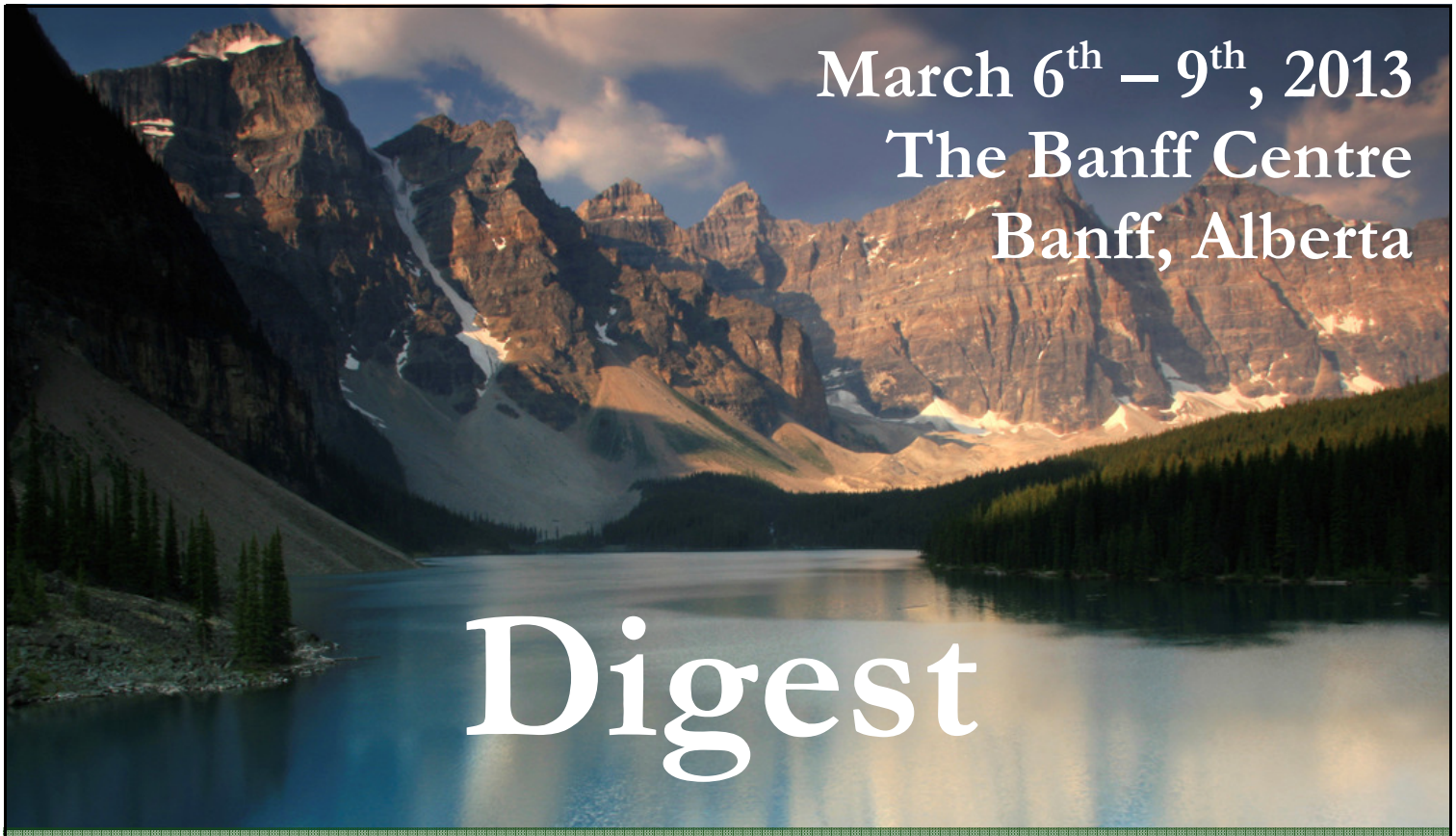

March 6th – 9th, 2013
The Banff Centre
Banff, Alberta

Digest

2nd Biennial Winter Institute

Faculty and Trainees from both **ART** and **NeuroDevNet** have come together for 4 days of education, interaction and recreation in the heart of the Rocky Mountains.

The following collective work is the fruit of their collaborative endeavor.

AUTISM RESEARCH TRAINING *Program*

NeuroDevNet

Table of content

Autism Genetics Updates ***DRAFT***
Edwin Cook Jr., University of Illinois at Chicago
Wednesday March 6, 2013
9:00 am to 10:15 am

Authored by Jonathan Lai[1], Anath Lionel, and Anthony Bailey
[1]McMaster University, [2]University of Toronto, [3]University of British Columbia

Dr. Cook provided a broad overview of the current state of autism genetics. He touched upon several key topics including the evidence backing a genetic basis for autism, the emerging genetic model for autism risk, the different classes of genetic studies that have yielded risk genes for the disorder and the implications of genetic findings for clinical treatment, genetic counseling and ethics. An overarching theme from the talk was that autism is a disorder of considerable complexity and heterogeneity and these twin facets are reflected in its clinical phenotype and the underlying genetic risk model.

Epidemiology of autism:

- Today, the measured prevalence of autism is ~1% of the population, a notable increase from the early 1980's, when the rate was around 2 to 5 / 10,000.
- One factor that might explain this increase is the change in definition of the disorder between the DSM-III and DSM-IIIR versions of The Diagnostic and Statistical Manual.
- Another contributing factor could be the recent emphasis on a more complete ascertainment of all individuals with ASD in the community as opposed to the previous focus of counting only those in specialty clinics.
- Supporting the above suggestions, a study by Brugha et al. 2011 using uniform assessment protocols, observed a consistent 1% autism prevalence rate across adults from 18 to 70 in the UK, with no significant increase among the younger generations.

The model of genetic risk for autism is both complex and heterogeneous:

- Family and twin studies provide strong evidence for a genetic basis for autism – sibling risk is almost 20 times higher than population prevalence. The concordance in monozygotic twins is 60%, much higher than that seen in dizygotic twins.
- The genetics of autism is incredibly complex, with 100s to 1000s of genetic variants likely being involved. The genetics, similar to the phenotype, is also highly heterogeneous with no two people being the same.
- Emerging consensus is that autism is multifactorial i.e. multiple contributing genetic risk variants, both rare and common, are responsible.
- *De novo* mutations (novel genetic changes in patients that are not inherited from their parents) are likely causal in 20% or higher of individuals with autism – examples of genetic regions affected by such mutations include 15q11-q13 duplication and 16p11.2 deletion among others.

Different types of genetic variants that have been implicated in risk for autism:

- Common inherited risk variants are detected by Genome-wide Association Studies (GWAS) that scan the entire genome for Single Nucleotide Polymorphisms (SNPs) associated with risk for the disorder. Specific genetic regions identified so far have not consistently replicated across different studies and have been of individually weak effect. Very large collaborative GWA studies comprising over 5,000 cases (Psychiatric Genetics Consortium) are currently underway.
- Chromosomal disorders are caused by large insertions or deletions of specific stretches of DNA in the genome and can be detected by different techniques including karyotyping, FISH and microarray. These disorders are generally rare (typical prevalence of 1:5,000 or less in the population). Examples of chromosomal disorders associated with risk for autism include 7q11 deletions and 15q11-q13 duplications.
- Copy Number Variations (CNVs) are a subset of chromosomal disorders and are generally small gains or losses of specific genes in the genome. CNVs are primarily detected by microarray technology. Examples of CNVs associated with risk for autism include 16p11.2 microdeletion, SHANK3 deletion and NRXN1 deletion.
- Single Nucleotide Variations (SNVs) are changes of a single DNA nucleotide, which can lead to a modified (missense variant) or truncated protein (nonsense variant). SNVs, together with other small base-pair level changes such as frame-shift and indel mutations, can be detected by Sanger sequencing as well as next-generation sequencing (NGS) technologies such as exome and whole genome sequencing. Examples of SNVs associated with risk for autism include nonsense mutations in genes such as CHD8, SCN2A and GRIN2B.

<u>Examples of genetic risk factors for autism: 15q11-13 duplication and 16q11.2 deletion</u>

- chr15q11-q13 duplication involves a specific segment of the long arm of chromosome 15 and is the most common genetic change associated with risk for autism, being present in ~1% of individuals with autism. There are several genes present within the 15q11-q13 region, of which UBE3A is one of the best candidates.
- In addition to autism, this duplication often presents with other symptoms including intellectual disability, epilepsy and hyperactivity. A serious complication associated with this duplication is sudden unexpected death in some individuals, thought to be associated with epilepsy or linked to adverse reactions to GABA-A agonist medications such as Ambien.
- The 16p11.2 microdeletion is a highly replicated risk factor of autism (around 1% of cases) that was first discovered five years ago after the advent of microarray technology.
- In addition to autism, the 16p11.2 microdeletion has also been reported in connected. with other phenotypes including severe obesity, learning disability and intellectual disability. On the other hand the duplication of the same region has been implicated as a risk factor for low BMI and schizophrenia.

<u>Recent whole-genome CNV and SNV studies of autism</u>:

- Several genome-wide microarray studies have found evidence for an elevated rate of highly penetrant *de novo* CNVs affecting exons of genes in individuals with autism compared to controls. These de novo

CNVs are unlikely to recur in siblings but the siblings might have an independent event that predisposes to autism and other neurodevelopmental disorders.

- Three recent whole-exome sequencing studies of autism have found evidence for involvement of novo missense and nonsense SNVs in autism. The de novo SNV mutation rate was higher in females compared to males and was also positively correlated with increased paternal age.
- Taken together, the CNV and SNV studies suggest a role for de novo mutations in 15 – 20% of ASD cases. Although more than a hundred genes have been implicated by these, they tend to cluster among a relatively small number of pathways with synaptic function and neuronal plasticity being important recurring themes.
- Since there are so many different CNVs and SNVs involved in autism risk, does this imply different treatments targeted at each individual genetic variant? Perhaps, it would be better to have a broader outlook and perceive autism as a "engine out of tune" with different sparkplugs that might be affected but same outcome and similar solution.

<u>Implications of genetic findings in autism</u>:

- Important to stress that neither genetics nor developmental brain disorders imply fate! For example in other genetic disorders such as Phenylketonuria and Rett syndrome, several possible treatment models have been observed that could reverse effect of genetic mutation. Therefore genetic etiology doesn't reduce need for habilitation, education and non-genetic treatments – all of these have the goal of empowering individuals with ASD and their families.
- Genetics does provide valuable clues for pathophysiology and guides the development of novel, more effective molecular based clinical treatments. Genetics also sometimes helps stop parents blaming themselves for their actions that they might think have caused their child's condition.
- The complexity of the genetic findings in ASD (e.g. weak individual effect of common variants, possible recurrence of de novo variants due to germline mosaicism, variable phenotypes associated with mutations in the same gene) poses challenges for genetic counseling of individuals with ASD and their families.
- The difficulty of conveying the uncertainty and lack of predictive nature of genetic findings also has important ethical implications. It is important to respect the autonomy of the parents and also the capacity for adaptation of the individual with ASD.

