

Dr. Barry Stanley  
*FASD as Neuropsychiatric and  
 Attention Disorder*  
 November, 2008

## The Real Impact

- Genetics, teratology, embryology; the anatomy and physiology of most parts of the body, including the fetus and placenta; cellular anatomy, physiology and pathology; neurology, neuroanatomy, neurophysiology and neuropathology; early childhood development; the education system and its deficiencies; the judicial system and its deficiencies; criminality and mental health problems. Finally, you will be forced to examine the meaning of culpability and responsibility.

## Historical view of alcohol as a teratogen

Aristotle - 384-322 B.C.  
 Diogenes - cir. 400 B.C.  
 Plutarch - 45-125 A.D.

- Behold, thou shalt conceive and bear a son: And now, drink no wine or strong drink.  
 Judges 13:7
- Navajo tradition, women who drink crazy water when bearing a child, will give birth to a child crazy in body and mind.



Rosett, 1984

## IN THE 19<sup>th</sup> CENTURY 21 REFERENCES TO EFFECT OF MATERNAL DRINKING.

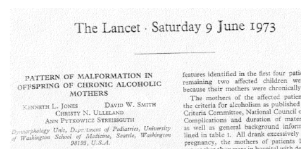
1726- British College of Physicians report to Parliament. 'a cause of weak, feeble and distempered children.'

1834- British House of Commons Commission. 'starved, shriveled and imperfect look'

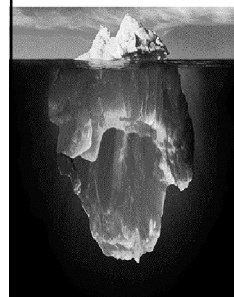
1899- British scientist, Sir Francis

Galton. 'children born to alcoholic mothers were- defective-neurotic.'

1899-Dr. W.C.Sullivan. First scientific study- 120 chronic alcoholic women prisoners-had healthy babies if pregnancy was carried while incarcerated, compared to crippling or lethal birth defects when out of jail.



FAS - only the tip of the iceberg



FAS  
 20%

ARND  
 80%

➔ FASD  
 One in  
 hundred  
 births

Adapted from Streissguth

## Nomenclature-1996

- F.A.S- Fetal Alcohol Syndrome.  
with and without confirmed maternal alcohol exposure.
  - Partial FAS with confirmed maternal alcohol exposure.
  - A.R.B.D.- Alcohol Related Birth Defects.  
with confirmed maternal alcohol exposure.
  - A.R.N.D.- Alcohol Related Neurodevelopment Disorder  
with confirmed maternal alcohol exposure.
- F.A.E.- Fetal Alcohol Effects. No longer used.
- F.A.S.D.- Fetal Alcohol Spectrum Disorder – covers all the FAS related conditions.

## 1996 Report – University of Washington, Seattle , U.S.A.

Understanding the Occurrence of Secondary Disabilities in Clients with Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE)

Final Report  
August 1996

Centers for Disease Control and Prevention  
Grant No. R04/CCR008515

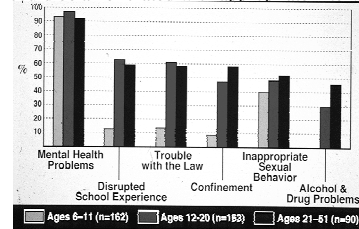
September 30, 1992—September 29, 1996

## Primary Disabilities

- -- are inherent in FASD individuals and are a consequence of the neurological damage and impaired neurological function

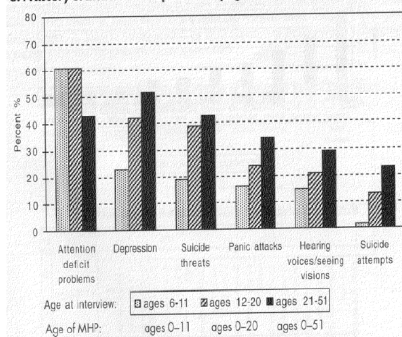
## Secondary Disabilities

Individuals with FAS/FAE have a range of secondary disabilities – disabilities that the individual is not born with, and which could be ameliorated with appropriate interventions.



