates compared to those who do not volunteer?

Methods: All participants were long-term graduates of the Volunteer Advocacy Program (VAP), a 12-week (36-hour) training program provided each academic term over five years. To provide details of advocacy activities up to four years post-graduation, 83 VAP graduates completed a web-based survey. The final survey was separated into four sections: (a) demographic information (age, gender, SES, education); (b) questions about advocacy activities since completing the training (number of families helped; degree to which advocate engaged in 8 specific activities); (c) motivation for volunteering and satisfaction (using the Volunteer Functions Inventory; Clary et al., 1998); and (d) information about the degree to which advocates considered being special education advocates as central to their role identities (from Callero, 1985). Analyses included correlations for advocacy rates, t-tests and chi-squares to compare advocates to non-advocates, and principal components analysis to understand the relation among different types of advocacy activities.

Results: In 1-4 years after program graduation, 63.8% (53 of 83) of graduates advocated for one or more families; these advocates reported stable rates of advocacy over time (last 6-month advocacy rate correlated with advocacy rate since VAP graduation at r = .819, p < .0001), and performed activities that were either family-focused or school-focused (these two factors accounted for 92% of the variance). For those (53) graduates who advocated post-training, amounts of advocacy were positively related to involvement with the broader disability community, r = .435, p < .001, and with other advocates, r = .319, p = .02. Compared to those not advocating after graduating, sustained advocates reported higher advocacy-role identities, increased involvement in disability groups, and greater likelihood of advocating in the upcoming year (all t-test differences at p < .001; effect sizes from d = 0.50 to 0.89).

Discussion: Taken together, these findings highlight the importance of role identity and the potential for advocacy training programs to build such identity. These findings have important implications for future research, practice, and policy as we work to train special education advocates to support families of children with intellectual and developmental disabilities.

References/Citations:
Title: The Relationship between Spirituality and Well-Being in Mothers of Children with ASD: The Mediating Roles of Relationship Satisfaction and Positive Perceptions

Authors: Kelcie D. Willis, Lisa Timmons, Megan Pruitt, Naomi V. Ekas

Introduction: Previous research has found that mothers of children with autism spectrum disorder (ASD) report more stress, depression, and anxiety than mothers of other children. However, in recent years, the focus has shifted to examining how positive constructs, such as spirituality, might impact well-being. Indeed, studies have shown that spirituality is associated with better well-being in mothers of children with ASD (Ekas, Whitman, & Shivers, 2009), yet the mechanisms underlying this relationship are unclear. Research in the general population suggests that spirituality is beneficial for reducing marital conflict (Lambert & Dollahite, 2006) and aids in positive cognitive reappraisal (Tunali & Power, 2002). Both of these constructs have been found to be important predictors of well-being among mothers of children with ASD (Lickenbrock, Ekas, & Whitman, 2011). Thus, the purpose of this study is to investigate the roles of relationship satisfaction and positive perceptions in the relationship between spirituality and well-being.

Method: The sample consisted of 72 mothers who reported having a child aged 2-18 diagnosed with ASD. Mothers completed questionnaires assessing spirituality, relationship satisfaction (CSI), positive perceptions of their child with ASD (KIPP), and anxiety (STAI).

Results: Spirituality was positively associated with both relationship satisfaction ($a_1 = 4.60, SE = 2.15, p < .05$) as well as positive perceptions ($a_2 = 2.28, SE = .89, p < .01$) respectively. In turn, an increase in both relationship satisfaction ($b_1 = -.15, SE = .07, p < .05$) and positive perceptions ($b_2 = -.40, SE = .16, p < .01$) was negatively associated with anxiety. The direct effect of spirituality on anxiety was not significant ($c' = -.26, SE = 1.25, p = .84$). The conditional indirect effect of spirituality on well-being through the mediators relationship satisfaction, $b = -.67$ (95% CI: -2.07, -.05), and positive perceptions, $b = -.92$ (95% CI: -2.23, -.14), was significant for each according to bias-corrected bootstrap confidence intervals. Therefore, both relationship satisfaction and positive perceptions fully mediated the relationship between spirituality and anxiety.

Discussion: The goal of this study was to examine the process by which spirituality affects well-being in mothers of children with ASD. Our results are consistent with previous research and confirm our original hypothesis that relationship satisfaction and positive perceptions serve as mechanisms to explain the relationship between spirituality and well-being. This finding has important implications with respect to how clinicians might ameliorate the anxiety of mothers with children with ASD. Interventions that focus on the daily spiritual experiences of parents of ASD should be implemented. According to our findings, targeting spirituality may result in improvements in parents’ romantic relationships, views of their child’s disability, and their mental health status.

References/Citations:
Title: Manual Dexterity and Executive Function in School-aged Children with Down Syndrome

Authors: Brianne Gerlach-McDonald, Lisa A. Daunhauer, Deborah J. Fidler

Introduction: The prevalence of children born with Down syndrome (DS) has increased by greater than 30% since 1979 (Shin et al., 2009). Due to the increasing prevalence, there is a critical need for the development of interventions in this population (NIH Working Group, 2014). Children with DS have cognitive and motor delays (For a review, see Daunhauer & Fidler, 2011). Children with DS have challenges in areas of executive function, or higher cognitive abilities associated with goal-directed behavior. In particular, parent and teacher reports and laboratory tasks reveal distinct challenges in working memory and planning (Daunhauer et al., 2014; Fidler et al., 2015).

In children with learning disabilities, studies show that movement skills are associated with academic outcomes, reading abilities, and working memory tasks (Alloway & Archibald, 2008; Vuijk, Hartman, Mombarg, Scherder, & Visscher, 2011). Fine manual dexterity skills are associated with working memory and planning abilities in adolescents with DS (Chen, Ringenbach, Albert, & Semken, 2014). The present study examined manual dexterity skills and working memory and planning as reported by parents in school-aged children with DS.

Method: Children with DS (n = 34, MA=49.86 mo SD=7.856) and a mental-age matched but chronologically younger typically developing children (n = 19, MA=48.68 mo SD=3.284) participated in this project which was a part of two larger studies. Mental age was assessed using the Brief IQ from the Leiter International Performance Scale-Revised (Leiter-R; Roid & Miller, 1997). Motor skills were assessed using the manual dexterity subscale from the Movement Assessment Battery for Children- 2nd edition (Henderson, Sugden, & Barnett, 2007) comprised of three skills: Posting coins, Threading Beads, and Drawing. Working memory and planning was assessed using the Emergent Metacognition index of the parent-reported Behavior Rating of Executive Function Inventory- Preschool Version (Brief-P; Gioa, Espy, & Isquith).

Results: A multiple linear regression was performed separately for children with DS and typically developing children. Emergent metacognition was regressed on IQ, drawing trial, posting coins preferred hand, posting coins nonpreferred hand, and threading beads. For children with DS, the overall model was significant (F (5, 29) = 5.60, p = .001). The drawing trial was the only significant predictor of emergent metacognition (Beta=.639, p < .001). The overall model accounted for 44% of the variance in emergent metacognition. For the typically developing children, the overall model was not significant (F (5, 14) = .695, p = ns).

Discussion: The results support previous findings regarding the relationship between fine motor skills and components of executive function for children with DS. However, this was one of the first studies to examine the relationship between a fine motor task and every day executive function problems for school-aged children with DS. This finding was unique to children with DS, and not typically developing children. However, only the drawing task was significantly associated with emergent metacognition. The higher amount of errors made on the drawing task was associated with higher levels of working memory and planning difficulties in everyday life as reported by the parents. However, these results must be considered preliminary and therefore replication is warranted. Based on these findings, future research may further examine the relationship between motor and executive functions skills in children with DS to develop targeted intervention.

References/Citations:
Title: Autism Spectrum Identity Scale (ASIS): Relationship to Gender, ASD Categories, and Postsecondary Outcomes of Education and Employment

Author: T A M. McDonald

Introduction: Adults on the autism spectrum struggle with postsecondary outcomes of education and employment. They also experience stigma, and stereotype threat research on other populations suggests stigma exerts direct and indirect detrimental impacts on performance. Since there are multiple studies reporting undesirable postsecondary outcomes for adults on the autism spectrum (e.g., Taylor & Seltzer, 2012), possibly, experiences of stigma also have a detrimental impact on performance for this group. Moreover, this impact may be mediated by variation in identification with the autism spectrum and stereotype threat intersectionality. As previously reported on this study, adults on the autism spectrum do vary in their identification with the autism spectrum along four domains: Changeability, Positive Difference, Context Dependent, and Spectrum Abilities. This study examines whether, and how, variation in autism identity, as measured by the Autism Spectrum Identity Scale (ASIS), gender, and identification with different diagnostic categories, relates to postsecondary outcomes of education and employment.

Methods: Over 1000 adults who have, or identify with, an autism spectrum diagnosis took a national online survey. In addition to the Autism Spectrum Identity Scale (ASIS) items, the survey included measures for stigma, self-esteem, and quality of life. The survey also gathered demographic data, including gender, diagnoses, diagnosis identification preference, and postsecondary student and employment statuses. This report focuses on identity and postsecondary outcomes of education and employment.

Results: Employed adults reported higher attitudes of Changeability, Positive Difference, and Context Dependence than unemployed adults. Students reported greater changeability than non-students. Men were more likely to be in education and employment settings than women. Adults with autism were more likely to be students, but were less likely to be employed, than adults with Asperger’s Syndrome. Men and adults with Asperger’s Syndrome reported greater endorsement of Changeability and Context Dependent than women and adults with Asperger’s Syndrome, respectively; yet these patterns were qualified by significant interactions.

Discussion: Increased attitudes in Changeability, Positive Difference, and Context Dependent related to better postsecondary outcomes for adults on the autism spectrum. Membership in twice, or thrice, stigmatized groups, such as being a woman on the spectrum or identifying with autism instead of Asperger’s Syndrome, related to poorer postsecondary outcomes. Since adults on the autism spectrum already have lower rates of employment and education attainment than the mainstream population, the intersection of being a woman on the autism spectrum is concerning. The differences in postsecondary outcomes between individuals who identify with autism and Asperger’s syndrome is surprising based on the classification decisions for the DSM - 5. Although, the DSM-5 recently collapsed these two diagnoses into a single category, many adults in this study were diagnosed within the DSM - IV criteria. One rationale for the DSM-5 change was the inability to reliably distinguish differences between these two groups (Hazen, McDougle, & Volkmar, 2013). It is unclear whether the differences found in this study were due to actual differences in ability or whether they mirror other literature on stereotype threat. More optimistically, interactions between stigmatized groups and higher self-concepts of Positive Difference and Changeability on postsecondary outcomes may represent important identity strategies to cope with stigma and preserve performance. Possibly, attitudes that characterize the autism spectrum as a positive difference and as changeable provide some resilience against stigmatizing experiences. Future research should examine causal relationships between these factors.

References/Citations:


Title: Parental Well-Being in Families with Multiple Children with Delays

Authors: Kenya T. Makhiaawala, Jillian Tuso, Laura Lee McIntyre

Introduction: It has been well established that parents of children with developmental delays and disabilities (DD) report significantly more psychological distress compared to parents of typically developing children (Baker, Blacher, Crnic, & EdelBrock, 2002; Estes et al., 2009). Children with DD are at heightened risk for developing behavior problems (Dosen & Day, 2001; Einfeld & Tonge, 1996). Parenting stress and poor mental health outcomes may be exacerbated by child challenging behavior (Lecavalier, Leone, & Wiiltz, 2005). Little is known about parent well-being in families with multiple children with disabilities or problem behavior. The purpose of this study was to examine if sibling problem behavior or delay status predicted parenting stress above the contributions of other child and family factors.

Methods: A sample of 41 families was recruited from a larger, ongoing randomized control trial examining the efficacy of a parent training intervention (McIntyre, PI). All families had a preschool-aged target child with DD and a sibling between 3 - 8 years. Data were collected through extensive in-home interviews and assessments of family demographics, target child and sibling problem behavior (CBCL; Achenbach & Rescorla, 2012), target child adaptive behavior (VABS-II; Sparrow & Cicchetti, 2005), parenting stress (PSI-3; Abidin, 1995), and caregiver depression (CES-D; Radloff, 1977).

Results: All target children had a developmental delay and over 40% of siblings (n = 17) were reported by parents to have a developmental delay (primarily speech/language delays). On average, target children were reported to have slightly elevated problem behavior (CBCL T score M = 61.95, SD = 12.55), while siblings' problem behaviors were reported to be average (CBCL T score M = 51.70, SD = 13.99). Although sibling delay status and problem behavior were significantly associated with parenting stress, sibling variables did not account for unique variance in parenting stress after accounting for problem behavior of the target child with DD.

Discussion: Prior research has explored parental mental health and well-being within the context of parenting a single child with a delay; however, very little research has attempted to unpack the relationships between a target child with DD, their sibling, and parent/family outcomes. Our results suggest that the problem behavior of the child with DD continues to be a strong predictor of parenting stress further highlighting the need for interventions. A family-systems perspective also warrants consideration of the relationships among family members and the dynamic interplay among family members. More research is needed to understand the impact of siblings on parent well-being.

References/Citations:

Supported by NIH grants R01HD059838 and R01HD059838-03S1 (McIntyre, PI).
Title: Early Communication in Very Young Children with Down Syndrome, Fragile X Syndrome, and Typical Development

Authors: Laura J. Hahn, Jessica F. Scherr, Jane E. Roberts

Introduction: While there is a fairly well established research base characterizing the Down syndrome (DS) behavioral phenotype in childhood, adolescence and adulthood, studies with very young children, especially infants, are less plentiful. Older children and adults with DS present with mild to moderate cognitive impairments and a phenotype characterized by patterns of relative strengths in receptive language, nonverbal social communication, and social functioning coupled with relative weaknesses in expressive language (Fidler et al., 2007; Luyster et al., 2011). However, more research is needed to examine how these patterns are emerging from infancy. Understanding the early communication profile in DS can help to determine the roots of the expressive language deficits and social communication strengths observed in later development, as well as identify areas for early interventions in this population. The purpose of the present pilot study was to describe differences in early communication in very young children with DS contrasted to fragile X syndrome (FXS)--who also have cognitive impairments--and typical development (TD).

Methods: Participants were 11 infants with DS, 9 infants with FXS, and 8 TD infants matched on chronological age (range 8-24 months; F(2, 25) = .32, p = .73). Their mothers completed the Communication and Symbolic Communication Scales (CSBS-DP; Wetherby & Prizant, 2002) Caregiver Questionnaire. This is a 41-item questionnaire that examines communicative competence in children between 6 and 24 months across three domains: Social, Speech, and Symbolic. These broad domains are comprised of communication subdomains (e.g., 'Understanding' and 'Object Use' in the Symbolic domain). Also, a Total Communication Composite score is calculated.

Results: Infants with DS or FXS had lower Total Communication scores than infants with TD, F(2, 25) = 4.66, p = .02, eta2 = .27. Similarly, infants with DS or FXS had lower Social and Speech scores than infants with TD (Social: F[2, 25] = 3.65, p = .04, eta2 = .23; Speech: F[2, 25] = 6.73, p = .005, eta2 = .35). However, there were no significant differences between DS and FXS infants on these domains. Infants with DS also had lower Symbolic scores than infants with TD, F(2, 25) = 3.41, p = .048, eta2 = .22. The difference between infants with DS and FXS on the Symbolic domain did not reach significance, but the effect size was large d = .82, indicating that infants with DS also had lower scores on the Symbolic domain than infants with FXS. We further examined differences between groups within each domain to explore which skill areas were driving these patterns. For example, within Symbolic communication, infants with DS had significantly lower object use (p = .005) than TD infants.

Discussion: Considering the cognitive impairments associated with DS, it is not surprising that infants with DS had lower early communication scores than infants with TD. While there appears to be some similarities in early communication between infants with DS and FXS, there is also evidence for syndrome-specificity in communication emerging very early in development. Further, it appears that the behavioral phenotype associated with DS (e.g., reduced object exploration) is already manifesting in the first two years and may have a cascading effect on other domains of development. Future research endeavors will evaluate the link between this early profile and later development in DS.

References/Citations:

Title: Beliefs about the Cause of Positive Behaviors in Children with ASD and Links with Parent Outcomes

Authors: Paige M. Bussanich, Sigan L. Hartley

Introduction: There has been a substantial amount of research aimed at understanding the contribution of the negative behaviors of children with autism spectrum disorder (ASD) to parent outcomes. In contrast, little is known about the link between the positive behaviors of children with ASD and parent outcomes. Parental attributions about child behavior have been shown to shape reactions to behaviors and subsequently impact parental psychological well-being and the parent-child relationship. The goal of the present study was to provide insight into parental attributions for the positive behaviors of children with ASD and their association with parental psychological well-being and closeness in the parent-child relationship.

Methods: Analyses included 183 couples of children with ASD (ages 5-12). Mothers and fathers individually reported attributions for a recent positive behavior by the child with ASD, and completed the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) to assess positive and negative affect, and the Positive Affect Index (PAI; Roberts & Bengtson, 1993) to assess feelings of closeness in the parent-child relationship. Mothers and fathers also individually rated the child with ASD’s severity of ASD symptoms, overall level of negative behavior problems, and functional skills.

Results: Multilevel models using HLM were conducted to account for the dependency in couple data. Child age was significant positively associated with parents' ratings of stability (b = .08, SE = .04, p = .03) and controllability (b = .07, SE = .04, p = .04). Overall level of negative child behavior problems was significantly negatively associated with parents' ratings of locus of control (b = -.03, SE = .01, p = .02) and stability (b = -.04, SE = .01, p = < .01). Level of parent education was significantly positively associated with ratings of controllability (b = .20, SE = .06, p = < .01). Parents' ratings of stability were significantly positively associated with positive affect (b = .51, SE = .25, p = .04) and closeness in the parent-child relationship (b = .55, SE = .21, p = .01). Repeated measure one-way multivariate analysis of variance (MANOVA) indicated that, at a within-person level, parents rated their child with ASD's positive child behavior as more internal (F (1, 382) = 3.84, p = .05), stable (F (1, 382) = 193.56, p < .001), and controllable (F (1, 382) = 11.42, p < .01) than their child's negative behaviors.

Discussion: Overall, findings suggest that parents' beliefs about the cause of the child with ASD’s positive behavior have important associations with parental psychological well-being and closeness in the parent-child relationship. Parents who believed that the positive behavior was caused by a stable factor experienced more positive affect and reported a closer parent-child relationship. Parents of younger children with ASD, parents of children with a higher global level of negative behaviors, and parents with lower levels of education were less likely to attribute the behavior to factors that were internal to the child, stable, and/or controllable by the child. At a within-person level, parents believed their child with ASD’s positive behaviors were more internal, stable, and controllable than a negative behavior. Findings from the present study can help inform the development of interventions and supports to alter parental attributions in ways that may promote psychological well-being and closeness in the parent-child relationship.

References/Citations:
Title: Skill Profiles and Communication Growth in Minimally Verbal Children with ASD

Authors: Charlotte DiStefano, Wendy Shih, Ann Kaiser, Rebecca Landa, Pamela Mathy, Connie Kasari

Introduction: Approximately 30% of children with autism spectrum disorders (ASD) are minimally verbal past age 5. Despite limited expressive language, these children demonstrate considerable variability in their other abilities, such as non-verbal cognition and receptive language. More research is needed to characterize these abilities, and to understand how abilities across domains are related to spoken language outcomes in children with ASD.

Objectives: This study seeks to 1) find common skill profiles in a sample of minimally verbal children with ASD, and 2) determine how baseline ability profiles are related to outcomes in a spoken language intervention.

Methods: Participants included 50 minimally verbal children with ASD from a 6-month intervention study, employing a blended intervention - Joint Attention, Symbolic Play, Engagement and Regulation (JASPER) and Enhanced Milieu Teaching (EMT). Participants were randomized to Speech (spoken language only) or AAC (spoken language plus augmentative/alternative communication device) versions of the intervention (Kasari et al., 2014). K-means analysis was used to identify skill clusters based on baseline assessment results across domains (ASD severity, repetitive behaviors, NVIQ and language). Linear mixed modeling was used to evaluate trajectories in spoken language growth based on skill clusters and treatment groups. Post-hoc contrasts were used to identify pair-wise differences.

Results: 4 clusters were identified. Cluster 1 (N=6) had the most impaired abilities across domains. Cluster 2 (N=5) had mid-range abilities across domains, but the highest rate of communicative utterances. Cluster 3 (N=27) mixed abilities across other domains. Cluster 4 (N=12) had a moderate rate of communicative utterances and the highest abilities across other domains. To examine spoken language outcomes, clusters were divided based on treatment assignment. Cluster 2 was removed from further analysis due to its small size, resulting in 6 groups (3 clusters by 2 treatment conditions). The mixed model indicated that growth in communicative utterances over the course of the study varied across groups ($X^2=27.2$, $p=.002$). Post-hoc analyses revealed that, in phase 1 of intervention (1st 3 months), participants in cluster 4 who were randomized to the AAC condition had significantly higher communication growth than participants in clusters 3 and 4 who were randomized to spoken language only ($p=.005$, $p=.01$). In phase two of intervention (2nd 3 months), cluster 4-AAC participants showed a negative slope in communicative utterances, which was significantly different than the positive slopes exhibited by participants in all other cluster by treatment groups ($p$-value range: .048-.003).

Discussion: In this sample of minimally verbal children with ASD, distinct skill profiles were identified. Patterns of spoken language growth were found to vary across these clusters. In particular, participants who were randomized to the AAC condition, and demonstrated the highest baseline cognitive abilities, displayed initially rapid growth in spoken language, followed by a decrease in spoken language in the latter half of the study. Although the AAC condition was associated with better spoken language outcomes overall, the results of this analysis indicate that additional strategies may be needed to sustain spoken language growth in this subgroup of participants. Further research is needed to determine whether similar skill profiles can be found in additional samples of minimally verbal children with ASD and how these skill profiles relate to longitudinal outcomes.

References/Citations:
**Title:** Early Gesture Use in 12 Month Old Infants with Fragile X Syndrome, Infant Siblings of Children with Autism and Typically Developing Infants

**Authors:** Lisa Rague, Kelly E. Caravella, Jessica Klusek, Jane E. Roberts

**Introduction:** Fragile X syndrome (FXS) is a genetically-based neurodevelopmental disorder and the leading known cause of intellectual disability. Many individuals with FXS show deficits across a range of domains, particularly in the area of communication (Roberts, Hatton & Bailey, 2001). Communication deficits in FXS range from impairment in syntactic production to pragmatic language difficulties (Roberts, Mirrett, Anderson, Burchinal & Neebe, 2002). One area that is important to the development of language is gesture use. Individuals with FXS have been shown to demonstrate a relative weakness in gesture use as early as 21 months (Roberts, Mirrett, Anderson, Burchinal & Neebe, 2002); however, little research has examined gesture use in FXS earlier in development, during the time gestures begin to emerge in typically developing (TD) children. This study investigates early gesture use in 12 month old infants with FXS as compared to TD infants, as well as infants who are at risk for early social communication deficits (i.e. infant siblings of children with autism (ASIB); Yirmiya et al., 2006).

**Methods:** The sample includes 70 males recruited through two longitudinal studies conducted at UNC-Chapel Hill and at the University of South Carolina. Participants included 25 infants with FXS (Mage = 12.53 months, SDage = 0.81), 23 ASIBs (Mage = 12.78 months, SDage = 1.16) and 22 TD infants (Mage = 12.15 months, SDage = 0.85). To measure developmental level and gesture use, the Mullen Scales of Early Learning (MSEL) and the MacArthur-Bates Communication Development Inventory (CDI) were used respectively. Analyses were run in R.

**Results:** An ANCOVA was run to determine whether differences in group means (TD = 10.63, ASIB = 9.11, FXS = 6.35) of Early Gesture scores on the CDI existed at 12 months of age, controlling for nonverbal ability using the Visual Reception subdomain of the MSEL. ANCOVA results showed that there were significant differences in group means of Early Gesture scores (F(2,66) = 9.38, p < 0.001). Post-hoc analyses of group differences showed that the FXS group used 5.78 less gestures than the TD group (p < 0.001) and 4.28 less gestures than the ASIB group (p < 0.001). Differences in amount of early gesture use between the ASIB and TD groups were not statistically significant (p = 0.26).

**Discussion:** Infants with FXS showed significant deficits in amount of gesture use as early as 12 months of age when compared to both TD infants, and infants at high risk of developing communication disorders, and these differences are not simply due to the general developmental delay typically observed in individuals with FXS. ASIB infants were not delayed in gesture use at 12 months, compared to the TD group. These findings highlight the importance of targeting gesture use in interventions specifically in FXS. Further research is needed to determine the effect of these early gesture deficits in FXS on later communication development.

**References/Citations:**
Title: Characterizing Objective Quality of Life and Normative Outcomes in Adults with Autism Spectrum Disorder: A Latent Class Exploratory Analysis

Authors: Lauren Bishop-Fitzpatrick, Jinkuk Hong, Leann E. Smith, Renee A. Makuch, Jan S. Greenberg, Marsha R. Mailick

Introduction: There is currently little consensus about how best to assess normative outcomes and objective quality of life (QoL) in adults with autism spectrum disorder (ASD). Past outcome research has found that very few adults with ASD achieve the conventional markers of adulthood - becoming employed and self-supporting, living independently, establishing one's own family, developing a network of friends, contributing to the community. Some have called for a reconceptualization of QoL for adults with ASD, but little empirical research has been conducted that can inform such a reconceptualization or identify strategies for improving the QoL of adults with ASD. The current study aims to construct a unified definition and conceptualization of normative outcomes and objective QoL for adults with ASD by: (1) characterizing the heterogeneity of normative outcomes and objective QoL; and (2) identifying predictors of positive normative outcomes and good objective QoL.

Methods: 180 adults with ASD between the ages of 23.72 and 60.47 (M=34.06, SD=7.99) were drawn from a longitudinal study, the Adolescents and Adults with Autism Study (AAA; Seltzer et al. 2003). Three indicators of normative outcomes (employment, independent living, social engagement) and four indicators of objective QoL (physical health, quality of neighborhood, family contact, mental health issues) were assessed using a dichotomous scale and entered into an exploratory latent class analysis in order to determine groups of adults with ASD who were similar in their normative outcome and objective QoL profiles. A simultaneous logistic regression was then run to test the association between intellectual disability status, age, daily living skills (Waisman Activities of Daily Living), autism symptomatology (Autism Diagnostic Interview - Revised), and executive functioning (Behavior Rating Inventory of Executive Function).

Results: Findings of an exploratory latent class analysis identified three discrete groups - Greater Dependence, Good Health, and Greater Independence - of adults with ASD in terms of normative outcomes and objective QoL. The Greater Independence group experienced the most favorable normative outcomes, while the Greater Dependence group experienced the worst. The Good Health and Greater Independence groups experienced the most favorable objective QoL while the Greater Dependence group experienced the worst. In addition, findings indicate that better daily living skills (Good Health vs. Greater Dependence: exp(B)=1.110, p<.001; Greater Independence vs. Greater Dependence: exp(B)=1.175, p<.001) and better executive function (Good Health vs. Greater Dependence: exp(B)=.966, p<.05; Good Health vs. Greater Independence: exp(B)=.964, p<.10) are associated with membership to outcome groups with better normative outcomes, when controlling for ID status, age, and autism symptomatology.

Discussion: This research proposed a broad conceptualization of normative outcomes and objective QoL that takes into account many facets of life, is long-term in nature, and may be variable over time. Interestingly, our findings indicate that normative outcomes and objective QoL for adults with ASD may be quite nuanced; having good normative adult outcomes may not necessarily lead to good subjective and objective QoL, and vice versa. Notably, there appears to be a relatively strong association between better daily living skills and membership to a group with improved normative outcomes and objective QoL. These findings have important implications for future research and for interventions designed to improve outcomes and QoL in adults with ASD.

References/Citations:
Title: The Relationship between ADOS and CARS for Males with FXS

Authors: Sarah Nelson, Robyn Tempero Feigles, Joan Gunther, Audra Sterling, Andrea McDuffie, Leonard Abbeduto

Introduction: Many individuals with fragile X syndrome (FXS), the leading inherited cause of intellectual disability, display symptoms of autism spectrum disorder (ASD). Studies examining the behavioral features of FXS, therefore, often include a metric of autism symptom severity or divide their samples into dichotomous groups with and without ASD. Two measures commonly used to characterize autism in samples of individuals with FXS for research purposes are the Autism Diagnostic Observation Schedule - 2nd Edition (ADOS-2) and the Childhood Autism Rating Scale - 2nd Edition, Standard Version (CARS2-ST). Although the ADOS is considered a gold standard measure for diagnosing autism, the CARS has been used in a large number of studies of FXS. Therefore, it is important to understand the ways in which the results of those studies are different from studies that have used the ADOS as a means to represent autism status or symptoms. The goal of the present study was to examine the relationship between the ADOS and the CARS to provide insight into how these instruments represent autism diagnostic status and autism symptom severity.

Research Questions

1. What is the correspondence between the CARS and ADOS as regards the ASD diagnosis?
2. What is the correspondence between the CARS and ADOS as regards the severity of ASD symptoms?
3. How do CARS and ADOS scores vary as a function of child characteristics?

Methods: All ADOS assessments were administered and scored by research-reliable staff according to the ADOS manual. Two trained researchers watched video recordings of ADOS assessments and scored using the CARS2-ST. A third researcher then watched and scored four videos from each researcher's set, comprising 20% of the total sample. Inter-scorer agreement was calculated on an item-by-item basis, and a score within a half-point was considered in agreement. Mean agreement was 90%, with a range of 86-93%.

Results:

Question 1 – Using the diagnostic classifications of autism (0,1) provided by the ADOS and CARS, a Pearson Chi Square revealed there was not a significant degree of concordance between the ADOS and CARS in the number of individuals who were classified as having autism/no autism using these measures: Chi-square = 2.80, p=.094. The nonparametric correlation between the two measures was .32, indicating a small and marginally significant degree of association.

Question 2 – Using the continuous measures of autism symptom severity provided by ADOS severity scores and CARS total scores, we found a moderate and significant correlation between the two measures, r(28) = .58.

Question 3 – There were no significant correlations between ADOS symptom severity and either chronological age, receptive vocabulary, expressive vocabulary, or nonverbal IQ. Total CARS scores were significantly and negatively correlated with receptive and expressive vocabulary and with nonverbal IQ.