How can biomakers support early identification and management of developmental disorders
Dr. Edwin Cook Jr., University of Illinois at Chicago; Dr. Evdokia Anagnostou, Holland Bloorview Kids Rehabilitation Hospital; Dr. Melissa Carter, The Hospital for Sick Children; Dr. Ilina Singh, London Shool of Economics and Political Science
Wednesday March 6, 2013
10:30 am to 12:15 am

Authored by Vicky Armstrong[1], Shreya Prasanna[2], and Krista Hyde[2]
[1]Dalhousie University, [2]McGill University

Introduction to the Session
Researchers and clinicians debated about the priorities in biomarker research and issues in translating this research into practice. The panel included Dr. Ed Cook, Dr. Melissa Carter, Dr. Evdokia Anagnostou and Dr. Ilina Singh.
Priorities identified included:

- Identify root causes, risks and protective factors
- Go beyond implications; how do we translate work more effectively to real world applications
- We need a dialogue between many groups and engage everyone in the conversation

Dr. Melissa Carter
Dr. Melissa Carter is a clinical geneticist, specializing in the genetics of ASD. She works with patients who have genetics testing to explain the test results and help with family planning if necessary. There are families who don't want this information. In contrast, there are some others who want to know about genetic risk at or before birth. They want to know if anything can be done to predict the outcomes in future children. They may feel that they could do more if they knew about the diagnoses earlier. There are, however, limitations with genetic testing. For example, they are not done at birth to predict long-term risk. Furthermore, the findings are often uncertain, therefore making it difficult to predict outcomes. Families generally, tend to have limited understanding of these limitations and the pros and cons of knowing genetic test results.
Dr. Evdokia Anagnostou
According to Dr. Anagnostou, in neurology, the focus is typically on locating the lesion. In ASD, genetic work is starting to give a sense of where the lesion is located. It provides information about what is the net functional impact of the connectivity on behavior. However, it is still difficult to understand the changes in the synaptic pathways and whether it increases or down regulates activity. It is often not possible to find the identifiable CNVS in every child. However, if we know the relationship between a particular CNV and a behavior pattern, it can help with treatment ideas. For example, if a child has ASD and Fragile X, we can provide treatment used in children with Fragile X. The knowledge obtained in such a situation can be then applied to children who do not have such rare findings. Given that ABA was developed from animal models, we need to further understand the nature of these pathways and figure a way to manipulate those using pharmacological and non-pharmacological interventions.
Dr. Ilina Singh

A key issue that Dr. Singh brought up was the involvement of children in understanding how development in biomarker research impacts society and public life. At present, researchers primarily speak to parents to understand the impact of ASD on their child's life. However, we need to speak to children as well – we need to get an understanding of their life with ASD, how it impacts their creativity and peer relationships. However, methodological challenges exist in talking with children and getting reliable data. Very often, high functioning children are included in studies that deal with children's perspectives. Hence, there is a need to involve

children with different levels of functioning to obtain more heterogeneous data. There is also the question of reliability when dealing with qualitative data. By accepting these limitations and making use of methodological advances, we can obtain data from children that will contribute to a rich phenotypic understanding of ASD and other disorders.

Dr. Ed Cook

Dr. Cook described key information regarding ethical issues surrounding genetics research. We have to consider the impact of the information for people involved in genetics research. Many people don't understand what could be uncovered. Findings could have implications for future ability to obtain medical insurance, work and knowledge about diseases (including ones that are not treatable). The consent process needs to be extensive. For example, when sequencing a whole genome, a whole day of consent is required. In some cases we may need to re-obtain consent from participants to see if they want to know about other findings. This is especially important if there is evidence of a treatable disease. This requires extra time with families that may not have been budgeted for. More difficulty surrounds findings that indicate diseases that are not readily treatable. Do people what to know this information? Incidental findings (in genetics, imaging etc.) are common. The hardest part is the unknown issues with legislature - what information others have access to? For example, a travel insurance company accessed test information of an individual and refused insurance based on the fact that a medical test was performed, rather than the results of the test. In that case, having a test in general increases risk factor mathematically, even if results show no problems.

Discussion

1. Information on a website for parents/kids?
   - A fact sheet vs. what they want to know and why - with individualized information
   - For people who don't have access to information it may good but the problem is that there is too much information and we can't separate the good from the bad.

2. How close are we to use the biomarkers in diagnosis processes and in accessing services?
   - It may not be specific to ASD. Very early intervention may not be ASD specific
   - A longitudinal perspective is important. May not be diagnosis related but services related
   - Genetic test result may help with focus of intervention. We don't really test for genetics unless we ID something phenotypically. It depends on the finding. It can help access to early intervention.
   - Prevention, early intervention? How targeted should it be? Something that shows risks and helps you get service is important
   - Parents: genetic test are offered with informed consent - we may find this or that. If you do find something will it help child. However, if a child has fragile X rather than ASD-- parent worries that he will be kicked out of ABA.
   - Projects involving baby siblings of children with ASD may identify features that are very common. Providing early intervention in such cases would exhaust our services /resources.

3. What is a good life with autism? Is a labeled life a good life?
   - Now, young people are being asked. But consent is geared to adult. We really don't know what kids would say.
   - How involved are older children in consent to genetic test? Ethics of labels etc?
   - Genetic counseling is a moral craft. Can you make a good decision based on this biomarker? Will this improve life and wellbeing? Seen in children with ADHD where older children start resisting drugs.

- Science of early intervention is a moral science. We are making assumptions about what a good way to live is. But social norms do play a role and children may have their own ideas, require more control.
- We need to make sure we consider the range of good life with autism.
- How do kids feel about discussing this? Many have not talked to anyone about this. Parents were worried about kids talking about this. They don't want kids to know about their disorder. But in Dr. Singh's studies, many of the kids liked talking about it.
- In terms of a good life, it is difficult to know these things ahead of time. At some point in one's life a person may want a cure, but this can change with time. Depends on many factors. None of us can know what is ahead tomorrow

4. Involvement of children in studies

- One of the plus sides but unintended side effects for assent over age 7: ethics board often wanted ASD mentioned on assent form. Parents asked first, and this opens the door for telling the child about autism. Researchers don't tell kids, but can help family with this. A positive side effect of kids getting this information is that they now have a name for why they are different and are often eager to sign the assent for studies. We need to give kids some time to think about participating in the study after they find out about autism. They should not be asked to sign the same day.
- Non-verbal kids: use an array of pictures. Just because they can't talk does not mean they don't understand. You don't know what he or she is thinking.
- Families usually elect for saliva than blood samples. Kids are very good and eager to spit into the tube. This indicates that they understand more than we think they do.

Neurodevelopmental disorders in DSM5
Wednesday March 6, 2013
1:30 pm to 3:30 pm

1) Neurodevelopmental disorders in DSM5: What's changing? What's staying the same?
Dr. Susan Swedo, NIMH

2) Does FASD (Fetal Alcohol Spectrum Disorder) or ND-PAE (Neurobehavioral Disorder due to Prenatal Alcohol Exposure) belong in the DSM5? Benefits and Risks
Dr. Gail Andrew, University of Alberta

3) DSM5 and Autism: The good, the Bad, and the Unknown for those of us on the autism spectrum
Mr. Chris McIntosh, Victoria, BC

Authored by Jeffrey MacLeod[1], Margot Stothers[2], and Isabel Smith[1]
[1]Dalhousie University, [2]University of Western Ontario

1) Neurodevelopmental disorders in DSM-5: What's changing? What's staying the same? **Dr. Susan Swedo, National Institutes of Mental Health (NIMH*)***

-Dr. Swedo was the chair of the DSM-5 Neurodevelopmental Disorders Workgroup

- The DSM-5 Neurodevelopmental Disorders workgroup addressed Learning disabilities, Intellectual disabilities, Core domains of autism, Co-morbid medical and genetic conditions, Asperger's disorder, regression/CDD, development/age and gender issues.
- The group was comprised of 11 regular members and 20 other advisors; subgroups focussed on various aspects
- Between spring of 2007 (after a workshop the previous year) and fall of 2012, the group had bi-monthly teleconferences, twice yearly meetings
- The group had ongoing input from researchers, clinicians, educators, affected individuals, family members, etc.
- The group was more open to public input than any in the past
- The Autism subgroup had more comments than any other

Change #1: DSM-IV Mental Retardation is becoming DSM-5 Intellectual Disability, or Intellectual Developmental Disorder

- DSM-5 Intellectual Disability will require deficits of greater than two standard deviations below average in both adaptive and cognitive functioning; terminology more consistent with international usage

  Criteria for Intellectual Disability, from Dr. Swedo's slides:
  - A. Deficits in intellectual functions, such as reasoning, problem solving, planning, abstract thinking, judgment, and academic learning and learning from experience, confirmed by both clinical assessment and individualized, standardized intelligence testing.
  - B. Deficits in adaptive functioning that result in failure to meet developmental and sociocultural standards for personal independence and social responsibility. Without ongoing support, the adaptive deficits limit functioning in one or more activities of daily life, such as communication, social participation, and independent living, and across multiple environments, such as home, school, work, and recreation.
  - C. Onset of intellectual and adaptive deficits during the developmental period.

Change #2: DSM-IV Learning Disorders (Reading, Mathematics, Written Expression, NOS) are becoming DSM-5 Specific Learning Disorder (with specifiers)

- This change is based on a lack of evidence for separate diagnoses. Often there was considerable overlap between the DSM-IV categories. It is expected that the use of a single diagnosis with specifiers will provide more utility for individual cases. Also, this conceptualization is more representative of the neuroscientific evidence.

  Criteria for Specific Learning Disorder:

  A. Difficulties learning and using academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 mos, despite provision of interventions that target the difficulties:

  - Inaccurate or slow and effortful word reading (e.g., reads single words aloud incorrectly or slowly and hesitantly, frequently guesses words, has difficulty sounding out words).
  - Difficulty understanding the meaning of what is read (e.g., may read text accurately but not understand the sequence, relationships, inferences, or deeper meanings of what is read).
  - Difficulties with spelling (e.g., may add, omit, or substitute vowels or consonants).
  - Difficulties with written expression (e.g., makes multiple grammatical or punctuation errors within sentences; employs poor paragraph organization; written expression of ideas lacks clarity).
  - Difficulties mastering number sense, number facts, or calculation (e.g., has poor understanding of numbers, their magnitude, and relationships; counts on fingers to add single-digit numbers instead of recalling the math fact as peers do; gets lost in the midst of arithmetic computation and may switch procedures).
  - Difficulties with mathematical reasoning (e.g., has severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems).

  B. The affected academic skills are substantially and quantifiably below those expected for the individual's chronological age, based on appropriate standardized measures, and cause significant interference with academic or occupational performance or with activities of daily living.

  C. The learning difficulties begin during school-age years but may not become fully manifest until learning demands exceed the individual's limited capacities.

  D. The learning difficulties are not better accounted for by intellectual disabilities, global developmental delay, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction

Change #3: DSM-IV Pervasive Developmental Disorders are becoming DSM-5 Autism Spectrum Disorder

- In DSM-IV, the Pervasive Developmental Disorder category includes Autistic Disorder, Asperger Disorder, PDD-NOS, Childhood Disintegrative Disorder, and Rett Disorder. In DSM-5, all of these will be captured by Autism Spectrum Disorder (ASD).

- Rett Disorder and other etiologic subgroups will be described by use of a Specifier: Associated with Known Medical or Genetic Condition or Environmental Factor

- CDD to be included under neuropathy

- Within the ASD category, the DSM-IV's three diagnostic domains (Social, Communication, Restricted & Repetitive Behaviors) will become two (Social Communication and Restricted & Repetitive Behaviors)

ASD criteria:

A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, **currently or by history** (*give benefit of the doubt when early history is unavailable*; examples are illustrative, not exhaustive; see text):

1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back and forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.

2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body-language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.

3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative not exhaustive; see text):

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping plates, echolalia, idiosyncratic phrases).

2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day).

3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).

4. Hyper-or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability or global developmental delays. Intellectual disabilities and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

Other points:

- For criterion C, DSM-IV requires that symptoms begin prior to the age of 3 years.
- Pattern of onset (i.e., "regressive" or not) and clinical course was initially considered important; now seems unlikely to be so
- The *DSM-5* requires that symptoms begin in early childhood, with the caveat that "symptoms may not be fully manifest until social demands exceed capacity" (during middle-school years, later adolescence, or young adulthood).