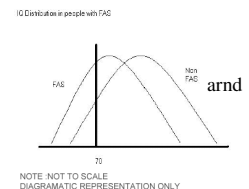
Streissguth, et al., 1996

8.4 History of mental health problems by age at interview (n=415)



## Effect on IQ

- Majority fall within normal range
- Normal distribution shifted to left
- Roughly 20 point shift
- FAS average IQ 79 - 72
- FAE average IQ 90

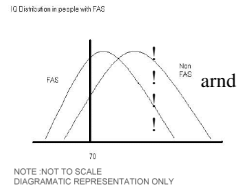


Streissguth 78,96, Matteson 96  
Olegard 79

## Effect on IQ

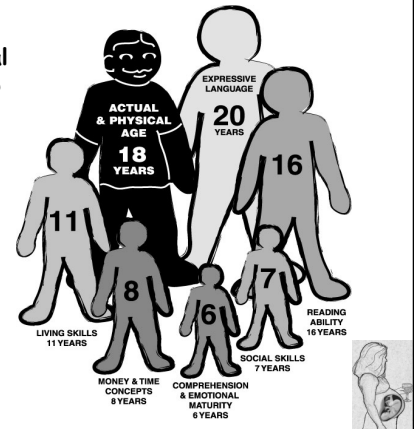
+AQ

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Streissguth 78,96, Matteson 96  
Olegard 79

## Developmental stages of 18 year old FASD child!



## Adaptive Functioning

- SIB-R “- an individual’s ability to effectively meet social and community expectations for establishing personal independence, maintaining physical needs, conforming to social norms, and sustaining interpersonal relationships”
- Vineland “- the performance of the daily activities required for personal and social sufficiency

## Of those afflicted with FASD

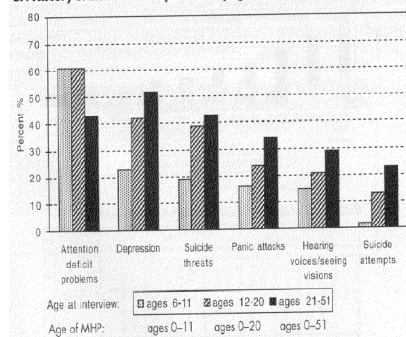
- only 10% have an IQ below 70
- 90% have an average, or higher than average IQ.
- all have a significantly lower AQ than might be expected



## FASD

**a neuro-psychiatric condition  
and attention disorder**

6.4 History of mental health problems by age at interview (n=415)



## Slides used with the permission of

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## Fetal Alcohol Spectrum Disorders

Conditions : Fetal Alcohol Syndrome & Alcohol Related Neurodevelopmental Disorder (ARND)

- Prevalence 1 in 100 ( Seattle)
- Growth retardation, facial dysmorphism, CNS dysfunction
- 75-80% individuals NOT mentally retarded
- Alcohol causes a chronic developmental and neuropsychiatric disorder (>90%)  
( Dual Diagnosis)

Rutter 1984, Harris 1995, Rapoport 200, Streissguth & O'Malley 2000

## Prenatal Alcohol causes a Chronic Developmental Neuropsychiatric Disorder

## Psychiatric presentations

| Diagnosis                 | All Subjects |    | FAS |     | FAE |    |
|---------------------------|--------------|----|-----|-----|-----|----|
|                           | No.          | %  | No. | %   | No. | %  |
| Total                     | 23           | 92 | 11  | 100 | 12  | 86 |
| Alcohol / Drug dependence | 15           | 60 | 6   | 55  | 9   | 64 |
| Major Depression          | 11           | 44 | 4   | 36  | 7   | 50 |
| Psychotic disorder        | 10           | 40 | 5   | 45  | 5   | 36 |
| Bipolar I                 | 5            | 20 | 1   | 9   | 4   | 29 |
| Anxiety Disorder          | 5            | 20 | 2   | 18  | 3   | 21 |
| Eating disorder           | 4            | 16 | 2   | 18  | 2   | 14 |
| Personality Disorder      | 10           | 48 | 3   | 38  | 7   | 54 |

