CONTRASTS IN FASD AND ASD:
A CLINICAL PERSPECTIVE FROM BC'S PROVINCIAL DIAGNOSTIC NETWORKS

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OBJECTIVES

Attendees will be able to:

- Describe the similarities and differences in social communication between ASD and FASD.
- Understand the neuropsychological overlap between FASD and ASD
- Reflect on clinical experiences in a large assessment network addressing dual query ASD and FASD in children and youth.

PRESENTER DISCLOSURES

- Dr. Armansa Glodjo
  - None
- Jamie Hack
  - None
- Dr. Kelly Price
  - None

NEURODEVELOPMENTAL DISORDERS

- Can have some overlapping features
- Generally distinguishable from each other
- Clusters of clinical features
- Known or unknown causes
- Genetic copy number variants or single nucleotide polymorphisms
- Can confer health condition state (i.e. genetic change = health condition)
- Can confer health condition risk (i.e. multiple 'hit' hypothesis)
- NOTE: Traits ≠ Disorders
- Should be supported based on severity of functional impairment, not diagnosis!

FETAL ALCOHOL SPECTRUM DISORDER

- Set of significant impairments associated with established presence of alcohol during fetal development
- Spectrum of impairments (physical/anatomical, neurodevelopmental)
- No amount of alcohol exposure to the fetus during pregnancy can be considered safe
- There is no safe trimester to consume alcohol
- All forms of alcohol have a similar risk to the developing fetus
- Binge exposure poses a dose-related risk to the developing fetus

Williams JF, Smith VC; Committee on Substance Abuse. Fetal alcohol spectrum disorders. Pediatrics. 2015;136(5).

AUTISM SPECTRUM DISORDER (DSM-5)

- A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by all of the following, (currently or by history):

  - 1. Deficits in social-emotional reciprocity
  - 2. Deficits in nonverbal communicative behaviors
  - 3. Deficits in developing, maintaining, and understanding relationships

AUTISM SPECTRUM DISORDER (DSM-5)

- B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following (currently or by history):