- **<u>Clinicians will be encouraged to use Specifiers:</u>**
    - Age of first concern
    - With or without loss of established skills
    - With or without accompanying intellectual impairment
    - With or without accompanying structural language impairment
    - Associated with a known medical or genetic condition or environmental factor
    - Associated with another neurodevelopmental, mental, or behavioral disorder
    - Severity of symptoms

- Severity specifiers provided for each of the two domains of impairment (Social Communication & RI/RBs), *not* the "autism", and examples given in text of the different levels
    - Level 1 – requiring support
    - Level 2 – requiring substantial support
    - Level 3 – requiring very substantial support

- The text of DSM-5 will include examples to help avoid misinterpretation of criteria.
- Comorbid ADHD and ASD will be possible in DSM-5.
- There should be fewer ways to make the diagnosis in DSM-5. For example, in DSM-IV there were three symptoms that all described social reciprocity. This has been eliminated.
- Regarding concern of loss of identity (Asperger disorder) – those correctly diagnosed will still meet ASD criteria

Change #4: DSM-5 will include five Communication Disorders

1. Language Disorder (no longer expressive and receptive subtypes)
2. Speech Sound Disorder
3. Childhood onset Fluency Disorder (stuttering)
4. Social (Pragmatic) Communication Disorder
5. Unspecified Communication Disorder

Of particular interest here is the new Social (Pragmatic) Communication Disorder (somewhat broader than Bishop's conceptualization).

Note that SCD cannot be comorbid with ASD. Early developmental history needs to be considered to make sure RI/RBs were not present at some point.

Criteria for SCD:

1) Persistent difficulties in the social use of verbal and nonverbal communication as manifest by deficits in all of the following:

- Deficits in using communication for social purposes, such as greeting and sharing information, in a manner that is appropriate for the social context
- Impairment in the ability to change communication to match context or the needs of the listener, such as speaking differently in a classroom than on a playground, talking differently to a child than to an adult, and avoiding use of overly formal language
- Difficulties following rules for conversation and storytelling, such as taking turns in conversation, rephrasing when misunderstood, and knowing how to use verbal and nonverbal signals to regulate interaction

- Difficulties understanding what is not explicitly stated (e.g., making inferences) and nonliteral or ambiguous meanings of language, for example, idioms, humor, metaphors and multiple meanings that depend on the context for interpretation

2) Deficits result in functional limitations in effective communication, social participation, social relationships, academic achievement, or occupational performance.
3) Deficits must be present in the early developmental period, but may not become fully manifest until social communication demands exceed limited capacities.
4) Deficits are not better explained by autism spectrum disorder, intellectual disability (intellectual development disorder), global developmental delay, or another mental disorder or medical condition.

Field trials:
Data presented by Dr. Swedo suggested good test-retest reliability (pooled estimate from multiple sites = 0.69). This level of reliability was good relative to other DSM-5 disorders, and the best of those tested.

Sensitivity and Specificity are comparable for DSM-IV and 5 when used by experienced clinicians.

Bottom line is still clinical judgment.

See reference for more on the comparability of DSM-5 and DSM-IV ASD criteria:
Am J Psychiatry. 2012;169(10):1056-1064. doi:10.1176/appi.ajp.2012.12020276

'Loss' of diagnosis due to not meeting RRB criteria (hence Social Communication Disorder)

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2) Does FASD (Fetal Alcohol Spectrum Disorder) or ND-PAE (Neurobehavioral Disorder due to Prenatal Alcohol Exposure) belong in the DSM5? Benefits and Risks. **Dr. Gail Andrew, University of Alberta**

- FASD affects 1/100 live births, and lifetime costs per person are estimated to be 1.8 million.
- FASD is relatively unknown to many professionals. Typically mental health professionals know of the disorder, but do not know much about the disorder.
- Typically less knowledgeable professionals over-focus on facial features, cognitive disability, racial minority groups
- Lack of FASD in the DSM may contribute to this lack of knowledge among professionals
- 90% of people with FASD have comorbid mental health diagnoses, and often these will be the presenting symptoms in the health system.
- "Treatment failures are system failures." Accessing treatment can be difficult for people with FASD. Often they are not permitted to be in treatment programs because they have FASD, and/or they are not able to participate in programs because they do not have the cognitive skills to support such participation (e.g., CBT groups).
- Public health problem – requires trauma-informed lens; recognition of multi-generational impact; *theoretically* preventable

- In DSM-5, FASD is included in the Appendix as a disorder for further study. Neurodevelopmental Disorder associated with Prenatal Alcohol Exposure (ND-PAE)

    - Some aspects of criteria included in DSM-5:
        - Confirmation of prenatal alcohol exposure is necessary
        - Neurocognitive impairment
        - Impairment in self-regulation
        - Deficits in adaptive functioning
        - Onset before age 18

- 2013 International FASD conference – but no 'next steps' identified
- Currently there is no clear consensus on diagnostic criteria or methods, and research evidence is lacking (critically, no longitudinal data; need prevalance data). Many diagnostic guidelines exist (that are much more comprehensive than the brief list above), but none are considered gold standard.

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3) DSM V and autism: the good, the bad, and the unknown for those of us on the autism spectrum. **Chris McIntosh, Victoria BC**

- Chris first discussed the concept of a continuum existing between AS and TD
- He suggested that a line in the sand on this continuum is not particularly realistic

There's a cliff; what separates us (AS) from "Neurotypical land" at the edge?

- A challenge is that we define a neurological condition by behaviour
- e.g., If one were to define blindness behaviourally, "symptoms"may be:
    - communication deficits especially discussing art
    - resistant to change, always use the same routes
    - inability to generalize (e.g., poor mobility in new places)

These are all true, but still miss the lack of vision as the essential nature of blindness. Therefore, there would be a misunderstanding of a blind person's experience.

Autism: Is there one definition or characteristic that captures autism?
Chris suggested we are currently missing this key characteristic. He suggests that it is lack of empathy.

- empathy = understanding the emotional pain
- compassion = kind, caring actions

People with ASD can and do display compassion, but have trouble with empathy. That is, they can act in kind and caring ways, but have trouble understanding the feelings.

What is ideal?
-DSM-5 has gone a long way to helping, by removing unnecessary criteria and diagnostic categories. This gets closer to the essence of ASD.
-Likes the flexibility of DSM-5 approach
-He suggested 'social communication disorder' clouds it

Chris' concerns with DSM-5:

- Inclusion of SCD – worry about loss of diagnosis and that SCD is actually an ASD (without RRBs; thinks of RRB as a co-morbidity)
- Concerned about under-diagnosis with new criteria

- No mention of differences between men and women
- Loss of identity & community in adults with Asperger syndrome
- Diagnosis by deficit only, no strengths listed
- Difficulty getting a diagnosis as an adult
- Difficulty in re-educating the public
- Inconsistency with ICD
- No time factor – people with ASD develop more slowly, well into adulthood

Thoughts about diagnostic tool:
-Adults can learn behaviors, so perhaps behavior isn't the best way to assess adults
-Language may be the place to focus on during diagnostic assessment; harder to learn these skills
-Assess in real-world contexts
-Suggests computer analysis of written and verbal language may reveal ASD patterns

A few points from panel discussion:
-Swedo:

- placement of ND-PAE in DSM-5 Appendix (versus text) because of lack of reliable diagnostic criteria; allows more research
- Empathy as a core impairment in ASD; committee agreed with Chris' position but advocacy advisors recommended removal due to potential for misinterpretation
- Query: was equal weight given to S-C and RRB factors in ASD – Swedo: yes
- If the presence of supports makes an individual look 'recovered' – should not lose diagnosis

-Developmental Coordination Disorder – can be co-morbid with any other disorder
-'Sensory defensiveness' / 'sensory processing disorder' – not recognized as disorders
Query: Why include FASD is specific etiologies are not otherwise? Swedo: Issue with Rett syndrome was not the specific etiology but the distinct phenotype.

Research Management and Professional Skills workshop

1) Effective mentorship, Dr. Jacob Burack, McGill University
2) Grant Writing, Dr. Elizabeth Kelley, Queen's University
3) Management of a research team, Dr. Pat Mirenda, University of British Columbia
4) Interdisciplinary Collaboration, Dr. Jonathan Weiss, York University
5) Achieving tenure and promotion, Dr. David Nicholas, University of Calgary

Thursday March 7, 2013
8:45 am to 10:15 am

1) Effective mentorship

Authored by Lori Sacrey[1] and Jacob Burack[2]
[1]University of Alberta, [2]McGill University

There are 2 caveats to the following information:

1. The following information is compiled from Dr. Burack's experiences with his mentors and this presentation is his means to transmit his positive mentee experiences onto us.
2. With that being said, there is no one-way to be an effective mentor. That is, there is no one 'good' way, as everyone can have his or her own effective style of mentorship

Mentors have many responsibilities.

One of a mentor's responsibilities is to prepare students for the next and future stages of their "chosen" career. To do this, mentors must impart certain responsibilities to his or her students. First, mentors must be ethical in their work. Second, mentors have a responsibility to their community. This is especially important when working with vulnerable populations (e.g., children and adults with special needs). Third, mentors have a responsibility to their students. Students include both individual students that are participants in their experiments and their own mentees. Fourth, mentors have to impart the importance of their research. When gaining informed consent from participants, mentors have to explain to the participant that the purpose of the experiment is to help others with the same disorder as them, that the experiment has a value for them, and that the research will "go somewhere," because it is important to the future of people living with the same disorder.

Mentors also need to facilitate opportunities for their mentees. Mentors need to include their students in publications, allow students to participate in academic and scholarly activities, and introduce them to leaders in the field. The Winter Institute is a valuable contribution because students are able to meet researchers in their field. It is a mentor's responsibility to introduce his or her students to meet other leaders to open doors for students to engage researchers in the future. This is especially important as a mentor cannot be an expert in everything, so making appropriate connections allow students to gain exposure to leaders with the needed expertise.

Quoting the essentials of mentoring

Mentors should be proud of their students and treat them as part of his or her academic "family". The most effective mentors befriend their students and become co-researchers together. As such, they can collaborate and transmit a passion for research onto the student, and engage their students in every aspect of research. Many mentors continue to work with their students after they have their own labs and become mentors themselves. Just like parents carry pictures of their kids to show them off, mentors should show off

their students!

"**Of all the things in my career**, **I'm most proud of my students**… " – Dr. Edward Zigler
"**The most effective teacher is… he who befriends his disciples**, **and together they become co-searchers and co-dreamers in the pursuit of truth.**" - Rabbi Joseph B. Soloveitchik;
"**Once you're part of my family you're always part of it**… " - Dr. Edward Zigler

It is important for mentors to encourage their students to collaborate with other researchers and be passionate about their work. Mentors should also promote his or her students and encourage the students' strengths.

"**Teach each student in their own way**…" – Proverbs…

Mentors should empower their students. It is important to bring out each students talents. Because each person has different talents, students and mentors must work together to merge their talents.

"**You came here on talent, you did your work with talent, and I did not intrude too damagingly…"** - Dr. Bill Kessen

Mentors should encourage independent thinking. By asking their students what they think about their research, the mentor empowers the student to realize that they really are the expert. If brainstorming between the mentor and mentee leads to new ideas, the mentor should acknowledge the mentees contribution.

"**You're the expert…**" – Dr. Edward Zigler
"**What do you think?**" – Dr. Gary E. Schwartz
"**Tell me about…**" – Dr. George Mahl

Mentors should encourage their students to write. Writing is hard and takes a lot of practice. It is important to teach students that they will not write like the best writers. Instead, students should take what they like from their favourite writers and develop their own style.

"**Find your own voice**… " - Dr. Robert Hodapp

Mentors should prepare their students to lose. During their graduate and professional career, students will face a lot of rejection. Papers will get rejected, grants will get turned down, and you may not get the job that you want. The key, however, is to never give up!

"**Tell your students to be ready to lose, to lose, to lose, and keep on fighting…"** - Dr. Edward Zigler

<u>Final thoughts on mentorship from "Pirkei Avot" (traditional Jewish teachings)</u>:

"The dignity of your student should be as precious to you as your own…" – "Rabbi Eliezer the son of Shamua
"I learned much from my teachers, and even more from my colleagues, but from my students I learned more than from all of them…" – Rabbu Yehudah HaNasi

2) Grant writing

Authored by Ainsley Boudreau[1], Layla Hall[2], and Elizabeth Kelley[2]
[1]Dalhousie University, [2]Queen's University

Aim: Review strategies to obtain grants and fellowships

1) **Finding Mr./Ms. Right**

Where to apply?