Discussion: Individuals with FXS often display symptoms that warrant an ASD diagnosis. Past studies examining the presence of ASD symptoms in individuals with FXS have used both the CARS and the ADOS to determine diagnostic status. The results of this study indicate that there is some, albeit limited, correspondence between how the ADOS and CARS diagnostically classify the presence of autism in FXS. There was a stronger correlation between the measures as regards ASD symptom severity. Finally, consistent with the design of the ADOS, severity scores were largely unrelated to measures of child age, language, and cognition. In contrast, language scores were related to CARS severity scores. These results demonstrate that the scores of the CARS and the ADOS do not always provide the same diagnostic categories or qualifications of autism symptom severity and that the confounding of language level of ASD severity in the CARS makes it less preferred than the ADOS for assessing individuals with FXS.
Title: The Impact of the Broader Autism Phenotype on Social Relationships and Mental Health for Mothers of Children with Autism Spectrum Disorder

Authors: Megan M. Pruitt, Kelcie Willis, Lisa Timmons, Naomi Ekas

Introduction: Several studies have shown that child symptom severity impacts the well-being of mothers of children with autism spectrum disorder (ASD; Ekas & Whitman, 2010); however, it is possible that maternal characteristics may also contribute to well-being. For example, mothers of a child with ASD who report higher levels of broader autism phenotype (BAP) characteristics also report greater depressive symptoms (Ingersoll & Hambrick, 2011). The proposed mechanism that explained this association was social support. That is, increased BAP characteristics predicted decreased social support, which was related to elevated depressive symptoms. Since the BAP consists of social interaction difficulties, it is possible that mothers with elevated BAP characteristics may find difficulty reaching out to others for support. Unfortunately, that study did not differentiate between the various sources of social support. In the current study, we sought to examine the role of various social relationships (friends, family, and spouse) in the association between the BAP and well-being in mothers of children with ASD.

Methods: Ninety-eight mothers of a child with ASD (8-16 years of age) completed online questionnaires. These measures assessed the broader autism phenotype (BAPQ), child behavior problems (SDQ), marital satisfaction (CSI), friend support and family support (MPSS), and depressive symptoms (CESD).

Results: Marital satisfaction partially mediated the relationship between BAP and depressive symptoms (95% CI: .10, 1.84), where increased BAP characteristics were associated with lower levels of marital satisfaction, b = -10.60, SE = 5.24, p < .05, which was associated with greater depressive symptoms, b = -.08, SE = .03, p ≤ .01. There was no evidence for mediation via friend or family support. Although there was a direct effect of both BAP, b = 4.49, SE = 1.52, p ≤ .01, and child behavior problems, b = .41, SE = .16, p ≤ .01, on depressive symptoms, there was no evidence of mediation for child behavior problems.

Discussion: Expanding on previous research, these results suggest that both maternal characteristics and child behavior problems are related to lower maternal well-being. However, we found that social relationships partially explain the relationship between the BAP and depressive symptoms. The social deficits associated with the BAP appear to negatively affect a mother’s marital satisfaction. Without the support of a satisfactory marriage, a mother may not be able to effectively cope with the challenges associated with raising a child with ASD. Overall, this study suggests that the marital relationship may be a key point of intervention for mothers of a child with ASD who are at risk for lower well-being due to elevated BAP characteristics as well as their child’s behaviors.

References/Citations:
**Title:** Partner Differences in Parenting Experiences and Marital Quality in Families of Children with Autism Spectrum Disorder

**Authors:** Greta Goetz, Sigan Hartley

**Introduction:** Parents who have a child with autism spectrum disorder (ASD) are faced with a high level of child-related challenges and often experience a high level of parenting stress. A great deal of research has investigated the impact of the child with ASD's symptoms and behavior problems, as well as parent's level of parenting stress, on parental psychological well-being. In contrast, little research has been aimed at understanding the impact of child-related challenges on couple experiences. The overarching goal of this study was to understand the impact of differences between partners in parenting experiences on marital quality. Our study aims were to: 1) examine whether, at a within-couple level, mother-father differences in perceptions of the child with ASD's symptoms and behavior problems are related to self-reported or observed marital quality; and 2) determine if, at a within-couple level, mother-father differences in level of parenting stress are associated with self-reported or observed marital quality.

**Methods:** Analyses included 179 couples in longstanding relationships who have a child with ASD (5-12 years). Mothers and fathers individually reported on the child's autism symptoms on the Social Responsiveness Scale- Second Edition (Constantino & Gruber, 2012) and global level of behavior problems on the Child Behavior Checklist (Achenbach & Rescorla, 2000), and their level of parenting stress on the Burden Interview (Zarit et al., 1980). The absolute difference in mother-father ratings was used in all analyses. Parents reported on marital quality using the Couple Satisfaction Index (Funk & Rogge, 2007). Observed marital quality was assessed based on a coded 7-minute couple problem-solving videotaped interaction.

**Results:** Paired sample t-tests indicated that, at a within-couple level, mothers reported a higher level of child autism symptoms (t (1, 188) = 2.25, p = 0.03) and parenting stress (t = 3.10, p < 0.01) than fathers, and a trend for mothers to report a higher level of child behavior problems (t (1, 188) = 1.69, p = 0.09). Multiple linear regressions indicated that mother-father difference in ratings of child autism symptoms, child behavior problems, and level of parenting stress were not significantly related to self-reported marital quality in mothers (b ranging -0.02 to 0.8, p > 0.05) or fathers (b ranging -0.01 to 0.06, p > 0.05). Similarly, mother-father difference in ratings of severity of child autism symptoms (b = 0.01, p = 0.92), level of child behavior problems (b = -0.01, p = 0.87), and level of parenting stress (b = 0.06, p = 0.44) were not significantly associated with the couple's observed global marital quality.

**Discussion:** Mothers and fathers frequently differ in their perception of their child with ASD's symptoms and behavior problems, and often experience different levels of parenting stress. Our findings suggest that these differences are not associated with poorer self-reported or observed marital quality. Despite the lack of average group effects, additional research is required to explore whether partner differences in parenting experiences is maladaptive for other family outcomes and/or related to poorer marital quality under certain conditions.

**References/Citations:**
Title: Co-Regulation Strategies in Toddlers with ASD and Their Mothers

Authors: Amanda Gulsrud, Gerhard Hellemann, Connie Kasari

Introduction: This study explores the temporal relationship of emotion co-regulation strategies in young children with autism and their mothers within the context of an early social-communication intervention. Previous work on this sample of children by Gulsrud et al., 2010 examined correlations between child and maternal strategy use averaged across an entire session. This study aims to further explore the contingent relationship between the dyad by employing sequential analytic approaches to fully elucidate the sequential and casual relationship between mother and child behaviors.

Methods: Study participants included 34 mother-child pairs from an existing intervention study for toddlers diagnosed with ASD and their mothers (Kasari et al., 2010). Each of the children met criteria for autism spectrum disorder on the Autism Diagnosis Interview-Revised (Lord, Rutter, & Couteur, 1994) and the Autism Diagnosis Observation Schedule (Lord, et al., 1989). The children ranged in chronological age from 21 to 36 months old with an average age of 30.6 months. The average mental age was 19 months. Approximately 40% of children were from ethnic minority backgrounds and 26 children were males. The majority of mothers had completed college and had graduate or professional training, with an average age of 34.5 years. A 10-minute mother-child play interaction was recorded at the end of each of the 24 individual intervention sessions. Sessions identified with at least one distress episode lasting 30 seconds or more were coded using a time sampling method in 10-second epochs for child emotion self-regulation strategies and maternal co-regulation strategies. The child's emotion self-regulation strategies were adapted from a study of typical toddlers during episodes of negativity (Goldsmith et al., 1999). Maternal strategies were adapted from a study of typical toddlers and their mothers (Grolnick et al., 1998).

Results: Periods in which the child was engaged in physical coping strategies (e.g. distraction, avoidance), and the period immediately following use of this strategy were identified. Maternal strategies during these two distinct phases of the child's coping behavior were also examined. Results confirmed that during child physical coping the mother was almost twice as likely to use emotional support strategies (22% vs. 13%) , and immediately following this period mothers were more likely to use active support strategies (70% vs. 55%). Planned future analyses include detailed considerations of the other coping strategies available for the children, and the interactions with the mothers' choice of coping strategies, by developing a markov chain model of the transition between these different coping states.

Discussion: Although previous work has shown that maternal active support strategies during negative distress episodes are the most commonly used (43%), the current study shows that mother's change their type of support depending on the child's emerging ability to self-regulate. While children engage in physical coping strategies, we see an increase in maternal emotional support strategies (e.g. "I see you trying" or "I know you want that toy"). Once the child's own physical coping ceases, mothers begin to engage in more active strategies. This temporal and specific relationship suggests that mothers are keenly aware of their child's growing ability to self-regulate and may differentiate types of support depending on the needs of the child.

References/Citations:
Title: Hopeful Thinking in Mothers of Children with Autism Spectrum Disorder: Pathways to Positive Outcomes

Authors: Lisa Timmons, Naomi Ekas, Erin McKay, Megan Pruitt, Kelcie Willis

Introduction: Mothers of children with autism spectrum disorder (ASD) may experience challenges associated with their child's behavior that lead to lower well-being compared to mothers of children with other developmental disabilities (Duarte et al., 2005). To date, there is a paucity of research focusing on factors that may promote positive adaptation among mothers of children with ASD. Personal strengths are characteristics of an individual that are hypothesized to foster better well-being and include virtues such as gratitude, benefit finding, humor, hope, and kindness (Duckworth, Steen, & Seligman, 2005). Among mothers of children with ASD, studies have found that hope predicts increased positive affect and life satisfaction and less depressive symptoms (Faso, Neal-Beevers, & Carlson, 2013; Lloyd & Hastings, 2009). However, there is no research delineating the mechanisms that may be responsible for these associations. The current study examined the role of loneliness and coping strategies as potential mediators of the association between hope and depressive symptoms in mothers of children with ASD.

Methods: Ninety-four mothers of a child with ASD (< 18 years old) participated in the study. Mothers completed surveys assessing hope (Hope Scale), loneliness (UCLA Loneliness Scale), coping strategies (Brief COPE), and depressive symptoms (CESD).

Results: A multiple mediation model was tested wherein hope agency and hope pathways were specified as predictors, loneliness and disengagement coping were hypothesized mediators, and depressive symptomatology was the dependent variable. There was a significant indirect effect of hope agency on depressive symptoms through loneliness (coefficient = -.42(.15), 95% CI: -.68, -.21) and disengagement coping (coefficient = -.21(.10), 95% CI: -.39, -.06). In addition, there was a significant indirect effect of hope pathways on depressive symptoms through disengagement coping only (coefficient = .15(.10), 95% CI: .02, .33). We also tested an alternative model wherein hope agency and pathways served as mediators of the association between loneliness and disengagement coping and depressive symptoms. There were no significant indirect effects.

Discussion: Previous research has established a relationship between hope and well-being in mothers of children with ASD. However, this study is the first to identify factors that may explain this association. An increased belief that your goals can be met (hope agency) was associated with less loneliness and disengagement coping which, in turn, predicted lower levels of depressive symptoms. The ability to generate ways to meet goals (hope pathways) predicted less disengagement coping which, in turn, predicted lower depressive symptoms. Mothers who are more hopeful about the future may be more likely to engage with others and draw upon their social support network in order to meet their goals. Overall, the results of this study support and extend previous research and call attention to the importance of focusing on personal strengths, such as hope, in predicting positive outcomes. An important next step is to identify ways to increase hopeful thinking in mothers of children with ASD.

References/Citations:

Title: Associations between Adaptive Behavior and Intrusive Parenting Behavior for Young Children with Developmental Delays

Authors: Evangeline Kurtz-Nelson, Laura Lee McIntyre

Introduction: Observed intrusive or insensitive parenting behaviors may contribute to poorer outcomes for young children with developmental delays (DD), such as increased externalizing behavior and decreased social skills (Niccols & Feldman, 2006; Stevenson & Crnic, 2013). Parents are likely to display more directive parenting behaviors with children with DD than with their typically developing siblings, indicating that characteristics of children with DD may prompt parents to engage in more structured or parent-led interactions with these children (Floyd, Harter, & Costigan, 2004). However, previous research has not examined how child characteristics may relate to intrusive parenting behavior in this population. As such, the present study sought to examine whether a specific characteristic of children with DD—low adaptive behavior in varied domains—was associated with observed parental intrusion during a free play task.

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 = 76) 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, child adaptive behavior (Vineland-II), child problem behavior (CBCL), and observed parent-child interactions (Parent Child Behavior Observation System; Phaneuf & McIntyre, 2007). Specifically, percentage of 30-sec intervals containing intrusive parenting behavior were analyzed during a 10-min parent-child interaction free play task.

Results: Parents engaged in intrusive interactions during a free play task during an average of 21% of all intervals (range 0 - 65%; SD = 16.38%). Bivariate correlations were conducted to examine associations between child adaptive behavior, child problem behavior, and intrusion. Intrusion was significantly negatively associated with child motor skills, r(64) = -.27, p < .05. Intrusion was not associated with other domains of adaptive behavior, overall adaptive behavior, or child problem behavior. Five independent samples t-tests were conducted to compare intrusive parenting behavior for children with low adaptive behavior (n = 48; standard score of 85 or below) and children with average adaptive behavior (n = 18; standard score of 86 or above) in four subdomains (communication, daily living skills, socialization and motor skills) and in overall adaptive behavior. Results indicated that parents of children with low communication skills (M = .22, SD = .17) engaged in more intrusion than parents of children with average communication skills (M = .14, SD = .09), t(64) = 2.35, p < .05. In addition, parents of children with overall low adaptive behavior (M = .22, SD = .17) engaged in more intrusion than parents of children with overall average adaptive behavior (M = .14, SD = .10), t(64) = 2.38, p < .05.

Discussion: Results suggest that parents of children with DD who have low communication skills or overall adaptive behavior engage in more intrusion than parents of children with average communication skills or adaptive behavior. Lower motor skills are associated with increased intrusion for children with DD. These results indicate that delays in specific dimensions of adaptive behavior as well as in overall adaptive behavior may lead parents to direct and control children's activities during parent-child play. Future research should examine the direction of the relationship between adaptive behavior and intrusion as well as the impact of parental intrusion on later behavior and development.

References/Citations:

Supported by NIH grant R01HD059838 (L. L. McIntyre, PI)
Title: Observed Couple Problem-Solving Interactions in Parents Who Have a Child with Autism Spectrum Disorder

Authors: Iulia Mihaila, Sigan Hartley, Aubrey M. Fisher, Sarah K. Dietrich,

Introduction: Parents of children with autism spectrum disorder (ASD) report poorer psychological well-being than parents of typically developing children, however little is known about how child-related challenges influence marital quality. Few studies have examined marital quality in parents with a child with ASD, and these studies have been limited to self-reported measures. The present study aimed to 1) determine whether couple problem-solving interactions about the child with ASD were observed to be more negative than interactions about other topics and 2) to examine associations between parent and child characteristics and the observed quality of couple interactions.

Methods: Analyses were based on 179 couples with a child with ASD. Parents were predominantly Caucasian, middle-class, and ranged from 22-60 years (M = 39.86, SD = 5.84). Children with ASD were aged 5-12 years (M = 7.90, SD = 2.26) and 87% were male. Couples completed a 7-minute videotaped problem-solving interaction, in which they discussed a disagreement that was problematic for their relationship. Additionally, parents reported on family socio-demographics and completed the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), Social Responsiveness Scale (SRS; Constantino & Gruber, 2012), and the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). Three trained lab members coded the interactions on dimensions of positive and negative affect, sensitivity, conflict resolution, and global interaction quality using well-defined criteria (Frosch et al., 1998; 2000).

Results: A one-way repeated measures multiple analysis of variance (MANOVA) indicated a significant difference in fathers' observed positive affect based on interaction topic (F(12,167) = 2.32, p = .01). Bonferroni-corrected post-hoc comparisons indicated that fathers who discussed chores displayed higher levels of positive affect than fathers who discussed work or the child with ASD. Additionally, there were significant differences in mothers' age (F(12,167) = 2.40 p = .01), fathers' age (F(12,167) = 1.99, p = .03), and fathers' depressive symptoms (F(12,167) = 2.08, p = .02) by topic. Bonferroni-corrected post-hoc comparisons indicated that fathers who discussed commitment were younger than fathers who discussed their child with ASD and fathers who discussed work had more depressive symptoms than fathers who discussed parenting. Finally, multiple linear regressions indicated that mothers' depressive symptoms (β = -.19, p = .01) were negatively associated with their observed negative affect, and the child's behavior problems (β = .18, p = .05) were positively associated. The presence of intellectual disability (ID) in the child (β = .17, p = .03) and behavior problems (β = .20, p = .02) were positively associated with fathers' observed negative affect, and severity of autism symptoms (β = -.26, p = .01) was negatively associated. Mothers' depressive symptoms (β = .19, p = .01) were positively associated with global interaction quality, and the child's ID status (β = -.18, p = .02) was negatively associated. Mothers' depressive symptoms (β = .17, p = .04) and the child's ID status (β = -.19, p = .02) were similarly associated with sensitivity. The child's ID status (β = -.19, p = .02) and severity of autism symptoms (β = .18, p = .05) were associated with conflict resolution.

Discussion: Findings indicate that parents engaged in couple problem-solving interactions about the child with ASD are not observed to be more negative than parents engaged in interactions about other topics. The child with ASD’s ID status, behavior problems, and severity of autism symptoms were associated with observed quality of the couples’ interaction. Additionally, mothers with higher levels of depressive symptoms were observed to have less negative interactions. Findings offer insight into the couple interactions of parents and identify which parents may be at risk of more negative couple problem-solving interactions.
Title: Assessment of Expressive Language in Minimally Verbal Children with ASD

Authors: Christina Kang, Connie Kasari, Tristram Smith, Rebecca Landa

Introduction: Language and communication impairments are common in children with ASD. These impairments, especially in expressive language (EL), are particularly salient in minimally verbal (MV) children. 30% of children diagnosed with ASD are MV, and there is heterogeneity in EL even among MV children. Therefore, understanding the methods and measures by which researchers capture language ability - by establishing convergent validity of EL assessments used with this population - is one step toward constructing a clear definition of what it means for a child to be "minimally verbal."

There are three common methods used to assess EL: direct assessment, observational language sampling, and parent/caregiver report. Few studies have investigated the convergent validity across methods of EL assessment, and none have examined validity with a MV sample.

Method/Participants: This study is a secondary analysis of a multisite, randomized controlled trial targeting social communication with MV preschoolers. All children used fewer than 30 words across behavioral assessments at baseline, received early intervention services, and had a confirmed diagnosis of ASD. The sample consisted of 181 children.

Procedure: The language measures used in the present study were collected as baseline measures for the original study. The direct measures were conducted by trained assessors in either school or clinic settings. The observational measure took place in home, school, or clinic settings. Caregiver reports were sent home for parents to complete.

Measures: The direct assessments analyzed were the EL subscales of the Mullen Scales of Early Learning (MSEL) and Reynell Developmental Language Scales, which are standardized cognitive assessments. Raw scores were used rather than standardized scores as some children received scores below basal level. The observational measure was derived from the Parent-Child Interaction (PCX), a free play assessment between parent and child. PCX videos were transcribed and analyzed for number of different words the child used. The parent reports used were the Vineland Adaptive Behavior Scales and the MacArthur-Bates Communicative Development Inventories: Words and Gestures form (MCDI). The EL subscale from the communication scale was used from the Vineland, and the reported number of words produced was used from the MCDI. Scores across all EL measures were correlated to determine convergent validity.

Results: The correlations between EL scores on the MSEL, Reynell, PCX, and Vineland were strong and significant at the 0.01 level. However, correlations between EL scores as reported on the MCDI and all other EL measures were close to zero and nonsignificant.

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<tr>
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Discussion: Results indicate that there was strong convergent validity across most EL measures. Additionally, there was convergent validity across different methods of assessment. Conversely, the MCDI vocabulary checklist had low convergent validity with the other EL measures analyzed. As the MCDI primarily centers on language in the home context, does not
distinguish between imitated and spontaneous language, and does not examine word frequency, it may be capturing a different EL construct. Designation of minimally verbal status is defined and shaped by the language assessments used with these children. Therefore, multiple language measures and multiple methods of assessment are key not only to informing better research practices but also for improving clinical interventions with this population.

References/Citations:

Title: The Influence of Developmental Severity on Child Behavior Outcomes in a Parenting Stress Intervention

Authors: Allyson L. Davis, Meredith L. Dennis, Cameron L. Neece

Introduction: The prevalence of both parenting stress and child behavior problems are high among families affected by developmental delays (DD; Baker et al., 2003; Baker, Blacher, Crnic, & Edelbrock, 2002). The stress experienced by these parents appears to be better accounted for by elevations in child behavior problems rather than intellectual or developmental functioning of the child (Baker, Blacher, & Olsson, 2005; Neece, Green and Baker, 2012). Furthermore, research has shown that parenting stress and child behavior problems have a reciprocal relationship, likely due to the impact of parenting stress on parenting behaviors (Baker et al., 2003; Neece et al., 2012). Mindfulness Based Stress Reduction (MBSR) is one intervention that has increasingly been used to target parenting stress in this population (Bazzano et al., 2013; Dykens et al., 2014; Neece, 2013; Singh et al., 2014). These studies have highlighted the positive effect of parenting stress reduction on child outcomes (Neece, 2013). However, little is known about the impact of the severity of the child’s disability on intervention outcomes. Thus, the aim of the current study was to evaluate the effect of baseline child adaptive behavior, cognitive functioning, and ASD symptoms on positive changes in child behavior problems following the MBSR intervention.

Method: The current study involved data from Phase 2 of the Mindful Awareness for Parenting Stress (MAPS) Project, which included 45 parents of children, ages 2.5 to 5 years old, with developmental delays. These parents participated in a randomized controlled trial examining the efficacy of MBSR in reducing parental stress and subsequent child behavior problems. Child adaptive behavior was measured using the Adaptive Behavior Assessment System (ABAS-II; Harrison, 2003), cognitive functioning was assessed using the Wechsler Preschool and Primary Scale of Intelligence (WPPSI-IV; Wechsler, 2012), and ASD symptom severity was measured using the Gilliam Autism Rating Scale (GARS; Gilliam, 2005). The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000) was used to measure child behavior outcomes.

Results: Hierarchical regression analyses were used to predict child behavior outcomes at post-treatment. Results indicated that neither cognitive functioning or ASD symptomatology were significant predictors of child outcomes (p > .05). However, total baseline child adaptive behaviors predicted positive changes in child behavior problems at post-treatment. Specifically, higher ABAS-II scores predicted greater decreases in oppositional defiant, externalizing, internalizing, and total behavior problems on the CBCL at post-treatment (β = -.44, t(19) = -2.73, p < .05, β = -.46, t(19) = -2.64, p < .05, β = -.36, t(19) = -2.32 p < .05, and β = -.41, t(19) = -2.85, p < .05, respectively).

Discussion: Results showed that child adaptive behavior skills predicted reductions in child behavior problems following a parent MBSR intervention. Children with better adaptive functioning prior to treatment appeared to show greater response to and benefit from a parental stress intervention, as evidenced by decreases in behavior problems. The implications of these findings suggest that children with DD who show greater competence in daily living skills are more responsive to changes in parenting behaviors following a parent stress reduction intervention.
Title: Stranger Fear in Preschoolers with Fragile X Syndrome and Idiopathic Autism Spectrum Disorder

Authors: Jessica Scherr, Debra Reisinger, Abigail Hogan-Brown, Jane E. Roberts

Introduction: Fragile X syndrome (FXS) is a single gene disorder associated with an increasingly well-defined phenotype including intellectual impairment and anxiety (Cordeiro et al., 2011). In addition, traits of autism are very common in FXS with increased impairment associated with these overlapping disorders making differential diagnosis challenging (Hagerman, 2002). Little work has examined how anxiety features emerge in FXS or other clinical disorders. Moreover, no study has examined behavioral observations of fear and its association with autism traits in young children with FXS from children with idiopathic autism spectrum disorder (ASD). The early detection of specific behavioral anxiety factors that may convey groups at-risk for anxiety is important given the impact that differential diagnosis and targeted treatments can have on changing the trajectory of the later development of anxiety disorders. Fear of strangers has been shown to be a particularly robust predictor of the emergence and severity of anxiety in young children (Brooker et al., 2013).

Methods: Participants consisted of 101 male preschoolers between the ages of 2-5 that were categorized into four groups: boys with fragile X syndrome (FXS; N= 29), FXS with elevated autism symptoms (fxASD; N = 25), idiopathic autism spectrum disorder (iASD; N = 11), and typically developing boys (TD; N = 36). Participants in each atypical group were matched on cognitive ability by the Early Learning Composite on the Mullen Early Scales of Learning. Additionally, the fxASD and iASD groups were matched on severity of symptoms of autism as measured by the total score on the CARS (fxASD M = 35.1, iASD M = 35.0). The Stranger Approach from the Laboratory Temperament Assessment Battery (Lab-TAB; Goldsmith & Rothbart, 1996) was used to elicit behavioral indicators of stranger fear including gaze patterns, escape behaviors and facial fear. The Childhood Autism Rating Scale (CARS) was used as a measure autism symptoms. Raw scores from the DSM-Anxiety subscale on the CBCL were used to assess relationships to stranger fear.

Results: Results from one-way ANOVAs indicated specific behavioral responses to a stranger differentiated preschoolers with more severe symptoms of autism (e.g. fxASD and iASD groups) from those with low autism symptomology (e.g. FXS and TD groups). Cross-group comparisons demonstrated that preschoolers with FXS displayed more avoidant gaze to the stranger and their parent during the stranger approach with boys with fxASD exhibiting the greatest avoidant gaze patterns. The fxASD group also referenced their parent less during the stranger approach in comparison to the FXS and TD groups. The iASD group displayed elevated facial fear in response to the stranger that differentiated them from the FXS, fxASD, and TD groups. No group differences were observed in escape behaviors. Overall, results from this study indicate specific behavioral patterns of social fear in response to a stranger using a normative and cross-syndrome approach. Correlational data between CBCL and stranger fear suggest unique patterns in each of our groups in how anxiety is expressed behaviorally.

Discussion: This is the first study to examine the early emergence of behavioral indicators of anxiety in boys with FXS and iASD. Our use of behavioral methodology goes beyond traditional parent and self-report methods that may differentiate individuals that are at risk for anxiety, such as those with ASD and FXS. Collectively, we have found behavioral profiles of social fear that are both distinct, yet similar, in disorders that often overlap in symptom presentation. Clarifying these distinctions can contribute to the refinement of differential diagnosis and treatment. It is critical to identify underlying traits that distinguish symptoms of anxiety in ASD and FXS early in development to provide better future outcomes.
Title: Using Machine Learning to Differentiate Autism Spectrum Disorder Risk Status Groups on M-CHAT-R Responses

Authors: Reina S. Factor, Luke E. K. Achenie, Angela Scarpa, Marlene V. Strege, Diana L. Robins, Scott McCrickard


A recent survey found only 60% of pediatricians reported using formal screening for ASD at 18 months and only 50% at 24 months (Arunyanart et al., 2012). Since current screening practices rely on clinician training and subjective judgment, machine learning (ML) may serve as a powerful complementary tool. ML techniques represent a class of artificial intelligence, capable of using large databases to learn patterns consistent with ASD traits. The M-CHAT-R must be hand-scored, interpreted, and followed up with an interview. In contrast, the ML tool is automatically scored, makes objective decisions with minimal human bias, and requires no clinical training. Self-Organizing Maps (SOM) is a specific kind of ML that clusters data according to similar responses (Bock, 2003).

Methods: The current study examined the use of ML to determine ASD risk status by using fewer M-CHAT-R items. Archival data consisted of 16,177 toddlers (16-30 months, collected during their 18- or 24-month well visit). Toddlers missing M-CHAT-R responses were excluded and the sample used included 14,995 toddlers (46.51% male), with 15 years average maternal education (Range=11-20 years). Children at risk were referred for diagnostic assessment. MATLAB script was created to interface with the SOM Toolbox (SOM Toolbox Team, Helsinki University of Technology, Finland) and was run for different data sets. All 20 M-CHAT-R questions were included as inputs and SOM selected the most informative questions and grouped data into clusters based on similarity of traits. Item analysis indicated key risk status group differences.

Results: SOM was able to separate toddlers into risk status groups, based on fewer items (12/20), and identify key symptom presentation differences. Three risk status groups were identified: Typically Developing (TD), Low Risk, and High Risk. Risk status indicates that a toddler may be at risk for any developmental disability, including ASD. As such, TD participants showed no more than one flagged item, Low Risk participants demonstrated more than one ASD-like trait, and High Risk participants demonstrated a number of ASD-like traits. All confirmed ASD cases fell in the High risk group.

Discussion: Overall, findings support the hypothesis that SOM was able to differentiate individuals based on risk status and do so using fewer items. This has implications for early detection. These results are consistent with the most recent M-CHAT-R findings, indicating that although screening positive does not necessarily indicate an ASD diagnosis, it is a good predictor of developmental delay or concern. Specifically, these results predicted 100% of screen positive toddlers, higher than the rates determined by previous clinical scoring (Robins et al., 2014). Therefore, groups highlighted by SOM tool might be a more accurate reflection of risk status. Applying SOM in a mobile application could make the MCHAT-R easier to use in pediatric settings, while maintaining accurate results.

References/Citations:

Title: Examining the Influence of Race and Gender on Screening for Autism Spectrum Disorder: A Self-Organizing Map Approach

Authors: Marlene V. Strege, Reina S. Factor, Luke E. K. Achenie, Angela Scarpa, Diana L. Robins, Scott McCrickard

Introduction: Research suggests delays and inaccuracies in autism diagnoses for racial minorities. For example, one study found that Caucasian children received a diagnosis earlier (6.3 years) than African American children (7.9 years; Mandell, et al., 2002). In addition, there may be gender differences in ASD presentation. ASD is predominately diagnosed in males. Researchers have implicated social and emotional differences as potential explanations for the imbalance in male to female diagnoses, which may result in an under-diagnosis of ASD in females (Head, et al., 2014). Following this, it would be beneficial to explore the role gender plays in ASD symptom manifestation and screening.

Machine learning (ML) may serve as an optimal data-analytic approach to examine potential differences between race and gender groups. Unsupervised ML techniques utilize algorithms to "learn" from data to make predictions and detect patterns of responses within the data. The self-organizing map (SOM) algorithm is an unsupervised ML analysis that clusters data according to similar responses (Bock, 2004).

Methods: The current study examined potential race and gender response differences on the Modified Checklist for Autism in Toddlers, Revised (M-CHAT-R; Robins et al., 2009). The sample consisted of four groups of toddlers (16-30 months): (1) Caucasians (N=11,156), (2) African Americans (N=2,425), (3) males (N=8,246), and (4) females (N=7,437). Toddlers determined to be at risk were referred for a comprehensive ASD diagnostic assessment.

SOM (MATLAB SOM Toolbox) was applied to each group's responses separately, resulting in clusters of varied levels of risk for an ASD diagnosis within each group. Item analysis was used to further explore potential race or gender differences in symptom manifestation.

Results: Clusters of varying risk levels were identified in each group. Risk level was determined based on the number of elevated ASD traits. Results demonstrated that SOM resulted in similar cluster results for Caucasians and African Americans. In both groups, three distinct risk status clusters (Typical, Low Risk, and High Risk) were revealed. The application of SOM in the male group also resulted in clusters of three levels of risk status; however, SOM failed to provide these risk differentiations for the female group, resulting in only Low Risk and High Risk clusters. In all groups, 100% of the ASD cases (determined by follow-up testing) fell into the High Risk clusters. Item analysis demonstrated overall consistent symptom manifestation across all four groups.