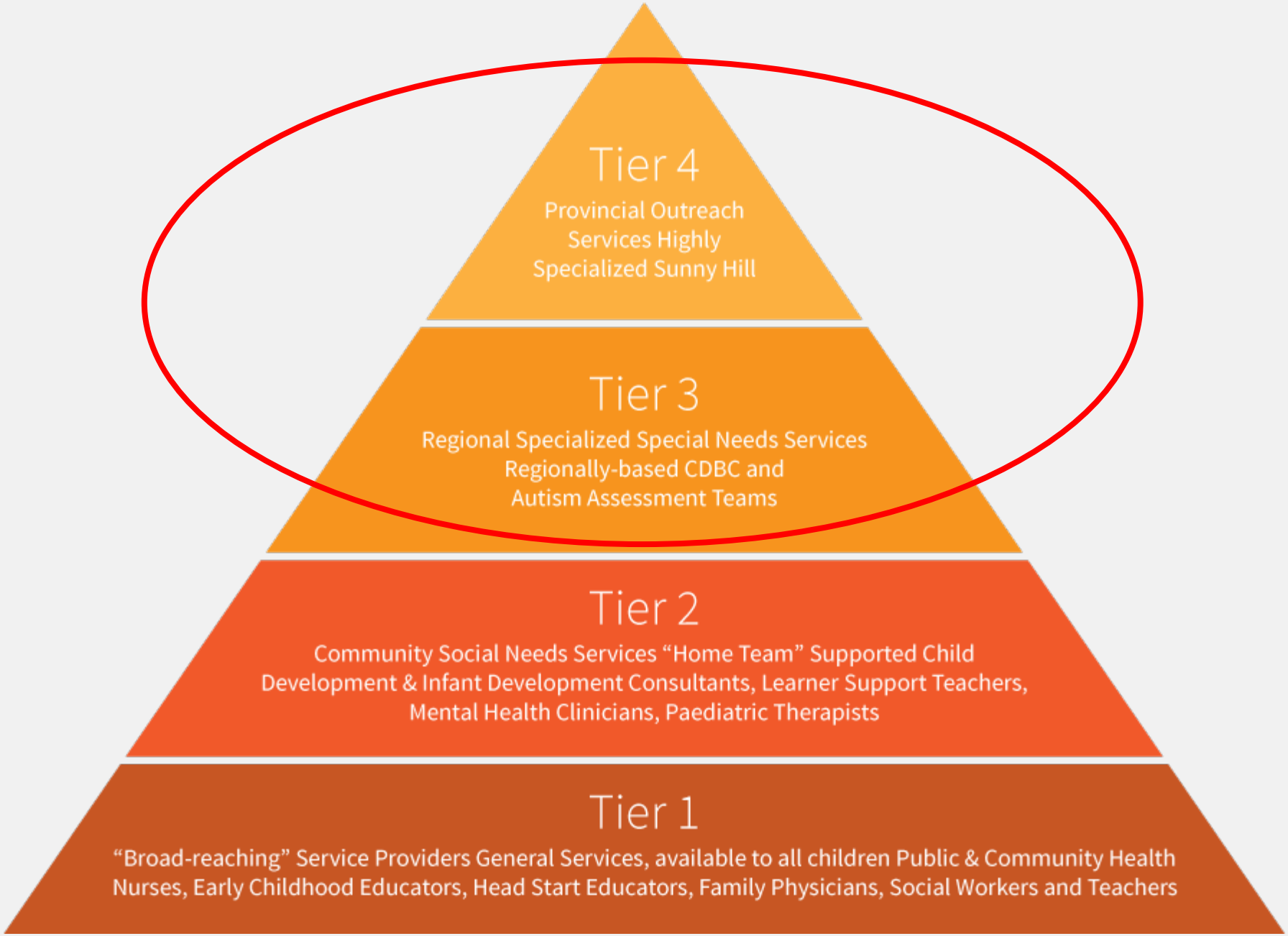
  - 1. Stereotyped/ repetitive motor movements, use of objects, or speech
  - 2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior
  - 3. Highly restricted, fixated interests that are abnormal in intensity or focus
  - 4. Hyper/ Hyporeactivity to sensory input or unusual interests in sensory aspects of the environment

AUTISM SPECTRUM DISORDER (DSM-5)

- 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 (intellectual developmental disorder) or global developmental delay. Intellectual disability 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.

NEURODEVELOPMENTAL DISORDERS

- Require assessments by experienced individual clinicians and/or by experienced multidisciplinary clinical teams
- Diagnostic assessments include causative and functional investigations
- BC: require Tier 3 services (regionally located specialized services) and/or Tier 4 services (unique specialized services located in centre(s) of excellence)


Tier 4
Provincial Outreach
Services Highly
Specialized Sunny Hill
Tier 3
Regional Specialized Special Needs Services
Regionally-based CDBC and
Autism Assessment Teams
Tier 2
Community Social Needs Services “Home Team” Supported Child
Development & Infant Development Consultants, Learner Support Teachers,
Mental Health Clinicians, Paediatric Therapists
Tier 1
“Broad-reaching” Service Providers General Services, available to all children Public & Community Health
Nurses, Early Childhood Educators, Head Start Educators, Family Physicians, Social Workers and Teachers

BRITISH COLUMBIA'S PROVINCIAL DIAGNOSTIC ASSESSMENT NETWORKS

- Diagnostic teams in all BC health authorities
- BC Autism Assessment Network (BCAAN)
  - Established in 2003; initial year funded for 150 assessments
  - 2017/18: ~ 3800 new referrals/yr; ~ 2100 assessments/yr
  - All assessments informed by gold standard instruments (ADOS-2 and ADI-R)
- BC Complex Developmental Behavioural Conditions Network (CDBC)
  - Established in 2006
  - 2017/18: ~ 2000 new referrals/yr; ~1100 assessments/yr
  - Single clinician or multiple clinician assessments