- Tri-council: CIHR, SSHRC, NSERC
    - ASD research: usually apply to CIHR
    - May apply to SSRHC/NSERC but focus on understanding social of biological processes in normal development (TD controls) and extend to ASD
        - Don't be afraid of applying to NSERC/SSHRC but don't use ASD in the title
        - Make sure that the grant can stand on its own as something interesting just with the typical development piece
- Look outside of tri-council agencies: there is a bias towards applying for tri-council funding but due to changes in application requirements (i.e., what you can study) and the amount of funding it is important to look elsewhere as well
    - Talk to research services
    - List-servs
    - Ask friends and colleagues where they get funding
    - Look through acknowledgement sections
    - Look for smaller foundations: Scottish Rite Foundation (developmental disability focus): grants for new researchers (few publications needed); Weatherstone Fellowships from Autism Speaks
    - March of Dimes (neurodevelopmental disorders focus): funds ASD research
    - Sinneave Foundation
    - Autism Speaks
    - Private Foundations
    - Canada Post has a Mental Health Initiative program
    - Templeton Foundation
    - Ministry of education
    - American Grants:
        - More competitive for Canadians
        - Apply later in career

2) **Time is of the Essence**
    - Start 8-12 months before deadline (minimum 6 months)
        - start with reading the guidelines and think about how your research will meet the guidelines
    - Small pieces take far longer than you anticipate
    - Leave enough time to send application to other people (mentors, supervisors, grant facilitators, any detail-oriented person, and people outside your field)
        - Make absolutely sure that you have others review your application first before submitting to catch pieces that are unclear or editing/grammar mistakes
    - Other factors impact preparation time: new faculty have to set up a lab, find students and get settled at the university

3) **We're BFFs, Aren't We?**

Ask to see other people's grants

- Ask to see successful grant applications (most useful if from the same agency)
- Ask for sample budgets
- Collaborate, especially outside of your field
- Ask mentors to read your CV

4) Sell, sell, sell!

- Don't be afraid to sell yourself
    - "This is why I'm the only one who can do this study"
- Sell yourself but don't lie
- Read the guidelines and follow closely
- Fully address each section of grant in a clear and relevant manner
- Tailor your application to agency aims; don't be afraid to use the grant 'catch phrases'
- Reality: sometimes you need to do projects that agencies are funding
- Sit on boards that review fellowships (do this early in your career to learn from experienced reviewers on the committee)
- Make sure your proposal is theory driven
    - reviewers will likely be from outside of your field so make sure you provide a background and really explain what the implications will be and how the study is important

5) Make Yourself Irresistible

- Spend time on developing a good CV (format and content matters)
    - Put as much in your CV as you can early in your career (e.g., how many students supervised, what did you did with them etc)
    - Emphasize path independence
- Papers
    - Explain your contribution to each paper
    - If no publications explain what you have been doing what your time
    - Don't give excuses for low productivity (ok to indicate maternity leave or illness leave); however, don't give too much personal information.
- Extra training looks really good (ART and NeuroDevNet)
- If you have taken any additional courses (e.g. statistical training) or attended special workshops be sure to include those (as you become more senior you can drop some of this stuff out)
- include information about media communication and KT training
- Stress why your previous experience makes you the ideal person to conduct the study
    - if you are changing research interests make it clear how and why you are making the jump
    - emphasize how new supervisors and collaborators will make this change possible
- If you have taken a maternity leave or leave of absence make that clear as to explain gaps in your CV, but don't give details

6) Who loves ya baby?

- Select letter writers who know you well and like you
    - they need to be able to comment on you personally
- Get supporting letters (e.g., department head)
    - the more personal info the better
- If you are starting new collaborations, be sure that you have enough interchange with your new collaborators that they can comment on your skills

- Be sure to get a letter from supervisor- looks strange if you don't
- Helps to write draft letters or prepare written summary of your skills for letter writers
- Make it clear that you are working toward independence (i.e., have your letter writer state what aspects of the project you completed independently)
- Ensure the content of the letter is consistent with your application and ensure that the details are consistent across the letters
    - make sure all your letter writers have the same info and are have the correct details

7) Huh? I don't get it!

- Make sure your writing is understandable for an educated layperson
- This is especially relevant for writing grants in the areas of genetics and imaging; don't assume reviewers will know your area
- Avoid acronyms-if you must use acronyms, include a cheat-sheet in the appendix
- Describe methodologies
    - don't refer the reviewers to other papers for description of methodology
    - if you are running short on space you can use appendices to include info about more detailed methodology
- Timelines and visuals are great
    - Can include a table of your preliminary results
    - Expected results via graph
- Don't bite off more than you can chew (common mistake with early career researchers); propose initial steps and put larger goals in future directions section
    - be realistic, you have your whole career to answer all the questions

8) The Devil is in the Details

- State hypotheses and implications very clearly
- Be very clear about your methods and how you will analyze the data
- Address possible confounds (show you have an awareness and will address in future)
- Do not bring up confounds that are unresolvable
- Longitudinal studies: make sure that you address attrition and how you will keep families in the study
- Clearly state how this project will add to the existing literature
- Make sure project details are consistent across submission
- include a layperson summary

9) Miscellaneous Pearls of Wisdom

- Volunteer to be on a grant or fellowships panel-cannot stress enough how much you can learn from this process!
- Re-submission: try again if positive reviews but must address concerns while making project clear; may or may not have the same reviewers
    - keep the old and add the new
- Pilot data never hurts, unless too much (if close to same N as the proposed study = too much; use it to show that your method works)
- Use appendices: provide a fuller description of methods, relevant papers, visuals
- Fill up all the application space
    - if you cannot write anything else then change the font or margins to make it fit
- KT section of grant: It's not enough to just tell other academics what you are going to do at study conclusion. Be more involved, talk to stakeholders etc.

- Grant reviewers are absolutely addicted to power analysis, make sure to include this even if you don't necessarily believe in it
- Granting agencies expect certain amount of independence but are also ok with some level of mentorship, as appropriate.
    - Early career: use term 'collaboration'
    - Fellowships- use term 'mentorship'
- Bottom line- publications are the most important thing.
    - Quality matters: Impact factor/H indexes (state it if it is good)
    - quantity also matters
- You can't go too far – as long as you are not lying you need to sell yourself like crazy. A reviewer will not say "this person is too full of themselves". However, do not claim that you have done things that you have not or exaggerate your contribution to a project.
- Grant reviewing services can be helpful although they are often very focused on tri-council awards so if you are applying to smaller foundations you should email the foundations themselves to get more information

3) Management of a research team

Authored by Danielle Levac[1], Fleur Macqueen-Smith[2], and Pat Mirenda[3]
[1]University of Ottawa, [2]University of Saskatchewan, [3]University of British Columbia

Session One

- No single "best" way in which to accomplish this
- There are many different options
- The key issues are:
    1. Making sure that the work gets done
    2. Communication between leader and team members
    3. Keeping up morale
- Getting together to celebrate socially major events in people's lives is important
- Regular lab meetings: frequency depends on workload
- The importance of the research coordinator cannot be overstated: this is someone who needs to thrive on organization and timelines
- The environment needs to be healthy – giving feedback to each other, supporting each other
- You have to be able to trust the people to whom you are delegating
- When interviewing, need to ask directly about organizational skills
- Important to have a lab technician who is very technically skilled and able to train new students; it's problematic if you are relying on grad students to teach new people. Written protocols are important as training approach should be consistent.
- A good lab size is one that isn't so big that you become an administrator, but not so small that you are doing everything yourself
- 10-15 people might be a good size

Session Two

- Important to knowing your role and responsibilities, and having an environment with open communication to address problems
- You need to understand what you want out of a project, as a member of a research team
- It is easier if the principal investigator (PI) has a clear vision, and the funding to achieve it
- When you have more than 8 people in a lab, a really good research coordinator/lab manager is crucial
- There's a key role for "obsessive-compulsive" research coordinators to play, as you may not have a lot of time or ability to manage staff as a PI
- You will not find all the skills you need in one person; you need a team of people whose skills complement each other
- Often you are hiring to fill a missing skill set
- Useful to understand the personalities of the people in the lab so you can understand their skills, how they will best work together
- Dealing with problematic students is difficult, as universities work to protect graduate students and often feel they are exploited. This can be a problem if a student needs remediation

One person recommended the book *StrengthFinders 2.0* by Tom Rath (see www.strengthfinders.com). Helps people identify their skills. Website suggests it is useful for team building as people work together better when they understand their individual strengths and how they can leverage one another.

4) Interdisciplinary Collaboration

Authored by Jamil Jivraj[1], Anna Patten[2], and Jonathan Weiss[3]
[1]University of Alberta, [2]University of Victoria, [3]York University

In this seminar we discussed the dynamics of working on research teams with individuals from different professional backgrounds. Interest in interprofessional collaboration on research teams has been increasing over the past decade given the growing requirement for grant applicants to demonstrate that clinical problems are being targeted from multiple perspectives. Our discussion reflected the perspectives of a diverse group of individuals including bench researchers, ethicists, allied health professionals, service providers, and others, each with varying levels of expertise working on research teams.

Dr. Weiss began the session by inviting each of us to reflect on a time we engaged in an interpersonal collaboration which worked well. We observed that maintaining clear communication, sharing a goal, and taking the time to understand work and personal culture contributed to successful collaboration. On the other hand, the group affirmed that differences in seniority and levels of professional training, differences in diagnostic style, and the inability to connect with collaborators in person made coming together a challenge.

The success factors we identified for interprofessional collaboration from our own experiences overlapped with four key elements of interprofessional team learning and work proposed by Rubin and Beckhard (1972). Those authors describe interprofessional collaboration as a hierarchical system starting with shared goals for collaboration, an understanding of everyone's role in terms of professional capacity, and a way to sort out the ongoing conflicts that inevitably arise.

Dr. Weiss categorized the broader challenges around interprofessional practice into organizational, structural, and attitudinal domains. Organizational challenges vary according to group culture and to individuals' readiness to adopt collaborative practice. Structural challenges describe policies around which voices are incorporated. Attitudinal challenges comprise beliefs an individual holds about other professionals, the importance of collaboration and teamwork, his/her role on the research team and the potential benefits of collaboration on research outcomes.

The session concluded with a collective thought experiment in which we engaged in a process of identifying a shared goal related to our different professions and reflected on how we could best foster collaboration. While brainstorming, it was noted that there may be a personal vulnerability associated with sharing the origin of a research question. We identified attitudes and interpersonal issues which could interfere with collaboration, including professional and methodological differences, tensions surrounding the pursuit of basic versus applied research, and labels associated with groups (e.g. ethics police).

Factors crucial to improving the context for interprofessional collaboration include open communication, mutual trust, the presence of a leader to facilitate collaboration, and ongoing clarification of the contribution of each professional on the team. As well, while funders tend to arrange "shotgun marriages" between collaborators and impose urgent time frames, experiences from individuals around the table reinforced that immense thoughtfulness and planning are required to facilitate successful collaborations.

5) Achieving tenure and promotion

Authored by Isabelle Chouinard[1], Annie Li[2], and David Nicholas[3]
[1]Institut de Recherches Cliniques de Montréal, [2]Queen's University, [3]University of Calgary

Introduction

When students enter graduate school, they do not necessarily know what lies ahead. Is career development the result of happenstance or planning? Many factors can influence career development. For example, opportunities for training may depend on the supervisor's funding and the resources available in the lab. Nevertheless, it is important to have clarity about the aims upon training completion. Students need to think about whether they want to move to and within academia, practice, industry, enterprise, or some other career path.

Post-doctoral fellowship

After completing their doctoral program, students can choose to pursue further training in a post-doctoral fellowship. If you plan on doing a post-doctoral fellowship, start looking early. The process is more informal in Canada than in the United States (US). However, there are fewer positions in Canada than in the US and typically you need to bring your own funding in Canada.