Discussion: Similar results for Caucasians and African Americans suggest race may not be a differential factor in M-CHAT-R screening. This may indicate that race does not directly contribute to potential diagnostic differences between races, but may be the result of other factors (e.g., SES, maternal education, or access to services). In contrast, SOM results differed between males and females. Specifically, SOM was able to differentiate risk status groups between males but was not as successful in designating risk status in females. Poorer performance in females may be because females with ASD tend to show symptoms later than males (Lai, et al., 2014) often not showing clear ASD features until school age when presented with more social opportunities (Robinson et al., 2009).

References/Citations:
Title: Actor-Partner Models Of Associations between Marital and Parent-Child Relationship Quality in Families of Children with Autism Spectrum Disorder

Authors: Emily J. Hickey, Sigan Hartley, Shari Blumenstock

Introduction: The family systems perspective theorizes that the quality of the marital relationship is connected to parenting experiences in meaningful ways. Virtually nothing is known about this connection in families of children with autism spectrum disorder (ASD). Expressed emotion in five minute speech samples (FMSS) provides a method for assessing warmth and criticism toward a child or spouse and has been shown to be associated with these qualities in actual interactions. The goal of this study was to use Actor-Partner Interdependence Models (Cook & Kenny, 2005) to: 1) examine how one's own (i.e. actor) and one's partner's level of warmth and criticism in a FMSS about their spouse relates to their level of parenting stress; and 2) examine how one's own (i.e., actor) and one's partner's level of warmth and criticism in a FMSS about their child with ASD relates to their level of marital quality.

Methods: Analyses are based on 79 married couples that have a child with ASD. Parents individually completed two FMSS, one about their child and one about their spouse (Magaña et al., 1986). Samples were audio recorded and coded for level of warmth and criticism by a trained and reliable coder according to well-developed criteria (Magaña et al., 1986). Parents were predominantly Caucasian, middle-class, and ranged from 25-65 years of age (M = 43.34 years, SD = 8.08). Children with ASD were aged 3-20 years (M = 11.84 years, SD = 4.9) and 77% were male. Parents individually completed the Marital Adjustment Test (Locke & Wallace, 1959), and Burden Interview (Zarit, Reever, & Bach-Peterson, 1980).

Results: Multi-level modeling using hierarchical linear modeling (HLM) was conducted. Level 1 variables included actor gender, race/ethnicity, education, age, warmth, level of criticism and warmth, and partner level of warmth and criticism. Level 2 variables included couple relationship length, household income, child age, child gender, severity of the child's autism symptoms, severity of the child's behavior problems, and child's presence of an intellectual disability. Results indicated that actor level of warmth in the FMSS about their spouse was negatively related to level of parenting stress (Coeff = -1.55, SE = 0.53). Actor level of warmth in the FMSS about their child with ASD was positively related to level of marital satisfaction (Coeff = 4.31, SE = 1.86). Actor level of criticism in the FMSS about their child with ASD was also positively related to level of marital satisfaction (Coeff = 5.36, SE = 2.46).

Discussion: Results indicate an association between marital quality and parenting experiences in families of children with ASD. Specifically, parents who expressed more warmth about their spouse reported lower levels of parenting stress. Parents who expressed more warmth about their child with ASD reported higher levels of marital satisfaction. Findings highlight the need for family-wide services and interventions, as outcomes for parents and children with ASD are closely linked.

References/Citations:
Title: Attention Shifts and Disengagement of Attention in Infants at High Risk for Autism Spectrum Disorders

Authors: Debra Reisinger, Alexis Brewe, Jane Roberts

Introduction: Attention control is a foundational developmental skill that emerges and develops across infancy with associations to social and non-social outcomes across typical and clinical populations. Evidence indicates that developmental changes in visual attention between 6 to 12 months-of-age predict later autism spectrum diagnoses (ASD; Ibanez et al., 2008). Infants with fragile X syndrome (FXS) are at high risk for developing ASD, as are infants with an older sibling diagnosed with ASD (ASIBs). Investigating early deficits in visual attention in infants at high risk for ASD can help characterize the infant phenotype of FXS and ASIBs and serve as a potential prognostic indicator of ASD risk. Our overarching research aim focused on characterizing the relationship of initial latency to visually disengage from a stimulus and frequency in shifts of visual attention across groups at high risk for developing ASD at 9, 12 and 24 months of age and the potential predictive value of these attentional control indicators to ASD severity at 24 months.

Methods: Participants included infant males with FXS (n=16), infant males with an older sibling with autism (ASIBs; n=9), and typically developing infant males (TD; n=15) assessed at 9, 12, and 24 months of age. A toy play epoch from the Laboratory Temperament Assessment Battery (LabTAB; Goldsmith & Rothbart, 1996) was used to measure initial latency to disengage attention from the toy and frequency of visual shifts in attention to the stimuli (e.g., the number of shifts away from and back to the stimulus during the 3 minute task). Behaviors were coded offline with a kappa of > 0.80 using Observer XT 10.5. The Mullen was utilized to control for developmental levels, and the Autism Diagnostic Observation Schedule-2 was utilized to obtain an autism severity score as the 24-month outcome.

Results: Developmental level was included in all models. Regression analyses were conducted to examine if latency to disengage predicted autism severity at 24 months of age. At 9 months, there were no main or interaction effects (F(4,23)=2.24, p=0.10, r²=0.15). At 12 months, a main effect of group (B=-0.64, SE=0.27, p=0.03) was found indicating more severe ASD features were associated with ASIB infants (r²=0.29). At 24 months, a trend was indicated suggesting increased latency to disengage was associated with more severe ASD features in FXS and ASIB infants (B=-0.64, SE=0.27, p=0.08, r²=0.62). Additional regression analyses were conducted to examine if attention shifts at 9, 12 or 24 months predicted autism severity. At 9 months, decrease d attention shifts predicted elevated ASD features at 24 months (B=-0.18, SE=0.08, p=0.03, r²=0.48). At 12 months, the overall model was significant but no specific effects were found between group and attention shifts in predicting autism severity (F(4,28)=3.78, p=0.02, r²=0.35). At 24 months, a trend was suggested with decreased attention shifts predicting elevated ASD features for the FXS and ASIB groups (B=0.36, SE=0.02, p=0.08, r²=0.70). Additional participants and hierarchical linear modeling will be added by final conference presentation.

Discussion: Our results support a relationship between visual attention across infancy and the emergence of autism symptoms at 24-months-of-age in FXS and ASIBs. These relationships appear primarily rooted in increased latency to disengage and decreased attention shifting that potentially reflects "sticky attention". These relationships appear to emerge early with medium to large effects that strengthen over time and are present by 24 months of age. These findings suggest that atypical visual attention may be a phenotypic feature for both FXS and ASIBs and highlight the potential value of visual attention as a prognostic indicator of autism risk in these two populations.

References/Citations:

Title: Preparing M.A. Degree/Autism Specialists to Sustain Use of Evidence-Based Practices

Authors: Laura J. Hall, Bonnie Kraemer, Christopher Brum

Introduction: Attrition rates in special education are notoriously high with research revealing that special education teachers often exit the field within three to five years of beginning practice (McLeskey & Billingsley, 2008) leaving students with disabilities and their families without the benefit of educators who are both well prepared and competent. Even when special educations remain in the field, surveys reveal their lack of use of evidence-based practices (Morrier, Hess, & Heflin, 2011). The results from follow up studies obtained from nine years of graduates of a university M.A. Degree/Autism specialization program contributes to the dearth of information about factors that support retention and sustained use of effective practices. The information reported supplements the positive outcomes reported for M.A. Degree graduates from 2006 (Hall, 2015).

Method: The multiple measures that were used to evaluate M.A. Degree program graduates' use of evidence-based practices up to nine years following graduation included: a Qualtics survey sent to program graduates that included questions about current and previous positions, use of evidence-based practices and progress monitoring systems, and factors that sustain practices; video samples from a subset of graduates used to score the fidelity of implementation of evidence-based practices by 2 inter-raters using the checklists from the National Professional Development Center (NPDC) on ASD (Odom, Cox & Brock, 2013); and matched t-tests results on the Autism Program Environmental Ratings Scale (APERS)(a measure of program quality) for a subset of graduates obtained when candidates entered the program compared with scores one year post graduation.

Results: The 57 survey responders (56% response rate) with representation from each of the 9 years, reveal that 95% remain in the field. Although they remained in the field, 72% changed positions an average of twice since graduation. The top factors why graduates changed positions were: professional development opportunities (35%), promotion (35%), better pay (33%), and increased opportunities to implement evidence-based practices (29%). The clearly top ranked program aspects that contributed to their sustained practice selected was "knowledge about research based strategies used with individuals with ASD" followed by "opportunities to practice skills with a coach during practicum."

All (100%) reported that they collected data for progress monitoring purposes and 100% continue to use the 24 evidence-based practices identified by the NPDC on ASD with fidelity as rated with a range of 80% to 100%. Results from matched t-tests revealed significantly improved scores on the APERS. All (100%) of the graduates reported on their survey that the university program contributed to a) their capacity to use evidence-based practices and b) their sustained use of these practices over time.

Discussion: These outcomes indicate that a M.A. Degree program that includes both didactic and competency-based training can result in graduates that remain in the field and maintain their use of evidence-based practices. These outcomes are contrary to those previously reported in the literature. Identified ways that university programs can prepare and support graduates so they remain in the field, even with positions changes, are discussed.

References/Citations:
Title: Minimally Verbal Children with ASD and Cognitive Impairment: Do Definitions Matter?

Authors: Vanessa Hus Bal, Terry Katz, Somer L. Bishop

Introduction: "High functioning" children with ASD (generally defined by IQ>70) show substantial variability in the nature and range of their language deficits. Some exhibit verbal skills below expectations based on their nonverbal cognitive abilities, suggesting that language and cognitive functioning are, to some extent, separable dimensions in children with ASD. There is very little information about associations between cognitive functioning and language in individuals with low nonverbal skills (IQ<70). Indeed, references to "low-functioning" children tend to confound cognitive and language impairment, despite evidence that some younger minimally verbal (MV) children have higher nonverbal cognitive skills (Munson et al., 2008).

Many definitions of MV children have been utilized, but it remains unknown how stratification methods compare. This study examines: 1) how using different instruments to define MV cohorts affects sample characteristics (demographics; ASD symptom, cognitive and adaptive profiles); 2) the overlap between cognitive and verbal abilities to identify areas in which MV children may be compared to children with IQ<70.

Methods: Children with ASD between 6 and 18 years old (N=2044) were drawn from the Simons Simplex Collection. All children had information from the Autism Diagnostic Interview-Revised (ADI-R), Vineland, Autism Diagnostic Observation Schedule (ADOS), cognitive assessment and parent questionnaires. Children were divided using the following MV definitions: ADOS Module 1 (No words/Some words), ADI-R language level (<5 words, 5+ words/no flexible phrases), Vineland Expressive age equivalent (<18 months), Social Communication Questionnaire (item 1 indicating no phrases) and parent estimate of vocabulary (none, 1-5, 5-25 words). Within children with NVIQ <70, MV children (ADOS Module 1, some words vs. no words) and verbal children (ADOS Module 2-4) were compared.

Results: 328 children (16% of the sample) were classified as MV. Of the 328, 24% were MV on two instruments and 38% on three or more. Most children (93%) were administered an ADOS Module 1 and 61% were reportedly not using daily, flexible phrases (ADI-R). Defining MV on the basis of the ADOS Module 1 yielded the largest group with the most discrepancies across measures (e.g., 62% MV on the ADI-R). Across MV definitions, 44-60% of children had VIQ<NVIQ profiles (i.e., VIQ 1+ SD below NVIQ), with as many as 15% of children with NVIQ>70.

Within the NVIQ<70 group (n=507), MV children were younger (F(2,504)=12.63, p<.001) and had lower VIQ (F(2,504)=222.97, p<.001) and NVIQ (F(2,504)=122.95, p<.001) compared to verbal children. A higher proportion of MV children (45%) had VIQ<NVIQ profiles than verbal children (20%; X2=78.82, p<.001). MV children had less severe current social-communication impairments on the ADOS (F(2,504)=24.38, p<.001), but more past symptoms on the ADI-R (F(2,504)=34.59, p<.001).

Discussion: This study demonstrates the variability in MV status depending on how it is defined. While no single approach is obviously "best," these results will inform methods to identify MV children within existing samples and design of studies ascertaining new samples of MV children. Within children with NVIQ<70, verbal and MV children differed on several characteristics. Nearly half of MV children exhibited VIQ<NVIQ profiles, suggesting a distinct subgroup of MV children whose language impairments are not attributable to general cognitive impairment. This highlights the need for future research to understand the unique strengths and challenges of MV children with ASD.

References/Citations:
Title: Differential Social Skills in Children with Autism Spectrum Disorder

Authors: Mikaela Kinnear, Regan Linn, Mary Baker-Ericzén, Niamh Murphy, Meghan Fitch, Stephen Kanne, Micah O. Mazurek

Introduction: Deficits in social communication and interaction (SCI) comprise one of two core symptom domains in the DSM-5 definition of autism spectrum disorders (ASD). While SCI deficits tend to be identified later in development in comparison to behavioral excesses, social difficulties can present significant challenges for those with ASD, particularly as they become more complex and challenging with age (e.g., Howlin et al., 2000). Longitudinal analyses of social skill development in young children with ASD indicate that these individuals tend to make moderate growth overtime in this area, particularly during early childhood (e.g., Gray et al., 2012). Additionally, recent studies have indicated that girls with ASD may display less diagnostic symptomology in social skill areas than boys (e.g., Coffman, 2015). The current study examines differential presentation of SCI deficits related to age, gender, and informant using both parent and clinician reports in a community sample of children with ASD.

Methods: Preliminary data are drawn from a comprehensive baseline assessment of an ongoing R01 study conducted in a community ABA therapy program. The Autism Diagnostic Observation Schedule, 2nd edition (ADOS-2; Lord et al., 2012) was administered to the child and the Vineland Adaptive Behavior Scales, 2nd edition (VABS; Sparrow, Cicchetti, & Balla, 2005) was administered to the parent via interview by trained, research reliable project staff. Parents completed the Social Responsiveness Scale, 2nd edition (SRS-2; Constantino & Gruber, 2012). This sample includes 95 children (79% male) ages 2-10 years (M = 3.9 years; SD = 2.0). Regression analyses were conducted to examine child age associated with each outcome variable. Age groups were also constructed (2 yrs, 3-4 yrs, and 5+ yrs) and ANOVAs were run to compare social skills by age and gender. Pearson correlation coefficients were used to examine relationships between the three measures.

Results: There was a significant relationship between age and the VABS Socialization composite scale standard score such that impairment in socialization increased with age (F=6.24, p=0.02). This relationship held when comparing age categories. There were no significant correlations between age and any of the SRS-2 social behavior subscales. The SRS-2 total score showed a significant relationship with age, but this relationship was no longer significant after accounting for the restricted and repetitive behaviors. There was no relationship between gender and any of the social measures.

Overall, there was no relationship between the subscales of the parent-rated SRS-2 or VABS-2 and the clinician-rated ADOS social affect scale. There was a small but significant correlation between the parent-rated SRS-2 "social awareness" subscale and the ADOS social affect scale (r=0.25, p<0.02).

Discussion: In a community sample, findings were mixed regarding the relationship between severity of social skills deficits and age for children with autism spectrum disorder in early childhood. As measured by the SRS-2, there is no relationship, and as measured by the VABS-2, there is a significant positive relationship between age and SCI. Our findings were inconsistent with previous findings in the literature suggesting further study to clarify factors that influence whether SCI improves with age versus becoming more impaired with age. Contrary to the previous literature, no relationship was found between gender and severity of SCI impairment as rated by parent or clinician. Poor correlation between parent-rated and clinician-observed social skills suggests that additional research is needed to determine potential factors influencing these disparities.

References/Citations:

Title: Quality of High School Programs for Students with Autism Spectrum Disorder in the United States

Authors: Samuel L. Odom, Kara Hume, Laura Hall, Bonnie Kraemer, Leann Smith

Introduction: As the prevalence of autism spectrum disorder (ASD) has increased markedly over the last 20 years, the number of students receiving interventions and special education services in high schools in the United States has also increased. To date, there has been no published information about the quality of such programs for students with ASD. The quality of program environments is essential because it affects the availability of learning opportunities for meeting students' individualized needs. The purpose of this study is to examine the quality of high school programs for meeting the needs of students with ASD.

Methods: This study took place in 30 high schools located in San Diego, central Wisconsin, and central North Carolina. In this multi-cohort study, 295 high school students with ASD, their teachers and related service staff, and their families participated. All high schools were public and provided services for students across the autism and intellectual ability spectrum. Authors assessed the quality of the educational programs using the Autism Program Environments Rating Scale (APERS). The 66-item, five-point Likert rating scale is organized into ten subscales (Environment, Climate, Assessment, Instruction, Communication, Social, Independence, Functional/Problem Behavior, Family, and Teaming), one composite score for transition, and also generates a total score. Raters conduct multi-day observations in high school programs, interview key staff members, and review records. They used this information to generate a rating for each school.

Results: The mean item ratings for the APERS collected in the 30 high schools was the primary metric for this study. With this assessment, mean scores of 3.0 are considered mediocre but have some of the features of a high quality high school environment or subdomain. Average item ratings below 3.0 indicate that programs are missing some qualitatively important features. Scores above 3.0 indicate that programs have features that are considered high quality. The results of the data from our first cohort will appear in a histogram figure (it would not load on this proposal program). As a group, the strongest features of high school programs were in the physical environment of classrooms and schools, the social climate of programs, and the interactions with parents (ratings of 4.0, 4.1, 4.3, respectively). Teaming, that is collaboration among service provider working in the high school, was slightly above the 3.0 level (3.3). Although the general subdomain of instruction was also slightly above the 3.0 level (3.18), the features of high school that focus on the areas of specific importance for students with ASD (assessment, social, communication, independence, challenging behavior) were all below 3.0. Also, the transition subdomain, a critically important area for students with ASD, had the lowest score of all subdomains (2.65).

Discussion: These results suggest that high schools in the US are providing some positive features, but the features of high school that focus on the educational needs that are most important (social competence, communication, independence, and behavior) are lagging behind. Importantly, they document concern about the quality of transition features of high school programs. In total, findings suggest the need for more focused comprehensive intervention programs for students with ASD at the high school level.

Note to reviewers: Although we feel that these data "stand on their own," by the time of the Gatlinburg conference, we will have APERS data for our second cohort, which we will merge with these data to have a total school "n" of 60.
Title: Emotion Regulation in Children with Autism Spectrum Disorder: The Role of Parent Co-Regulation and Scaffolding

Authors: Victoria Ting, Carly Albaum, Priscilla Burnham Riosa, Andrew Goodwin, Andrea Maughan, Jonathan A. Weiss

Introduction: Children with autism spectrum disorder (ASD) often have externalizing (e.g., aggression) and internalizing (e.g., anxiety) emotional and behavioral problems. Emotion regulation (ER), the set of processes that control emotions, may explain many of these difficulties in children with ASD. Parents can support children's emotional development and ER through co-regulation (i.e., motivational and emotional scaffolding, and helping their child regulate emotions), which in turn may help improve psychopathology. However, research has only focused on very young children with ASD, despite parent support of child emotion regulation going well beyond the preschool years.

Research Questions:

1. What types of co-regulation strategies do parents of school-age children with ASD use?
2. What are the associations between parent co-regulation strategies, child ER, and child externalizing and internalizing problems?
3. Do child ER skills mediate the relation between parent co-regulation and child psychopathology?

Methods: All 39 participants (90% male, N = 34) were enrolled in a randomized controlled trial of CBT to improve emotion regulation in children with ASD, 8 to 12 years of age (M = 9.60, SD = 1.26) with average intellectual functioning (IQ > 80). Most parents in this sample were mothers (80%, N = 31). Data analyses are based on the baseline data collection period.

This study used parent-report, open-ended measures, and behavioral observation. We used two open-ended measures to assess child ER ability: Dylan is Being Teased and James and the Math Test. To measure parent co-regulation strategies, we applied a behavioral coding scheme to parent and child behaviors during a standardized Emotion Discussion Task, in which each dyad discussed a time when the child felt anxious, angry, and happy (five minutes per emotion). We created three composite scores for parent co-regulation strategies: Vocal (e.g., reassurance), Active (e.g., prompting), and Following (e.g., emotion following). We also assigned global ratings for parent motivational and emotional scaffolding using a 5-point Likert scale. Externalizing and internalizing problems were measured via parent report on the Behavior Assessment System for Children, Second Edition - Parent Rating Scales.

Results: The most commonly observed types of co-regulation strategies were prompting (M = 22.76, SD = 5.21) and emotion following (M = 21.79, SD = 5.44). Child externalizing problems were significantly associated with the mean quality of parent scaffolding (r(36) = -.51, p = .001) and child ER ability (r(35) = -.34, p = .04), and were marginally significant with the Following co-regulation composite (r(36) = -.30, p = .07). The overall model accounted for 39% of the variance in externalizing problems, F(4, 31) = 5.06, p = .003. Although child ER did not emerge as a significant mediator, parent scaffolding (t = -2.67, p = .01) and child ER (t = -2.33, p = .03) were significant independent predictors of externalizing problems.

Discussion: This is the first study to use observational methods to investigate parent co-regulation and ER in school-age children with ASD. Parents most commonly used prompting and emotion following in their co-regulation efforts, which may together function to help guide children's emotional experience and avoid emotional arousal, while helping children internalize adaptive ER skills. Parents continue to play a fundamental role in their children's emotional development, beyond toddlerhood and into school-age years. With future research, parent co-regulation and scaffolding may emerge as useful areas of focus in interventions targeting internalizing and externalizing problems in children with ASD or other developmental disabilities.

References/Citations:

Title: Symbolic Play as a Behavioural Cusp in Early Development of Social Communication Skills

Authors: Soo Wee Ho, Dennis Moore, Angelika Anderson

Introduction: Social communication development is conceptualised as part of one's adaptive behaviour. Systematically building the capacity for representational or symbolic play may facilitate the development of representational thought linked to symbolic language development (Landa, 2007). This research investigated the importance of teaching symbolic play acts as target behaviours in early interventions, in terms of its impact on communication and language development. A behavioural cusp is any behavior change that brings the organism's behavior into contact with new contingencies that have even more far-reaching consequences (Rosales-Ruiz & Baer, 1997, pp. 533). It is hypothesized that symbolic play skills, when acquired, will lead to the development of new behaviours, by bringing the child into contact with new contingencies that have even more far-reaching consequences, illustrating the concept of a behavioural cusp (Rosales-Ruiz & Baer, 1997).

Methods: A developmental trajectory approach was used to examine the unfolding of communication, language and play skills of two groups of children longitudinally over three time points, one with ASD and the other neurotypical group. A single case symbolic play intervention study was layered over this developmental trajectory study. This is a partial systematic replication of the targeted symbolic play intervention study conducted by Kasari and her colleagues (Kasari et al., 2006). One target child from the ASD group of four children received daily targeted play intervention over a ten-week period.

Results: From the developmental trajectory study, the neurotypical group of children made better progress compared to the group of children with ASD, both in their language and in their play skills. The child receiving targeted interventions made gains in her play skills. Post-interventions, the child’s proportion of play involving indiscriminate actions fell from 38.5% to 22.8%, which is a decrease of 15.7% of developmentally least advanced level of play. Even though language skills were not explicitly targeted, she made gains in language skills, especially in her expressive communication as assessed by Preschool Language Scale, Fifth Edition. Her Expressive Communication standard scores increased from 88 (21st percentile rank) to 98 (45th percentile rank) post-interventions, and to 104 (61st percentile rank) at a three-month maintenance probe.

Discussion: This study shows evidence of collateral gains in auditory comprehension and expressive communication from a targeted symbolic play intervention. The findings support the notion that symbolic play was a cusp behaviour in that it leads the organism to "come into contact with new reinforcers" (Rosales-Ruiz & Baer, 1997, pp. 534). These naturally occurring reinforcers then promote a new learning cycle which continued to spur further learning. This study has provided evidence that targeted symbolic play may be a cusp to early development of communication skills, with collateral gains in language skills. Going beyond using play as a backdrop to teaching various skills, the author argued that symbolic play targets are worthy early intervention goals by themselves.

References/Citations:
Title: Maternal Depressive Symptoms, Parent Behaviors, and Sleep in Infants Born Preterm

Authors: A. J. Schwichtenberg, Emily Abel, Julie Poehlmann-Tynan

Introduction: Optimal sleep is a critical element of development for all children. Early sleep behaviors are associated with learning, memory, impulse control, behavior problems, and social competence. Sleep may be particularly important for infants born preterm because they are also at elevated risk for difficulties with impulse control, attention, and social interactions (Bhutta et al., 2002). Although there is no universally agreed-upon definition of what constitutes optimal sleep for preterm (or full-term) infants, 'good' sleep is generally characterized by independent sleep onset, longer consolidated sleep periods, self-soothing, and more sleep per sleep-wake cycle. Parents often strive to foster these sleep patterns while exhibiting sensitive responsiveness to the infant's fatigue and social cues. For some mothers, depressive feeling may influence their ability to read infant fatigue cues and may ultimately impact their parenting behaviors and infant sleep development. The present study explores the associations between maternal depressive symptoms (MDS), parenting behaviors, and preterm infant/toddler sleep from 4 to 24 months (corrected for gestational age).

Method: Within a longitudinal prospective design, we used structural equation modeling to examine MDS as a predictor of parenting behaviors and infant/toddler sleep patterns at 4, 9, and 24 months in 156 infants born preterm. Infant prematurity and family sociodemographic assets were recorded at hospital discharge. At each subsequent visit, MDS were indexed via the Center for Epidemiologic Symptoms - Depression Scale, parenting behaviors were assessed with an interview and with the Parent-Child Early Relational Assessment. Infant sleep estimates were generated from parent-report diaries.

Results: Family sociodemographic assets were associated with MDS at 4 and 9 months; wherein, fewer sociodemographic assets were associated with more MDS. Maternal depressive symptoms and child sleep behaviors were consistent over time (e.g., infants who slept more at 4 months continued to sleep more at 9 months). Maternal depressive symptoms were associated with concurrent and future parenting behaviors both during the day and at night (during infant/toddler bedtime routines). Mothers who endorsed more depressive symptoms engaged in daytime interactions that were characterized by less positive affect and involvement. At night, these mothers were less involved in their infant's bedtime routine and their routines were overall less complex. Less maternal involvement and less complex bedtime routines were associated with less infant nighttime sleep over time.

Discussion: Support for mothers raising infants born preterm often includes addressing elevated depressive symptoms and dyadic interaction difficulties. However, few interventions include bedtime routines as a target interaction. The present study draws attention to parenting behaviors at bedtime and a potential mechanism through which elevated maternal depressive symptoms may impact infant development.

References/Citations:
Title: Highs and Lows: Parents Reflect on Autism's Impact on the Family

Authors: Tyler A. Hassenfeldt, Angela Scarpa

Introduction: The relationship between a child with a developmental disability (DD) and his/her family is nonlinear and mutually influential (Patterson, 1991). This has a number of implications for family functioning. Dyson (1997) found that parents of children with DDs had more child-related parenting stress than parents of typically-developing (TD) children, and parental stress was correlated with various negative aspects of family functioning.

Within the field of DDs, it is critical to examine the entire family context, as studying each member individually is insufficient to understand the system at large. More narrowly, symptoms associated with an Autism Spectrum Disorder (ASD) may place a number of burdens on family members (Herring et al., 2006), leading them to rearrange their lives and forfeit social opportunities (Kelly, Garnett, Attwood, & Peterson, 2008). Myers and colleagues (2009) utilized an online open-ended questionnaire to discover five crucial areas in which ASD impacts the family: stress, the behavior of the child with ASD, parental well-being, impact on the family as a whole, and social isolation. Woodgate, Ateah, and Secco (2008) found that families of children with ASD describe themselves as "living in a world of our own." The current study employed qualitative methods to explore both the "hassles" and "uplifts" (Giallo & Gavidia-Payne, 2006) of living with a child with ASD.

Methods: Data were collected through two focus groups (n=5) and 14 individual interviews, for a total of 19 participants. All participants had a child with a previous ASD diagnosis as well as a TD sibling (grades 1-9). Families were recruited nationally, with 68% living in Virginia. Interviewees were predominantly Caucasian, female, and the child's biological parent. Interviews were recorded and transcribed; data were coded using NVivo for Mac coding software.

Results: A number of common themes emerged through the use of classical content analysis (Leech & Onwuegbuzie, 2011), highlighting both the unique challenges and 'silver linings' of having a child with ASD. Initially, many parents described feelings of grief and disappointment upon receiving their child's diagnosis. Struggles to accept the diagnosis and alter initial expectations were depicted. Coordinating therapy services for their child was noted to be particularly overwhelming. Parents reflected upon a number of ways that their child with ASD places limits on the family, such as restrictions on social outings or family meals due to behavior problems.

More positively, parents described a number of collateral benefits their TD children experience, such as increased patience, compassion, awareness, and empathy. Some families noted improved closeness between siblings and between parents. Parents shared how their child with ASD's restricted interests could be channeled into positive outcomes. Finally, many participants discussed how their child's ASD symptoms provided a sense of perspective - a reminder to count their blessings, because "it could always be worse.

Discussion: Parents discussed their perceptions of a number of both positive and negative effects on the overall family unit stemming from their child with ASD. Findings have implications for supports and resources that should be offered to families and TD siblings. The positive aspects of a challenging disorder are important to share with families of newly-diagnosed children.

References/Citations:
Title: Effect of Anxiety Disorders on Functional Daily Living Skills in Young Adult Males with Fragile X Syndrome

Authors: Sara Matherly, Jane Roberts, Angela Thurman, Andrea McDuffie, Leonard Abbeduto

Introduction: Fragile X syndrome (FXS) is the most common inherited genetic cause of intellectual disability (ID). Daily living, socialization, and communication skills play pivotal roles in the life success of individuals with ID and encompass specific domains of functional skills. Research has illustrated that the majority of adult males with FXS master basic daily living skills, such as toileting, eating, and bathing (Bailey, 2009). However, co-occurring mental health conditions of an autism spectrum disorder have been found to negatively influence more complex functional skills related to adult independence for individuals with FXS (Hartley, 2011). FXS is also characterized by anxiety and social withdrawal in comparison to general ID populations, indicating a profound, pervasive effect of the FMR1 gene mutation on anxiety symptoms. Despite the striking prevalence of anxiety in FXS, these debilitating symptoms often go untreated and their impact on functional skills related to adult independence remains unknown. The purpose of this study was to evaluate the dimensional and diagnostic effects of anxiety disorders on daily living skills in young adult males with FXS, which may inform targets for interventions with young adult services.

Methods: This sample represents preliminary data from a larger ongoing study. Participants included 30 young adult FXS males (Mage=18.6 (2.3) with nonverbal IQs below 85. The Children’s Interview for Psychiatric Syndromes: Parent Version (PChIPS) was used to characterize participants for anxiety disorders including Specific Phobia, Social Phobia, Separation Anxiety and Generalized Anxiety. The Autism Diagnostic Observation Schedule-2 provided an autism severity index for each participant, which was examined as a predictor of daily living skills in analyses. The Child Behavior Checklist, a parent-report instrument, assessed dimensional aspects of anxious/depressed behaviors. The Waisman Activities of Daily Living Scale (W-ADL), a parent-report questionnaire, rated independence of daily living skills from a scale of 0 to 34 with greater scores indicative of more skills.