Famy et al 1998

Raja Mukherjee SGHMS 2004

## Diagnostic and Statistical Manual of Mental Disorders

--Only reference to FASD

-- Mental Retardation – Predisposing factors  
prenatal damage due to toxins  
[ e.g. maternal alcohol consumption-]

- Parents of F.A.S.A. individuals will recognize their children in the pages of the D.S.M. Manual, under the headings of-
- Mental Retardation, Learning Disorders, Pervasive Developmental Disorders, Attention Deficit Disorders, Substance Related Disorders, Mood Disorders, Anxiety Disorders, Impulsive Control Disorders and Personality Disorders.

## Cognitive, Language & Behavioral Evaluation of FASD

### Cognitive

- complex /mixed learning disorders with inability to link cause and effect
- poor working memory
- specific deficits in mathematics, and/or reading/writing skills
- often marked split verbal/performance IQ 12-15 points
- poor capacity for abstraction
- metacognition deficits in school performance
- Executive function deficits in planning and organization
- poor insight
- impaired judgment

Streissguth 1997, Mattson & Riley 1998, Connor et al 2000, Massey V& D 2005, Page 2005,

## Language

- Deficits in higher level receptive and expressive language i.e. inability to comprehend the feelings/ motivations of other's
- Impairment in social interaction, social perception social cognition and social communication
- Problems in articulating emotions, Alexithymia i.e. the patient does not have the words to express feelings and so acts them out in physical expression

Coggins et al 1998, 2005, Kapp & O'Malley 2001, O'Malley & Nanson 2002, Sullivan 2005

## PSYCHIATRIC DISORDERS IN PREGNANT WOMEN WHO DELIVER INFANTS/ CHILDREN WITH FASD

P.T.S.D. ( Chronic), 90% Sexual abuse  
Depression  
Bipolar Disorder  
Psychotic Disorder ? Schizophrenia  
ADHD  
Generalized Anxiety Disorder

## Behavioral

- Attentional problems, visual and auditory
- Poor impulse control
- Physical hyperactivity
- Poor adaptive functioning measured on Vineland Adaptive Behavioral Scales (VABS)

Driscoll et al 1990, Institute of Medicine 1996, Streissguth et al 1996, Carmichael Olson et al 1997, O'Malley & Nanson 2002, Massey V& D 2005, O'Malley 2005

## FASD ARE THE GREAT MASQUERADERS!

ADHD  
Mood Disorder ( Affective Instability)  
Major Depressive disorder with mood-incongruent psychotic features  
Generalized Anxiety Disorder  
Panic Disorder  
Post Traumatic Stress Disorder\*  
Schizoaffective Disorder  
Brief Psychotic Disorder  
Personality change i.e. labile, aggressive  
Asperger's Disorder or P.D.D.  
Seizure Disorder, i.e. Complex Partial, Absence

## DIAGNOSIS IN FASD

### AXIS I

|                           |                |
|---------------------------|----------------|
| Major Depressive Disorder | 11 of 25 (44%) |
| Psychotic Disorders       | 10 of 25 (40%) |
| Brief Psychotic Disorders | 7 of 25 (28%)  |
| Bipolar I Disorder        | 5 of 25 (20%)  |
| Anxiety Disorders         | 5 of 25 (20%)  |

### Co-Morbid Diagnosis

|                           |                |
|---------------------------|----------------|
| Alcohol & Drug Dependence | 15 of 25 (60%) |
|---------------------------|----------------|