A post-doctoral fellowship allows flexibility for research and publication without teaching and administration responsibilities. During this time, post-docs can get their dissertation and other work published and have opportunities to network with peers as well as train and be mentored without as much teaching or administrative demands. Post-docs can also use this time to advance a new area or a new method that may or may not be extended from their previous work. Although moving to a completely new area may take a lot of time and effort and may potentially lead to a seemingly unproductive gap period between publications, moving to a new area may work if there is coherence around one's work.

Post-docs need to be really productive as productivity is a requirement of tenure and promotion in academic positions. However, quality of work is as important as quantity of work. Rather than aiming for quick publications and putting out as many articles as possible, post-docs should aim for journals with high impact ratings; having some high impact publications are viewed more positively than having many low impact publications. During this period, it is important to manage time between publishing and moving forward in the area as well as work out work/life balance. When faced with new opportunities, post-docs should pause and reflect on whether the activity will contribute to getting tenure. It is important to be fully focused on each role you take on— substantial multitasking is not recommended—and be clear about the impact on your overall work.

Adjunct or non-tenure track academic position

There are two types of academic positions: adjunct or non-tenure track positions and tenure-track positions. The adjunct or non-tenure track positions, also known as sessional work, are often for a limited term. These positions often are teaching-based and associated with lower pay and fewer benefits than tenure-track positions. However, the adjunct track is a nice augmentation of other roles because teaching experience is important earlier on in your career and it is important role throughout the academic career. It may be helpful to teach a broad range of courses and acquire evaluation documentation for teaching (e.g., collect formative and summative evaluations from students and adjust the course based on feedback on the formative evaluations; be responsive to each class and try to tailor the course to their needs).

Career development/Academic pathway

In the early stages of an academic career, a well-planned academic pathway can pave the way to achieving tenure. A key element that can be considered early on includes having a geographical sense of your discipline, such as where the main researchers in your field are located and where there may be opportunities to develop your own research niche. It may be important to be willing to stretch your geographical bounds to follow the geographical movement in your field. In addition, hiring committees often look for academics with a breadth of institutional experience.

Another essential part of planning relates to the research itself. Young academics must strive to develop specific expertise in methodology and analysis relevant in their field and to develop a coherent and sound research program. It is also at this stage that they must hone their grant writing and research dissemination writing skills, as this will become a substantial component of their work for years to come.

Understanding the requirements for productivity in the planning stages of an academic career is also crucial in preparing a strong tenure application. Once potential institutions have been identified, learning their criteria for achieving tenure will ensure that work can be done early on to meet the criteria once it is time to apply for entry-level positions as well as tenure. Mentors can be a great resource, especially in the early stages of navigating and understanding tenure processes.

Tenure and promotion

Achieving tenure is a desirable goal for many academics. While an arduous path to follow, it can lead to relative job security, and, depending on the field, academics can enjoy more academic freedom once they have acquired tenure. Developing a solid tenure application package requires some forethought. For instance, it is important to be familiar with your institution's research priorities, their expectations around which grants are more highly valued (team grants, localized sources of funding, etc.), the importance given to team research, and the importance given to teaching performance. Finding ways to become familiar with tenure application processes can be valuable. For instance, becoming a junior member of a tenure assessment committee can help new academics acquire information about how to best present a tenure dossier.

Achieving tenure is a long-term commitment and often can take between four and six years, depending on the institution. During this time, academics must not only have demonstrated academic productivity, but also carved a path to future and long-term productivity. Once academics have a better grasp of their institution's requirements for tenure, an application package must be compiled. An important piece of advice is to organize tenure materials early. Practically, this can be done in several ways. Putting everything into one file (or system of files), however, makes it much easier to find everything once it is time to assemble the tenure dossier. This file should include scholarly activities (publications, conferences), teaching productivity (course outlines, contribution to graduate students), and service (committee work, community involvement). It is essential to document everything, including training consultations or other activities that are not always captured in a typical CV. Documenting teaching activities can also be helpful. This file can include such things as thank you notes from students, course outlines, course evaluations, and anything related to teaching or service activities. Finally, developing the discipline of keeping an updated curriculum vitae can save time and frustration in the long run, and can ensure that all activities are recorded and no achievement is forgotten. Documented productivity and academic activities are critical to creating a well-presented tenure application dossier. The value of this exercise should not be underestimated.

Discussion

In addition to developing a strong curriculum vitae and application dossier, the following are several strategies that can support academics in achieving successful careers in academia.

Mentorship

Finding a mentor when first becoming Faculty can be extremely beneficial. This person can orient junior Faculty to the University's and department's expectations and to some of the politics and processes within which you will work and function. They can be a good resource for any questions you may have.

Work balance

It is important to establish priorities. A common faculty load, although varying by institution and program, may consist of approximately 40-60% research time, 20-40% teaching time, and 20% community service time. Given work place demands, academics may need to periodically reassess and recalibrate their work-life balance. Ensuring health and well-being is important.

Professionally, it can be easy to be distracted by activities that do not advance one's program of research. Continually coming back to focus on the backbone of academic work, such as publication and grant writing, ensures that time is spent on, and strategic focus is devoted to, the types of activities that often weigh most heavily in the evaluation of academic productivity. Many opportunities will present themselves on the path to tenure. Pausing each time to reflect on whether the activity will contribute in a meaningful way to the tenure application may be a helpful strategy. Being clear on the impact of one's work, and remembering the reasons for pursuing it, will assist in selecting activities that achieve both the goal of having an impact as a researcher and achieving tenure.

Relationships

Fostering collegial relationships and networking can lead to helpful and meaningful networks. These relationships often spur partnerships for scholarship, and these individuals further often come to know the individual and their work, track record, collegiality and substantive focus. These individuals also may be helpful in a tenure dossier, given their knowledge of the candidate, and may be willing to offer letters of support for tenure application packages. Therefore for multiple reasons, most notably, the opportunity to work together in building strong research agendas, it is important in becoming an engaged member of collegial teams.

Writing

Developing strong writing skills and a productive writing focus is foundational to a successful academic career. This can be fostered by blocking periods of protected time to focus on writing and advancing one's scholarship and research. When writing, it is important to keep in mind that the *quality* is important as is the *quantity* of written materials.

Conclusion

An academic career is a challenging and highly rewarding adventure! Careful and strategic navigation in pursuing and demonstrating impact and contribution in one's area of substantive interest requires concerted effort, focus and perseverance. Yet the journey is also rich in learning, growth and satisfaction.

Novel behavioral and computer-based therapeutics
Thursday March 7, 2013
10:30 am to 12:15 pm

1) Using an Adaptive, Non-Violent Videogame to Improve Attention and Executive Functioning in Adolescents with ASD
   Elizabeth Kelley, Rosaria Furlano, Layla Hall, Queen's University
2) A Metacognitive Training Program for High-Functioning Adolescents with ASD
   Shannon Johnson, Laura Goodman, Dalhousie University
3) Implementing Computerized Training for Cognitive Deficits in Children with Fetal Alcohol Spectrum Disorder
   Kimberly Kerns, Jennifer MacSween, University of Victoria
4) Anxiety Meter: Physiological Detection and Management of Anxiety in Autism Spectrum Disorder
   Evdokia Anagnostou, Tabitha Chiu, University of Toronto

Authored by Jennifer Ference[1], Anna Patten[2], and Veronica Smith
[1]University of Calgary, [2]University of Victoria, [3]University of Alberta

For this session, graduate students from universities across Canada presented their research on novel behavioral and computer-based therapies and assessments. These procedures were discussed as being used with children and adolescents with Autism Spectrum Disorder (ASD) and/or Fetal Alcohol Spectrum Disorder (FASD). By taking advantage of new and exciting advances in technology, these researchers have found methods that may assist in (1) the assessment of anxiety in these complex populations, (2) improve executive functioning abilities, and (3) enhance metacognitive skills. Finding methods that embrace the use of technology offers clinicians a novel way to engage their clients and bootstrap more traditional methods in practice.

First, Tabitha Chiu from the University of Toronto, supervised by Dr. Evdokia Anagnostou presented her talk titled "*Anxiety Meter: Physiological Detection and Management of Anxiety in Autism Spectrum Disorders*". Anxiety in ASD is highly prevalent and has a major negative impact psychological and physiological health; however, the diagnosis and treatment of anxiety in ASD remains complicated. The most common techniques to diagnose anxiety rely on self-report and difficult-to-observe behaviors, while introspection and self-awareness are relied on for treatment. To mitigate these challenges, the current study aimed to design a non-verbal anxiety meter for use with individuals with ASD. A pilot project was first conducted to measure the physiological symptoms of anxiety in patients with ASD. Anxiety was induced in participants while various physiological indicators of anxiety (e.g., heart rate, blood volume pulse, etc.) were measured. It was found that individuals with ASD had a higher basal heart rate compared with control subjects, which may indicate hyperarousal of the sympathetic nervous system in ASD. At present, an anxiety meter is being developed using an android tablet and wireless wearable sensors that will measure ECG (heart rate) and EDA (electrodermal activity). Future research directions include using this technology in conjunction with cognitive behavioral therapy, so as to make use of a biofeedback system whereby children may be able to control their anxiety using the indicator.

Second, Jenny MacSween from the University of Victoria, supervised by Dr. Kimberly Kerns, presented her talk titled "*Implementing Computerized Training for Cognitive Deficits in Children with Fetal Alcohol Spectrum Disorder*". Children with FASD have difficulties with attention, working memory, and executive functioning abilities. In the school setting, these difficulties can create knowledge gaps, impaired planning/completion of tasks, and inconsistent self-regulation of mood. Repeated failures in the classroom are

common and often lead these children to feel frustrated, angry, and helpless. By using neuro-rehabilitation methods, nervous system functions may be optimized for children with FASD. 'Process Specific Training' is one such form of intervention that is systematically designed to improve impaired processes through practicing new skills by utilizing neural plasticity principles. Research has shown that this form of training can actually change underlying brain functioning. Four key strategies for Process Specific Training were described: 1) working specifically on neural pathways thought to elicit certain behavior changes, 2) use repetition of newly learned skills, 3) use motivation and attentional saliency, and 4) thinking about this learning as a process over time, rather than a single measureable event.

Dr. Kerns' lab has designed a computer-based program that is aiming to improve cognitive deficits in children with FASD, focusing more closely on attention and working memory. This computer program is currently being tested on 50 to 60 children, ages 6-12 years, who are diagnosed with FASD or ASD. The program is being administered by Educational Assistants who receive online training around FASD and/or ASD, attention and executive function, how to deliver the intervention, and metacognitive/behavioral strategies. Online forums set up to enable EAs to speak to each other, and to post questions to research assistants who have experience providing the intervention. Finally, these assistants will collect behavioral information on how the child is progressing through the tasks. Overall, this project offers an exciting new means of treating significant problems in a largely neglected population.

Third, Rosaria Furlano and Layla Hall, from Queen's University under the supervision of Dr. Elizabeth Kelley, presented their talk on "*Using an Adaptive, Non-violent Videogame to Improve Attention and Executive Functioning in Adolescents with ASD*". Videogame use has increased considerably over the past 10 years and as technology continually improves, a fruitful area of investigation in treating ASD has emerged. Dr. Kelley's lab has developed one such game that was designed to increase attention and cognitive flexibility in children with ASD and ADHD. This game focuses on adaptive training of individual deficits and trains attentional breadth, control, and processing speed. At present, 40 participants aged 12-18 years are completing a trial of this videogame 'treatment'. Baseline cognitive, behavioral, attentional, executive functioning, and adaptive functioning information are being collected prior to treatment, which lasts for 30 minutes/day for 30 days. Following this training, participants will be tested again. Amazingly, this game has the ability to adapt to train the weaknesses of the children, as it is internet based. Further questions being asked by this group surround gaining a better understanding of the children's self-perceptions of their own competencies (over/underestimating) in various modalities (e.g., social situation), and testing whether this varies depending on the participants actual performance on specific tasks versus more global tasks. Finally, the current study aims to clarify the predictive relationship of executive function and attention with functional outcomes in children with ASD/ADHD.