Results: Young adult males with FXS had a mean of 22.12 (SD 5.08) reflecting mastery of between 8-11 out of 17 possible daily living skills. Additionally, 60% of participants met criteria for at least 1 anxiety disorder on the PChIPS with 23% falling above the at risk clinical cutoff on the CBCL and 13% meeting criteria across both measures. Daily living skills were negatively related to autism severity (B=-.83, p<.05; R2=.54) and positively related to anxiety on the CBCL (B=.67, p<.05) and Leiter Growth scores (B=.17, p<.05). Lastly, only the presence of Separation Anxiety Disorder on the PChIPS resulted in significantly reduced functional daily living skills (B=-8.37, p<.05; R2=.17).

Discussion: These findings indicate that daily living skills are impaired in young adult males with FXS. Given that reduced daily living skills were associated with lower nonverbal IQ and elevated autism symptoms, this suggests that these individuals are in need for more intensive and, perhaps, more specialized treatment to increase their daily living skills. A complex pattern emerged with poor daily living skills associated with decreased anxiety symptoms yet, also, with the presence of Separation Anxiety Disorder. Perhaps, elevated anxiety at a sub-threshold level serves to heighten awareness and mobilize efforts towards adaptive behavior while anxiety at a higher, diagnostic level results in impairment.

References/Citations:
Title: Writing Achievement in Higher-Functioning, School-Age Children with Attention-Deficit/Hyperactivity Disorder or Autism Spectrum Disorders with High and Low ADHD Symptomatology

Authors: Matthew C. Zajic, Nancy McIntyre, Lindsay Swain-Lerro, Tasha Oswald, Peter Mundy

Introduction: Higher functioning children with autism spectrum disorders (HFASD) or attention-deficit/hyperactivity disorder (ADHD) often find writing challenging. However, writing research has not focused on children at-risk for comorbid ASD and ADHD. Exploring comorbidity's impact can help better understand writing difficulties faced by children with HFASD and/or ADHD.

Methods: A total of 116 children (between 8 and 16 years old) participated: 51 with HFASD, 29 with ADHD, and 36 with typical development (TD). A planned-comparison-group analysis was used with a three-diagnostic-group split (3DX)—HFASD, ADHD, and TD—and a four-diagnostic-group split (4DX)—HFASD with high ADHD symptomatology (HFASD-H), HFASD with low ADHD symptomatology (HFASD-L), ADHD, and TD. The 4DX had 34 children with HFASD-H and 17 with HFASD-L. No groups in either split differed on age or grade.

All children came into the study with community diagnoses. Diagnoses were confirmed using ASD (ADOS-2, ASSQ, SCQ, and SRS) and ADHD (Conners-3 Parent Report) diagnostic assessments, which confirmed expected differences in both splits. The 4DX HFASD-H group composed of children with HFASD with elevated averaged inattentive and hyperactive-impulsive Conners-3 symptom scales t-scores greater than 70 (two SDs above the mean). FIQ was assessed with the Wechsler Abbreviated Scales of Intelligence-2; due to a main effect of FIQ in both splits, writing analyses covaried for FIQ.

Writing achievement was measured with the Wechsler Individual Achievement Test-III, an expository writing task that provides age-standardized scores for overall writing, word count, and thematic content. Five trained research assistants coded writing samples, including overlapping subsets (N=16-45). Intraclass correlation coefficients ranged between 0.87 and 1.00, demonstrating high reliability.

Results: A main effect of diagnostic group on overall writing scores occurred in the 3DX, F(2,112)=3.559,p=.032,η_p^2=.06, and the 4DX, F(3,111)=5.217,p=.002,η_p^2=.124. For the 3DX, the TD group was higher than the two clinical groups (who did not differ). For the 4DX, the HFASD-L group scored higher than the HFASD-H group, the ADHD and HFASD groups did not differ, and the TD group differed only from the HFASD-H and ADHD groups.

A main effect of diagnostic group on word count score occurred in the 3DX, F(2,112) =4.891,p=.009,η_p^2=.08, and the 4DX, F(3,111)=3.970,p=.010,η_p^2=.097. Group differences were similar to the overall writing scores' results.

A main effect of diagnostic group on the thematic score did not occur in the 3DX, F(2,112)=1.564,p=.21,η_p^2=.027, but did occur in the 4DX, F(3,111)=3.876,p=.011,η_p^2=.095. The HFASD-L group differed from the HFASD-H and ADHD groups but not the TD group, while the HFASD-H group differed from the TD group but not the ADHD group.

Discussion: The 3DX supported prior research in showing that clinical groups struggled with writing. However, accounting for ADHD symptomatology, the 4DX demonstrated that children with HFASD-H performed the lowest on thematic content, while children with HFASD-L performed more similar to TD peers. These findings are useful for identifying writing difficulties faced by children with HFASD and better isolating struggling and achieving subgroups with implications for writing interventions.

References/Citations:
Title: The Contribution of Human Capital and Social Capital to Employment of Adults with Autism Spectrum Disorders with Comorbid with Intellectual Disability

Authors: Wai Chan, Leann Smith, Jinkuk Hong, Jan Greenberg, Marsha Mailick, Julie Taylor

Introduction: Consistent employment is considered as an important factor for quality of life, yet maintaining employment can be challenging for individuals with autism spectrum disorder (ASD; Chiang & Wineman, 2014; Henricks, 2010; Levy & Perry, 2011). Past research indicated multiple risk factors for poor employment outcomes including functional limitations, severe autism symptoms, and lower family income (Shattuck et al., 2012; Taylor et al., 2015). However, less is known about the positive factors that may promote employment stability for individuals with ASD, especially those with intellectual disability (ID).

Human and social capital may contribute to positive employment outcomes, including those assets which are pertinent to individuals with ASD or their family. For example, higher education and better living skills of individuals with ASD has been connected with consistent employment (Araten-Bergman & Stein, 2014; Taylor et al., 2015). Living in a metropolitan area also has been associated with greater odds for a stable employment (Yeung & Rauscher, 2014). Thus, the goal of the current study was to explore the contribution of human capital (skills, education, friendship, and residential location) and social capital (maternal education and social network) to the consistent employment for pay among individuals with ASD with comorbid with ID.

Methods: A subsample of a larger longitudinal study was used (Adolescents and Adults with Autism Study; Seltzer et al., 2011). Mothers of adult children with ASD with comorbid with ID (N = 103; M = 32.97, ranged from 21 - 59 years old) participated in the study at two time points approximately 18 months apart. Employment was dichotomized as "consistently employed" vs. "never employed". Those individuals who were working for pay independently or with support greater than 10 hours per week across two time points were categorized as consistently employed. Conversely, those individuals who were not working for pay greater than 10 hours per week at any given time point were classified as never employed (84.5%).

Human capital for individuals with ASD included their level of daily living skills (Waisman Activities of Daily Living, WADL; Maenner et al., 2013; Smith et al., 2012), highest level of education, friendship, and residential location (i.e., large urban area vs. others). Social capital of mothers included their educational level and size of social network (Antonucci & Akiyama, 1987). Sex, age, and lifetime autism symptoms of individuals with ASD were statistically controlled.

Results: Logistic regression techniques were used to predict the likelihood of consistent employment of individuals with ASD with comorbid with ID. Results indicated that one unit increase in WADL was associated with 19% increase in the likelihood of being consistently engaged in employment for pay (OR = 1.19, p < .01). Those living in a large urban area were about 3 times more likely than those not living in a large urban area to stay employed at trend level (OR = 3.58, p < .10). An expanded social network of mothers was also marginally related to consistent employment (OR = 1.39, p < .10). Daily living skills were found as the most important capital for consistent employment.

Discussion: The current study explored the contribution of social and human capital to the employment of adults with ASD with comorbid with ID. Consistent with our hypotheses, social and human capital may enhance the probability that individuals with ASD with comorbid with ID could achieve a competitive job more than 10 hours a week. Daily living skills remained a robust predictor, even overshadowing the effect of education level of both individuals with ASD and their mothers. These findings confirm the importance of developing independence in living skills for those individuals with ASD and ID.
Title: Physiological Reactivity and Synchrony in Couples Who Have a Child with Autism and Link to Parenting Stress

Authors: Sigan Hartley, Robert Olson, Paige Bussanich, Iulia Mihaila, Greta Goetz, Emily Hickey

Introduction: There is evidence that challenges associated with having a child with autism spectrum disorder (ASD) can affect marital relationships. Research is now needed to elucidate the processes that allow some couples to adapt to these challenges and understand the pathway between couple interactions and parenting experiences. Evidence from studies on the general population suggests that partner physiological reactivity and synchrony (i.e., linkages in the physiological state of partners) during couple problem-solving tasks taps into the quality of couple interactions and is predictive of longer-term outcomes. In the current study, autonomic nervous system activity assessed via heart rate (HR) and electrodermal activity (EDA) was collected as parents who have a child with ASD engaged in a 7-minute couple problem-solving task. The study aims were to: 1) determine the relation between physiological reactivity and synchrony of parents during a couple problem-solving task and the observed quality of the interaction; 2) evaluate the relation between parent's physiological reactivity and synchrony during a couple problem-solving task and level of parenting stress.

Method: Analyses included 93 couples in longstanding relationships who have a child with ASD (5-12 yrs). Parents were predominantly White (88.5%), middle-class, and aged 22-58 yrs (M = 37.75, SD = 5.14). Couples completed a 5-minute baseline task and then a 7-minute problem-solving task in which they discussed a difference of opinion or disagreement problematic for their relationship. Parents wore a multisensor wireless wristband that continuously collected HR and EDA. The observed quality of the couple problem-solving task was rated along several dimensions (engagement, positive affect, negative affect, conflict resolution, and global quality) using well-established criteria (Frosch et al., 2000). Parents rated level of parenting stress on the Burden Interview (Zarit et al., 1980).

Results: After controlling for movement and socio-demographic characteristics, multilevel models using hierarchical linear modeling software indicated that parents observed to exhibit a higher level of negative affect (Coeff = 0.05, SE = 0.02) and engagement (Coeff = 0.03, SE = 0.01) during the couple problem-solving task exhibited a higher mean increase in EDA, relative to baseline. Parents observed to exhibit a lower level of conflict resolution (Coeff = 0.08, SE = 0.04) in the couple problem-solving task exhibited a higher mean increase in HR, relative to baseline. Multilevel models indicated that mothers’ EDA (Coeff = 0.18, SE = 0.08) and HR (Coeff = 0.11, SE = 0.03) significantly positively co-varied during the couple problem-solving task with father’s EDA and HR. However, this association was stronger for couples observed to exhibit higher negative affect. Mothers who evidenced a higher mean increase in EDA (Coeff = 4.31, SE = 1.86) during the couple problem-solving task, relative to baseline, reported a higher level of parenting stress. Synchrony in EDA during the couple problem-solving task was significantly positively associated with level of parenting stress (Coeff = 4.31, SE = 1.86).

Discussion: Findings offer insight into physiological reactivity and synchrony in the couple interactions of parents of children with ASD. Both reactivity and synchrony in physiological arousal appear to be markers of couple functioning. Moreover, physiological reactivity and synchrony in couple interactions were related to level of parenting stress, highlighting the link between marital and parenting experiences.

References/Citations:
Title: Sensory Behaviors in Minimally Verbal Children with Autism Spectrum Disorder: When and How Do Caregivers Respond?

Authors: Clare Harrop, Nicole Tu, Ann Kaiser, Rebecca Landa, Connie Kasari

Introduction: Unusual interests in or reactions to sensory stimuli are widely reported in children with ASD (Baranek et al., 2006) and are now featured within DSM-5 criteria. These behaviors are characterized by self-stimulation, avoidance of stimuli, sensory seeking and failure to respond to sensory modalities. Based on caregiver report, between 45 and 95% of children with ASD react to or seek sensory stimuli from their environment (Baranek et al., 2006).

While there is a sizeable body of research defining sensory behaviors in children with ASD, there has been very little research exploring how children's sensory behaviors affect the responses of those close to the child (namely caregivers) of children with ASD and ID who are school aged and minimally verbal.

Method: The responses of caregivers of 56 minimally verbal children with ASD were examined on the Sensory Experiences Questionnaire (SEQ-2). Child sensory behaviors were classified as hypo vs. hyper; social vs. non-social; as well as by sensory modality.

Caregivers’ responses were further classified by follow up questions (1) Do you try and change this behavior and (2) If yes, what do you do. Coding of caregiver strategies was achieved through a two-step process; firstly we identified categories of responses that we expected to arise through previous literature. Secondly we identified categories that emerged from the data through content analysis of the free text caregiver responses that weren't classifiable into one of the categories identified through previous literature.

Caregiver responses were explored in two ways; firstly how frequently caregivers reported they employed a response to address their child’s sensory behaviors. Secondly we examined whether the type of response varied as a function of child sensory behavior.

Results: Seven categories of caregiver response emerged from the data; reassurance, prompting, caregiver modifications, environmental modifications, exposure, redirections and training/professional support.

Caregivers did not respond uniformly across all types of sensory behavior; they responded less frequently to behaviors involving movement (p <.001) and more frequently to taste/smell and visual behaviors (p <.001). Caregivers did not differ in how frequently they responded to hypo or hyper-responsive behaviors (p = .08), but they did report responding more to behaviors involving social rather than non-social stimuli/triggers (p <.001).

Across all items, the most common type of caregiver response was prompting followed by the caregiver changing their own behavior in response to their child's sensory behavior. Nearly 15% of responses included multiple responses to a single child sensory behavior.

Discussion: Our findings demonstrate how extensively caregivers adapt to their children's sensory behaviors. The findings are consistent with previous qualitative and quantitative investigations of caregiver responses, extending them to minimally verbal children. Our findings suggest that caregivers adapt their behavior and employ multiple strategies in response to their child's sensory behaviors, with variation in the frequency and type of response by sensory modality, processing pattern and social-nonsocial contexts. Further work is required to examine whether these same patterns are found in younger children and those with greater language abilities.

References/Citations:
Title: Interaction Style of Mothers of Young Children with Williams Syndrome and Relations with Child Expressive Vocabulary

Authors: Danielle Henderson, Debora Perez-Garcia, Carolyn B. Mervis

Introduction: Studies of both typically-developing children and children with developmental disabilities such as fragile X syndrome or autism spectrum disorder have shown that children whose mothers have a more sensitive/responsive interaction style have significantly larger expressive vocabularies than do children of the same age whose mothers have a less sensitive/responsive style. The purpose of this study was to provide the first examination of the relation between maternal responsivity and child expressive vocabulary ability for children with Williams syndrome (WS). We hypothesized that child expressive vocabulary ability would be predicted by maternal interaction style even after taking into account the effect of child nonverbal reasoning ability.

Method: Participants were 75 children (35 girls, 40 boys) with classic deletions of the WS region (7q11.23) aged 4.01 - 8.39 years. Children completed the Differential Ability Scales-II (DAS-II; mean Nonverbal Reasoning Cluster standard score (SS): 79.4, SD: 14.8) and the Expressive Vocabulary Test-2 (EVT-2; mean SS: 81.6, SD: 16.5). In addition, each mother-child dyad participated in a 30-minute play session with developmentally appropriate toys. Play sessions were videotaped.

Maternal behavior during the play sessions was coded from the video-recordings using the coding system most often used by the NICHD Early Child Care Research Network ([1]). This system yields a composite formed from the sum of ratings on three 7-point Likert scales: Supportive Presence, Respect for Child Autonomy, and Hostility (reversed), with higher scores indicating greater responsivity. The same two coders scored each recording independently; the maternal interaction style composite score was the average of the two coders' ratings. Median composite score was 16.0 (range: 10.5 - 21.0).

Results: To examine relations between child expressive vocabulary SS, child CA, child nonverbal reasoning SS, estimated annual family income, and maternal interaction style composite bivariate nonparametric correlations were computed. The maternal interaction style composite was moderately positively correlated with EVT-2 SS (rs = .42, p < .001) and DAS-II Nonverbal Reasoning SS (rs = .42, p < .001). EVT-2 SS was strongly positively correlated with DAS-II Nonverbal Reasoning SS (rs = .62, p < .001). Estimated annual family income and child CA were not significantly correlated with any of the study variables (ps > .38).

To test the study hypothesis, sequential-model multiple regression analysis was performed. Model 1 was comprised of child CA, estimated annual family income, and DAS-II Nonverbal Reasoning SS. This model provided a significant fit to the data, accounting for 39.3% of the variance in EVT-2 SS. The only significant predictor was DAS-II Nonverbal Reasoning SS (p < .001). Maternal interaction style composite was added in Model 2, which provided a significantly better fit to the data, accounting for 43.4% of the variance in EVT-2 SS. Once again, Child CA and estimated family income were not significant predictors (ps > .5). However, both maternal interaction style composite (p = .02) and DAS-II Nonverbal Reasoning SS (p < .001) were significant predictors of child EVT-2 SS. Predicted EVT-2 SS ranged from 72 for a maternal interaction style composite of 10.5 (the lowest in this sample) to 93 for a composite score of 21 (the highest), after controlling for DAS-II Nonverbal Reasoning SS.

Discussion: Maternal interaction style significantly predicts child expressive vocabulary SS in children with WS aged 4-8 years even after taking into account the effects of nonverbal reasoning SS, estimated annual family income, and child CA. Implications of these findings for facilitating the language development of children with WS are discussed.


Funding: NICHD R37 HD29957, Williams Syndrome Association WSA-0104
Title: Maternal Responsivity on Language Outcomes during a Language Intervention for Children with Developmental Delay

Authors: Nonyé Nwosu, MaryAnn Romski, Rose Sevcik

Introduction: Families of children with developmental delays and little functional speech may experience challenges communicating with them and meeting their needs (Landry et al., 2008; Smith et al., 2011; Broberg, Ferm, & Thunberg, 2012). Thus, communication difficulties have the potential to bi-directionally affect these relationships and the family structure (Landry et al., 2008; Smith et al., 2011). Maternal responsivity is one aspect of parenting style that is critical to early child development, in particular communication (Brady, Warren, & Sterling, 2009; Warren & Brady, 2007). It refers to the mother’s emotional and physical response to her child’s needs. Furthermore, early language intervention provides a critical opportunity to assuage communication difficulties that are necessary for development (Romski et al., 2010; Romski & Sevcik, 2005) and in turn strengthen the caregiver-child relationship. The purpose of this study was to assess the relationship between maternal responsivity and language outcomes in young children with significant developmental delays and fewer than 10 spoken words.

Methods: 62 toddlers with significant developmental delays and fewer than 10 spoken words and their mothers participated in this study after a 24-session language intervention. The data for this secondary analysis are from a longitudinal study that evaluated language outcomes after a parent-implemented augmented or spoken language intervention (Romski et al., 2010). We expected that children of responsive mothers who attended to their child’s needs, contingently and with positive affect, will have greater language outcomes (target spoken and augmented vocabulary items) post-intervention than those whose mothers were not as responsive (Brady, Warren, & Sterling, 2009). Maternal responsivity, from pre-intervention to post-intervention, will moderate the relationship between children’s expressive (spoken and augmented) language gains, calculated using transcripts from intervention sessions. Furthermore, we expected that mothers across all intervention groups will become more responsive from pre-intervention to post-intervention because of the skills acquired during the intervention process.

Results: Preliminary review of the data indicate that instances of maternal responsivity increased from pre- to post-intervention and on average the instances of directive behaviors decreased. Mothers in the two Augmented interventions groups appeared to be more responsive and less directive than those in the Spoken Communication intervention. Additional analyses will include an analysis of variance (ANOVA) with one between groups factor (spoken, AC-I, AC-O) and one with-in groups factor (pre/post intervention) to assess the differences in maternal responsivity from pre-intervention to post-intervention. As well, a correlation between maternal responsivity and target expressive vocabulary, using the Pearson product-moment correlation (r) across groups at pre- and post-intervention, provided information regarding the amount of variance in target expressive vocabulary explained by maternal responsivity. These analyses provided additional information regarding any significant differences amongst the three groups.

Discussion: Results will be discussed with respect to the aforementioned analyses to provide quantitative information about the relationship between maternal responsivity and expressive target vocabulary over the duration of the intervention.

References/Citations:
Title: Caregiver Concerns Prior To a Diagnostic Evaluation: Differences between Children with and Without Autism Spectrum Disorder

Authors: Anna Wallisch, Brenda Salley, Lauren Little

Introduction: Research suggests that parental concerns precede an Autism Spectrum Disorder (ASD) diagnosis; it is unclear if specific types of concerns may be specific to children with ASD versus another developmental condition. While previous studies have gathered parent-report data from high-risk samples (Ozonoff et al., 2009) or used retrospective reports, caregiver concerns preceding a diagnosis of ASD in a large community based sample remain unexamined. Therefore, this study examined the extent to which parent concerns differentiate children with an eventual diagnosis of ASD versus those without in a community based sample aged 12 months-9 years.

Methods: This secondary data analysis of caregiver report data gathered prior to a child's diagnostic evaluation resulting in a diagnosis of ASD (n=271) or non-ASD (including global developmental delay; n=314). We examined 3 groups of participants: (ages 0-3yrs; 3-6yrs; 6-9yrs) with a total of n=585 children. Concerns were coded from an intake form prior to diagnostic evaluations. Coding was adapted from Ozonoff et al. (2009), and included: 1) Externalizing; 2) Cognitive development; 3) Medical; 4) Motor; 5) Speech/communication; 6) Social interaction; 7) Stereotyped behavior; 8) Sensory aversions/preferences; 9) Unspecified autism; 10) Internalizing. We used binary logistic regression to determine the extent to which categories of caregiver concerns predicted diagnostic group (ASD/non-ASD) in 3 age groups of children. In the youngest group, increased Externalizing (p<.05; OR=.334) and Cognitive development (p<.05; OR=.221) differentiated children in the non-ASD group. In children 3-6 yrs, increased Speech (p<.05; OR=1.640) and Social concerns (p<.01; OR=2.156) differentiated children with ASD. In the oldest group, increased Social concerns differentiated children with ASD (p<.05; OR=2.433). These four concerns correctly classified 74.5% of children 0-3yrs; 62.5% 3-6yrs; and 73.1% of children 6-9yrs.

Discussion: Results suggest that parental concerns may help predict a diagnosis of ASD, but distinct concerns differentiate ASD across age groups. Children that do not receive an ASD diagnosis in the 0-3yr group have a higher likelihood of Cognitive development and Externalizing concerns potentially due to the emphasis of reaching developmental milestones at this age. Among children aged 3-6 years that received an ASD diagnosis, the likelihood of Speech and Social concerns was increased. This may be due to the changing social demands on the child (e.g., preschool). At 3 years, many children are increasingly demonstrating complex language and social play, and this may be a potential differentiating factor and concern for parents of children with ASD. In children with a diagnosis of ASD aged 6-9 years, speech concerns diminish, and the likelihood of Social concerns is very high. The social demands for children further increase, as children are expected to cooperatively play and interact when entering kindergarten. Children in the 0-3yr group do not yet have this social press and parallel play is acceptable. The study results indicate that the contextual demands on children based on age may assist in better cognizance of potential parental concerns predicting a diagnosis of ASD. By understanding the parental concerns that best differentiate those with an eventual ASD diagnosis, we can better monitor children at risk of a diagnosis and identify children earlier.

References/Citations:
Title: Examining Insomnia in Adults with Autism Spectrum Disorder

Authors: Melissa M. Jenkins, Mary Baker-Ericzen

Introduction: Little research to date has examined insomnia in adults with autism spectrum disorder (ASD). Insomnia symptoms include difficulty falling or staying asleep, early morning awakenings, sleep dissatisfaction, and distressed or impaired daytime functioning from sleep disturbance (American Psychiatric Association, 2013). Individuals with insomnia experience significantly lower quality of life (LeBlanc et al., 2007), are at greater risk for accidents (Léger et al., 2002), and high rates of psychiatric comorbidities (Morin & Jarrin, 2013). Children with ASD are prone to insomnia (Richdale & Schreck, 2009; Sivertsen et al., 2012; Souders et al., 2009), particularly difficulties with sleep initiation and sleep continuity (Richdale, 1999). It is likely adults with ASD also frequently experience insomnia (Tani et al., 2003); however, this line of research is still in its infancy. The present study examines the prevalence of insomnia and type of sleep difficulties in a sample of young adults with ASD.

Method: Nineteen adult participants, ages 18-29, with a diagnosis of ASD were enrolled in a 6-month training in Supported employment, Comprehensive Cognitive Enhancement and Social Skills (SUCCESS). All adult participants and their parent/caregivers completed a comprehensive assessment battery pre and post SUCCESS. Here we present baseline data on participant sleep functioning as reported by the adult participants and their parents/caregivers. Participants completed the Insomnia Severity Index (ISI; Morin et al., 2011). The ISI is a widely used measure of insomnia with well-established reliability and validity (Morin et al., 2011). It consists of 7 items, assessing severity of insomnia as well as satisfaction with sleep pattern, effect of sleep on daytime and social functioning, and concern about current sleep. In community samples, a score of 10 or higher indicates insomnia (86% sensitivity; 88% specificity). ISI total scores are classified into four severity categories: 0-9 (no insomnia); 10-14 (mild); 15-21 (moderate); and, 22-28 (severe). The ISI was adapted for parents/caregivers; they were asked to answer the 7 items about the participants' sleep behavior.

Results: Participant (n=19) ratings on the ISI ranged from 0 (none) to 19 (moderate insomnia). Based on participant ISI total scores, 79% had no insomnia, 5% mild, and 16% moderate. In terms of difficulty falling asleep (i.e., early insomnia), 26% of participants reported mild difficulty (30-45 minutes), 11% moderate (45-90 minutes), 11% severe (90-120 minutes), and 11% very severe (>120 minutes). For difficulty staying asleep (i.e., middle insomnia), 16% reported mild difficulty (30-45 minutes) and 11% moderate difficulty (45-90 minutes). For problems waking too early (i.e., late insomnia), 26% reported mild (30-45 minutes). Parent/caregiver (n=19) ratings on the ISI ranged from 0 (none) to 27 (severe insomnia). Based on parent/caregiver ISI total scores, 47% of participants had no insomnia, 16% mild, 26% moderate, and 11% severe. For difficulty falling asleep, 17% of parents/caregivers reported mild, 6% moderate, 22% severe, and 11% very severe. For difficulty staying asleep, 11% reported mild, 22% moderate, 6% severe, and 6% very severe. For problems waking too early, 33% report mild, 6% severe, and 6% very severe. Participant and parent report on the ISI demonstrated a small to medium positive association, r=.42, p=.07.

Discussion: We are aware of no previous studies using the ISI to characterize insomnia in adults with ASD. As suspected, findings suggest a substantial number of adults with ASD experience insomnia. More than 20% of participants and more than 50% of parents/caregivers reported above threshold symptoms of insomnia. More research is needed to better understand how to best assess insomnia in ASD populations including how to maximize informant report. Improving the detection of insomnia in adults with ASD is an important yet largely unexplored area that could have a meaningful impact on research and clinical practice.
Title: Profiles of Repetitive and Restricted Behavior in Individuals with Rare Genetic Syndromes Associated with Autism Spectrum Disorder

Authors: Cristan Farmer, Audrey Thurm, Joan Han, Forbes Porter, Latha Soorya

Introduction: Repetitive and restricted behaviors (RRB) manifest in various forms, cutting across many syndromes and disorders. However, there is growing support for the use of behavioral phenotypes to inform our understanding about the etiological underpinnings of various disorders. With regard to genetic disorders associated with intellectual disability (ID), distinct syndrome-specific profiles in repetitive behavior have been described (Moss, Oliver, Arron, Burbidge, & Berg, 2009). We add to the literature by exploring profiles of RRB in rare genetic syndromes associated with intellectual disability and varying rates of autism spectrum disorder (ASD): Smith-Lemli Opitz Syndrome (SLOS), Phelan-McDermid Syndrome (PMS), and WAGR Syndrome.

Methods: Individuals participating in syndrome-specific studies at NIH or were enrolled in a general screening protocol of neurocognitive and behavioral phenotyping or a collaborating protocol at Mt. Sinai. An ASD diagnostic evaluation, including the Autism Diagnostic Interview-Revised (ADI-R), was administered by expert clinicians. Participants were included in this report if they had a valid ADI-R and were between the ages of 18 months and 24 years at the time of administration. We characterized the profile of RRB using the Restricted, Repetitive, and Stereotyped Patterns of Behavior domain (Total C) of the ADI-R diagnostic algorithm, obtained from 39 individuals with PMS (mean age, 7.4±4.5 years; mean Vineland-II composite, 52.2±13.1), 24 with WAGR syndrome (mean age, 11.4±4.8 years; mean Vineland-II composite, 66.0±16.3), and 21 with SLOS (mean age, 12.0±5.9 years; mean Vineland-II composite, 59.4±18.6). The Total C score comprises four sub-domains: C1, Encompassing preoccupation or circumscribed pattern of interest (two items, 4 points possible); C2, Apparently compulsive adherence to nonfunctional routines or rituals (two items, 4 points possible); C3, Stereotyped and repetitive motor mannerisms (higher scored of two items, 2 points possible); and C4, Preoccupation with parts of objects or nonfunctional elements of material (higher scored of two items, 2 points possible). C1 and C2 are often referred to as "higher-order" and C3 and C4 as "lower-order."

Results: Based on our full evaluation, the following proportions of each group met DSM-5 criteria for ASD: PMS, 77%; WAGR, 8%; SLOS, 24%. A high proportion of all genetic disorder groups met the autism threshold of 3 on the Total C score: PMS, 74% (mean score = 4.18±2.27); WAGR, 71% (mean score = 3.25±1.73); SLOS, 81% (mean score = 4.05±2.16). For all groups, scores on the higher-order subdomains were lower than scores on the lower-order subdomains, especially striking given the wider range of possible scores on the higher-order subdomains. Between the groups, scores on subdomains C2 and C4 were very similar. However, the WAGR group had a low score (0.38±0.71) on C1, compared to PMS (1.13±1.26) and SLOS (1.14±0.96). C3 scores also varied across groups: PMS was highest (1.36±0.87), followed by WAGR (1.00±0.93) and SLOS (0.71±0.96). Detailed profiles of these symptoms within these domains will be displayed, and compared against age and IQ ranges and ASD classifications in each group.

Discussion: These results indicate that profiles of repetitive and restrictive behavior differ among the three genetic disorders studied here, consistent with results showing disparities in these symptoms in other genetic disorders studied by Moss et al. (2009).