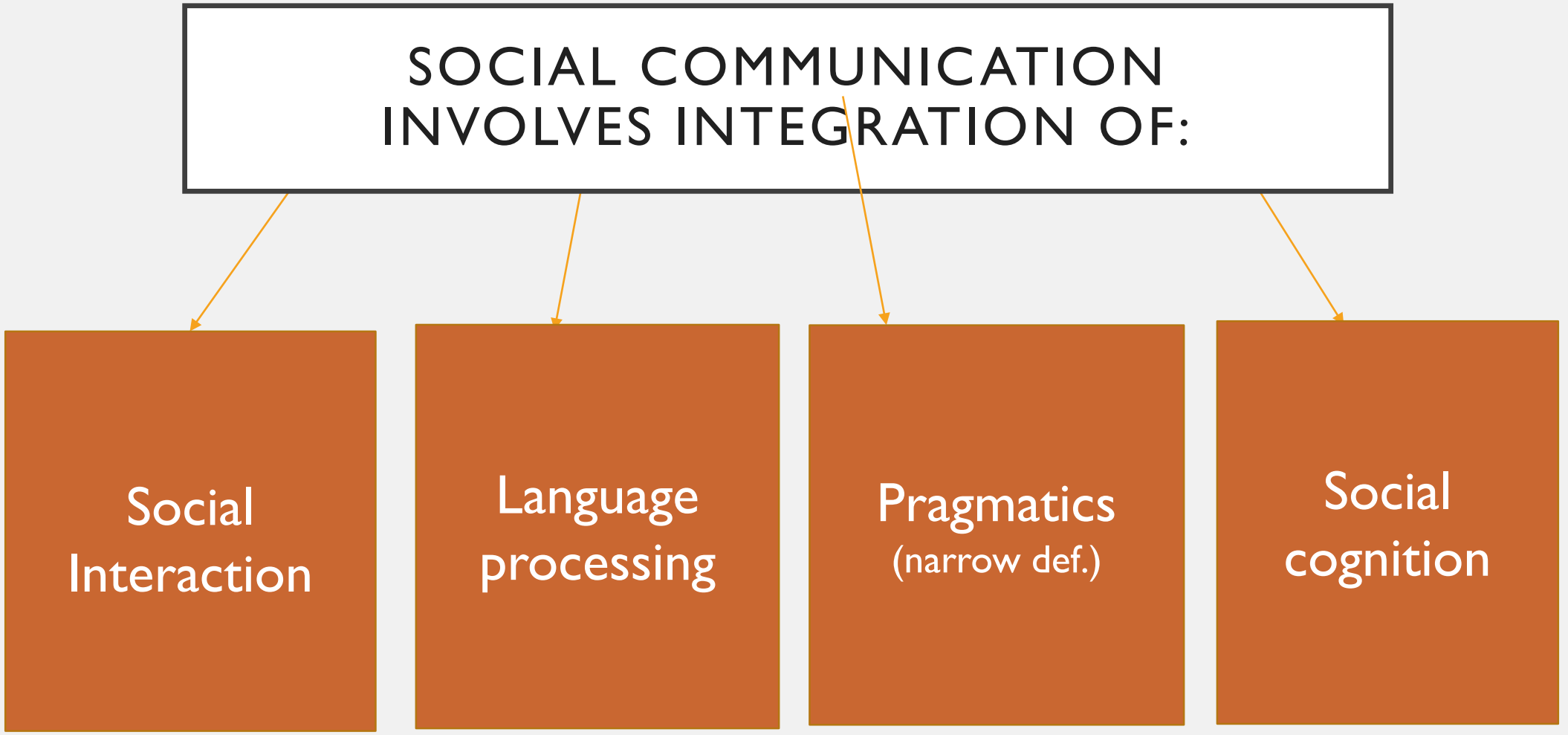
BC DATA

- TBA

SOCIAL COMMUNICATIVE COMPETENCE REQUIRES:

The ability to *interpret both nonverbal and verbal messages*, depending on the *specific context of the interaction*, using implicit knowledge about the *socio-cultural interaction rules*, while *planning your own contribution*, and (hopefully) *managing one's behavior* during the interaction

SOCIAL COMMUNICATION INVOLVES INTEGRATION OF:



from work of Adams 2005, Brinton & Fujiki 2014

CONVERSATION

- Reduced responsiveness to communication partner's utterance
- Interrupting/overlapping comments
- Verbosity, with unrelated comments
- Inappropriate feedback to partner
- Organizational difficulties
- Socially inappropriate questions, responses, statements, topics, jokes
- "Chatty" but "shallow"
- Limited ability to exchange information effectively within a conversation; difficulty providing adequate and relevant info to partner

NARRATIVES

- Shorter, incomplete; Organization difficulties
- Fewer cohesive devices (pronouns, conjunctions); logical links often missing between events
- Ambiguous referencing; difficulty distinguishing between shared/new info (e.g. inappropriate use of articles to refer and maintain reference)
- Increased proportion of vague statements and reduced proportion of informative ones
- Difficulty explaining what they have seen or heard in a logical manner
- Difficulty determining and conveying relevant info
- Failure to derive necessary inferences and conclusions from a passage

SOCIAL COGNITION

- Reduced perspective-taking on Theory of Mind tasks (inferring mental states of other and using this info to predict intentions, beliefs, emotions, desires); difficulty with false belief tasks even when simplified format
- Difficulty perceiving and interpreting social cues, especially subtle ones
- Difficulty interpreting affective information (judging emotions, e.g. based on facial expressions)
- Indiscriminately friendly ("overly social")
- Reduced ability to anticipate consequences of their actions behavior
- Difficulty recognizing social (or physical) risk, poor judgment, engaging in risky behaviors
- Difficulty effectively grasping underlying reasons for and meaning of appropriate behaviors
- Increasing challenges in sophisticated social contexts
- Reduced empathy, guilt

SOCIAL REASONING

- In social problem-solving tasks (group-entry and provocation situations): chose higher proportion of aggressive or inept solutions; evaluated competent responses as less effective; were less likely to attribute benign intent to another child; encoded less information about vignette (missed cues)
- Difficulty explaining problems, providing details
- Difficulty generalizing newly-acquired skills to a variety of contexts
- May repeat same misguided action regardless of consequences
- Avoidant, careless or impulsive approach to solving everyday problems

PEER INTERACTION

- Peer victimization and rejection; teasing/bullying
- Fewer opportunities for acquiring new skills and experiencing consequences of positive interaction due to *reputational bias* (how they are viewed by peers)
- Difficulty cooperating, sharing
- Viewed as immature compared to age peers
- Miss or misinterpret peers' intents – may ignore or respond negatively to peers' attempts to interact
- Difficulty following rules in games
- Blurting out silly, irritating or inappropriate comments that upset others
- Fewer sustained close relationships
- May become withdrawn, socially isolated, avoidant

IN GROUP SETTINGS

- In classroom-based studies: less time socially engaged, and exhibited more time in passive/disengaged and irrelevant performance (proportion and average length in each, but # instances of prosocial was higher for FASD). IQ not a factor.
- Significant changeability as measured in rate of changing between dimensions, i.e. varying their manner of social performance frequently between behavior states; and significantly more variable in day-to-day performance (re proportion of time spent in prosocial/engaged versus irrelevant) across days. Resulting in perception by others of unpredictable, irregular, unstable performance in social communication.
- Socially inappropriate questions, responses, topics, jokes in classroom or workplace
- May discuss personal info not appropriate for situation
- Socially indiscriminate behaviors from peer pressure, gang membership, promiscuity
- Anti-social behaviors such as cheating, stealing, bullying

WHAT IS ASD?