Finally, Laura Goodman from Dalhousie University under the supervision of Shannon Johnson presented her talk titled "*A Metacognitive Training Program for High-Functioning Adolescents with ASD*". Perceptual and cognitive deficits in children with ASD can impact daily lives and are often under reported in youth. Accurately perceiving your own symptoms is also related to better outcomes in several disorders. She discussed research designed for training patients with schizophrenia on how to improve metacognitive awareness (Moritz and Woodward), which she adapted for high functioning individuals with ASD. She investigated whether these participants would actively engage in the metacognitive training and whether differences in mood would emerge. Seven sessions were administered, which involved interactive lectures, group activities, and discussion and concluded with each participant giving a final presentation about themselves to the group. In terms of outcomes, the self-esteem data remained unchanged, as well as the depression scores. Overall, however, they found that this form of intervention may increase metacognition skills in some individuals. Indeed all 8 of these participants reported having had a very positive experience and

enjoyed the interactive piece. Parents also enjoyed having the opportunity to meet with other parents. The authors concluded that metacognitive training is a feasible approach to improving specific skills.

In terms of the discussion, a common concern emerged, which was that computer-based interventions may take a child away from social interaction. This was viewed to be particularly problematic in populations where social interaction is most needed. Despite this common concern, it was pointed out that these games were never designed with the purpose to replace typical social-skill-building, face-to-face interventions. Rather, these interventions have been designed with the notion that technology is all around us and truly unavoidable, and that we can develop programs that will be more to our benefit than not. Indeed, these computer-program based interventions are not meant to replace traditional therapeutic approaches, rather they are meant to be used in conjunction with those approaches as a way of continually maintaining gains in a child's down-time, for instance, in a way that is appealing and rewarding to a child. Overall, these new approaches offer unique, advanced, and current tools that clinicians can use and easily integrate into their intervention programs for children with developmental disabilities who suffer from anxiety, as well as those who could benefit from improving their executive functioning and metacognitive skills.

Empirical Ethics and stakeholder engagement in child development research – perspectives from ADHD research

Dr. Ilina Singh, London School of Economics and Political Science
Friday March 8, 2013
8:45 am to 10:15 am

Authored by Tamara Germani[1], Danielle Levac[2], Lori Sacrey[1], and Fleur Macqueen-Smith[3]
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Dr. Singh works on the "VOICES [Voices on Identity, Childhood, Ethics and Stimulants] project". VOICES is special in that it asks children to join the conversation about stimulant drug use in children with Attention Deficit Hyperactivity Disorder (ADHD). VOICES speaks to many audiences, including philosophers, clinicians, sociologists, educators, and scientists.

Ethics Surrounding Stimulant Medications for Children

The US Presidents' Council on Bioethics (2003) stated, "what should concern us the most are the implications of inserting novel and precedent-setting use of drugs into child-rearing and educational practices … in all cases, the use of [behavior modifying drugs] raises serious questions concerning the liberty of children." (pg. 101). There are several bioethical concerns that surround the administration of stimulant drugs to children:

1. Undermine the emerging capacity for self-creation and sense of uniqueness (authenticity) – drugs may harm the ability of the child to decide who they want to be
2. Encourage children to give over responsibility for behaviour to a diagnosis (responsibility) – drugs promote an external reason for bad behaviour
3. By-pass decision-making in moral dilemmas (moral agency) – does stimulant medication affect knowing the difference between right and wrong?

The media accuses stimulation drugs of turning children into robots, zombies, or druggies. Dr. Singh was interested in testing these philosophical claims empirically, but when she broached the idea with philosophers, she heard that they did not use empirical research to test philosophical claims.

The field of empirical ethics research developed to examine ethical concerns and to incorporate ethics into practice by providing an evidence base for ethical concerns and claims. Empirical ethics investigates the relevance of ethical claims and concepts "on the ground" to inform health and education policy and clinical practices.

Parent's Perspective on Stimulant Medication for ADHD

There are many stereotyped ideas that surround children and stimulant drugs. A recent quote by Hanif Kureishi personifies these stereotypes:

> "…Ritalin and other forms of enforcement … are the contemporary equivalent of the old practice of tying up children's hands in bed, so they won't touch their genitals. The parent stupefies the child for the parent's good" (NY Times, Feb 2012).

Because of these kinds of media representations of children's experiences, Dr. Singh decided to talk to families about their children, to understand how parents decide to put their children on stimulant medication.

Early in her career, Dr. Singh published several papers on parental perspectives on stimulant use in children for the treatment of ADHD:

1. Singh, I. (2005). Will the 'real boy' please behave: dosing dilemmas for parents with boys of ADHD. *American J. of Bioethics, 5*(3), 34-47
2. Singh, I. (2004). Doing their jobs: Mothering with Ritalin in a culture of mother-blame. *Social Science and Medicine, 59*(6), 1193-1205.
3. Sigh, I. (2003). Boys will be boys: Fathers' perspectives on ADHD symptoms, diagnosis and drug treatment. *Harvard Review of Psychiatry, 11*(6), 308-316.

She used several qualitative research methods for these interviews: semi-structured questions and photo elicitation (having people look at photographs in a magazine, and choosing one that represents their feelings) as a framework to understand how American parents felt about their child's behavioural disorder. Mothers often chose a picture of a roaring dinosaur to describe their inability to manage their child, causing them to feel like bad mothers. Fathers often felt that their child was just showing a lack of motivation ("what's *wrong* with you?") and that the mothers were overreacting about the child's behaviour. Interestingly, after a diagnosis, fathers "owned" the disorder and thought that they gave their child the genes for ADHD. Both parents report guilt and shame following the diagnosis.

Ironically, the parents used the diagnosis as an excuse to strategically get access to teachers and services for their child. In other settings, they were much more hesitant, especially surrounding medication decisions (e.g. only put them on medication on weekdays and abstain on the weekends so the child could be "more him- or herself"). Although she found these studies valuable, Dr. Singh said she then wanted to explore the children's perspective on stimulant drug use and how they were actually functioning with the diagnosis.

<u>VOICES - Children Join the Debate on Stimulant Medication</u>

The VOICES studies recruited three groups of children to interview concerning their perspectives on taking stimulant drugs for ADHD: 1) children diagnosed with ADHD and taking stimulant medications; 2) children diagnosed with ADHD and not medicated; , and 3) children without a psychiatric diagnosis. The population consisted of 151 participants recruited from both the UK and the US between 2008 and 2010. Children were between the ages of 9-14, approximately 70% were boys, and most were white and lower middle-class. The interviews were designed around questions of authenticity, moral agency, and personal responsibility (ethical concerns). In addition, the characteristics of childhood were examined, including schooling expectations, peer relationships, ADHD stigma, and family relationships.

Children were interviewed for an hour, and interviews were taped. During the hour, they were asked semi-structured questions, discussed standardized pictures, made drawings of their brains, did sentence completion activities and ordering tasks, and discussed vignettes. Dr. Singh took care to quantify parts of this qualitative interview process, so that her results would be more acceptable to those in many quantitative circles.

The main finding of the VOICES study was that children were not hijacked by the stimulant meds. The claims of the ethical harms were largely unsupported and the children felt the drugs were doing them good, and would prefer to take them than not, although ideally they would prefer not to have ADHD. One of the children said: "[t]he medicine is supposed to help the parts that don't behave well… behave better." The

biggest complaint children had with taking medication was its side effects, not the "loss of their authentic self", which had been identified in ethics literature and the media as a major concern. When the children were asked if they would rather take something else for ADHD, they said no, but the older children did want more say in the dosing decision.

Conduct Niche and Performance Niche

Dr. Singh reported that the experiences of children with ADHD in the UK and the US differed. Children in the UK thought that ADHD was "anger" and "aggression." One child said, "ADHD is like temper, kids who are really aggressive." In addition, the children in the UK thought that ADHD meant that you were dumb, "you're slow, not bright." Children in the US thought ADHD was a disorder of academic performance, and medications were designed to treat classroom-oriented performance. This highlighted the difference in the goals of ADHD treatment. In the US, the focus is on "doing well" and "successful children", which Dr. Singh identified as a *performance niche*, with an emphasis on academic successes, achievement, and classroom behaviour. In the UK, the focus is on "behaving well", with children with ADHD labeled as "naughty children", which Dr. Singh identified as a *conduct niche* with an emphasis on appropriate social behaviour and social hierarches.

The division of niches highlighted the importance of considering the environmental influences on ADHD behaviour. Almost all conduct niche (UK) children discussed bullying and aggression as part of daily school experiences. Dr. Singh also described the "culture of aggression" in UK schools. Children with ADHD are targeted for bullying; it is often a game for other children to try and make them lose their temper. She said that children would try various ways to get them angry, and if unsuccessful, they would then say something negative about the child's mother, which usually prompted an angry response.. The children attempt to deal with the bullying by trying to calm down when someone tries to make him or her angry or transferring to another school. Treating the "bad behavior"' by "upping the dose" dismisses the whole point of what is actually happening to create the behavioural symptoms (i.e., targeted bullying).

In the US (performance niche), the children viewed having an ADHD diagnosis as "no big dealas this is what they heard from people around them. Parents and teachers avoided talking about ADHD, and parents reassured children that there was nothing wrong with them. Dr. Singh explained that part of this stemmed from peoples' fears about the stigma that could come from being labeled with ADHD, so it was best not to talk about it. However, she found that this was problematic for children, because they ay not understand what ADHD is, and feel that they cannot ask about it. When asked what ADHD was, US children were quoted to say, "cancer disease, my brain is rotten," "like something is wrong with [my brain]," and "ADHD is all about kids having to take medicine, controls kids who can't stay in school." One child thought that the pill they took for ADHD was "the ADHD"; others thought they were vitamin pills.

Concluding Thoughts and Additional Resources

The focus groups of children with ADHD wanted others to know that they are not lazy, stupid, crazy, or bad. From the interviews, the children identified three key concerns surrounding their ADHD diagnosis:

1. They want to be able to think before they act (not so impulsive)
2. They want to be able to talk about their ADHD with someone
3. They want to be able to stop taking medication at some point

Dr. Singh also found that children have developed many non-drug ways of managing their behavior, which is largely unreported in the literature, with its focus on medication. As well, she noted that physical

education teachers were excellent with ADHD children, as they were very good at managing large groups of rambunctious kids.

In her 2012 paper *Not robots: children's perspectives on authenticity, moral agency and stimulant drug treatments* in the Journal of Medical Ethics, available through Open Access[i], she discusses "children's reported experiences with stimulant drug treatments for attention deficit hyperactivity disorder in light of bioethical arguments about the potential threats of psychotropic drugs to authenticity and moral agency." She notes in this paper, and did in her talk that very few children see medical professionals as a "resource to talk to about difficult issues in relation to their diagnosis or treatment," something she identifies as a clinical, societal and ethical concern.

Dr. Singh recommends taking an "eco-bio-developmental" model to inform approach to the care of children with ADHD (ecology becomes biology, and together they drive development across the lifespan[ii]).

She concluded the talk by showing one of the animated videos her team developed to share children's voices, on visiting the doctor (online at: http://www.adhdvoices.com/adhdvideos/doctors.shtml). This is one of a series of videos that share the study's findings using the voices of children interviewed. The VOICES team also developed a plain language final report, and a longer film of all the short videos, "ADHD and Me." All of these resources are available on the VOICES website at: www.adhdvoices.com.