References/Citations:
Title: Profiles of Regression in Individuals with Rare Genetic Syndromes Associated with Autism Spectrum Disorder

Authors: Audrey Thurm, Cristan Farmer, Latha Soorya, Joan Han, Forbes Porter

Introduction: Autism spectrum disorder is associated with many genetic abnormalities, including abnormalities in genes involved in brain development and metabolic function (Frye, 2015; Ghaziuddin & Al-Owain, 2013). A subset of children with autism spectrum disorder (ASD) experience significant regression of skills in the first few years of life. The etiology of regression is unknown, but both environmental and biological mechanisms are suspected. Given that regression may be associated with certain genetic vulnerabilities in ASD (e.g., Molloy, Keddache, & Martin, 2005) and in specific related genetic conditions (Neul et al., 2014), we sought to elucidate the profile of regression in individuals with specific rare genetic disorders associated with ASD (i.e., Phelan-McDermid Syndrome, PMS; WAGR syndrome; and Smith-Lemli Opitz Syndrome, SLOS).

Methods: Individuals participating in syndrome-specific studies at NIH were enrolled in a general screening protocol of neurocognitive and behavioral phenotyping. An ASD diagnostic evaluation, including the Autism Diagnostic Interview-Revised (ADI-R), was completed by research reliable clinicians. The ADI-R contains a section on loss of language and other skills, which was used for this report. A total of 85 participants aged 2-24 years are represented, including 40 with PMS, 24 with WAGR syndrome, and 21 with SLOS.

Results: The following proportion of each group met DSM-5 criteria for ASD: PMS, 78%; WAGR, 8%; SLOS, 24%. Regression in some form occurred most commonly in the PMS group (28%), followed by 13% percent in WAGR and 14% percent in SLOS. A loss of at least five words was reported for n=2 WAGR (neither with ASD), n=2 SLOS (both with ASD), and n=5 PMS (all with ASD). Within WAGR, language loss included prior daily spontaneous use of the words (n=1) and prior occasional word use (n=1). Both SLOS patients who lost language had used daily spontaneous speech before loss and one regained language. Four of five PMS patients with language loss had previously used daily spontaneous speech. One child with PMS regained speech 5 months later; losses persisted for the remainder. None of the language losses in any group were associated with physical illness.

Regression in skills other than language (domains of hand movements, motor, self-help, play, or social) was reported for n=3 WAGR (none with ASD), n=2 SLOS (one with ASD), and n=11 PMS (eight with ASD). Two WAGR patients had skill losses in either motor or self-help; the third had reported losses in all domains but play. Loss in one WAGR subject was associated with chemotherapy. One SLOS patient had definite loss of motor skills and one SLOS patient experienced loss in self-help, play, and social domains. Each of the PMS subjects with other skill loss had reported losses in at least two domains. Loss in these domains was associated with illness in five patients. Both language and skill regression was reported for five in the PMS group (all with ASD), one in the WAGR group (no ASD), and one in the SLOS group (no ASD).

Discussion: The current study confirms the existence of regression in a proportion of individuals with specific neurogenetic disorders. Further, use of a systematic instrument that documents timing and type(s) of regression indicates a wide age range and wide range of behavioral areas in which loss is occurring across the genetic disorders. Future use of more fine-grained detailed analyses of pre-loss skill attainment and post-loss functioning will be essential to tease out the relevance of regression in these genetic conditions to phenotype and developmental outcome. Descriptions of regression can then begin to be tied to either prenatal or postnatal underlying molecular biology, as has begun with other specific genetic disorders (Pescosolido et al., 2014).

References/Citations:

Title: A Comparison of the Efficacy of an Explicit Approach for Teaching Grammatical Forms to Children with ASD or Primary Language Impairment

Authors: Katherine J. Bangert, Lizbeth H. Finestack

Introduction: There is a subgroup of children with autism spectrum disorders (ASD) who have significant difficulty mastering grammatical forms (Robers, Rice, & Tager-Flusberg 2004). These grammatical weaknesses are very similar to the weaknesses expressed by children with primary language impairment (PLI). Despite these well-documented deficits, there is little research examining intervention approaches for teaching grammatical forms to children with ASD. Moreover, studies of traditional grammatical interventions for children with PLI reveal that extensive treatment programs result in moderate outcomes (Leonard et al., 2004; 2006). These traditional interventions rely on implicit approaches, such as modeling and recasting, to teach grammatical forms. However, in an investigation of an alternative, explicit intervention approach, in which the examiner presented the rules guiding the target form, Finestack and Fey (2009) found a significant advantage for explicit instruction in comparison to implicit instruction. The current study is an extension of the Finestack and Fey (2009) and evaluates the use of an explicit approach to teach two novel grammatical markers to children with ASD or PLI.

Methods: A total of 17 children with ASD and 25 children with PLI who demonstrated difficulty with grammar completed this study. Children were aged between 4 and 9 years. Examiners instructed the children that a space creature just came to Earth and that there is something different about the way the creature talks. The examiners told the children that they had to figure out the language. Using this game, the children were taught two novel grammatical forms with either explicit or implicit instruction. With explicit instruction, the game included models of the target form plus specific instructions regarding use of the target pattern (e.g., "When it is a boy doing the action you have to add -ip to the end"). With implicit instruction, the game only included models of the novel pattern. The novel target forms form included a gender marker (e.g., "John can eat pizza-ip") and a first person singular marker (e.g., "I can clap-sh"). Children who achieved 80% accuracy producing the target form were categorized as pattern users (PU) and those who performed below 80% were categorized as non-pattern users (NON).

Results: For each novel grammatical form and for each instructional approach the number of pattern users (PU) and non-pattern users (NON) in the ASD and PLI groups were compared using Chi-square analyses. For both the gender and person forms, there was not a significant difference between the number of ASD and PLI PUs and NONs with explicit ($\chi^2=2.81$, p=.09; $\chi^2=2.29$, p=.13) or implicit ($\chi^2=.73$, p=.39; $\chi^2=0.11$, p=.74) instruction. Within groups, significantly more participants with ASD were PUs when gender was the target with explicit instruction than implicit instruction ($\chi^2 = 4.10$, p = .04), but not for the person form. For the PLI group, more participants were PUs with explicit instruction for both forms ($\chi^2=11.78$, p<.001, $\chi^2=5.49$, p=.02). When the ASD and PLI groups were collapsed, significant differences emerged for both the gender and person forms, favoring explicit instruction ($\chi^2=5.87$, p=.01; $\chi^2=15.07$, p<.001).

Discussion: Preliminary results suggest there is no difference in learning with explicit or implicit instruction for children with ASD or PLI. Both the ASD and PLI groups demonstrated learning advantages with explicit instruction. Subsequent analysis will investigate the role of expressive and receptive language skills in learning outcomes. However, it appears that explicit instruction may be a viable treatment approach for both groups of children.

References/Citations:

Title: Employment and Choice Making in Adults with Autism, Down Syndrome or Intellectual Disabilities

Authors: Kelsey Bush

Introduction: This study provides an in-depth look at the current state of employment for adults with intellectual disability (ID) only, autism (ASD) and ID, and Down syndrome and ID, and each groups’ choice-making abilities as it pertains to short-term choices and long-term choices, as outlined by the National Core Indicator’s (NCI) Adult Consumer Survey. It is well known that rates of employment are lower in the disability community (Bureau of Labor Statistics, 2015, Butterworth et al., 2011), and this study aims to understanding factors associated with participation in employment. Factors investigated include diagnostic categorization, age, ID severity level, behavior problems and/or number of mental health conditions for taking medication. This study also aims to describe differences in groups on these factors, as well as employment status. Finally, this study looks at the relationship between these different factors and employment in each of the three groups.

Methods: This study conducted secondary data analyses using the NCI’s Adult Consumer Survey datasets from years 2011-2012 and 2012-2013 on the three populations of interest. Exploratory and confirmatory factor analyses were used to derive the latent variables of short-term and long-term choices from the choice making section of the Adult Consumer Survey. Median analyses were used to indicate group differences in demographic variables, as well as employment status and choice making, while correlations and regressions were used to determine factors related to employment status and choice making.

Results: Results indicated that each study group has different levels of employment, different factors associated with successful employment, and varying levels of choice making. As a group, adults with DS had the highest rates of paid community jobs, followed by adults with ID, and then adults with ASD. As a group, adults with ID made the most long-term and short-term choices, followed by adults with DS, and then adults with ASD. In regression analyses, short-term choices and ID severity level were significantly associated to level of employment for adults with ASD and DS. Diagnostic group categorization had significant odds for increasing probability of paid community employment for those with DS compared to those with ID when controlling for all other investigated factors, but not between ASD and ID populations.

Discussion: The non-significant difference between the employment odds of the ASD and ID groups when controlling for choice-making variables indicates that choice-making, short-term choices specifically, is accounting for a large portion of the difference in employment status between these two groups, and not the diagnosis of the individual. Additionally, Individuals with DS were more employed in either a community paid job or in facility paid work than both individuals with ID and ASD, however, results showed that the DS group worked fewer hours, and consequently earned lower gross wages, at the community paid level than those with ID. Possible reasons for this discrepancy could be the number of activities that individuals with DS are engaged in limits the hours they can spend at a paid job, or an increased wage may threaten the receipt of welfare or benefits.

References/Citations:
Title: Sensory Hyporesponsivity Predicts Later Difficulties with Language Understanding in Infants at Risk for Autism Spectrum Disorder

Authors: Sarah Bowman, Abby Morgan, Cara Damiano, Wendy Stone, Lisa Ibañez, Carissa Cascio, Tiffany Woynaroski

Introduction: Individuals with autism spectrum disorder (ASD) often show atypical responses to sensory stimuli, even as early as infancy. A pattern of hyporesponsivity (characterized by absent or reduced responding to sensory stimuli) in particular seems most prevalent in, and specific to, ASD. It has been proposed that reduced responsivity to sensory stimuli early in life may produce cascading effects on higher level abilities, such as spoken language, in individuals with ASD. Past work has found that sensory hyporesponsivity covaries with concurrent spoken language in preschool and school-age children with ASD. However, to date no study has evaluated whether hyporesponsivity in infancy predicts future spoken language in children with ASD. A primary obstacle to this work is our inability to diagnose ASD in infancy. One way to overcome this challenge is to prospectively study infants who are known to be at high risk for ASD, such as infant siblings of children diagnosed with ASD (Sibs-ASD).

Objectives
This project, a pilot for a larger scale study to be conducted at Vanderbilt University, specifically sought to determine (a) whether Sibs-ASD differed from infants with a typically developing older sibling (Sibs-TD) in early sensory hyporesponsivity and (b) whether early hyporesponsivity predicted later spoken language, at least in Sibs-ASD.

Methods: Sensory hyporesponsivity of 14 Sibs-ASD, as well as 18 Sibs-TD was assessed at 18 months using the Sensory Experiences Questionnaire. Language use and understanding was assessed at 24 months using the Mullen Scales of Early Learning. An independent samples t-test was used to evaluate mean differences in early hyporesponsivity between Sibs-ASD and Sibs-TD, and bivariate correlational analyses were used to examine predictive associations between early hyporesponsivity and later language abilities for Sibs-ASD and Sibs-TD.

Results: We found several anticipated effects, including a trend towards higher hyporesponsivity—reduced responding to sensory stimuli— at 18 months in the Sibs-ASD group relative to the Sibs-TD group (d = .64). Hyporesponsivity at 18 months was strongly predictive of language understanding at 24 months in the Sibs-ASD group (r = -.82), but not the Sibs-TD group. Associations between early hyporesponsivity and later language use were non-significant.

Discussion: Results provide increased empirical support for the proposal that early sensory differences may produce cascading effects on higher-level abilities, such as spoken language, in children diagnosed with, or at high risk for, ASD. Findings specifically suggest that sensory hyporesponsivity may be a valuable predictor of later deficits in language understanding in ASD. Implications for practice and needs for future research will be discussed.

References/Citations:
Title: Gender Differences in Relations between Emotion Regulation, Inhibition, and Adaptive Functioning in Children and Adolescents with Williams Syndrome

Authors: G. Nathanael Schwarz, Kristin D. Smith, David Bennett, Carolyn B. Mervis, Bonita P. Klein-Tasman

Introduction: Adaptive functioning impairments are common among individuals with Williams syndrome (WS), as are difficulties with emotion regulation and behavioral inhibition. Considerable variability in level of performance has been found in all three areas (1,2,3). While intellectual functioning predicts adaptive functioning in individuals with WS (1), it does not account for a large portion of the variance (estimates range from 14-49%), such that other potential predictors warrant exploration. In the current study, we tested the hypothesis that inhibition difficulties may in part drive emotion regulation difficulties which in turn may impair the development of adaptive behavior. Hence, the purpose of the current study was to examine whether emotion regulation mediates the relation between inhibition and adaptive functioning in children and adolescents with WS, above and beyond the contribution of intellectual functioning.

Methods: 91 children and adolescents with WS (48 girls, 43 boys), ages 8-15 years (M=11.35, SD=2.57) and their parents participated. Parents completed the Behavior Rating Inventory of Executive Function (BRIEF) to assess child executive functioning in everyday contexts and were interviewed about their child’s adaptive behavior using the Scales of Independent Behavior-Revised (SIB-R). Child intellectual functioning was measured with the Kaufman Brief Intelligence Test -2 (KBIT-2).

Results: A series of multiple regression models was conducted to examine emotion regulation as mediator of the relation between inhibition and adaptive functioning after accounting for intellectual functioning. Because girls had significantly higher IQs (p=.025) and adaptive functioning standard scores (p=.008), gender was included as a predictor. Girls and boys did not differ significantly in parental ratings of inhibition or emotion regulation. In Model 1, overall adaptive functioning (SIB-R Adaptive Behavior Composite) was significantly predicted uniquely by BRIEF Inhibit T-scores (semi-partial correlation [sr] =.25, p=.002) and IQ (KBIT-2 Composite, sr=.51, p<.001). In Model 2, emotion regulation (BRIEF Emotional Control T-score, sr=.19, p=.016) significantly predicted adaptive functioning after controlling for inhibition (sr=.13, p=.091), IQ (sr=.50, p<.001) and gender (sr=.10, p=.18). In Model 3, with the interaction between emotion regulation and gender added, emotion regulation predicted adaptive functioning more for girls than for boys (sr=.18, p=.019). When analyses were conducted by gender subgroup, emotion regulation (sr=.05, p=.67) did not predict adaptive functioning for boys after controlling for IQ (sr=.51, p<.001) and inhibition (sr=.11, p=.43). However, emotion regulation (sr=.33, p=.001) did predict adaptive functioning after controlling for IQ (sr=.46, p<.001) and inhibition (sr=.10, p=.314) for girls.

Discussion: Intellectual functioning was a consistent strong predictor of adaptive functioning. For girls with WS, inhibition and emotion regulation also were related to adaptive functioning, and emotion regulation difficulties appear to mediate the relation between inhibition and adaptive behavior. It is possible that, for girls, emotion regulation difficulties may disrupt successful practice of adaptive skills. However, for boys with WS, only intellectual functioning was a significant unique predictor of adaptive functioning, with no significant relations to inhibition or emotion regulation. Additional research, particularly with longitudinal designs, may elucidate whether early emotion regulation difficulties predict adaptive functioning difficulties later in development.

References/Citations:


Funding: Research Scholar grant from the University of Wisconsin - Milwaukee Center for Applied Behavioral Health Research, NICHD R37 HD29957, and NINDS R01 NS35102.
Title: Language and Phonological Memory Development Over Two Years in Down Syndrome

Authors: Andrew S. Tungate, Frances A. Conners, Leonard Abbeduto, Edward C. Merrill, Gayle G. Faught

Introduction: Down syndrome (DS) results from trisomy of chromosome 21 and is recognized as having a unique developmental profile, which differs from typically developing children. In particular, syntax and phonological memory are specific challenges, whereas receptive vocabulary is consistent with nonverbal cognitive ability level. However, there is a need for research on the developmental course of these abilities in DS. Laws and Gunn (2004) conducted a five-year longitudinal study in DS finding overall improvements in receptive vocabulary. Interestingly, they found improvements in phonological memory for younger participants but a decline in performance for older participants. In the present study, we examined individual differences and change over two years in youth with DS.

Methods: The study included 38 participants with DS, age 10-21 (M= 15.1 SD= 3.3, 47% male) who completed a series of cognitive tests as part of a larger grant-funded study. All were screened for hearing, vision, and autism. Participants completed the series of cognitive tests on two occasions separated by two years. Specifically, they completed the Leiter-R Brief as a measure of nonverbal cognitive ability, PPVT-4 for receptive vocabulary, TROG-2 for receptive syntax, a narrative syntax task, the CELF-P-2 WS Word Structure subtest for productive syntax, the CTOPP Memory for Digits (MD), and Nonword Repetition (NR) subtests for phonological memory. Growth scale values (GSVs) and raw scores were used in data analyses because of their utility in measuring performance over time.

Results: There were strong correlations between the two time points across all measures: Leiter-R, r(36)=.88, p<.001; PPVT-4, r(36)=.90, p<.001; TROG-2, r(36)=.91, p<.001; narrative syntax, r(29)=.85, p<.001; CELF-P-2 WS, r(34)=.94, p<.001; CTOPP MD, r(35)=.81, p<.001; and CTOPP NR, r(36)=.63, p<.001. There was significant change over two years for only two measures: improvement in PPVT-4, t(37)=3.02, p<.01, and decline in CTOPP NR, t(37)=3.37, p<.01. However, the pattern of change over two years was different for younger vs. older participants. The younger subgroup (<15.5 years) improved on Leiter-R, t(18)=2.23, p<.05, PPVT-4, t(18)=3.47, p<.01, and CTOPP MD, t(17)=2.41, p<.05. The older subgroup (>15.5 years) declined on CTOPP NR, t(18)=4.18, p<.01.

Discussion: These findings suggest that individual differences in nonverbal cognitive ability, receptive vocabulary, receptive syntax, productive syntax, and phonological memory are highly stable over a two-year period in DS, when measured by the tests we used. They also suggest that growth in syntax abilities may slow substantially by middle childhood, whereas nonverbal cognitive ability, receptive vocabulary, and phonological memory (as measured by digit memory) continue to improve through mid-adolescence. However, in late adolescence, phonological memory (as measured by nonword repetition) shows marked decline. These findings are similar to the results reported by Laws and Gunn (2004) and justify further study of the patterns of growth and decline in language and phonological memory skills in youth with DS. Future studies with larger samples could detect smaller degrees of growth and decline. Also, further examinations of the intriguing findings related to phonological memory are warranted.

References/Citations:

Title: Aggression in Children with 7q11.23 Duplication Syndrome: A Preliminary Examination

Authors: Brianna D. Yund, Carolyn B. Mervis, Bonita P. Klein-Tasman

Introduction: Studies of individuals who have genetic disorders have the strong potential to contribute to the understanding of relations between genes and behavior. A recent examination of the psychological characteristics of individuals with 7q11.23 duplication syndrome (Dup7) [1] indicated high levels of separation and social anxiety and also elevated aggression/oppositional behavior compared to same-aged peers. To further delineate the Dup7 phenotype, we sought to describe the presence and severity of aggression in 63 children with Dup7 and the potential contributions of intellectual functioning and anxiety to levels of aggression.

Methods: Participants were 63 children with genetically-confirmed Dup7 (25 females, 38 males) aged 4 - 17 years (Mean= 8.64 years, SD= 3.77). Children were administered the Differential Ability Scales-II (DAS-II) to assess overall intellectual functioning. Primary caregivers were interviewed about ASD symptomology using the Autism Diagnostic Interview-Revised (ADI-R) and also completed the Conners Comprehensive Behavior Rating Scales (CBRS) to assess current behavior functioning for the 45 participants aged 6 years and older (18 females, 27 males; Mean=10.31 years, SD=3.29). For the purpose of this study, parent ratings on the Oppositional Defiant Disorder (ODD), Separation Anxiety Disorder and Social Anxiety Disorder symptom scales were examined. Items relating to aggression on the ADI-R (items 81 & 82) were examined for presence and severity. Children were also administered the appropriate module from the Autism Diagnostic Observation Schedule-2 (ADOS-2; Module 1 n=9, Module 2 n=22, Module 3 n=32). An item relating to aggression on the ADOS-2 was examined to determine the degree to which aggression toward the examiner was present during the ADOS-2 assessment.

Results: On the CBRS, 49.2% of children had elevated scores on the ODD scale (Mean=60.25, SD=15.47); 62.2% had elevated scores on the Separation Anxiety Disorder scale (Mean=66.54, SD=15.44); and 77.8% had elevated scores on the Social Anxiety Disorder scale (Mean=73.02, SD=15.20). Males showed significantly more difficulties on the Separation Anxiety Disorder scale than did females. No other gender or age differences were present. Scores on the CBRS ODD scale were significantly related to scores on the CBRS Social Anxiety Disorder scale (rho=.377, p <.05). On the ADI-R, 57.2% of children were reported as currently showing some degree of aggression toward caregivers and 63.6% were reported as evidencing some degree of aggression toward caregivers either currently or in the past. Current aggression toward caregivers (ADI-R) was significantly related to parent ratings on the CBRS Social Anxiety (rho=.321, p<.05) and Separation Anxiety Disorder (rho=.485, p<.05) scales. On the ADOS-2, 17.5% of children were rated as showing some type of aggression toward the examiner. Significant relations were present between overall intellectual functioning (DAS-II GCA) and score on the ADOS-2 aggression item (rho=-.365, p<.05) but not on the ADI-R aggression item.

Discussion: Results indicate elevated levels of aggression in children with Dup7, suggesting that genes within this region may contribute to the presence of aggression. Overall intellectual functioning was significantly related to aggression in interaction with the examiner but not to parental ratings of aggression. Based on parental report, children with more aggression also showed higher levels of social and separation anxiety. Further research about the presence of aggression and interventions that may reduce aggression in children with Dup7 is warranted. Implications of these findings for the study of Dup7 and genotype-phenotype relations will be discussed.

References/Citations:


Funding: Simons Foundation SFARI 238896, NICHD R37 HD29957.
Title: Beliefs about Causes of Developmental Delays and Vaccine Hesitancy among Parents of Children with and without Autism Spectrum Disorder

Authors: Robin P. Goin-Kochel, Sarah S. Mire, Leandra N. Berry, Lauren R. Dowell, Charles G. Minard, Danielle Guffey, Leila C. Sahni, Rachel M. Cunningham, Julie A. Boom

Introduction: Evidence suggests that nearly 42% of parents of children with autism spectrum disorder (ASD) believe that vaccines played some causal role in their child’s condition. However, little is known about vaccine hesitancy in this group and its relation to parents’ beliefs about causes of ASD. The purpose of this study was to (a) assess parents’ beliefs about causes of their children’s developmental delays and vaccine hesitancy among parents of children with ASD and children for whom ASD was ruled out, (b) examine potential relationships between parents’ attributions for their children’s diagnoses and vaccine hesitancy, and (c) determine if ASD and non-ASD groups differ in terms of their attributions for their children’s diagnoses, etiological beliefs, and vaccine hesitancy.

Methods: Data were collected from 89 parents of children who had been seen at the Autism Center at Texas Children’s Hospital and enrolled in a research registry (child’s M age = 7.3 years, SD = 3.1; 78% male). Families who had agreed to be contacted about new studies were mailed packets that contained a cover letter, a Parent Attitudes About Childhood Vaccines questionnaire (PACV; measure of vaccine hesitancy), a Revised Illness Perception Questionnaire (IPQ-R; measure of attributions about children’s diagnoses and etiological beliefs), and a demographic form. Clinical diagnoses (ASD or not) were extracted from the electronic medical record by one co-author and validated by a second. Summary statistics were compared between diagnosis groups using two-sample t-tests or Fisher’s exact test. A multiple logistic regression model was used to estimate odds ratios for each response variable (belief that vaccines caused the child’s developmental difficulties, vaccine hesitancy) with 95% confidence intervals. Variables significant at the 0.20 level in the univariable analysis were included in both regression models adjusting for diagnostic group (ASD or not).

Results: Overall, 20/87 (23%, 95% CI: 15, 33) of the parents believed that toxins in vaccines caused their child’s developmental difficulties, while 21/89 of the parents (24%, 95% CI: 15, 34) were vaccine hesitant (PACV ≥ 50). Parents of children with ASD were significantly more likely to believe that vaccines contributed to their child’s developmental difficulties (28% vs. 5%, p = 0.03). Adjusting for age and child’s gender, the odds of believing vaccines caused the child’s developmental difficulties were 7.3 (95% CI: 0.9, 60.8) times greater among parents of children with ASD compared to parents of children without ASD. Parents of children with ASD also tended to be more vaccine hesitant compared with parents of children without ASD (28% vs. 10%, Fisher’s p = 0.14). Adjusting for age and child’s gender, the odds of being vaccine hesitant were 4.0 (95% CI: 0.8, 20.5) times greater among parents of children with ASD compared with parents of children without ASD. Additional results about attributions for and beliefs about other causes of their children’s delays are forthcoming.

Discussion: These results demonstrate the strength behind the theory of an autism-vaccine connection and reinforce the need to understand how and when such beliefs emerge, particularly among families whose children receive an ASD diagnosis.

References/Citations:
Title: Play Level and Diversity in Toddlers with Autism Spectrum Disorder

Authors: Stephanie Y. Shire, Connie Kasari

Introduction: Social communication and play skills are recognized as uniquely challenging for children with autism (Mundy, Sigman, Ungerer, & Sherman, 1997). Concerning play, symbolic play is more impaired than functional play; however, functional play is delayed in toddlers with ASD relative to typical children. Given the heterogeneity of play profiles in children with autism, attention to the selection of developmentally appropriate play goals is crucial to appropriate intervention. The current study describes: (1) the type and level of play demonstrated by toddlers with autism during an assessment delivered by teachers and paraprofessionals to set intervention targets, and (2) explores differences in play type and level by children’s level of expressive language.

Methods: Participants. One hundred twenty-one toddlers (mean age: 31.5 months) with autism who were enrolled in a larger study were included. Children were developmentally and ethnically diverse with expressive language age-equivalent scores on the Mullen Scales of Early Learning ranging from 2-37 months (mean= 17.5 months) and all families reporting a non-Caucasian ethnicity. Children attended a public early intervention center-based program in two underserved and under-resourced communities in a major metropolitan center.

Measures. Teaching professionals were trained to administer the Short Play and Communication Evaluation (SPACE: Shire 2013). The SPACE is a brief structured protocol using a standard set of toys designed to provide opportunities across play levels.

Children’s Language. Children’s spontaneous spoken utterances for the purposes of requesting and joint attention were coded from the SPACE (ICC=.91). Children were divided into three groups: no utterances (n=36), low rate communicator: 1-20 spontaneous utterances (n=58), high rate communicator: 21+ utterances (n=27).

Children’s Play. The frequency of children's unique play acts at each level (simple, combination, pre-symbolic, and symbolic) were coded from SPACE videotapes (ICC=.90). Further, the frequency of each unique act was summed across the 121 children to characterize the diversity of acts across the group at each play level.

Results: A linear model indicated significant differences in the total number of unique play types amongst the three language groups (f(2, 118)= 15.26, p<.0001). Children with high rate language had the highest frequency of play acts (mean= 15.29, SD= 4.50), while those with no words demonstrated the fewest acts (mean=8.22, SD=4.40). Children with no words had the greatest proportion of simple (mean=.54, SD=.23) and combination acts (mean=.40, SD=.21). Children in the low and high rate language groups also demonstrated a high proportion of combination acts (mean=.37 and .40 respectively). While the no word group demonstrated a mean of 5% pre-symbolic acts and <1% symbolic acts, the groups with some language demonstrated about 15% pre-symbolic and 3% symbolic acts.

All groups demonstrated a high proportion of combination play. Descriptive data indicated early general combinations (e.g., pieces in puzzle- 73 children) occurred most frequently while higher-level combinations (e.g., physical combinations: 1 child) were infrequent. Emerging pre-symbolic acts primarily included child as agent acts where the child places a figure inside a structure or vehicle, essentially a combination play act using a figure.

Discussion: All toddlers demonstrated some functional play skills with children using at least one spoken word demonstrating the highest proportion of pre-symbolic and symbolic play types. Descriptive analyses indicate higher-level combination and pre-symbolic types are emerging but less frequent. Notably all groups demonstrated a mix of play levels from simple through symbolic. These findings emphasize the importance of identifying individualized developmentally appropriate play targets for use in intervention programming. Although language may be emerging for the majority of toddlers in this study, further attention is required to bolster the development and level of children’s play skills in order to improve outcomes overall.
Title: ASD Symptom Profiles in Males with Chromosomal Aneuploidies Compared with Idiopathic Autism

Authors: Mary Godfrey, Chelsea Sharber, Moshe Maiman, Elizabeth Adeyemi, Gregory Wallace, Jonothan Blumenthal, Liv Clasen, Jay Giedd, Lauren Kenworthy, Nancy Raitano Lee

Introduction: Autism spectrum disorder (ASD) is characterized by impairments in social interaction and communication skills (SOC-COM) as well as a restricted or repetitive range of behavior and interests (RBI). Although these symptoms often occur together, research suggests that independent genetic factors may account for each component, and therefore, these symptoms may be separable [1]. Youth with genetic disorders that have elevated rates of ASD symptoms offer an opportunity to examine SOC-COM and RBI skills within the context of a disorder with a known etiology. Thus, investigating differing ASD symptom profiles across genetic disorders could help to explain the factors influencing the development and fractionation of the ASD phenotype. This was the goal of the current research.

Methods: Seventy-one males participated in the study (ASD:n=15, XXXY:n=6, XXXXY:n=11, XYY:n=23, DS:n=16; sample mean age =11.94±4.70). Participants were a subset of individuals enrolled in studies at the NIMH and Children's National Medical Center. Parents of participants completed the Social Communication Questionnaire-Revised, Lifetime version and mean symptom scores (total number of autism positive items/total items in a scale) were compared for SOC-COM and RBI items. To evaluate whether the SCQ profiles varied as a function of diagnostic group, a 2x4 repeated measures ANOVA was run with one within-subjects factor (domain: mean SOC-COM or RBI score) and one between-subjects factor (diagnostic group). This analysis was followed up by a 3 (domain: mean SOC, COM, or RBI score) x 4 (diagnostic group) repeated measures ANOVA in order to evaluate whether different profiles would emerge if the social and communication questions from the SCQ were considered separately (analogous to the autism triad model from the DSM-IV).

Results: The results of the 2x4 repeated measures ANOVA revealed a group x domain interaction (F[3,67]=3.34, p<.05) such that the ASD group had significantly higher RBI than SOC-COM difficulties on the SCQ (p<.01) while the other three groups did not (ps>.4). The follow-up 3x4 repeated measures ANOVA revealed a somewhat different pattern of results. Specifically, while a group x domain interaction was still found overall (F[6,134]=2.71, p<.05), an examination of the SOC, COM, and RBI scores within the groups revealed a different pattern for the DS group in particular. Specifically, the DS group demonstrated significantly fewer ASD symptoms in the SOC than COM domain (p<.001) and there was also a trend for their SOC score to be lower (indicating fewer impairments) than their RBI score (p<.06). For the ASD group, both SOC and COM scores were lower than RBI scores (ps<.03). No differences among SOC, COM or RBI scores were found for the males with XXXY/XXXXY or XYY.