What causes it?

What are the symptoms?

WHAT IS FASD?

What causes it?

What are the symptoms?

NONE OF THESE ARE PART OF THE DIAGNOSIS:

- Acting out
- Inability to manage money
- Can't learn from consequences
- Inappropriately friendly to strangers
- Mental health problems
- Trouble with the law
- Inappropriate sexual behaviour
- Alcohol and drug problems
- Passive
- Stubborn
- Fearless
- Irritable
- Mood swings
- Difficulty sleeping
- Difficulty adapting to change
- Easily over stimulated
- Truancy
- Teasing or bullying

FETAL ALCOHOL SPECTRUM DISORDER

		#	#	#		#		
Definite	4						4	High Risk
Probable	3						3	Some Risk
Possible	2						2	Unknown
Unlikely	1	X	X	X		X	1	No Risk
Brain Effects		Growth	Face	Brain		Prenatal Alcohol		Prenatal Alcohol

AN ALPHABET OF CAUSES

- **A**buse
- **B**irth weight
- **C**igarettes
- **D**eprivation
- **E**nvironment
- **F**amine
- **G**enetics
- **H**ead…
- **I**njury
- pre**J**udice
- **K**nowledge
- **L**ead
- **M**aternal depression
- **N**utrition
- **O**xygen deprivation
- **P**overty
- **Q**uality of maternal bonding
- **R**egulation of emotion
- **S**tress
- **T**emperament
- **U**ndersocialization
- **V**ision
- **W**itnessing of violence
- **X**-rays?
- **Y**-chromosome
- **Z**inc deficiencies

ASD SYMPTOMS IN FASD

- Difficulties with social cues, particularly faces and gaze
- Comprehension of mental states and emotions of others
- Resistance to change
- Understanding prosody
- Abnormal sensory responses
- Difficulty relating to people and initiating social interactions
- Deficiencies in social language processing
- Passive or active-but-odd characteristics during interactions.

Stevens, Nash, Koren,& Rovet (2013)

SOCIAL DIFFICULTIES IN FASD

Strengths	Weaknesses
initiating conversations	perseveration
inviting others to join activities	withdrawing
showing concern for others	not taking appropriate turns
	interacting poorly

Stevens, Nash, Koren,& Rovet (2013)

ARE THERE FASD *SYMPTOMS* IN ASD?

How do we answer that question…?

What are the symptoms of FASD?

WHAT AREAS OF FUNCTION ARE AFFECTED IN FASD?

Motor Skills		Memory	
Neuroanatomy		Attention	
Cognition		Executive Function	
Language		Affect Regulation	
Academics		Adaptive/Social	

WHAT AREAS OF FUNCTION ARE AFFECTED IN FASD?

Rasmussen et al (2006)			
Motor Skills		Memory	✓
Neuroanatomy		Attention	✓
Cognition	✓✓	Executive Function	
Language		Affect Regulation	
Academics		Adaptive/Social	

WHAT AREAS OF FUNCTION ARE AFFECTED IN FASD?

Quattlebaum and O'Connor (2013)			
Motor Skills		Memory	✓
Neuroanatomy		Attention	✓
Cognition	✓	Executive Function	✓
Language	✓	Affect Regulation	✓
Academics		Adaptive/Social	✓

WHAT AREAS OF FUNCTION ARE AFFECTED IN FASD?

Nash et al., 2013			
Motor Skills		Memory	✓
Neuroanatomy		Attention	
Cognition	✓✓	Executive Function	
Language	✓	Affect Regulation	
Academics	✓	Adaptive/Social	

WHAT AREAS OF FUNCTION ARE AFFECTED IN FASD?