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[1] Available through Open Access at: http://jme.bmj.com/content/early/2012/08/27/medethics-2011-100224.short

[1] See the American Academy of Pediatrics' description and model for more information: http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/EBCD/Pages/Eco-Bio-Developmental.aspx?nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token

Sleep disorders as a commonality to Neurodevelopmental disorders

Friday March 8, 2013
10:30 am to 12:15 pm

1) How mouse models, genomics, and new technologies can inform our understanding of sleep and the pathological consequences of disrupted sleep
   Dr. Bruce O'Hara, University of Kentucky
2) Waking Up to the Consequences of Inadequate Sleep in Children
   Dr. Penny Corkum, Dalhousie University

Authored by Jamil Jivraj[1], Julie Longard[2], and Shannon Johnson[2]
[1]University of Alberta, [2]Dalhousie University

Background Information on Sleep Disorders

- **Causes of Poor Sleep:** Sleep disorders and lifestyle factors
- **Sleep Disorders**
  - Present in ~30% of children and ~40% of adults
  - Usually diagnosed in the context of other health problems
  - DSM-5 focusing on insomnia, hypersomnia, and arousal disorders instead of dysomnias and parasomnias
  - **Insomnia:** difficulty falling or staying asleep
    - Most common sleep disorder
    - A child may be sleeping less than average, but you need to see the impact of the sleep disorder to make a diagnosis of insomnia
    - May be more of a problem of the environment than a disorder (e.g. not getting to bed on time due to environmental reasons)
- **Lifestyle Factors**
  - Individuals sleeping 1hr less over the past century, which impacts daytime functioning
    - Reasons: electronics, sleep not seen as a priority, extra-curricular activities, social activity, and school start times
    - This results in *social jet lag* (it takes time to adjust to sleep deprivation after staying up late on the weekend and needing to get up for school on Monday)
    - This also increases *sleep debt* (homeostatic build-up of need for sleep)
  - Many children are chronically sleep deprived
- **Measurement of Sleep**
  - **Polysomnography** (PSG): multiple electrodes over body, conducted in a sleep lab
    - Children with ASD can be sensitive to electrodes (possible to do with children with disabilities but special considerations are needed, including increased staff)
    - Gold standard but not as ecologically valid because children are out of their home environment
  - **Actigraphy**: tells how long child is asleep or awake, ecologically valid because it is done at home and can be done over multiple nights
    - Some children with ASD are uncomfortable wearing watch at night, but can put soft fabric behind it
  - **Sleep Diary**: can be done by parents about child's sleep
  - **Questionnaires**: asking parents to report on their child's sleep over the past month
- **Sleepiness**

- Lack of sleep can effect cognition/learning (e.g. children who sleep the least have the lowest academic outcome), mental health (e.g. poor sleep can precede mental health issues), physical health, and quality of life

- **Sleep Manipulation Studies**
  - Research findings show adults have significant impairments based on sleep restriction. especially in mood, sustained attention, and executive function (which are important for ASD)
  - Research with children is mostly correlational, but shows similar findings

Study 1: Sleep Manipulation in Typically Developing Children

- Naturalistic sleep deprivation
- Looked at sleep quantity and quality using actigraphy and sleep diaries
- N=32 8-12 year olds
- **Within-Subjects Design**
  - Collected information about typical sleep then randomized participants into either restricted then extended or extended then restricted sleep, then came into lab and completed numerous measures
- **Findings**
  - Children sleeping about 8.9 hours per night
    - Healthy children with no problems already in somewhat sleep deprived state
    - Children sleepy based on child, parent, and research assistant accounts
  - **Emotional Functioning**
    - Showed children stimuli and asked them to rate emotional response to the picture
    - Children in sleep restricted condition were flatter in their emotional reactivity
    - But parents reported they had more difficulty regulating negative emotions
      - Parents reported more temper outbursts, reactivity, emotionality, etc.
      - Connection between sleep problems and developmental disabilities
  - **Memory**
    - Child had to repeat back patterns
    - Performed worse on both short-term and working memory when sleep restricted
  - **Executive Functioning**
    - Child had to draw a line between letter and number sequence
    - Restricted and weaker executive functions and more inattention when sleep restricted
  - **Academics**
    - Child had to answer many easy math questions in a short period of time
    - Answered fewer questions correctly when sleep restricted
- **Conclusions**
  - Children not sleeping the recommended amount
  - Significant impacts based on only 1 hour of sleep deprivation per night
  - Children did not report any of these problems

Background Information on Sleep in Children with Neuro-Developmental Disorders (NDD)

- No research in this area but we expect to see a greater effect of sleep issues in this population
- Parent's sleep health is also effected by child's sleep problems and this relationship may be exacerbated in families who have children with NDD
- **Sleep and Mental Health Disorders/NDD**
  - Very little research in this area but some studies using questionnaire data

- Average prevalence rates: Anxiety ~85%, Depression ~75%, ADHD ~70%, ASD ~70%, FASD and CP unknown
- Depends on how and who is reporting, and if studying intrinsic sleep problems or insomnia

- **Importance of Sleep**
  - Sleep problems puts individuals at risk for mental health problems, can exacerbate existing problems, and can confuse the diagnostic picture
    - e.g. children with sleep apnea can look like they have ADHD – need to be careful when doing assessments to make sure these are addressed
  - If child is well-rested other interventions will likely be more successful
- **Another Important Consideration**
  - Corkum et al. did blinded trial using PSG and found that the placebo group was lower than the medication group – medication group taking longer to fall asleep, which reduces their sleep duration as well
  - It reduces the sleep period, but the percentage of sleep at each stage was maintained
  - Important for ADHD and other NDD, such as ASD
- **Treatment of Sleep Problems**
  - Usually treated with medication, even in children
  - Children with ADHD more likely to receive medication for sleep problems
  - Lack of efficacy for medication – short-term treatment
  - Behavioural treatments are preferred by parents and highly effective
  - Most of the research done with young typically developing children
- **Barriers**
  - Gap between what we know works and what we do
  - Physicians get about 1 hour of sleep training, which is mostly focused on adults
  - Few interventions available
  - Sleep problems are seen as a daily hassle and parents may be criticized for thinking it is an issue
- **Limitations**
  - Little research in older typically developing children and children with NDD
  - No studies with FASD or CP
  - Most studies do not use objective measures
  - Need to evaluate delivery models and long-term efficacy

Study 2: Intervention Study with Children with ADHD

- **Design**
  - Randomized controlled trial of Better Nights/Better Days Program
  - Recruited healthy children with insomnia (trouble falling and staying asleep)
  - 1/3 had ADHD, 2/3 typically developing
- **Sessions**
  - Distance treatment supported by coaches
  - 5 sessions:
    - 1) Information about sleep – understand why certain recommendations are made to motivate parents
    - 2) Promoting good sleep habits – sleep hygiene and bedtime routines
    - 3) Learning strategies to promote good sleep
      - Faded bedtime: put child to bed at a time when they are tired, if they do not fall asleep take them out of bed for quiet activity – this pairs sleep and bed so the two are associated – slowly back it up until they meet the target time

        - Reward program
    - 4) Starting the faded bedtime and reward program
    - 5) Fine tuning and fading the program - how will you know when you reach your goal and how will you fade the intervention
- **Participants**
    - Treatment N=26, Waitlist N=28, matched for age, sex, and ADHD
- **Child Sleep Habits Questionnaire**
    - Developed by Judy Owens, most widely used, norms from children aged 2 years to teenaged
    - All children having trouble at baseline, but treatment group showed improvements in sleep onset and duration
- **Actigraphy**
    - Children poorly matched at baseline, but treatment group showed improvements in sleep onset and duration
- **Child Behaviour Checklist**
    - Parents rated improvement in externalizing and internalizing behaviours
- **Analyses by Group**
    - Children with ADHD responded similarly to typically developing children
- **Treatment Satisfaction**
    - Parents reported that this study did not give them new information, but the step by step approach and distance support from the coach was very helpful

Study 3: Treatment of Sleep Problems in Children with ASD

- N=3 children with ASD, 8-9 years old
- Goal: to reduce sleep onset delay
- Measures: actigraphy, sleep diaries, CSHQ, CBCL, satisfaction questionnaire
- Modified the intervention so rewards were more immediate and salient, and thought about what to do during quiet time because children with ASD could become preoccupied with a so-called boring activity and have difficulty transitioning
- **Results**
    - All children responded well to the intervention and had improvements in sleep onset but not duration
    - Improvements in CBCL and after treatment
    - Parents less satisfied than in the previous intervention because it was a lot of work
        - Very demanding, difficulty finding rewards and quiet activities that were successful, so sessions extended beyond the original 5 week timeline, moved at slower pace
- **Conclusion**
    - Promising intervention but need to look at more diverse sample of ASD

Take Home Messages

- Sleep is important for learning, physical and mental health, and general well-being
- We need to consider sleep when conducting assessments and treatment planning
- Need to conduct more research on sleep in children with NDD

Questions from the Audience for Dr. Corkum

Question 1: You reported that 94% of interventions produce better sleep. Were they similar behavioural interventions?

Response 1: They were all sleep interventions; most were focused on insomnia, but using different behavioural strategies. When you look at the literature, most sleep problems are behaviourally and not intrinsically based. It can be challenging to get children, especially with NDD, to get to sleep. Most children's sleep problems are behavioural and they respond to behavioural interventions, even while on Ritalin.

Question 2: Beth-Ann Mallow did behaviourally-focused child-friendly intervention which considered medical issues, published through Autism Speaks. She has a similar program showing a behaviourally-based program for ASD can be effective. We need to find resources to make it available. Providing it online would be wonderful.

Response 2: Beth's research is in line with ours, and Shelly Weiss helped us develop our intervention. Other medical issues need to be addressed. We need health professionals trained in sleep to make sure we are treating the right thing.

Questions from the Audience for Drs. Corkum and O'Hara

Question 1: Are there studies to explain the relationship between falling asleep and staying asleep as well as treatment implications?

Response 1 (Corkum): In children, the research says if you treat the sleep onset problems, you tend to treat the night awakening problems because the issue is that children have trouble self-soothing into sleep. Treating sleeping problems at the beginning of sleep may help children generalize. However, night awakenings could be caused by other factors, such as seizures, which need to be addressed.

Response 1 (O'Hara): In adults this is not true. They can usually go to sleep but awake in the night for other issues, such as body temperature. Therefore, treating difficulties falling asleep does not help adult clients stay asleep.

Question 2: Beth Mallow's studies have found that about 30% of children do not respond to treatment, which is a large number. At least 9 studies in ASD show melatonin abnormalities. If you had a circadian rhythm disorder, would you expect behavioural interventions to work? And if you had a behavioural disorder, do you think melatonin could work?

Response 2 (Corkum): We should think of behavioural interventions as the first line. However, a sizeable minority do not respond to behavioural interventions. Therefore, a 2-stage treatment approach using sleep hygiene intervention followed by melatonin is recommended as this found high success.

Response 2 (O'Hara): Light therapy could be used with children who have ASD to help kick start a circadian rhythm.

Question 3: Pat Mirenda and Joe Lucicien at UBC have been doing a positive behaviour support program including graduated extinction, and they found that many families cannot do the procedures at night when the parents are tired no matter how much information and training they have. But when sleep coaches go into the home for the first couple of nights and help support the parents, they find much higher success with behavioural treatment. When you see that 30% of children do not respond to behavioural treatment, it may be that the interventions are not implemented by parents with fidelity.

Response 3 (Corkum): When looking at how to develop sleep services, it is important to consider how we can assess what service level the child needs. Many families can use web-based intervention, but others need telephone intervention during the night, and others may need more support. You don't want to spend too long on any one level and frustrate the family. 5 weeks is probably an appropriate amount of time.

Response 3 (Mirenda): Duran has both parent and coach workbooks. He has a book called 'Sleep Better'. You sometimes have to get in there and show parents how to do it!

Mental Health Comorbidities in neurodevelopmental disorders
Friday March 8, 2013
1:30 pm to 3:30 pm

1) Mental Health problems in youth with ASD: A review of the literature and considerations for future research
   Dr. Jonathan Weiss, York University
2) Mental Health Issues in Fetal Alcohol Spectrum Disorder
   Dr. Gail Andrew, University of Alberta
3) The need to be flexible. Implementing the new from bench to practive. And you mentioned Resources?
   Dr. William Mahoney, McMaster University

Authored by Ainsley Boudreau[1], Irene Drmic[2], Michael Stolte[3], and Elizabeth Kelley[4]
[1]Dalhousie University, [2]McMaster University, [3]University of Alberta, [4]Queen's University

1) Mental health problems in youth with ASD: A review of the literature and considerations for future research. **Jonathan Weiss, York University**.