### AXIS II

|                        |               |
|------------------------|---------------|
| Avoidant Personality   | 6 of 25 (29%) |
| Antisocial Personality | 4 of 25 (19%) |
| Dependent Personality  | 3 of 25 (14%) |

FAMY et al, Seattle, 1998 (SCID), Amer. J Psychiatry

## PSYCHIATRIC ASSESSMENT

57 Patients, 3 to 32 Years  
40 Males, 17 Female (Calgary Consultation practice)

### AXIS I

|                                       |      |
|---------------------------------------|------|
| ADHD                                  | 58%, |
| Mood Disorder                         | 44%  |
| Personality Change: Labile/Aggressive | 36%  |

### AXIS II

|                                 |     |
|---------------------------------|-----|
| Avoidant Personality            | 14% |
| Dependent Personality           | 13% |
| Passive/ aggressive personality | 9%  |
| Schizoid Personality            | 8%  |

O'Malley , 2001 ( CDC), O'Malley 2007

## PSYCHIATRIC DIAGNOSIS

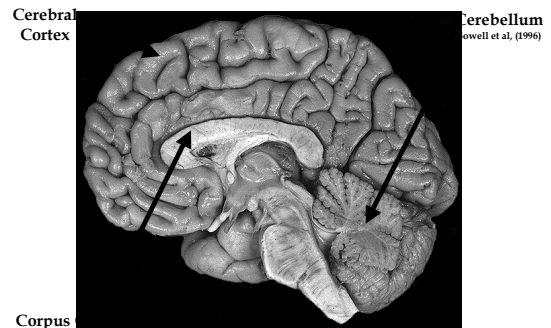
57 Patients, 3 TO 32 Years  
40 Male, 17 Female  
Calgary Consultation Practice

### CO-MORBID AXIS 1 DISORDERS

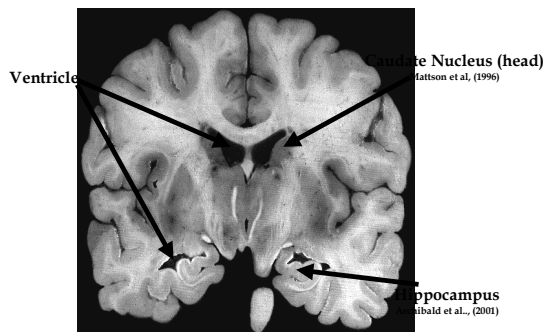
|             |     |
|-------------|-----|
| 1 Disorder  | 17% |
| 2 Disorders | 64% |
| 3 Disorders | 19% |

O'Malley, 2001, (CDC), O'Malley 2005

## Regions of the Brain Affected by Prenatal Alcohol



## Regions of the Brain Affected by Prenatal Alcohol



## Findings of Neuroimaging and Neuropsychological Performance

- Thick Corpus Callosum Associated with:
  - Poor Executive Function
  - Relatively Intact Motor Functioning
- Thin Corpus Callosum Associated with:
  - Poor Motor Coordination
  - Relative Sparing of Executive Functions

## Mechanism of Fetal Brain Damage by Alcohol

All parts of the brain may be effected

both grey and white matter is affected

- impaired myelin formation
- impaired glial formation and cell migration
- impaired cell adhesion
- damage to cell membrane
- intracellular damage e.g. mitochondria
- altered regulation of intracellular  $Ca^{++}$
- interference with cell growth, division and survival

- impaired production of neurotransmitters

## THE DEVELOPMENTAL DAMAGE TO THE FETAL BRAIN BY ALCOHOL IS UBIQUITOUS.

Fetal alcohol brain damage results in abnormal neurotransmitter levels  
[ Chemical Imbalance ]

One of the serious manifestations of this damage is psychiatric illness.

Serotonin, Dopamine, Norepinephrine,  
Acetylcholine, Gamma aminobutyric acid,  
and Histamine

"Chemical Imbalance" is synonymous with psychiatric illnesses that are treated with psychotropic medications.