Aragón et al. (2008)			
Motor Skills		Memory	✓
Neuroanatomy		Attention	
Cognition	✓✓	Executive Function	✓
Language	✓	Affect Regulation	
Academics		Adaptive/Social	

WHAT AREAS OF FUNCTION ARE AFFECTED IN FASD?

Ali et al. (2018)			
Motor Skills		Memory	
Neuroanatomy		Attention	✓
Cognition		Executive Function	
Language		Affect Regulation	
Academics		Adaptive/Social	✓

WHAT AREAS OF FUNCTION ARE AFFECTED IN FASD?

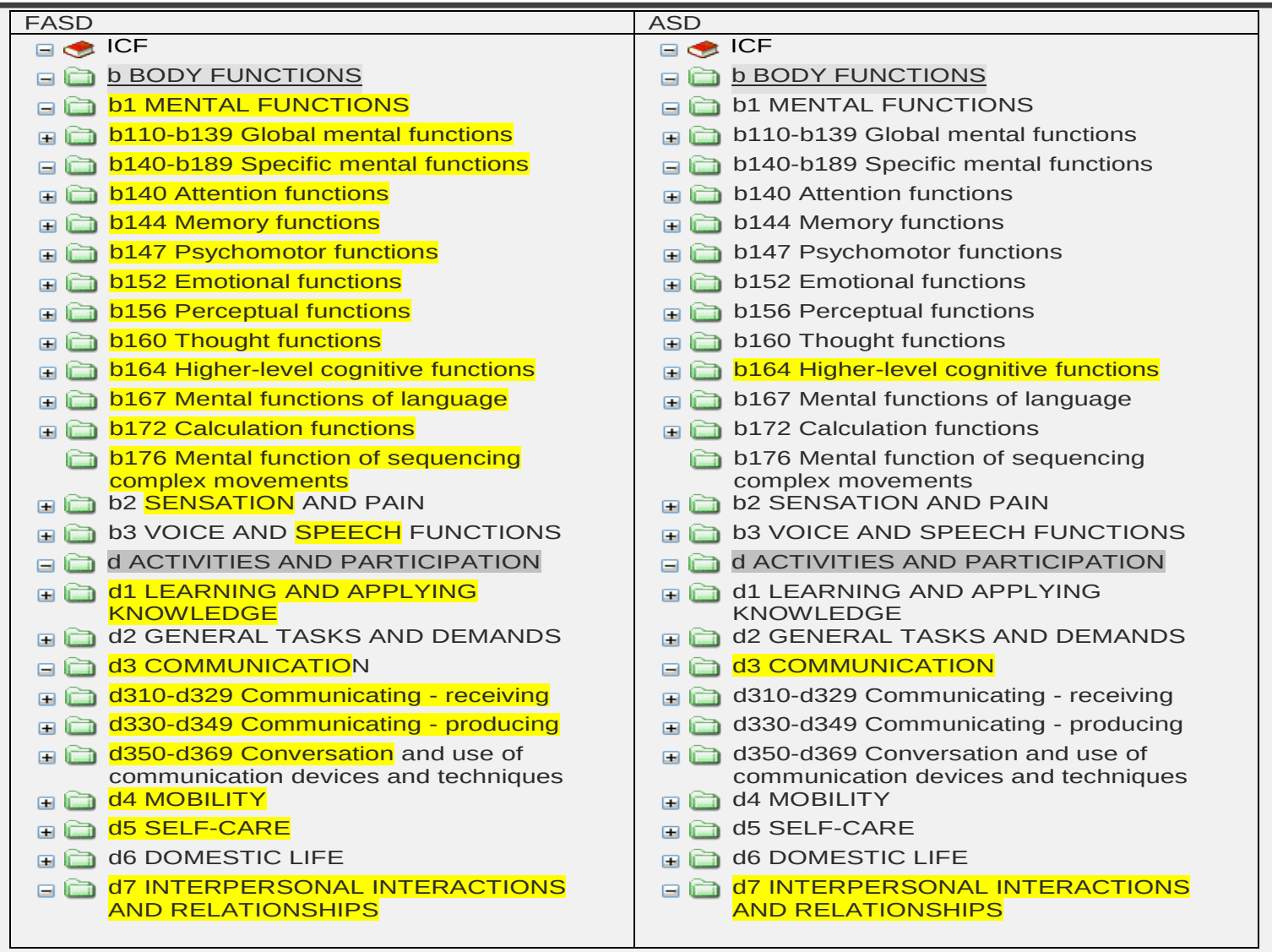
Enns & Taylor (2018)			
Motor Skills		Memory	✓
Neuroanatomy		Attention	
Cognition	✓	Executive Function	✓
Language		Affect Regulation	
Academics	✓	Adaptive/Social	