Discussion: These findings illuminate the differences in ASD symptom profiles across genetic disorders and highlight differences with idiopathic ASD. Specifically, the ASD group was characterized by relatively greater impairments in RBI than SOC-COM. This greater difficulty in RBI appeared to be uniquely related to ASD, as none of the other groups demonstrated this difference in scores. The DS group pattern revealed significantly lower (less impaired) scores for social interaction than communication, suggesting sociability is a relative strength of Down syndrome, consistent with the larger literature [2]. For XXXY/XXXXY or XYY groups, similar scores were found across all three categories. The current results illustrate the utility of the SCQ in describing the nature of ASD symptoms in genetic disorders, and elucidate the differences in ASD symptom expression across genetic disorders.

References/Citations:
Title: The Focus of Educational Goals for Transition-Age Youth Receiving Special Education Services

Authors: Gael I. Orsmond, Jasin Wong, Wendy J. Coster, Ellen S. Cohn, Brett Erspamer

Introduction: Approximately 6.5 million youth with disabilities exit the school system each year, many of whom have received special education services under the categories of autism and intellectual disability. Data from the National Longitudinal Transition Study (NLTS2) indicated low rates of post-secondary school engagement, employment, and independent living among these youth (Newman et al., 2011). We have recently developed a system of coding educational goals written into student Individualized Education Programs (IEPs) to capture the focus of the educational experience during the transition time period. We present our coding approach and initial findings. Better methods to capture and measure educational experiences will assist researchers to identify service gaps and ultimately how the focus of educational goals for transition age students might predict post-school outcomes.

Methods: Parents of 14 transition-age youth receiving special education services participated in focus groups to understand their experiences of the transition process. Parents also provided copies of their son or daughter’s IEP. A coding system to categorize the focus of educational goals was developed through review of the research literature and current assessments that measure daily functioning, and examination of theoretical models of disability and impairment. The final goal categories included: (1) Language and communication; (2) Independent living skills; (3) Sensory/motor; (4) Employment; (5) Social/emotional/behavioral; (6) Academic; (7) Post-secondary education; (8) Leisure; and (9) Executive functioning.

Results: Students ranged in age from 15 to 21. Half of the students (n=7) were receiving special education services under the autism disability category, with the remaining receiving services under the intellectual disability or emotional/behavioral disability categories. All had significant impairments in communication, cognition, and/or social-emotional functioning. Inter-rater reliability using the coding system and rules for 39 goals across 6 students averaged .81 (kappa). Of the 14 students, all had at least 1 educational goal in the social/emotional/behavioral category. Most had at least one goal in the independent living skills (n=13), employment (n=12), and academic (n=10) categories. Notably, none of the students had a goal focused on leisure skills and only one student had a goal focused on preparation for post-secondary education, despite the fact that 4 of the students were on track to receive a high school diploma. As expected, students who were participating in a transition program (e.g., ages 18-21; n =6) were less likely than students in traditional education classrooms to have academic goals; all transition program students had at least one goal focused on independent living skills.

Discussion: Our goal was to develop a system for categorizing the focus of educational goals for transition-age students receiving special education services for intellectual, developmental, and/or social-emotional difficulties. Understanding the educational experience and preparation for life after school for these students is important, especially in light of the findings of poor post-school outcomes and underachievement of young adults with intellectual and developmental disabilities. Our findings suggest that, on average, these youth may be receiving adequate focus on social/emotional/behavioral functioning, independent living skills, and employment. However, the low frequency of goals related to post-secondary education and leisure were surprising. Greater attention to the development of leisure skills during the high school years may promote greater quality of life in young adulthood. Future research could use the proposed system to examine whether the focus of goals does indeed predict post-school outcomes.

References/Citations:
Title: Comparing Effects of Public Service Announcements on Young Adults' Perception of the R-Word

Authors: Vann Morris, MaryAnn Romski, Jaye Atkinson, Dan Crimmins, Natalie Tindall

Introduction: Though the word "retard" or "retarded" (henceforth called the "r-word") is considered hate speech in American society, it still exists in everyday discourse. The r-word evolved from past medical labels used to describe intellectual disability, and by using the r-word as a socially pejorative term it transfers the stigma of intellectual disability to the object of insult; this perpetuates the stigma of intellectual disability.

The Special Olympics developed two PSAs as part of their "Spread the Word to End the Word" communication campaign. This study examined the efficacy of these PSAs. Six hundred and seventy-five participants were randomly assigned to one of three groups: experimental group 1 who watched a PSA titled "It's Not Acceptable" (PSA 1 group), experimental group 2 who watched a PSA titled "We Need a New R-word" (PSA 2 group), and a control group who watched no PSA. The purpose of the control group was to gain a baseline of how today's young adults perceived the r-word with no influence from PSAs.

Methods: It was hypothesized that PSAs would be effective at modifying young adults' perception of the r-word, and that PSA 1 group would have a more negative perception of the r-word than PSA 2 group and the control group. This hypothesis was theoretically grounded in the Elaboration Likelihood Model (Petty & Cacioppo, 1986a). It was hypothesized that PSA 1's technique facilitated elaboration along both the central route (through framing the r-word as similar to other minority slurs) and the peripheral route (through the use of affect). In order to examine this, this study asked both experimental groups to rate their cognitive processing (central route) and affective responses (peripheral route) to their PSAs.

The two experimental groups watched their respective PSA and completed a consent form, their affective and cognitive responses to the PSA, their ratings of the r-word and their demographic information. The control group watched no PSA and completed their consent form, their ratings of the r-word, and their demographic information. This study then examined what differences existed between the three groups' perception of the r-word.

Results: This study found that PSAs may be useful tools in modifying young adults' perception of the r-word, as PSA 2 group participants perceived the r-word as significantly less respectful than the participants in the control group.

Discussion: The PSAs used in this study did not utilize content that was pro-attitudinal, and utilizing content that fits within the existing attitudes young adults have regarding the r-word may prove more efficacious. Findings from this study also included how young adults use the r-word, so that it may be included in future messaging. In addition, future PSAs should also educate them on why the r-word perpetuates the stigma of disability. Past medical terms used to label intellectual disability have also evolved into socially pejorative terms; thus, even if the r-word is eradicated, history predicts that the term "intellectual disability" may take its place. Finally, this issue of past intellectual disability labels evolving into socially pejorative terms begs the question: Why do we care about the r-word specifically? Idiot and moron are both past medical labels commonly used terms in society today; why are we only focusing on the r-word? The answer to this lies within the historical context of mental retardation. Mental retardation was used as a medical label for intellectual disability from 1921 to 2010; thus, this is the term which most of society understands is connected to intellectual disability. Moving forward we can re-frame the conversation to include other past labels such as idiot, moron and imbecile - but we have to start somewhere.

References/Citations:
Title: Parent and Child Eating Behaviors in Children with IDD and Overweight/Obesity

Authors: Catherine M. Sanner, Allyson L. Davis, Cameron L. Neece, Sylvia Herbozo

Introduction: Obesity rates are higher among children with intellectual and developmental disabilities (IDD) compared to their typically developing (TD) peers (Strahan & Elder, 2013; Phillips et al., 2014). Research has shown numerous factors affect obesity risk, including parent obesity and parent eating behaviors. Not only do parents create a food environment for children, but they often model eating behaviors and food choices that may affect child eating behaviors (Campbell, et al. 2007). Previous studies have shown that obese children tend to eat more rapidly, are less sensitive to satiety cues, are more responsive to food cues, and tend to be less picky with food (Webber, Saxton, Jaarsveld, & Wardle, 2009). While several studies have investigated eating behaviors in typically developing children, little research has examined eating behaviors in children with IDD and their parents. In a community sample of children with IDD and overweight/obesity, the current study will (1) assess rates of overweight/obesity in parents and (2) examine eating behaviors in both parents and children.

Methods: Twenty-seven participants (mean age=11.33;SD=1.80;81.5% male) were enrolled in Operation Fit, a pilot study of a four-day intervention developed to improve health/nutrition knowledge and physical activity in overweight/obese children with IDD. Prior to the intervention, participants’ and parents’ height and weight were measured to determine overweight or obese status (overweight, BMI ≥ 85th percentile; obese, BMI ≥ 95th percentile). Measures in the current study included the Child Eating Behavior Questionnaire (CEBQ; Wardle, Guthrie, Sanderson, & Rapoport, 2001), and the Eating Behavior Patterns Questionnaire (EBPQ; Schlundt, Hargreaves, & Buchowski, 2003). Both measures are parent report measures assessing eating behaviors of children and parents, respectively, and are rated on scales from 1 to 5.

Results: The majority of children in the current study were categorized as obese rather than overweight (70.4%; 29.6%, respectively). The average child BMI percentile was 95.26, and 73.9% of parents were considered obese (Obese=BMi≥30; 13.0% Healthy Weight, BMI<25; 13.11% Overweight, BMI=25-29.9). Compared to a community sample of women with a range of BMIs, parents endorsed lower scores on the following scales: Snacking on Sweets (M=14.5, SD=4.65), Emotional Overeating (M=28.62, SD=9.24), and Lifestyle Eating (consuming meat/starch/breads; M=9.67, SD=2.88). However, parents reported a higher incidence of Haphazard Planning of meals (M=24.54, SD=6.34). Parents also reported that their children had a greater incidence of emotional overeating (M=2.53, SD=1.09), were less sensitive to satiety cues (M=2.23, SD=.70), were more responsive to food cues (M=3.3, SD=1.03), and reported more fussiness to food (M=3.38, SD=.96) compared to a TD healthy weight population.

Discussion: Findings in the current study were mostly consistent with research on obesity in children. Parent responses indicated similar child emotional overeating, sensitivity to satiety cues, and responsiveness to foods as TD children with overweight/obese. Parent’s also indicated greater child fussiness to food; however, given the high rates of obesity in the current population, it is likely that these children prefer energy dense food, which is consistent with current research in the IDD/Autism field (Curtin, Anderson, & Bandini, 2010). While child findings were consistent with previous research, parents endorsed fewer unhealthy habits than a normative sample with a lower average BMI. The elevated levels of obesity in this population and endorsement of fewer unhealthy eating habits suggest that parents may be unaware that their eating habits are unhealthy and/or there are additional factors contributing to their health. Given the effect that parent eating patterns can have on child health, the current study highlights the importance of targeting parent health education in child obesity interventions.

Authors: Kathryn E. Unruh, James W. Bodfish

Introduction: The Social Motivation Theory of Autism suggests that the social-specific reward deficits in ASD result from a lack of motivation toward social information. While this theory has been influential in studying ASD-specific social deficits, few measures have been developed to directly quantify social motivation. Eye-tracking and pupillometry can be used to study attention in ASD. We have developed two novel tasks that incorporate these methods to quantify differential preference for and arousal to social and nonsocial stimuli.

Methods: Our preferential viewing (eye-tracking) task measures patterns of visual attention to social and nonsocial content. Social images (face) are paired with one of two types of objects: images of high interest to children with ASD (HAI images; e.g. trains, electronics) and images of low interest to children with ASD (LAI images; e.g. clothing, furniture). Our pupillometry task measures differential maintained attention (pupil dilation) over time. In this task one image is displayed at a time: social (face) or HAI. All stimuli were controlled for luminance and complexity, counterbalanced for image position, and presented in a passive manner for 5 seconds each, with a 2-6 second variable interstimulus interval. Participants included children diagnosed with ASD (N = 33, mean age = 13.9 years) or typically developing (TYP; N = 41, mean age = 10.3 years); groups were matched on IQ and gender. Gaze patterns were analyzed between array types (SOC + HAI and SOC + LAI). Pupil responses were analyzed between stimulus types (SOC and HAI) and across 5 epochs (1000 ms each).

Results: Repeated measures ANOVA of gaze patterns showed that individuals with ASD had a longer latency to first view social images than TYP, only when the social image was paired with an HAI nonsocial image (F = 4.3, p = .042). Additionally, individuals with ASD spent significantly more time looking to objects [F = 15.4, p = .005], while TYP showed a preference for faces (F = 20.1, p = .001). This suggests that our task is sensitive to group differences in social preference. Repeated measures ANOVA (Age Group x Epoch x Stimulus) of pupil response revealed a significant 3-way interaction (F = 13.9, p = .013), indicating that pupil response to social and nonsocial stimuli differed as a function of both age and time. This suggests that our task is sensitive to differences in social and nonsocial information processing. Post-hoc paired-samples t-tests revealed greater pupil dilation to nonsocial images at each time period in older children only (all ps < .05), and minimal differences between image type in younger children. This suggests that our task may be sensitive to developmental differences in social orientation.

Discussion: These results suggest that in ASD, social information processing deficits may be relative and context-dependent, rather than 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. While gaze-tracking reveals attentional patterns, pupil responses indicate physiological arousal; thus, these tasks may be useful markers of different underlying mechanisms contributing to social motivation deficits. The joint use of these tasks may provide a method to tease apart the differential approach patterns seen in ASD to social and nonsocial sources of information, while also examining differences in developmental trajectory. Furthermore, both tasks are short (approximately 5 minutes) and passive, requiring no instructions and, therefore, may be ideal for use with both very young children and individuals who are minimally verbal.

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**Title:** Autism Symptom Severity in Fragile X Syndrome: Effects of ADOS Module

**Authors:** Cynde Katherine Josol, Emma Charlotte Cooper, Angela Thurman, Andrea McDuffie, Leonard Abbeduto

**Introduction:** Fragile X syndrome (FXS), which is caused by a mutation in a single gene on the X chromosome, is the leading inherited cause of intellectual disability. Additionally, individuals with FXS, particularly males, are at a high risk for presenting with symptoms of autism spectrum disorder (ASD). For example, gaze aversion and repetitive behaviors are commonly associated with the FXS phenotype. The Autism Diagnostic Observation Scale (ADOS) is one of the gold standard diagnostic tools used to evaluate the presence of ASD symptomatology. Within this measure, one of four modules is administered based upon expressive language level. The current version of the ADOS was designed to control for language differences and allow comparison across modules. Although the ADOS is commonly used to assess ASD symptomatology in FXS, there are no data on whether the different modules function as intended in FXS or on how language level affects measurement outcomes in FXS. Such data are needed given recent findings suggesting differences in the developmental mechanisms underlying ASD symptom severity between individuals with FXS and those with idiopathic ASD. In the present study, we examined: (1) the severity of ASD symptomatology as a function of ADOS module in FXS and (2) the relationship between severity of ASD symptomatology and chronological age and the relationship between severity of social affective and restricted and repetitive behavior symptomatology in FXS.

**Methods:** Participants were 195 individuals with FXS (170 males, 25 females) ranging in age from 3.85 - 23.15 years (M=12.31 years, SD=4.59). Participants were administered the either the ADOS (n=105) or the ADOS-2 (n=90). For participants who received the ADOS, the Comparison score was computed (Gotham et al., 2009). In addition, the Social Affect Calibrated Severity scores and the Restricted and Repetitive Behavior Calibrated Severity scores, (Hus et al., 2014), were computed for all participants. In the present sample, participants received either a Module 1 (n=23), 2 (n=84), or 3 (n=88).

**Results:** Results indicated that the overall severity of ASD symptomatology varied significantly as a function of module, with less severe symptomatology observed for individuals with FXS who received a Module 3 relative to those who received a Module 2. Moreover, although there was no effect of module on severity of social affective symptomatology, severity of restricted and repetitive behaviors did vary as a function of module, with more severe scores observed for individuals who received a Module 1 than for those who received a Module 3. Differences were also observed across modules in the association between severity of social affective and restricted and repetitive behavior symptomatology.

**Discussion:** It is well documented that there are a number of similarities between the phenotypes associated with FXS and idiopathic ASD. That being said, there is a growing body of research indicating that the developmental mechanisms underlying the features shared between these two conditions also may be different in clinically important ways. Given these findings, it is important to consider the possibility that the tools found to be effective for characterizing symptoms present in individuals with idiopathic ASD may not translate to individuals with FXS. Our data suggest that, for individuals with FXS, severity of ASD symptomatology and the association between severity in the two symptom domains differ across the different language level categories utilized by the ADOS. Clinical and theoretical implications will be discussed.

**References/Citations:**
- Hus et al. (2014). Standardizing ADOS domain scores: Separating severity of social affect and restricted and repetitive behaviors. JADD, 44, 2400-2412.
Title: A Rat Model of Maternal Immune Activation

Authors: Katherine Ku, Milo Careaga, Carolyn Chang, Alex Chiang, Robert F. Berman, Melissa Bauman

Introduction: Infection during pregnancy increases the probability of offspring later being diagnosed with a neurodevelopmental disorder such as autism or schizophrenia. However, not all women exposed to infection during pregnancy have a child with altered neurodevelopment. The intensity and timing of the maternal immune response, combined with genetic susceptibility and postnatal risk factors, may be informative for linking prenatal environment with abnormalities of postnatal brain development and behavior. Our present study focuses on how different forms of polyriboinosinic-polyribocytidylic acid (PolyIC) can affect the intensity of the maternal immune response by comparing high (HMW) and low (LMW) molecular weights of the viral mimic.

Methods: Pregnant rats received tail vein injections on gestational day 15 with PolyIC-HMW, PolyIC-LMW, or saline. Cytokine levels were measured by taking blood draws at 3, 4.5, and 6 hour time points following injections. Blood sera were analyzed for IL-1β, IL-6, IL-10, and TNF-α. Sickness behaviors were assessed in the pregnant rats during the 24-hour period following injection, using the Columbus Instruments Comprehensive Lab Animal Monitoring System (CLAMS). The male offspring were assessed at juvenile, young adult and adult time points (PND26-110) for the following behaviors: anxiety, sociability, locomotion, pre-pulse inhibition, and reciprocal social interactions. Following behavior testing, cell density and parvalbumin expression were assessed in the CA-1 and CA-3 regions of the hippocampus.

Results: Our preliminary results indicate that different forms of PolyIC can yield dramatically different cytokine responses and sickness behaviors. The behavioral and histological impact of these two forms of PolyIC on the offspring is currently being investigated.

Discussion: These novel findings are critical to understanding the mechanism underlying the MIA model and may explain variability in previous studies.
**Title:** Nutrition Choices and Decision Making in Individuals with Fragile X Syndrome  
**Authors:** Kylee Miller, Alexandra Alvarez, Anne Wheeler, Margaret DeRamus

**Introduction:** Individuals with intellectual and developmental disabilities (IDD) are at risk for being overweight and experiencing malnutrition (Van Riper, 2010), both health problems with known medical comorbidities. While much consideration has been given to assessing intake of specific nutrients in individuals with IDD, little is known about food choices relative to cognitive functioning and adaptive behavior; particularly for individuals who are living in more independent settings. This study explores the relationship between decisions regarding healthy lifestyle and food choices, cognitive functioning, and weight in a sample of adolescents and adults with fragile X syndrome (FXS).

**Methods:** Data was collected as part of a larger study designed to assess factors that contribute to decisional capacity in FXS. Direct assessment measures include weight, height, the Stanford Binet -5 as a measure of general cognitive skills, and four measures of executive functioning from the DKEFS: 20 Questions, Color-Word, Tower, and Trails. Guardian-reported adaptive skills from the SIB-R and an evaluation of each child's history with minor and major life decision making are also collected. The nutritional evaluation is adapted from the Healthy Eating Adds Up curriculum, a nutrition education program developed for individuals with IDD (Johnson, 2012). Preliminary analysis explored nutritional knowledge and decision making in individuals with FXS, and cognitive contributors to healthier outcomes.

**Results:** Participants included 83 adolescents and adults with FXS. Nearly ¾ of the sample met criteria for intellectual disability [no ID, n=20, 34%; mild ID, n=27, 32%; moderate ID, n=21, 25%; severe ID, n=15, 18%]. On each of the four decision making questions, the majority of participants were rated as being able to make the decision independently or with minimal help [what to cook=95%; select snack items=98%; when to exercise=90%; what to order from a menu=100%]. Correlations between IQ and decision making experiences revealed strong positive relationships (r=0.55), specifically with how often daily decisions are made for individuals with FXS by others. Multiple regression was conducted to determine the best linear combination of gender, age, IQ, BMI, anxiety, cognitive flexibility, inhibition, abstract thinking, and decision making experiences for cooking, choosing snacks, exercising, ordering from a menu for predicting nutrition decision making. Assumptions were checked and met. This combination of variables significantly predicted healthy nutrition decision making, F (15,28)=2.733, p=.01, with the variables of IQ and previously making their own decisions of when to exercise significantly contributing to the prediction. The adjusted R squared value was .38; indicating that 38% of the variance in nutrition decision making was explained by the model. The beta weights suggest a high IQ (β=.60) contributed the most to making healthier nutrition decision, and that exhibiting higher levels of disinhibition is associated with fewer healthy decisions (DKEFS Color Word, β=-.32).

**Discussion:** Initial results indicate that having a higher IQ is associated with healthier nutritional decisions. Disinhibition also contributed to the model, suggesting that a high IQ is not necessarily a protective factor, and that certain executive functions, namely inhibiting a response or choice, significantly impacts ones' ability to make healthy decisions. Understanding nutritional decision-making and the cognitive processes behind how individuals make these decisions has important implications for individuals with IDD, including the development of targeted nutritional interventions.

**References/Citations:**
Title: Predictors of Specific Phobia in Children with Williams Syndrome: Behavioral Regulation and IQ

Authors: C. Holley Pitts, Bonita P. Klein-Tasman, Jason W. Osborne, Carolyn B. Mervis

Introduction: The prevalence of Specific Phobia (SP) in children with Williams syndrome (WS) exceeds 50% in several published studies. To consider the effects of possible predictors on the probability that a child with WS would be diagnosed with SP, a logistic regression analysis was conducted with age, sex, IQ, and behavioral regulation difficulties as possible predictors.

Methods: Participants were 193 children with WS (100 girls, 93 boys) aged 6.01 - 17.98 years (M: 10.71, SD: 3.39). The Anxiety Disorders Interview Schedule: Parent was administered to determine if the child met DSM-IV diagnostic criteria (including interference and impairment) for SP. Child intellectual abilities were measured by the Kaufman Brief Intelligence Test-2 IQ (M: 73.84, SD: 14.78). Behavioral regulation was measured by the Behavioral Regulation Index (BRI) T-score on the Behavior Rating Inventory of Executive Functioning-Parent (M: 63.20, SD: 10.59; general population M: 50, SD: 10). Higher T-scores indicate greater difficulties. T-scores at or above 65 are considered clinically elevated.

Results: Diagnostic criteria for SP were met by 56% of the children. To evaluate possible predictors of the probability of receiving a SP diagnosis, a blockwise logistic regression was conducted. Presence of SP diagnosis was the dependent variable. In step 1, the effects of age and sex were evaluated. The predictors significantly improved model fit (null -2LL = 268.81, step 1 -2LL = 257.88, $\chi^2(2) = 6.93, p < .031$). As age increased, the probability of having SP decreased ($p < .01$). No sex differences were detected ($p < .30$). The linear effects of IQ and BRI T-score were entered in step 2 and significantly improved model fit (-2LL = 240.48, $\chi^2(2) = 17.40, p < .002$). Possible quadratic effects of IQ2 and BRI T-score2 were examined in step 3. Entry of IQ2 did not yield a significant improvement in model fit (-2LL = 238.67, $p < .18$). To improve model specification, the nonsignificant effect of IQ2 was removed. When BRI T-score2 was entered into the equation, model fit significantly improved (-2LL = 233.08, $\chi^2(1) = 7.40, p = .007$). In the final model, a significant linear effect of IQ ($p = .005$), a linear effect of BRI T-score ($p < .002$), and a quadratic effect of BRI T-score ($p < .01$) was detected. As IQ increased, the probability of receiving a SP diagnosis decreased. When converted to conditional probabilities, results indicated that, after controlling for BRI T-score, age, and sex, a child with an IQ of 52 had an 83% chance of receiving a SP diagnosis whereas a child with an IQ of 96 had a 52% chance. After controlling for IQ, age, and sex, the probability of being diagnosed with SP initially increased as BRI T-scores increased. However, the probability began to asymptote at a high level when BRI T-scores reached the clinical range. A child with a BRI T-score of 50 had a 37% chance of receiving a SP diagnosis whereas a child with a BRI T-score of 65 had a 72% chance and a child with a BRI T-score of 76 had a 71% chance.

Discussion: As age increased, prevalence of SP decreased. After controlling for behavioral regulation difficulties, children with lower IQs were more likely to meet criteria for SP. The curvilinear effect of BRI T-score revealed that, after controlling for IQ, the probability of being diagnosed with SP gradually rose as behavioral regulation difficulties approached the clinical range. Once the clinical range was reached, the probability of receiving a SP diagnosis leveled off at a high level. Implications of these findings will be considered.

Funding: NICHD R37 HD29957, NINDS R01 NS35102, Williams Syndrome Association WSA-0104.
Title: Physiological and Neural Mechanisms of Eating Behavior in Autism Spectrum Disorder

Authors: Lauren Little, Rebecca Lepping, Winnie Dunn, Cary Savage

Introduction: Unusual eating behavior (e.g., food selectivity, aversion to novel foods) presents in up to 90% of individuals with autism spectrum disorder (ASD) (e.g., Mari-Bauset et al., 2013). Eating behavior in ASD overlaps with eating disordered populations (obesity, anorexia); studies with these populations have shown that physiological and neural mechanisms associated with disgust/reward underlie atypical eating. Therefore, we investigated the extent to which generalized food motivation (measured via fMRI) and temporal profiles of disgust/reward (measured via facial EMG) differed between adolescents with ASD versus typical development (TD).

Methods: Participants included adolescents with ASD (n=10) (mean age=12.8 yrs; SD=1.5 yrs) and TD (n=9) (mean age=13.3 yrs; SD=2.1 yrs); recruitment and testing is ongoing. We used facial EMG to test affective responses to food images, and data is collected using 4-mm electrodes placed along the zygomaticus (reward response) on the left cheek and the corrugator (disgust response) above the left eyebrow. A standardized block design was used in our imaging paradigm to display food, non-food (animal), and blurred baseline images (see Martin et al., 2010). Functional connectivity was measured with blood-oxygenation level dependent (BOLD) images when participants were mild fasting (post 4-hours eating). Participants completed cognitive, sensory, food selectivity, and autism diagnostic assessments.

Results: We obtained meaningful fMRI data from all children; movement analyses show 71% usable data in ASD and 90% in controls. Preliminary fMRI results suggest that in response to food images, children with ASD versus TD showed differential activations in the hippocampus based on their sensory sensitivity scores (threshold p<.05, corrected for multiple comparisons). Children with ASD that show decreased hippocampus activation to food show high sensitivity scores; children with ASD with lower sensitivity scores show higher hippocampal activation. Activation and sensitivity patterns in TD show an opposite trend. Analysis of facial EMG data is ongoing; preliminary results suggest that children with ASD show increased disgust responses to food versus controls.

Discussion: Findings suggest that children with ASD show differences in neural responses to food images as compared to controls. The interaction between sensory sensitivity and hippocampus activation across groups may be indicative of how memory retrieval and appraisal of emotionally salient stimuli plays a role in eating behavior and associated sensory sensitivity in ASD. It may be that children with ASD are limited in generalizing experience with familiar foods to novel presentations of food. Restricted eating behavior (i.e., only eating one color of food; using one plate) may be related to how children with ASD recognize food as palatable, and memory retrieval may be related to this process in ASD.

References/Citations:
Title: Toddler Externalizing Behavior, Social Support and Parenting Stress

Authors: Laura E. Murphy, Kriston B. Schellinger, Rebekah L. Hudock, Julie E. Ritter, Mingjuan Wang, J. Carolyn Graff, Frances A. Tylavsky

Introduction: While child externalizing behavior problems such as aggressiveness and overactivity are typical during the toddler years, high levels of externalizing behaviors are stressful to parents and place them at risk for depression, intimate partner discord, and low parenting self-esteem (Lee, Lee, & August, 2011; Suarez & Baker, 1997). However for those experiencing stress, social support has been associated with improved well-being (Lee et al., 2011; Schoefield et al., 2012). Although the benefits of social support are known, there is limited research on the impact of social support for parents of toddlers who are experiencing high levels of parenting stress. This study examined the possible moderating role of social support on the association between child externalizing behavior and parenting stress in a sample of typically developing 24-month-olds and their parents.

Methods: Data were obtained as part of the Conditions Affecting Neurocognitive Development and Learning in Early childhood study, a large longitudinal study exploring factors related to early childhood development. In total, complete data were available from 1079 participants. Mean maternal age was 29.52 years (SD = 5.51, range = 18.4 - 43.6 years) and the average child age was 24.98 months (SD = 1.49, range = 21.6 - 30.5 months). Generalized linear modeling was used to examine the relation between child externalizing behavior (measured with the Brief Infant-Toddler Social and Emotional Assessment), social support (measured with the Social Support Questionnaire - 6) and parenting stress (measured with the Parenting Stress Index - Short Form). Additionally, social support was explored as a potential moderator of the relation between child behavior and parenting stress.

Results: Nonparametric analyses (Kruskal-Wallis and Man-Whitney U tests) detected a significant relation between parenting stress and three demographic variables: maternal marital status, maternal education, and insurance type. Thus, these variables were all included in the model. However, maternal marital status and insurance type did not yield significant effects in the model; therefore, they were not included in the final model. Additionally, the interaction term was not significant and was thus removed from the final model. However, maternal education (t = 2.44, p < .05), child externalizing behavior (t = 10.27, p < .001), and social support (t = -8.80, p < .001) were all significant in the final model. Results suggest that mothers who have more than a high school education report less parenting stress. Additionally, lower levels of child behavior concerns and higher levels of social support were associated with lower levels of parenting stress. However, social support did not moderate the relation between child externalizing behavior and parenting stress.

Discussion: Findings suggest that parents of typically developing toddlers with higher levels of externalizing behaviors who have limited social support may be particularly vulnerable to experiencing parenting stress. This suggests that social support is particularly important to parents of young children, and may be especially important if the child exhibits challenging behaviors. Future research is needed to better understand how social support benefits parents of toddlers, especially those toddlers with behavioral concerns.

References/Citations:

**Title:** The Effects of Maternal Coping on Academic Involvement in the Early Transition Years for Children with ASD

**Authors:** Elizabeth Llanes, Yasamine Bolourian, Geovanna Rodriguez, Jan Blacher

**Introduction:** Mothers of children with ASD are more likely to report poor or fair mental health than mothers in the general population (Montes & Halterman, 2007). However, it has been suggested that positive coping styles may protect against negative maternal outcomes caused by the stress of caring for a child with ASD (Benson, 2010). Furthermore, research in classroom settings has shown that problem behaviors such as aggression, noncompliance, and disruption are common for many school-age children with ASD (McClintock, Hall, & Oliver, 2003). These problem behaviors often make it difficult for children with ASD to fully engage with and participate at school, thus causing stress for their parents. This paper will examine early school transition for young children with ASD with a focus on their involvement and competence at school. It will also explore the relationship of maternal coping style to child school involvement (as defined by student-teacher relationship quality, competence with peer interactions, and academic engagement), during this early school transition period. Child characteristics as well as teacher characteristics will also be considered.