Anxiety, depression, anger/conduct, and attention are common co-morbid concerns at tremendous cost for children, families, schools, and the community at large. UK National Autistic Society (2010) – You Need to Know (recommended KT document)

- Parsing out ID from ASD has been a historic problem in identifying comorbid rates
- Totsika et al. (2011a); 5-16 yrs. old compared typical population with ASD and ID (84% to 19 hyperactivity; 64 to 22 conduct problems; 74 to 18 for emotional problems). Having an ID increased odds of having comorbid difficulties, ASD even more.
- Totsika et al. (2011); 5 yr. old children, longitudinal followed, if ASD and ID also demonstrated increased mental health risk relative to comparison group
- Simonoff et al. (2008) used semi-structured interviews for psychiatric conditions; 70% of 10-14 year olds had at least one psychiatric disorder; 38% met 3 or more psychiatric disorders; anxiety was highest (42%), oppositional defiant (28%) and ADHD (28%); those with ADHD, 82% had a secondary diagnosis.
- Leyfer et al. (2006), 109 5-17 yrs with ASD: high comborbid concerns with ADHD, phobia, depression and OCD most prevalent
- Adolescents with ASD – higher internalizing symptoms self-reported (Hurtig et al., 2009) though parents reported both internalizing and externalizing symptoms

Anxiety – suggested prevalence rate is 42% (range 11-84%); high variety due to way construct is operationalized, measured, and population sub-type.

Other correlates of ASD:

- Gastrointestinal, epilepsy, sensory over/under responding
- IQ has a small relationship with oppositionality and is negatively correlated with hyperactivity
- ASD severity has a mixed profile, may be moderator variables such as social ability and awareness

Future research:

- Need to discern risk factors from risk modifiers; the antecedents of mental health issues
- Need to discern environmental factors as they interact with ASD symptoms

- Need to distinguish the temporal aspects of mental health, and seek underlying common mechanisms that may be expressed through mental health
- Need to move towards mental wellness / health as a target to move towards preventative medicine rather than reacting to symptoms (example provided through Lerner et al., 2011)

Recommended mental health blog being launched: Asdmentalhealth.blog.yorku.ca

2) The need to be flexible. Implementing the new from bench to practice. And you mentioned resources? **William Mahoney, McMaster University.**

- Look at beliefs, practices, and barriers that interfere with the implementation of real world clinical practice.
- 15% of children have a diagnosable mental health disorder but only 15% of those children get treated.
- There has been an increased awareness of mental health disorders, although funding for services has been reduced.

ADHD (MTA Cooperative Group, 1999)

- We know parent training helps reduce symptoms, particularly for children who display oppositional behavior; however, medication is still a first line defence.
- Children have better outcomes if parents view children positively, are confident, have appropriate parenting skills etc.
- Children have poor outcomes and are at risk for conduct disorders if parents display hostile emotion, emotional over involvement, critical comments, and self-blame.
- What doesn't work well: office-based social skill training, play therapy, cognitive therapy, 1:1 therapy.
- There is evidence that children with ADHD benefit when their parents receive telehealth training from paraprofessionals (McGrath et al., 2011). This is a promising treatment approach that increases access for families living in rural areas.

Learning Disabilities

Poor readers / children with learning disabilities (LD) are at risk for many concerns (lower graduation rate, increased mental health disorders, decreased quality of life etc).

- At 5-7 years of age children with LDs are still reported to be happy and motivated; however, by the time they are teenagers they tend to be sad, discouraged, and have a more negative life outlook.
- We need to screen and intervene proactively (Response to Intervention; RTI), rather than wait for children to fall behind significantly ("wait to fail" method). Diagnosing LD before we treat doesn't always work well.
- We need to focus on early intervention and transitional planning.
- Recommend screening all 5-6-year-olds.
- There are some genetic contributions to LD.
- There is evidence that systematic, intensive, and explicit phonics-based reading intervention can improve reading ability and neurological functioning (Simos et al., 2003).

Tourette's Syndrome

- First line is often medication.

- Cognitive behavioral therapy (CBT), including relaxation training, is also useful for reducing tics. However, a remaining issue is how do people access this service?

Intellectual Disabilities

- Maladaptive behaviors are learned or inappropriately reinforced.
- Genetic contribution: not all behavior is learned; behaviors may be an indicator of an underlying problem (e.g., gaze aversion, anxiety, picking, etc).
- Behavior management needs to take phenotype into account.

Takeaway:

- We need to give up on what is less effective and focus on what is more effective.
- We need to empower communities to provide evidence-based interventions.
- We need to also implement preventative mental health strategies for children with neurodevelopmental disorders.

***3) Mental health issues in FASD*. Gail Andrews, University of Alberta.**

Lots of complexity as alcohol exposure already puts an individual at heightened risk for mental health concerns. Genetic factors are also a contributor (mental health, LD in parental lineage). Hard to partial out multi-generational FASD from inherent ability without the alcohol exposure. Additional concerns include possible exposure to adverse pre and post natal factors, and other psychosocial stressors.

Other diagnosis common (ODD, CD, ADHD) without reference to FASD; children may not present as having difficulties until the school years. Adaptive skill deficits may be masked through a supportive care system, often not apparent until transition in adolescence or adulthood, and this often depends on family functioning or government supports.

Longitudinal data is poor, though we do know mental health presents early, and IQ doesn't define FASD.

Pei et al. (2011): high levels of internalizing and externalizing problems; multifactorial influences; paper concludes a need for early screening and access to early intervention. Other studies:

- 63% had 1 or more psychiatric disorder (13 years+)
- 97% had Axis I disorder (12 years+)
- 87% psychiatric disorder (5-13 years), often mood disorders
- 8 year old sample; most common disorder was ADHD; Axis I diagnosis
- 60-95% have ADHD as secondary diagnosis, though presents somewhat differently than classic ADHD (more rooted in executive functioning deficits); often presents earlier, compounded by sensory processing difficulties and chaotic environments
- Only 6 studies on using meds with FASD and ADHD – these children do respond differently to stimulants; some children are getting treated with anti-psychotics when the environment should be the intervention target
- Conduct disorder is higher in FASD population (55% vs 7% controls; 10-18 years)
- Anxiety and mood disorders are higher in FASD population (up to 92%)
- Adults – increased risk as they age for poor quality of life, increased suicidality risk, and Axis 1 and 2 disorders; increased misuse of substances; this is moderated by genetics, life experience and stress exposure growing up including both risk and protective factors

Intervention

- Need to look at evaluating intervention programs for long term effectiveness; good interventions include parent training, enriched environments, matching interventions to brain impairment profile (rather than diagnostic profile) – particularly for generalizability into under-served areas
- Need to also look at the child welfare system and schools for training in terms of cost-effectiveness

Glenrose Study

- Compared FASD and pre-natal exposed population – tended to have similar needs in terms of foster care placements, exposed to neglect & violence, poor quality homes, etc.; as well as internalizing and externalizing problems
- FASD: High rates of ADHD, suicidal thoughts, and then other mental health concerns. 87.5% had comorbid mental health concerns. Other issues were problems with the law and adaptive functioning.
- Age of diagnosis, parent medication use associated with mental health problems
- Early age of diagnosis associated with fewer mental health concerns
- Services – parents got educational supports, but not access to behavioral interventions
- 35% of those with FASD – documented sleep disorders

References

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Offord, D.R., Boyle, M.H., Racine, Y. A., Fleming, J.E., Cadman, D.T., Munroe Blum, H., … Woodward, C.A. (1992). Outcome, prognosis, and risk in a longitudinal follow-up study. *Journal of the American Academy of Child Psychiatry, 31*, 916–23.

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Strategies for advancing genetic discover in neuropsychiatric disorders through systematic study of phenotypes

Dr. Russell Schachar, The Hospital for Sick Children
Saturday March 9, 2013
10:30 am to 12:15 am

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1. **The future of developmental science: Phenotypes**

   The topic of developmental science was introduced, and phenotypes were suggested as the rate-limiting factor in advancing our understanding of neurodevelopmental disorders. Phenotypes are characteristics in an organism that emerge from the combination of genetics and the environment. Phenotypes are useful as measurable characteristics that, when identified, can be linked back to the genotype to establish genes responsible for contributing to a particular disorder. There are two levels of analysis in phenomics: behavioural and cognitive. In neurodevelopmental disorders (NDDs), possible phenotypes stem from a mix of rare and common mutations that are influenced by the environment, and produce a range of behaviours and symptoms. NDDs have high heritability (even higher than some medical conditions), so they are good candidates for this type of research.

2. **Problems with NDD phenotyping thus far:**

   - Small sample sizes
   - Incomplete coverage of existing methods (whole genome sequencing)
   - Research has been based on the presence or absence of DSM disorders, which may not be informed by genetics
   - NDDs are not directly observable (as is the case with variables such as weight or height), but are latent traits (i.e., can only be assessed with questionnaires or interviews) or constructs (i.e., 'attention', 'obsessions'), all of which are more difficult to measure
   - We assume that if we are looking at a latent trait, the measurement is reliable, valid, and that variants are related to these latent traits. However, instruments previously used for phenotyping have led to high measurement error due to the inclusion of ambiguous or vague items, wording that includes confusing double negatives, jargon, or compound items
   - Researchers often lump across trait dimensions, further decreasing reliability
     - It is more likely that a trait is made up of many items that are differently weighted and error bound
     - We do not know if latent traits are made up of multiple or single traits

3. **What can we do at the behavioural phenomic level to improve this situation (i.e., to develop informative phenotypes)?**

   - Item-level data (e.g. answers to individual questions on measures) must be made available
   - Studies must be informed by issues of heritability/familial clustering
   - Individuals should be clustered into informative groups
   - Tools to look at genomic and phenomic types of data together are needed
   - Take Home Message: Behavioural phenotypes are difficult to identify and are very expensive

4. Proposed criteria for identifying endophenotypes in future research

To date, most individual difference research has used behavioural measures that are based on loss of function analysis and educational prediction. However, genes are unlikely to affect function to the same extent as brain damage. Therefore, Dr. Schachar proposed using aspects of *cognition* as an endophenotype. He proposed using the following as a priori criteria by which to judge candidate endophenotypes:

- Must be psychometrically sound and reliable – norms are needed
- Associated with disorder
- Heritable (family and twin studies)
- State independent (remain stable even if child gets better or worse)
- Feasible

Alternatively, it is not required that:

- They be disorder-specific, as genes do not appear to be disorder-specific
- They be sensitive and specific diagnostic markers. It is more likely that there are biological pathways increasing risk for NDD, in general, than there are specific paths.

5. Example of an endophenotype that meets this criteria

Dr. Schachar described the Stop Signal Task, which requires the participant to press one button when they see an 'x', a different button when they see an 'o', and to stop when they hear a tone. This task measures inhibitory control, and could be a good candidate for an NDD endophenotype, as it meets all of the recommended criteria (see above). Please see the following studies for more information:

- Chevrier, Noseworthy, & Schachar, 2007
- Crosbie et al., In Preparation
- Cummins et al., 2011
- Eagle, 2007
- Goos, Crosbie, Payne, & Schachar, 2009
- LeBlanc et al., 2005
- Lipszyc & Schacher, 2010
- McAuley et al., Under Review
- Schachar, Forget-Dubois, Dionne, Biovon, & Robaey, 2011
- Soreni, Crosbie, Ickowicz, & Schacher, 2009
- Tannock, Schachar, & Logan, 1995

6. What will it take to advance the field?

- Identify other putative endophenotypes (e.g. meta analysis of Go/No-Go task)
- Text-mining of existing clinical and genetic studies in the literature
- Collaboration (e.g. having a genetics consortium) for larger samples
- Task development

        - There is standardization on these tasks in some areas, but there is an urgent need to create a toolbox of measures that are standard and can be widely used - if appropriate tasks do not exist, we need to develop them
        - Standardization and evaluation against endophenotype data
        - Translation into practice
- Modeling of multivariate phenotypes linking cognitive processes and behavioural phenomena
- More research on twin or family studies
- Population-based genomic-phenomic studies
- Multi-stage online phenotyping