WHAT AREAS OF FUNCTION ARE AFFECTED IN FASD?

OVERALL			
Motor Skills	Not well addressed	Memory	✓✓✓✓✓
Neuroanatomy	Not well addressed	Attention	✓✓✓
Cognition	✓✓✓✓✓✓	Executive Function	✓✓✓
Language	✓✓✓	Affect Regulation	✓
Academics	✓✓	Adaptive/Social	✓✓

A generalized deficit

BRAIN PROCESSES AFFECTED BY FASD/ASD



WHAT IS THE PURPOSE OF DIAGNOSIS?

- Recognize a condition based on a set of symptoms
- Facilitate communication between clinicians and systems
- Predict the course of symptoms
- Determine the probable efficacy of any particular treatment
- Determine the cause of symptoms

FEATURES	ASD	FASD
Atypical gaze	Y	Y
Peer Interest	Y	N
Early Group play	Y	Y
Friendships	Y	Y
Early showing	Y	N
Shared enjoyment	Y	N
Use of body as tool	Y	N
Pointing (interests)	Y	N
Use of gestures	Y	N
Stereotyped speech	Y	N
Neologisms	Y	N
Pronomial confusion	Y	N
Inappropriate comments	Y	Y
Reciprocal conversation	Y	Y
Chit chat	Y	Y
Imitative play	Y	N
Imaginary play	Y	N
Unusual preoccupations	Y	N
Circumscribed interests	Y	N
Verbal rituals	Y	N
Behavioural rituals	Y	Y
Motor stereotypies	Y	N
Sensory interests	Y	Y
Interests in parts of objects	Y	N
Difficulties with change in personal environment/routines	Y	Y
Difficulties with change in general environment/routines	Y	Y
Sensory aversions	Y	Y
Self-injury	Y	Y

Dr. A. Glodjo added DSM-5 categories; modified from Dr. V. Dua's DSM-IV model

WHEN IS ASD/FASD APPROPRIATE?

IF ALREADY DIAGNOSED FASD

- Query ASD if there are restricted, repetitive, or stereotyped patterns of behaviour.

IF ALREADY DIAGNOSED ASD

- Query FASD if there is a substantial history of PAE.
- Query FASD if the facial features are present
- Consider ethical issues relative to:
  - Blame
  - Stigma
  - Racial issues

SUMMARY

- Comparing ASD and FASD is like comparing apples and oranges
- Having both is possible, especially in the presence of facial features and a clear and substantial alcohol history

SUMMARY

- ASD and FASD are distinct neurodevelopmental disorders
- We are hard wired to be social and reciprocal
- Most individuals with FASD are social and reciprocal
- Some individuals with FASD can have ASD
- Some symptoms overlap between these conditions
- Overlapping symptoms tend to be the least diagnostic for ASD (but often prompt the ASD referral!)
- Individuals with ASD and FASD are more clinically complex and do not show expected response to supportive interventions at school/community
- Require regular follow-up with community pediatrician and close monitoring of progress
- Should be supported based on severity of functional impairment, not diagnosis!

THANK YOU !