**Methods:** Participants were recruited from a larger study of the early transition to school for children with ASD (N = 81) ages 4 to 7 years old. Mothers of the participants filled out the COPE Inventory (Carver, Scheier, & Weintraub, 1989), which measures problem- and emotion-focused coping with the transition to school. There are three coping subscales in addition to a total score: emotional and social support; denial; behavioral disengagement. Student involvement in the schools was measured using teacher reports of the Student-Teacher Relationship Scale, total score (STRS; Pianta, 2001), the Academic Engagement Scale (AES) total score, and the Social Competence and Behavior Evaluation total score (SCBE; LaFreniere, Dumas, Capuano, & Dubeau, 1992). Child autism characteristics were assessed with the Social Responsiveness Scale, total and subscales (Constantino & Gruber, 2005), and teacher characteristics obtained included years of teaching and ASD specific training.

**Results:** Correlational analyses were used to assess the relationship between maternal coping style and school involvement. Mothers' use of the emotional and social support coping style was positively associated with good student-teacher relationship quality ($r = .243, p = .036$). Denial as a maternal coping style was negatively related to the child's behavioral engagement in school ($r = -.257, p = .021$). Maternal behavioral disengagement coping style was positively associated with student social competence ($r = .329, p = .003$). Regression analyses will be conducted in order to determine whether maternal coping styles, child autism characteristics, or teacher characteristics predict children's overall school involvement.

**Discussion:** Preliminary analyses suggest that maternal coping strategies relate to child behavior at school as assessed by teacher. While these data are correlational, it may be possible to ascertain the direction of effects over time. Implications for how these findings might inform parent education and practices will be considered.

**References/Citations:**

Title: Prevalence and Predictors of Anxiety Disorders in Adolescent and Adult Males with Fragile X Syndrome

Authors: Jordan A. Ezell, Sara Matherly, Shannon O’Connor, Cameron Thomas, Leonard Abbeduto, Jane Roberts

Introduction: Fragile X syndrome (FXS) is a monogenetic disorder characterized by abnormal social behavior and intellectual disability. The FXS behavioral phenotype is typified by shyness, avoidant eye contact, elevated states of physiological arousal, withdrawn and autistic behaviors (Cohen, 1997). Additionally, high rates of anxiety symptomatology have been reported in FXS with most research focused on broadband, screening level scales. In the one study using DSM-IV diagnostic measures in 58 males with FXS (5 - 27 years old), results indicated that 86% met for any anxiety disorder with Specific Phobia (65%) and Social Phobia (35%) as the most frequent disorders. Older age, lower IQ and the presence of an autism spectrum disorder were associated with increased prevalence in specific anxiety disorders. The purpose of this study is to advance our understanding of the nature of anxiety disorders in adolescent males with FXS by examining the prevalence and predictors of anxiety disorders using multiple measures over time and including heritable factors given the high prevalence of anxiety disorders in mothers of children with FXS.

Methods: Participants included males with FXS from 16 to 24 years of age, who demonstrated phrase speech and a nonverbal IQ below 85. In this longitudinal study, screening indices of anxiety preceded diagnostic determination a year later. Screening measures included the Anxiety Depression and Mood Scale (ADAMS) and the Child Behavior Checklist (CBCL) anxiety, internalizing and problem behavior subscales. The diagnostic measure was the Children's Interview for Psychiatric Symptoms-Parent Version (P-ChIPS), a semi-structured diagnostic interview for anxiety disorders including Specific Phobia, Social Phobia, Separation and Generalized Anxiety completed by the mother. The Beck Anxiety Inventory (BAI) was completed to determine the relationship of maternal anxiety to child anxiety. The Autism Diagnostic Observation Schedule - 2 was used to document autism severity and non-verbal IQ was measured by the Leiter-R.

Results: Our data indicate that 61% of adolescent males with FXS met criteria for at least one anxiety disorder with 29% for Specific Phobia, 18% for Social Phobia, and 32% for General Anxiety Disorder. Results from logistic regression analyses indicated that older age predicted Social Phobia (p<0.05, r=0.73) with a trend for the ADAMS anxiety subscale to predict Generalized Anxiety Disorder (p=0.065, r=0.04) and for maternal anxiety to predict any anxiety (p=0.178, r=0.4). The trend continued for the CBCL anxiety subscale, internalizing subscale, and anxiety problems subscale to predict any anxiety disorder and to predict General Anxiety Disorder (p<0.20).

Discussion: This study is consistent with previous work indicating a high prevalence of anxiety disorders in FXS; however, our data indicate generally lower prevalence levels for both any anxiety disorder and for specific disorders. Also, we did not find a relationship between IQ and autism severity to anxiety disorders as has been reported. Yet, we did find that older age indicated increased risk consistent with others. Ours is the first to document a tentative relationship between anxiety symptoms and elevated maternal anxiety features to later diagnoses. This work is important to develop targeted treatments for adolescents and young adults with FXS as well as to surveil children for the emergence of anxiety.

References/Citations:

Title: Examining Genetic Subtype Differences in Pretend Play among Children with Prader-Willi Syndrome

Authors: Anastasia Dimitropoulos, Olena Zyga, Sandra Russ, Nathan Danker, Elizabeth Roof, Elizabeth Dykens

Introduction: The processes involved in pretend play are associated with the positive development of cognitive, emotional, and social skills (Russ, 2004). Deficits in play have been identified in children with various developmental disorders, including autism spectrum disorder (ASD). Play deficits in ASD are related to delayed social, language, affective, and creativity development. Specifically, children with ASD can express high rates of repetitive behaviors and rigid/stereotyped play. Although research suggests individuals with Prader-Willi syndrome (PWS) have social deficits and repetitive behaviors similar to that of ASD with a greater risk associated with the maternal uniparental disomy (mUPD) subtype, play patterns have not been well studied. While hallmark characteristics of PWS include hyperphagia, obsessive-compulsive symptoms, and cognitive delays, understanding social-cognitive risk factors for individuals with the disorder is important for planning intervention and increasing quality of life. Recently, Zyga et al. (2015) found pretend play in children with PWS to be similar to children with ASD with reduced social-cognitive processing. In addition, children with PWS did not differ from those with ASD in individual and joint play. The addition of a play partner increased social-cognitive scores in both groups. However, the effects of genetic subtype could not be examined in that small sample. The purpose of the current research is to extend this examination of pretend play in a larger sample of children to identify if early social-cognitive processes in play differ by genetic subtype in children with PWS.

Methods: 60 Children with PWS (DEL=29, mean age=9.97; mUPD=31, mean age=9.95) underwent the Autism Diagnostic Observation Schedule (ADOS) as part of larger studies examining the social phenotype of PWS at either CWRU (n=14) or Vanderbilt University (n=46). The ADOS sessions were video recorded and secondary analyses of play abilities were assessed by scoring the "Make-Believe Play" activity using a modified Affect in Play Scale (APS; Russ, 2004). The modified APS scored participants on scaled measures of comfort, imagination in play, organization of storyline, affective expression in play, frequency of symbolic versus functional play versus no play acts, and number of repetitive actions. In addition, the "Make-Believe Play" activity included both individual and joint play periods, where the child played with the experimenter.

Results and Discussion: Preliminary analyses indicate that during both the individual and joint play periods, genetic subtype groups did not differ in play ability and showed a similar pattern of deficits across all original measures within the APS (Imagination, Organization, Comfort, Frequency/Categories of Affect expressed) and spent the majority of time in No Play activities (DEL = 72%; mUPD = 73%). These findings add to previous findings (Zyga et al., 2015) and suggest that children with PWS do indeed have deficits within their play abilities that are not mediated by genetic subtype. Additional results indicate both groups showed gains in most measures with the addition of a play partner. However, only the DEL subtype showed a significant increase (t=-4.34, p<.001) in time spent in symbolic play from individual (3%) to joint play (18%). Overall, these results suggest that play facilitation allowed for similar increases in social-cognitive processes in play in both groups, however, DEL subtype may be more malleable in terms of symbolic increases in play. Intervention tailored to target deficits in both groups could be beneficial in increasing play skills and more global processes related to pretend play development.

References/Citations:

Title: The Relationship of Behavior Changes in Males with FXS to Maternal Mental Health from Middle Childhood to Adolescence

Authors: Steven Warren, Shelley L. Breden-Oja, Kandance Fleming, Nancy Brady

Introduction: Children and adolescents with Fragile X Syndrome (FXS) are at risk for a variety of behavior problems. These can create substantial challenges for their parents. This analysis was conducted as part of a larger longitudinal study (Brady et al., 2014). We collected maternal report data on the behavior of 27 males with FXS in middle-childhood and again when they were adolescents. We also collected data on the mother’s perception of her relationship with the child, her emotional state, and a self-report measure of depression.

Methods: Twenty seven mothers from a larger longitudinal study participated in additional data collection regarding their son’s behaviors and their own mental health. The mean age of these males was 111 months (SD= 8.9 months) at the first data collection, and 165 months (SD=11.9 months) at the second collection. Nine of the 27 males had comorbid autism. Twenty-six of the mothers were carriers and one had the full FXS mutation. We collected the middle childhood data during a home visit and the adolescent data point via mail. The measures collected for this analysis were the Child Behavior Checklist (CBCL), the Profile of Mood States (POMS), the CES-D (a measure of maternal depression symptoms), and the Social Communication Questionnaire (SCQ).

Results: Scores on the CBCL generally improved for the males without autism from middle childhood to adolescence but either decreased modestly or were flat for boys with comorbid autism. SCQ scores were stable from the middle childhood to adolescence, indicating that autism symptoms were stable over this time. Males without autism averaged 9.93 (SD=5.84) on the SCQ in middle childhood and averaged 10.47 (SD=5.29) in adolescence. Males with autism averaged 19.44 (SD=5.68) on the SCQ in middle childhood and 21.44 (SD=4.45) in adolescence.

For the males without autism maternal POMS Anger-Hostility scores declined significantly (t (15) = 2.57, p=.021, d=.65) from childhood (M=5.44, SD=3.98) to adolescence (M=3.31, SD=3.55). Maternal scores also declined modestly but not significantly on the POMS Tension-Anxiety scores and CES-D depression scores for these males. For 9 males with autism, maternal POMS Tension-Anxiety scores increased from 10.22 (SD=4.32) to 13.00 (SD=5). This was not a statistically significant increase, t(8) = 1.73, p=.12, although the effect size for the difference was moderate (d=.58). At the middle childhood period, the POMS Anger-Hostility scores were significantly different between the groups. Tension-Anxiety score was not significantly different, but the effect size was moderate. However, in adolescence, both scores were significantly different between the groups.

Discussion: This dataset is limited in size and scope and should be viewed as preliminary. Nevertheless, the data suggest that differences in the parenting burden of males with FXS and autism may pose an increasing risk for mother’s to experience mood disorders during their child’s adolescence. For mothers of males with FXS but no autism, the data suggest a stable and in some ways improving picture that may help buffer them from further risk in terms of their own mental health.

References/Citations:
Title: Aging Adults with and without Down syndrome: Parental Changes when Offspring are in their 40s and 50s

Authors: Robert M. Hodapp, Meghan M. Burke, Richard C. Urbano

Introduction: Although adults with intellectual disabilities are living longer lives, increasing longevity seems especially marked for those with Down syndrome. But as these adults reach their 40s and 50s, they may experience the triple-challenges of more often having older (or deceased) mothers and fathers; their own old-age health problems; and living situations that involve living in their family home or with siblings. Caregiving challenges for these aging adults may thus differ somewhat from those for individuals with (non-DS) intellectual disabilities.

In this study, we focus on the health, mortality, and caregiving of mothers and fathers. Although aging and health concerns occur among the parents of all middle-aged offspring, in Down syndrome (vs. non-Down syndrome ID), parents who are in their 70s and 80s should be expected to have children who are more often younger; conversely, middle-aged offspring with Down syndrome should more often have parents who are older or deceased. To examine caregiving of middle-aged adults with (vs. without) Down syndrome, we adopt the dual-perspective of looking "backward" from parental ages to offspring ages and "forward" from offspring ages to parent health, mortality, and caregiving ability.

Methods: Respondents included adult siblings of 622 adults with (non-DS) developmental disabilities and of 156 adults with Down syndrome; all adults with disabilities were aged 20 through 59 (we had only a few aged 60+). Siblings responded to a nationwide, web-based survey. Respondents reported on the ages and health status of their brother-sister with disabilities, whether their mothers and fathers were each alive (and how old each was), the overall health of the mother and of the father, and the degree to which their parents were able to care for their brother-sister with disabilities. Responses were examined through age-categories of the parents (through 40s; 50s; 60s; 70s; 80s+) and of offspring with disabilities (20s; 30s; 40s; 50s).

Results: For parents in their 70s and beyond, offspring with Down syndrome were younger than those without. For mothers aged 70+, offspring in the Down syndrome group averaged 44.08 years, those in the non-Down syndrome group 49.79, t = 3.21, p < .002. Similar differences, on the order of about 5 years, were noted for fathers.

From the offspring’s perspective, parental changes occurred in both groups, beginning when adults with Down syndrome were in their 40s, and for both groups when adults were in their 50s. In the Down syndrome group, percentages of mothers who were either 80+ or deceased rose from 0% (for offspring in their 20s), to 13.3% (30s), to 76% (40s), to 80.0% (50s); changes also occurred in the non-DS group, but not as dramatically until adults with disabilities were in their 50s (20's = 2.9%; 30's = 6.8%; 40's = 46.4%; 50's = 90.4%). In both groups, older parents (i.e., 70 years or older) showed high percentages with poor-fair health (mothers: non-DS = 61.1%; DS = 63.3%), and poor-fair abilities to care for their offspring with disabilities (for mothers: non-DS = 53.1%; DS = 52.9%; all chi-squares comparing < 69 years vs. 70 and older mothers, significant at p < .001).

Discussion: By having parents who are (on average) 5 years older than parents of others with disabilities, offspring with Down syndrome (vs. non-DS intellectual disabilities) encounter increased percentages of parental problems when offspring themselves are younger. By their 40s, adults with Down syndrome have parents who are either deceased or have health problems and diminished caregiving abilities. Given the inadequacy of state-run disability services, concern is growing as to who will care for these aging adults in the decades ahead.
Title: Using Brief Intensive Feeding Treatment to Decrease Maladaptive Behavior and Parent Stress

Authors: Sharnita D. Grays-Harris, Jessica F. Scherr, Jonathan Wilkins, Micheline Silva, Megan Stone, Tyler A. Hassenfeldt, Elizabeth Kryszak, Lindsay McGuirk

Introduction: Although deficits in communication, social interaction, and behavior are the defining characteristics of Autism Spectrum Disorder (ASD), feeding problems are also a major concern. Forty-six to 89% of children with ASD exhibit feeding difficulties, including inadequate intake, food refusal, food selectivity, texture sensitivity, and vomiting and rumination (Ledford & Gast, 2006). Feeding problems adversely impact children's nutrition and are correlated with high rates of parental stress (Curtin, et al., 2015). Thus, effective treatment focusing on mealtime behavior and mastery of feeding strategies through parent training is essential for decreasing inappropriate mealtime behavior, mastering feeding strategies, and reducing parent stress. Escape extinction is an empirically validated behavioral procedure used to increase preferred behaviors of acceptance of the spoon or cup and decrease interfering behaviors (Kodak & Piazza, 2008). Researchers have examined the effects of evidence-based treatment; however, studies have not specifically investigated the combination of brief intensive feeding treatment and parent training on maladaptive feeding behavior and caregiver stress reduction in ASD.

Methods: Participants include children with ASD referred for intensive outpatient treatment by a clinical provider. In this four-week program, three participants are seen for 30 minutes of brief, intensive feeding intervention three days per week. Treatment is going with 15 participants diagnosed with ASD. The intervention includes a combination of clinician-implemented behavioral feeding intervention with parent education and training so that parents become the primary feeders by the end of the program. Pre and post-treatment data on maladaptive feeding behaviors and parent stress are measured via the Brief Assessment of Mealtime Behavior in Children (BAMBIC; Hendy, Seiverling, et al., 2013) and the Parenting Stress Index, Fourth Edition Short Form (PSI-4; Abidin, 2012), respectively. Sessions are conducted by a team of psychologists and psychology trainees trained in implementation of behavioral procedures and data collection. Interobserver agreement is measured 20% of treatment sessions.

Results: At this point, one participant has completed the brief, four week intensive feeding program. This participant is four years of age; has diagnoses of ASD, Jacobsen syndrome, and Global Developmental Delay; and was referred for treatment due to low feeding acceptance rates. Participant 1’s rates of food acceptance increased from 23% to 100% within nine 30 minute sessions in response to a protocol that implemented exposure, escape extinction, and parent training.

Discussion: ASD is a neurodevelopmental disorder often accompanied by feeding difficulties. Feeding problems in children are positively associated with parental stress, which negatively influences child development. It is critical to treat behavioral difficulties related to feeding problems as well as empower and educate parents. In order to maximize developmental outcomes and learning in children with ASD, feeding treatments must offer family-centered care that takes into account both child and parental factors.

References/Citations:
Title: The Relationship between School Satisfaction and Parent and Child Characteristics

Authors: Busisiwe L. Ncube, Adrienne Perry, Jonathan A. Weiss

Introduction: Research suggests that, for school-age youth, several school-related factors, such as teacher support and academic achievement, are significantly related to a child's quality of life (Suldo et al., 2006). Children with severe developmental disabilities (DD) typically have limited skills on conceptual, social, and practical domains of living (APA, 2013). For children in this group, the quality of education services may impact the child's life in even more ways than it does for typically developing youth. Due to the dependence on others and physical restrictions that often accompany severe DD, individuals in this population experience an increased need for support and special services (e.g., Patnaik et al., 2011), including a need for increased personnel support within the school (McNally et al., 2001). The quality of school services can be a source of stress for parents of children with DD and impact their lives in many ways as well (Phetrasuwan & Miles, 2009). The objective of the present study was to examine the relationship between school satisfaction and the characteristics of children with severe DD and their parents.

Methods: This study is part of the larger GO4KIDS project looking at the experiences of children with severe DD (defined as those functioning in the moderate, severe, or profound range of Intellectual Disability). Parents of 454 children (age M = 11.18, 70% male) completed surveys on the general health, well-being and social inclusion of both the children and the parents. School satisfaction was measured using parent responses to the following item, rated on a 5-point Likert scale: "overall, how satisfied are you with the quality of your child's education?" For the purposes of analysis, scores on this item were collapsed into two categories: unsatisfied/mixed (previously ranging from "very unsatisfied" to "mixed") and satisfied (previously "satisfied" and "very satisfied"). Child variables included parent ratings of their child's happiness, quality of friendships, and whether or not the child was achieving their potential, all rated on 5-point Likert scales. Other child variables included the child's age and whether or not the child had a diagnosis of an autism spectrum disorder (ASD). Parent variables included ratings of parent mental health measured on the Kessler 6 scale (a brief screening measure for mental health problems), parent positive outlook, parent socialization, and perception of burden. An estimate of family income, based on the median income of the neighbourhood in which the family resides, was also analysed in relation to school satisfaction.

Results: School satisfaction was found to be significantly related to parent ratings of the degree to which they believed their child was achieving his or her potential, t(233) = -6.26, p < .001, and marginally related to quality of friendships, t(225) = -1.87, p = .06, but not to the child's age, t(234) = -.26, p = .79, presence of an ASD diagnosis X(1) = 1.288, p = .35, or child's perceived happiness, t(233) = -.16, p = .87. In addition, school satisfaction was significantly related to several parent variables including parent mental health problems, t(229) = 2.93, p = .004, parent positive outlook, t(233) = -3.51, p = .001, parent socialization, t(233) = -2.85, p = .005, and perception of burden, t(232) = .18, p = .801. School satisfaction was not significantly related to estimates of family income, t(213) = -.31, p = .75.

Discussion: Results of this study have implications for parent support services and school interventions. Increasing support for parents in regards to the advocacy of their children's education has the capacity to improve both parent and child outcomes.
Title: Stigma and Down Syndrome: Social Preferences and Attributions Towards Themselves and Others by Young People with and without Down Syndrome

Authors: Andrew Jahoda, Karen Deakin, Derek Moore

Introduction: Little is known about the impact of stigma on children growing up with an intellectual disability. Research with adults does not take into consideration the development of self-perception and identity, which might play a key role in children’s awareness of stigma, how they deal with it and its long-term effects. Children with Down syndrome may have a heightened sense of difference due to the visibility of their disability. This study investigated children with Down syndrome’s awareness of their disability.

Methods: Twenty-eight young people with Down syndrome (aged 8-17 years old) were recruited, along with a control group of 53 typically developing young people of the same age and 14 typically developing children who were younger. Three tasks were used to explore the children’s developing awareness of Down syndrome: i) choice of partner for social activities, ii) sorting photographs of children with and without Down syndrome, and iii) attributing positive or negative descriptors to photographs of children with and without Down syndrome and to themselves. All the tasks used carefully developed visual materials to allow the children with limited expressive verbal abilities to indicate their preferred responses reliably.

Results: Participants with and without Down syndrome expressed a preference to engage in social activities with typically developing peers. While the typically developing participants accurately sorted the photographs of children with and without Down syndrome, the participants with Down syndrome failed to do so. The majority of the participants with Down syndrome identified with the typically developing young person. Both sets of children also attributed more positive descriptors to the photographs of the typically developing young people than to the photographs of young people with Down syndrome. Nevertheless, most participants with and without Down syndrome remained positive about themselves.

Discussion: The encouraging finding that the children with Down syndrome were able to retain a positive sense of self, despite holding apparently negative views about others with Down syndrome, may be testimony to these children’s resilience or a strategy of identifying with what they regard as a higher status group. However, the children’s negative views towards their peers with Down Syndrome have implications for policy and practice. Families can find it difficult to know when and how to talk to their children about their disability, for fear of causing distress (Ali et al. 2012). However, the findings suggest children with Down syndrome have insight into their condition and related social attitudes from a young age. Failure of family or professionals to talk openly about this topic could be misunderstood by young people with Down syndrome disability as tacit support for prevailing negative attitudes. Therefore, there may be a need to support family and professionals to have the confidence to talk with children at a younger age about their disability.

References/Citations:

Title: Transition Planning for High School Students with ASD: Measuring Student, Parent, and Teacher Perspectives

Authors: Leann Smith, Kate Szidon, Kara Hume, Jessica Dykstra, John Sideris, Molly Johnston

Introduction: The Individuals with Disabilities Education Act mandates that student input be included in the development of educational plans, including postsecondary goals. However, currently there are few standardized measures designed to assess student goals and preferences, particularly for students with autism spectrum disorder (ASD). The Secondary School Success Checklist (SSSC) is a new measure developed to allow students to describe their current skill level as well as to rank their priorities for goal setting. The SSSC is designed to be completed by the student, teacher, and parent. The present study examined the internal consistency of the SSSC across reporters (students, parents, and teachers) and explored differences between students and adults in goal prioritization.

Methods: Data were drawn from a larger, ongoing study of high schools students with ASD. Over 600 students from 60 high schools will be enrolled by the end of the study. Inclusion criteria included: having an educational diagnosis of ASD, being between the ages of 13 and 22 years, and not having a significant uncorrected vision or hearing impairment. For the present study, data were available for 279 students from the first cohort of students who completed the SSSC; data on the SSSC was also available from parents/caregivers and teachers (or other school staff). On average, students in the current analysis were 16.3 years of age (SD=1.5). The majority of students were White (75.1%) and 83.9% were male. The parent/teacher version of the SSSC included 105 items assessing four key domains (independent behavior, transition, social, and academics). The student version of the SSSC had 25 items that were representative of each domain. For each item, participants indicated if the behavior was 0= not like student, 1 = like student, or 2= much like student on a Likert-type scale. Items from each domain were averaged to create four total scores, with higher scores reflecting better skills. Respondents also provided a priority ranking for learning each item. The priority ranking was used to calculate the proportion of students who "really wanted to learn" each skill.

Results: Total scores for each domain of the SSSC demonstrated moderate to high internal consistency with Cronbach alphas ranging from .50 to .82 for parents and .38 to .85 for teachers. The alphas for students were lower, ranging from .33 to .56. Agreement was strongest between parents and teachers, with correlations ranging from .39 to .56. There was less agreement between students and parents/teachers (most rs<.25). In general, students reported lower levels of skills across domains than adults. Notably, student report of priority rankings (i.e. what they really wanted to learn) was highly aligned with past literature on educational needs for students with ASD, suggesting students had insight into their own areas of difficulty. More than a quarter of the students prioritized wanting to learn how to do the following skills: "when I have a problem in class I can figure out a solution"(27.2%; independent behavior), "I have ideas about what I want to do after high school" (27.1%; transition), "I can figure out what other people are feeling" (27.0%; social), "I know how to stay calm when I am mad about something" (25.5%; independent behavior). Over 20% of students also gave a priority ranking to the item: "I understand what I read in my classes" (21.7%; academic). Additional analyses will explore differences in priority rankings by subgroups of students, parents, and teachers.

Discussion: Findings suggest that the SSSC is a promising tool for developing educational goals for high school students with ASD. Further, students had fairly good insight into their areas of need and indicated interest in learning skills related to core domains.
Title: Parent Support Buffers Psychophysiological Risk for Externalizing Behaviors in Children with ASD

Authors: Jason Baker, Rachel Fenning, Jacquelyn Moffitt

Introduction: Externalizing behavior problems are common among children with autism spectrum disorder (ASD), but significant individual differences exist. Knowledge regarding the development of externalizing problems in populations with otherwise typical development may inform our understanding of such heterogeneity in ASD. Under-arousal of the sympathetic nervous system has been identified as a reliable biomarker of risk for externalizing behavior problems in children without ASD, and this association may be particularly strong in the context of less optimal parenting (Cappadocia et al., 2009; El-Sheikh & Erath, 2011). Although EDA has been examined in ASD (see Lydon et al., 2015), studies have tended to focus on status-group differences, with investigations of individual differences in child functioning largely revealing conflicting and inconsistent results. To our knowledge, no study has explored under-arousal theory as an explanatory mechanism for comorbid behavior problems in ASD. The current study examined children's EDA responses during various laboratory tasks as a predictor of externalizing problems, and considered parent support as a buffer of this association.

Methods: Participants included 34 children with ASD (82% male) between the ages of 4 and 11 years (M=6.85), and their primary caregivers (two fathers). The sample was diverse with regard to race/ethnicity, socioeconomic status, intellectual ability (ABIQ from 47 to 139), and ASD symptom levels (ADOS Comparison M=7.27, SD=2.28). The dyads completed a laboratory visit that included diagnostic testing as well as structured laboratory tasks that involved both parent and child (free play, problem-solving, prohibition, clean-up), and the child alone (frustration task). Children wore wireless wrist sensors that logged EDA levels continuously at 8 hertz and also tracked movement (Baker et al., 2015). EDA responses were indexed by the frequency of non-specific skin conductance responses (NSCRs; Beauchaine et al., 2015) in each task. Tasks were organized a priori into contexts that were designed to specifically elicit child compliance to parent directives (prohibition and clean-up) and those that were not; EDA composites were created by averaging relevant standardized scores. Parental support was coded from the joint problem-solving task, using the Parental Scaffolding Observational System, which has demonstrated reliability and validity for children with developmental difficulties (Baker et al., 2007). Parents also completed questionnaires that included the Child Behavior Checklist (CBCL).

Results: Missing data (4% overall) were handled through multiple imputation. Demographic variables (e.g., gender, age, family income), child IQ and ASD symptom levels, and sensor movement were not related to the variables of interest in a manner that would confound the findings. Two hierarchical multiple regressions predicting CBCL externalizing T-scores were conducted, with child EDA and scaffolding entered on the first step, and the interaction term added at the second step. As predicted, child EDA responses during the compliance tasks were inversely related to their externalizing scores, t= -2.90, p< .01, which is consistent with the under-arousal theory. Scaffolding did not moderate this association. EDA responses during the other tasks did not directly predict externalizing scores; however, the interaction between EDA and scaffolding was significant, t= 2.06, p< .05. Follow-up analyses suggested that EDA under-arousal during these tasks only predicted higher externalizing problems in the context of low-quality parental scaffolding, r= -.38.

Discussion: Findings suggest that the under-arousal theory, supported in research conducted with children without ASD, may also inform our understanding of individual differences in the behavior problems of children with ASD. High quality parental scaffolding may buffer this risk imparted by general sympathetic under-arousal, but seems to play a diminished role when under-arousal is evidenced in compliance-oriented tasks. These findings have important implications for understanding heterogeneity in ASD, and for identifying environmental supports to promote positive development in these children.
Title: Are the Core Features of Autism Convergent or Divergent?

Authors: Allison Whitten, Jim Bodfish

Introduction: Across individuals with autism, there is a large variety of ways that the symptoms within the three "core domains" (social, language, RRB) are expressed. This makes autism a behaviorally complex disorder and this level of complexity raises an interesting question: are the three symptom domains that comprise the diagnosis of autism "divergent" (i.e. not associated with each other and presumably caused or maintained by distinct factors) or "convergent" (i.e. closely associated with each other and potentially sharing similar causes or maintaining factors)? This study sought to address several short-comings of previous studies and investigate the degree of association between the three core features of autism.

Methods: A sample of 224 children with ASD and 158 typically developing children matched on age and gender were included. Association of different phenotypic features was examined using correlational analysis, principal components analysis (PCA), and planned comparisons within subgroups of the ASD sample based on symptom severity. A battery of phenotypic measures was collected and included the KBIT, ADOS, ADI-R, SRS, SCQ, and RBSR.

Results: Correlations between severity measures of the three core features were found to be stronger in the ASD group compared to TD group, but the magnitude of the correlation coefficients were weak to moderate (0.2 - 0.3) in the ASD group. Overall analysis of multiple items measuring each core feature within the ASD group using PCA found evidence for three distinct components that largely corresponded to each core feature. However, the resulting three principal components model accounted for only 24% of the total phenotypic variance across all ASD cases indicating that additional sources of phenotypic variability exist. Follow-up PCAs of items within each domain found multiple significant principal components within each core feature suggesting that measures of individual core features may be multifactorial and more phenotypically complex than often assumed. Subgroup analyses based on symptom severity revealed that individuals scoring in the upper quartile (more impaired) of social impairments (n = 72) scored significantly higher than the low severity social group (n = 67) in terms of both communication symptom severity, t(137) = 4.7, p < .001, and RRB symptom severity, t(137) = 4.1, p < .001. The same pattern emerged when cases were sorted into either high/low severity of communication impairments or high/low severity of RRB impairments. Additionally, measures of the severity of each core feature were only significantly correlated in the high severity ASD subgroups.

Discussion: We found greater evidence for the divergent model of the ASD phenotype in lower severity ASD cases and typically developing cases (i.e. the "broad autism phenotype"). In contrast, more evidence for convergence was found in the subset of ASD cases with more severe impairment on any core feature. Thus, the question of convergence or divergence between the core features of ASD may be too simplistic and instead, it may be more meaningful to determine in which subgroups we see more or less evidence for divergence of the core phenotype.

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Title: Beat Perception and Sociability: Evidence from Williams Syndrome

Authors: Miriam Lense, Elisabeth Dykens

Introduction: Beat perception in music has been proposed to be a human universal that may have its origins in adaptive processes involving temporal entrainment such as social communication and interaction. We examined beat perception skills in individuals with Williams syndrome (WS), a genetic, neurodevelopmental disorder. Musical interest and hypersociability are two prominent aspects of the WS phenotype although actual musical and social skills are variable. Prior findings on musical beat perception skills in WS have been mixed, with some studies reporting preserved skills and others finding impairments in this area. However, previous studies are limited by their small sample sizes, choice of control groups (for example, age-matched vs. mental age-matched vs. musical experience-matched controls), and the attentional and working memory demands of their tasks. We examined individual differences in beat perception abilities in WS and explored how this related to their musical preferences and social skills.

Methods: Participants included 74 adolescents and adults with WS and 53 age and gender-matched typically developing (TD) controls. Participants were matched for years and types of musical training, percent of sample with percussion training, and time spent listening to music. Participants completed two measures of beat perception abilities -- the meter subtest of the Montreal Battery of Evaluation of Amusia (MBEA) and the Beat Alignment Test (BAT), both of which assess beat perception abilities using real music. Participants also completed a test of auditory processing style and a brief IQ test. Parents/caregivers of participants with WS completed the Vineland Adaptive Behavior Scale, 2nd edition. A subset of 26 individuals with WS completed a questionnaire of their musical preferences.

Results: Participants with WS performed worse than TD participants on both the MBEA (24.43±5.1 vs. 26.92±3.5) and the BAT (d' 1.4±0.98 vs. 2.17±0.75). However, there was significant individual variability with participants ranging from chance levels to perfect beat perception abilities in both groups. Item analyses revealed that both WS and TD participants performed better with songs with faster tempos and a more salient beat. Within the WS group, regression analyses indicated that cognitive abilities, auditory processing style, and musical training predicted 25.3% and 30.4% of MBEA and BAT scores, respectively. Among the subset of individuals who completed the musical preference questionnaire, participants had a pronounced preference for musical styles that had a strong and salient beat. Moreover beat perception skills were related to Vineland-II Socialization skills (rho's=.34-.42, p<.05) but not to other Vineland-II scales.

Discussion: This is the largest study to date to directly examine beat perception abilities in WS and contextualize these abilities with respect to cognitive abilities, musical training, and auditory processing style. Compared to other studies that have focused on musical skills as being preserved in WS, our results reveal that beat perception abilities in WS vary widely, similar to recent findings in regard to their pitch perception abilities. Results highlight the need to take an individual differences approach to understanding musical skills in WS. Additionally, these results are the first findings linking beat perception abilities to social adaptive skills, supporting hypotheses regarding the role of temporal processes in both musical and social tasks and the possible adaptive value of music. Results also add to previous findings of links between musical and social behaviors in WS within the domain of emotional processing. Implications for understanding gene-brain-behavior relationships involved in musical and social engagement will be discussed.

References/Citations:

Title: Cognitive Empathy as a Predictor of Social Skills Improvement for Adolescents with ASD Following the UCLA PEERS® Program

Authors: Lijing Zhang, James Yang, Elina Veytsman, Elizabeth Laugeson

Introduction: Empathy involves the capacity to recognize, identify, understand, and experience the emotional states of others, and is essential to the development and maintenance of meaningful relationships (Davis, 1980). In particular, empathy requires both the ability to share the emotional experience of the other person (affective component) and an understanding of the other person’s experience (cognitive component) (Decety & Jackson, 2004; Eisenberg & Eggum, 2009; Hodges & Klein, 2001). Baron-Cohen and Wheelwright (2004) characterize high functioning autism spectrum disorder (ASD) as an empathy disorder, arguing that those with ASD often lack empathy and are unresponsive to socio-emotional cues. The Program for the Education and Enrichment of Relational Skills (PEERS®) is an evidence-based, caregiver-assisted social skills training program (Laugeson & Frankel 2010), which has been shown to improve social skills and empathy in youth with ASD without intellectual disabilities. While improvements in empathy have been observed, the extent to which empathy at post-treatment is related to improvement in social skills following PEERS® has yet to be examined. The present study examines the relationship between post-treatment levels of empathy and improvement in social skills for adolescents with ASD following the PEERS® social skills intervention.

Methods: Participants in this study included 90 adolescents (67 males, 23 females) with ASD ranging from 11-18 years of age (M=13.86, SD= 1.76) and their parents who presented for social skills treatment through the UCLA PEERS® Clinic. Adolescents and parents attended weekly 90-minute group treatment sessions over a 14-week period. Skills related to making and keeping friends and handling peer conflict and rejection were taught through didactic instruction using concrete rules and steps of social etiquette, role-play demonstrations of targeted skills, in-session behavioral rehearsal activities, and parent-assisted weekly socialization homework assignments. In order to understand the relationship between empathy and social skills improvement following treatment, parents completed the Social Skills Improvement System (SSIS; Gresham & Elliot, 2008) pre-and-post intervention. Empathy was assessed at post-intervention through parent reports on the Empathy Quotient (EQ; Baron-Cohen & Wheelwright, 2004), which assesses empathy levels among adolescents with ASD. Pearson correlation coefficients were calculated to examine the relationship between parent-reported EQ following treatment and the change in parent reported SSIS from pre- to post-test.

Results: Results indicate that cognitive empathy on the EQ following treatment was associated with improvement in Communication (p<.05), Assertion (p<.01), and Internalizing Problem Behaviors (p<.05) on the SSIS. No statistically significant correlations were observed between total scores on the EQ, SSIS, or other subscales.

Discussion: These findings suggest that adolescents with ASD whose parents reported higher cognitive empathy following the PEERS® program were more likely to have better communication skills, assertion, and exhibit less internalizing problem behaviors following treatment. These findings are useful in distinguishing those who may be more likely benefit from targeted social skills treatment.

References/Citations:
Title: Toddlers and Families Together: Promoting Joint Engagement for Young Children with or at Risk for Autism Spectrum Disorder

Authors: Connie Wong, Kathleen C. Gallagher, Kira Wong, Leonard Nieto, Shani Arbiv, Jessica Page

Introduction: Research on early intervention programs targeting toddlers with or at risk for autism spectrum disorder (ASD) primarily involve individual sessions with the caregiver and child in the home which may be isolating or impractical for some families. Given the importance of joint engagement to later development, in Toddlers and Families Together (Together), toddlers and their families participate in eight weekly group sessions that take place during the weekend and focus on increasing joint engagement with their child. Specifically, families have an opportunity to practice strategies and receive feedback within a context of everyday routines and activities within 3-hour long group sessions that also include a family education/support segment to learn and discuss strategies with a facilitator and other caregivers while the toddlers are engaged in various learning activities. With an overarching goal of promoting joint engagement for children with ASD through the Together program, the specific questions of this study include:

1. Does participation in the program result in changes in joint engagement during play interactions between the toddler and his/her caregiver?
2. After participating, what are caregiver perceptions of the strategies and the program?

Methods: This study utilized a single case multiple baseline design across four toddlers (24-31 months) with or at risk for ASD and their families that included an initial baseline period (of 4, 6, 8, or 10 weeks) followed by participation in the 8-week Together program. The weekly sessions included a 10-minute video-recorded interaction between the child and the primary caregiver that was coded for length of time the child was in a supported or coordinated joint engagement state. Caregivers were also rated on eight items that were scored on a three-point Likert scale for implementation of strategies to promote joint engagement. In addition, families participated in a semi-structured interview to provide their opinions about the intervention.

Results: Results show increases in the amount of time children spent in a joint engagement state as well as an increase in caregiver implementation of strategies during intervention. Visual analysis indicates a functional relationship between the intervention and duration of children’s joint engagement with increased level changes observed during the intervention phases for all children. Similar trends were found for caregiver’s implementation of the strategies. Furthermore, most family members felt comfortable and confident with the strategies but did note that it did take a little effort and time to implement the strategies. They also reported that the family support/education sessions were the most helpful aspect of the intervention.

Discussion: The results from this study provide preliminary efficacy and social validity data supporting the Together program. However, findings from our ongoing randomized controlled trial is needed to test the program with a larger sample of children and families. Furthermore, additional analysis is required to examine caregiver outcomes of stress and coping as well as child outcomes of joint attention and play. Overall, it may be beneficial to both toddlers and families to use a group-based model of intervention for families of young children with or at risk for ASD.

References/Citations:
Title: Toddlers in Early Intervention: Engagement, Play, Joint Attention, and Language

Authors: Ya-Chih Chang, Stephanie Shire, Wendy Shih, Connie Kasari

Introduction: Toddlers learn while socially interacting with adults in their natural environment. Cognitive and language skills are targeted for toddlers with special needs during these naturalistic interactions. Studies have found that when young children with special needs are in a state of joint engagement, they are more likely to demonstrate play skills, joint attention, and language (Adamson, Bakeman, Deckner, & Romski, 2009; Kasari, Gulsrud, Wong, Kwon, & Locke, 2010). However, most of these studies have examined primary caregiver-child interactions, and very few studies have examined children's joint engagement with paraprofessionals that young children with special needs spend much of their time with within their early intervention programs. The current study will examine children's engagement, joint attention, and language skills within the context of group interaction time at an early intervention center.

Methods: Participants included 113 toddlers (2-3 years of age) with autism spectrum disorder (ASD) who were recruited from an early intervention center from the New York area to participate in a center-based targeted social communication intervention. The sample included toddlers from under-resourced families and of diverse backgrounds.

Language T scores from the Mullen are recoded into 4 categories based on standard deviations (SD) from the mean: Group 3=T Score≥50, Group 2=(T Score<50 and T Score ≥40, 1 SD from the mean), Group 1=(T Score<40 and T Score ≥30, between 1 SD and 2 SD lower from the mean), and Group 0=T Score<30 (below 2 SD from the mean). Many of the children did not demonstrate any joint engagement, play, or joint attention skills at entry given opportunity during group activities. Hence, joint engagement, play, and joint attention skills are recoded into binary processes: having no skills or any skills. Logistic regression was used to evaluate the relationship between joint engagement, play, or joint attention skills with standardized language scores.

Results: Toddlers were categorized into four groups based on their standardized language abilities. There were 64 (57%) children who were in Group 0, 29 (26%) children in Group 1, 18 (16%) children in Group 2, and 2 (1%) children in Group 3. Increases in standardized language scores was not significantly associated with having joint engagement (χ²(3)=4.678, p=0.197) or functional play (χ²(3)=3.974, p=0.264). However, increases in standardized language scores was significantly associated with increased odds of having joint attention skills (χ²(3)=13.95, p=0.00297).

Discussion: The results indicate that toddlers with ASD in center based group activities are spending a significant amount of time unengaged or object-engaged/parallel play. Toddlers were rarely in joint engagement. Additionally, standardized language skills were not associated with children's engagement and play skills. These findings suggest that despite children's language abilities, appropriate scaffolding and support from adults is needed to be jointly engaged. Future studies should implement intervention strategies to better support paraprofessionals at early intervention centers to improve play and joint engagement.

References/Citations:
Title: Predicting Behavior Problems in Preschool Children from Low-income Families: The Role of Language Skills, Maternal Depression, and Home Environment

Authors: Cathy Qi

Introduction: Children with low language skills and behavior problems are among the most challenging preschoolers to include in typical classrooms. Both social and academic performances may be impaired in this population. Low language skills place children at risk for learning additional language and reading skills. Children with low language skills may be at increased risk for behavior problems. The purpose of this study was to examine the role of language skills, maternal depression, and home environment in predicting the behavior problems in preschool children from low-income families.

Methods: Participants were 235 children (48% girls), ranging in ages from 36 to 54 months (M = 43.43, SD = 3.62) participated in the study. The children attended 41 classrooms in 14 Head Start centers in a medium-sized city in the southwestern United States. A total of 167 (71%) children spoke English as their first language and 68 (29%) spoke Spanish as their first language.

Measure

The Preschool Language Scale-5 English (PLS-5, Zimmerman, Steiner, & Pond, 2011) was administered individually by trained research assistants to English-speaking participants. The Preschool Language Scale-5 Spanish (PLS-5, Zimmerman, Steiner, & Pond, 2012) was administered by trained Spanish-speaking research assistants to Spanish-speaking participants. The PLS-5 is designed to assess the auditory comprehension (AC) and expressive communication (EC) abilities of children from birth to 7 years 11 months. Teachers completed the Child Behavior Checklist ½-5 -Teacher Forms (CTRF, Achenbach & Rescorla, 2001) and parents completed the Child Behavior Checklist ½-5 (CBCL). Mothers completed the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). Mothers completed Home Screening Questionnaire (HSQ; Frankenburg & Coons, 1986) to assess the home environment, such as learning materials, activities, physical environment, and parental involvement.

Results: To examine factors that best statistically predict the teacher- and parent-reported behavior problems of the preschool children, four linear regression analyses were conducted. Independent variables were PLS-5 total language scores, maternal depression, and home literacy; dependent variables included CTRF and CBCL internalizing and externalizing behavior scores. The overall model predicting children's internalizing problem reported by teachers was significant, F(3, 140) = 5.39, p = .002, accounting for 10% of the variance. The PLS-5 total scores significantly predicted teacher-reported internalizing behavior, B = -.233, p < .001. Children who had higher language skills were reported to have lower internalizing behaviors. The overall model for externalizing behavior reported by teachers was also significant, F(3, 140) = 3.81, p = .012, accounting for 8% of the variance. Only PLS-5 total scores emerged as significant predictor of externalizing behavior, B = -.206, p = .001.

Examining the regression models for parent-reported internalizing behavior, the overall model was significant, F(3, 137)=9.03, p<.001, accounting for 17% of the variance. Children's PLS-5 total scores (B= -.191, p=.005) and maternal depression (B = .354, p = .001) were significant predictors of internalizing behavior. Children who had higher language skills were reported to have lower internalizing behaviors and children whose mothers reported higher depressive symptoms had higher level of internalizing behavior problems. The overall model for parent-reported externalizing behavior was also significant, F(3, 137) = 8.88, p < .001, accounting for 16% of the variance. Both PLS-5 total scores (B= -.188, p = .002) and maternal depression symptoms (B = .345, p < .001) predicted externalizing behavior.

Discussion: As expected, higher language skills were associated with fewer behavior problems among preschool children from low-income families. Maternal depression was related to parent-reported behavior problems. This study has implications for early prevention and intervention programs aimed at increasing language skills of preschool children from low-income families, and providing mental health services to mothers who are at risk for depression.
Title: Comparison of Parental and Gestational Age Risk Factors Associated with Autism Spectrum Disorder (ASD), Intellectual Disability (ID), Co-occurring ASD and ID, and Individuals without ASD and ID

Authors: Kang Won Choi, Christy L. Hom, Ira T. Lott

Introduction: Autism Spectrum Disorder (ASD) is often comorbid with intellectual disability (ID) and associated with poorer outcome. Past studies have found advanced paternal age to be a risk factor for ASD and ASD+ID, with a stronger association than maternal age(1-2). Also, large differences (>10 years) between parental ages may increase the risk of ASD(3). Moreover, low gestational age is believed to increase the risk of ASD or ID, or both(4-6). This retrospective study is the first to examine whether the following four groups have different risk factors: 1) ASD, 2)ID, 3)ASD+ID, 4)No ASD/ID. We hypothesize that advanced paternal age, large discrepancies between the mother and father’s ages, and low gestational age all increase the risk of ASD, regardless of patients’ ID status. It is unknown whether the same risk factors predict a diagnosis of ID among individuals without ASD.

Methods: We analyzed data drawn from 462 patients evaluated in a neurodevelopmental clinic between 2001 through 2013. All were receiving services funded by the California Department of Disability Services due to ID, ASD, or conditions that require treatment and services similar to an individual with developmental disability. Patients were grouped into the following diagnostic categories: 1) ASD (n=48, 10.39%), 2) ID (n=192, 41.56%), 3) ASD+ID (n=204, 44.16%), and 4) No ASD/ID (n=18, 3.90%).

Results: Preliminary analysis of our data indicated that paternal age was associated with increased risk of comorbid ASD and ID (χ²(1)=17.95, p<0.001, OR=1.057, 95% CI=1.029, 1.085), but not with a sole diagnosis of ASD or ID. Meanwhile, gestational age was associated with increased risk of a sole diagnosis of ASD (χ²(1)=7.84, p<0.01, OR=1.21, 95% CI=1.044, 1.400), but not with ID or the comorbid diagnosis of ASD and ID.

We will build a 2-stage model for each of the four diagnostic groups. In stage 1, we will use regression analysis to calculate the residual between maternal age and the predicted maternal age in relation to the paternal age. In stage 2, we will use binary logistic regression to determine the risk for being in each diagnostic category using paternal age, residual of maternal age in relation to paternal age, and gestational age as predictor variables.

Discussion: Our study has found that the factors that predict a comorbid diagnosis of ASD and ID are different than factors that predict ASD without ID. If we also find differences in the factors that predict ID status among individuals without ASD, we will have further evidence that ASD and ID represent orthogonal constructs, not varying levels of severity along the same continuum. This has important implications for how clinicians diagnose and treat these disorders as well as how educators teach children with either or both disorders.

References/Citations:
- Sandin S, et al., Autism risk associated with parental age and with increasing difference in age between the parents, Molecular Psychiatry (2015), 1-8, advanced online publication, June 9.
Title: Assessment of Social Skills in Females with Fragile X Syndrome, Discrepancies between the SRS-2 and Clinical Judgment

Authors: Anne Hoffmann, Elizabeth Berry-Kravis

Introduction: Fragile X syndrome (FXS) is characterized by social deficits in both males and females, and an increased risk of autism in both groups, however, relatively little is known about the how the specific pattern of social impairment in FXS, as reported by parents on the Social Responsiveness Scale-Second Edition relates to a confirmed clinical diagnosis of autism (AUT).

Methods: Data were obtained from 26 females with FXS evaluated at the Rush University Medical Center Fragile X Clinic. Results were taken from the Social Responsiveness Scale-Second Edition (SRS2), which is a 65-item parental report instrument that examines social skills across five sub-areas including Social Cognition, Social Awareness, Social Communication, Social Motivation, and Restricted and Repetitive Behaviors. These combine to give an overall indicator of autism risk, ranging from within normal limits (WNL) to severe.

Results: 17 of the 26 subjects (65%) were rated as having AUT based on the SRS2. However, of those 17, 11 (65%) did not qualify for a clinical diagnosis of AUT as based on either previous educational and therapeutic assessments or expert opinion of the FXS clinic director based on DSM5 criteria. An analysis of scores revealed that in the overall group, all subscale scores were highly correlated with each and with the overall score (p<.001). To better understand what might contribute to the discrepancy in diagnosis noted above, the group was then divided into individuals whose clinical diagnosis was in agreement with the results of the SRS2 (had AUT on both assessments, Group A), and individuals whose clinical diagnosis was not in agreement (did not have a clinical diagnosis of AUT, but were classified AUT by the SRS2, Group B). Once divided, the subscales for Group A remained correlated at the p<.05 level, but in Group B two subscales were no longer correlated (Social Cognition and Restricted Repetitive Behaviors). When group means were compared using independent t-tests, only the scores for Social Communication and the Overall score were significantly different between Group A and Group B (p <.05) with Group B having significantly lower scores in both areas.

Discussion: Given that the SRS2 is an instrument that has been used both as an outcome measure in clinical trials and as a measurement to capture key phenotypic descriptions of this population, it is vital that it be interpreted appropriately. Females with FXS are a relatively under-studied group, which makes it even more important that these descriptions provide an accurate portrayal of their social strengths and weaknesses. Based on these results, it appears that there may be a sub-group of individuals for whom social communication (e.g., understanding the rules for social language use), is especially difficult and affects their social responsiveness to a greater degree.
Title: Intellectual Disability Risk in Children Born to Women with Perinatal Psychiatric Diagnoses

Authors: Alexis Hicks, Briget Wiekowski, Guibo Xing, Cheryl Walker

Introduction: Recent studies suggest that up to 20% of women suffer from mood or anxiety disorders during pregnancy. Although there is evidence that psychiatric disorders are more common in mothers of children with intellectual disability (ID), few have assessed maternal mental health diagnosis while pregnant and the possible effect on a fetus.

Objective: We investigated the extent to which maternal psychiatric diagnoses during pre- and peri-natal hospitalizations were associated with offspring ID in a large, socio-demographically diverse 18-year statewide birth cohort.

Methods: This retrospective cohort study linked hospital discharge records for 8,951,763 California singleton births occurring 1/1/91-12/31/08 from the office of Statewide Health Planning and Development with neurodevelopmental diagnostic and treatment service records from the Department of Developmental Services (DDS). Pre- or perinatal inpatient maternal psychiatric diagnoses - schizophrenia, bipolar disorder, major depressive disorder, dissociative and factitious disorders, somatoform disorder, dysthymic disorder, and depressive disorder-NOS - were culled from delivery discharge diagnoses via ICD-9 codes. DDS diagnosis of ID was the outcome in 53,000 children. Logistic regression models explored the relationship between maternal psychiatric disorders and ID adjusting for maternal education, race, country of birth, and parental age.

Results: California children with ID were similar to those in other studies, with inflated risk for males, older parents, lower maternal education and Black race. In adjusted analysis, mothers diagnosed with any psychiatric condition during pregnancy - mood and anxiety disorders as well as schizophrenia - were 73% more likely compared to women without psychiatric conditions to have child diagnosed with ID (Figure 1). Mothers diagnosed with each specific individual psychiatric condition were 1.48-2.39 times more likely to have a child with ID (Figure 2), with higher risk in women with psychoses than in those with anxiety and depressive disorders. The correlation between maternal mental health diagnoses and ID varied minimally by severity of ID, with more severe variants less common and confidence intervals widened, and was consistent across all categories of co-morbidity except for seizures (Figure 2). Compared to mothers without mental health issues, those with schizophrenia had a four-fold increased chance that their child's ID would be severe with an IQ of 25-40, and that the child would be diagnosed with cerebral palsy as well.

Discussion: Women diagnosed with a psychiatric disorder during pregnancy were 73% more likely compared with women without such diagnoses to have a child diagnosed with ID. Mechanisms that may explain these associations involve genetic predisposition, maternal stress, fetal exposure to certain psychiatric medications, and variations in early formal and information support for the child. These findings emphasize the need for routine prenatal screening for psychiatric conditions and timely interventions directed to optimization of maternal wellbeing as well as fetal and early postnatal neurodevelopment. Further, these results underscore the need for targeted developmental monitoring of children born to women with psychiatric conditions to detect early signs of ID and implement early intervention at the earliest possible opportunity.
Title: Fluoxetine (Prozac®) Effects in a Rhesus Monkey Model of Childhood Therapeutic Exposure

Authors: Mari S. Golub, Casey E. Hogrefe, Christoph W. Turck, John P. Capitanio

Introduction: Fluoxetine (Prozac®) is widely used during childhood in treating depression, autism, anxiety, ADHD, and conduct disorder. Post-therapy consequences for brain development are difficult to study in children and require animal models.

Methods: Juvenile male rhesus (n=16 compared to 16 vehicle controls) were given fluoxetine daily for two years (1 to 3 years of age), a period roughly equivalent to 4 to 12 years of age in children. The dose (2 mg/kg, oral) was determined in pilot studies to produce blood levels in the range of treated children. They were evaluated for growth, health, activity, sleep patterns, social interaction, emotional response, impulsivity and attention. After discontinuation of dosing they were evaluated for an additional year prior to puberty with the same tests, plus additional tests of short term memory and cognitive flexibility. Assessments were based on side effect reports in adults and children and serotonin system functions. Metabolomic profiles were used to look for peripheral markers of central effects. The monkeys were genotyped for polymorphisms in serotonin-related genes monoamine oxidase (MAOA) and serotonin transporter (SERT) that have homologous polymorphisms in humans. Data analysis included potential interactions with these polymorphisms.

Results: Growth was normal with the exception of a delay in long bone growth in association with SERT polymorphisms. There was no indication of hyperactivity during 48 h actimeter monitoring but increased sleep fragmentation was seen in the fluoxetine group. Social interaction with their familiar cagemate was increased 30% by fluoxetine treatment, and MAOA genotype influenced the types of behaviors affected. Impulsivity, evaluated with a reward delay task, was greater in the fluoxetine group, and sustained attention, evaluated with the continuous performance test, was impaired. Emotional responses elicited by pictures were lower specifically in the monkeys with the low transcription MAOA polymorphisms. Metabolomic profiles from blood and cerebrospinal fluid samples reflected fluoxetine impact on neurotransmitter and purine/pyrimidine pathways, as well as interaction with MAOA genotype. After dosing, effects on attention, impulsivity and emotional response persisted, and an effect was also seen in the cognitive flexibility test. The occurrence of these effects was often modified by MAOA genotype. Low transcription MAOA polymorphisms are known to interact with developmental experiences in both humans and monkeys to influence later behavior.

Discussion: In the absence of psychopathology, fluoxetine influenced many brain regulated behavior domains in juvenile monkeys as might be anticipated from its biological actions. After discontinuation of dosing, some of these effects persisted. A striking interaction of polymorphisms in the MAOA gene with fluoxetine may be relevant to use of this pharmacological agent in children.
Title: The CCS: Sensitivity to Intervention Effects

Authors: Nancy Brady, Alison Holbrook, Nicole Tu, Rebecca Swinburne-Romine, Kandace Fleming, Connie Kasari

Introduction: Measuring growth in communication development in individuals with intellectual disabilities and minimal verbal skills can be difficult. Many scales do not encompass beginning communication behaviors and individuals’ scores may be at floor levels. In these cases, repeated measures before and after an intervention may not indicate a change, despite gains in communication behaviors. The purpose of this study is to determine if a recently developed measure, the Communication Complexity Scale (CCS), will be able to detect changes in communication skills with comparable sensitivity to an established measure. Communication skills were assessed prior and subsequent to a behavioral intervention for children with autism and minimal verbal skills.

Methods: Participants. 67 children with autism between the ages of 3 and 9 were assessed before and after receiving an intervention aimed at improving communication skills. At the outset, all of the children had 20 or fewer spoken word vocabularies. The length of intervention varied, with some children, on average receiving 6 months (n =45); some receiving 3 months (n =9) and the remaining (n = 13) receiving 6 weeks. The intervention was provided as part of UCLA intervention projects directed by Dr. Connie Kasari.

Measures. The CCS is a 12 point scale developed by Brady and colleagues (2012) to measure expressive communication that is primarily nonverbal. The scale spans beginning awareness behaviors through two-word (or symbol) combinations. Higher scores reflect more complex behaviors (e.g., gestures) and clear directionality in behaviors. For example, vocalizing and pointing while looking back and forth at a communication partner would receive a score of 10, whereas giving an object to someone would receive a score of 7. Communication is observed and scored from videotaped interactions between a child and experimenter. In this case, activities from the Early Social Communication Scale (ESCS) were scored. In the ESCS, a series of activities are presented and each activity provides opportunities for participants to request or comment. Communication acts observed during the videotaped interactions were coded by trained observers in the UCLA lab who were blind to the assessment timing (i.e., pre vs post intervention).

Analyses. We compared changes in CCS scores derived before and after intervention to changes in ESCS frequency scores from these same time points. The ESCS had been previously coded for the frequency of joint attention communication acts by trained coders not affiliated with the current study. These frequencies were converted to rates per minute.

Results: Comparisons were made within groups based on length of time in intervention. Significant change was found for CCS scores and ESCS frequency scores in those children who received 6 months of intervention. Non-significant changes were observed across shorter intervention periods for both the CCS and the ESCS scores. Small effects were observed for the six-week intervention and moderate effects were observed for the three- and six-month interventions using both scoring systems.

Discussion: Results indicate that the CCS is sensitive to changes associated with an intervention for children with autism. There are two primary advantages of the CCS in comparison to ESCS scores: 1) the CCS takes less time to code because only the responses to communication activities are scored instead of each communication act and 2) the scale reflects meaningful differences in communication development, thus it is more interpretable than a frequency score.

References/Citations:
Title: Parent-Teacher Alliance of Young Students with ASD

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Introduction: Parent-teacher alliance is central to promoting positive educational outcomes. While the impact of parent and teacher relationships has been evaluated in the general student population (Adams & Christenson, 2000; Hughes, Gleason & Zhang, 2000; Sheridan, Bovaird, Glover, Garbacz & Witte, 2012; Hughes & Kwok, 2007), there is little research documenting the significance of positive parent-teacher relationships for students with Autism Spectrum Disorder (ASD). In general, the literature has focused on parent-teacher alliance as a mechanism of positive outcomes for students (Hughes, Gleason & Zhang, 2005; Sheridan et al., 2012.) However, the factors that lead to positive parent and teacher relationships remain unclear.

The purpose of this study was to understand predictors of parent-teacher alliance of students with ASD. Specifically, parent-specific characteristics, child-specific variables, and teacher-specific variables were examined to assess their predictive value on parent-reported parent-teacher alliance.

Methods: A secondary analysis was performed from a well-characterized dataset generated from two randomized controlled trials of a parent-teacher consultation intervention for children with ASD between the ages of 3 and 8 years (COMPASS, Ruble, Dalrymple, & McGrew, 2010; Ruble, McGrew, Toland, Dalrymple, & Jung, 2013). Seventy-nine student-teacher-parent triads completed a comprehensive battery of baseline assessments prior to randomization to the intervention. Assessments included child, teacher, and parent variables. Child variables included IQ, autism severity, language ability, adaptive behavior, and problem behavior. Parent variables included demographics, parenting stress, demands, and burden, alliance with teacher, and ratings of reported child challenging behaviors. Teacher variables included experience, autism training, administrative support, self-efficacy, burnout, and stress.

Results: Pearson Product-Moment Correlation and Spearman’s rank-order correlation were performed to identify significant relationships between parent-teacher alliance and the parent-specific, teacher-specific, and child-specific variables. Chi-square tests were also performed to examine the relationships between parent-teacher alliance and demographic variables. The child variable of age ($r = .266$, $p = .023$), teacher variables of number of years teaching ($r = -.252$, $p = .034$), administrative support for continuing education ($r = .281$, $p = .018$), burnout measured as sense of accomplishment ($r = .643$, $p = .045$), child externalizing behaviors ($r = -.285$, $p = .018$), stress ($r = -.467$, $p = .006$), and self-efficacy ($r = -.118$, $p = .048$), and parent variables of child internalizing ($r = -.348$, $p = .004$) and externalizing ($r = -.254$, $p = .035$) behaviors, stress related to the perceptions of the demands of caring for the child ($r = -.239$, $p = .045$), and stress related to the reaction to the demands of caring for the child ($r = -.116$, $p = .048$) correlated with parent-teacher alliance. Significant variables identified from the aforementioned analyses were then entered into stepwise multiple linear regression to develop a model for predicting parent-teacher alliance. The final model demonstrated that teacher sense of accomplishment (Beta = .840), teacher stress (Beta = -.313), and teacher self-efficacy (Beta = -.481) were significant predictors of parent-teacher alliance, $F(3, 6) = 18.5$, $p = .002$, Rsquared = .903.

Discussion: The results of this study revealed that teacher burnout, stress, and self-efficacy accounted for parent report of teacher alliance. Particularly, teacher burnout measured as a sense of accomplishment was the strongest predictor of parent-teacher alliance. These results highlight the importance of teachers’ sense of well-being and the impact this has on parent perceptions of alliance.