FASD IS A NEUROPSYCHIATRIC CONDITION

## Canada – F.A.S.D and Mental Health

- 10% of Canadians have mental health problems
- 1% of Canadians have F.A.S.D.
- 95% of F.A.S.D. have mental health problems
- Conclusion- almost 1 in 10 patients, seen by mental health workers, must be F.A.S.D.
- Yet patients, seen by mental health workers, are very rarely diagnosed as F.A.S.D.

## Review of Canadian and American Journals of Psychiatry

- C.J.P.- Feb.1996 – Oct.2006
- Only one article on FASD
- = 0.08 per cent of all articles published

A.J.P.- Jan.1996 – Sep.2007

- Only one article on FASD
- = 0.03 per cent of all articles published

B. Stanley

**FASD is a neuropsychiatric condition.**

**All FASD individuals will have more than one psychiatric [DSM] diagnosis.**

**Knowledge of FASD is necessary, even vital in some instances, when prescribing psychotropic medications.**

## Inattention

To understand the medications for attention disorders we first have to define the term 'attention disorder'

The DSM defines it as six or more of –

- a) often fails to give close attention to details or makes careless mistakes in schoolwork, or other activities.
- b) often has difficulty sustaining attention in tasks or play activities.
- c) often does not seem to listen when spoken to directly.
- d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace [not due to oppositional behavior or failure to understand instructions]
- e) often has difficulty organizing tasks and activities.
- f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort [such as schoolwork or homework]
- g) often loses things necessary for tasks or activities[ e.g. school assignments, pencils, or tools]
- h) is often easily distracted by extraneous stimuli.
- i) is often forgetful in daily activities.

## Some causes of Inattention

- 1- ADD, easily distracted – by normal level stimuli
- 2- Perseveration
- 3- Transition Reactions
- 4- Not understanding- memory- information processing disabilities - executive functioning - abstract reasoning deficits
- 5- Sensory/Motor abnormalities – hypersensitive/hyperactive

Often associated clinically with –

- Concrete thinking
- Filling in gaps
- Disorganized narration

### Neurobehavioural Assessments

For FASD

- 1- Hard and soft neurological signs-including sensory/motor signs.
- 2- Brain structure [ O/F circumference, MRI etc. ]
- 3- Cognitive [ IQ ]
- 4- Communication- receptive/expressive - verbal/visual
- 5- Academic achievement
- 6- Memory
- 7- Executive functioning and abstract reasoning.
- 8- ADD. [ easily distracted ][hyperactivity]
- 9- Adaptive behaviour, social skills, social communication.

**ADD [easily distracted] is just one manifestation of Inattention**

- To deal with Inattention the real causes have to be considered.

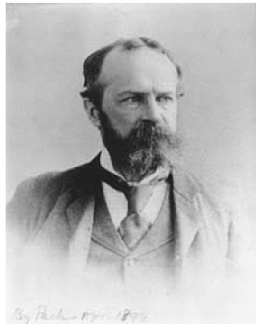
**Many of those diagnosed as ADD have not been assessed for the real causes of Inattention**

**ADD**

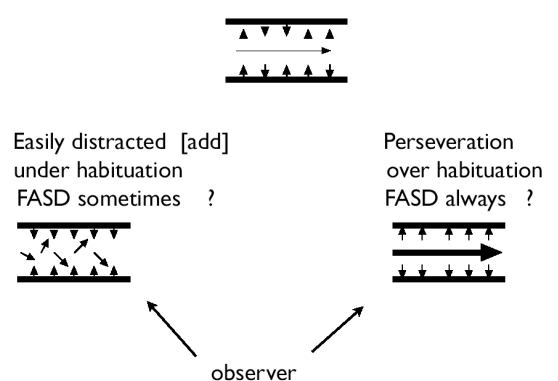
and

**Perseveration**

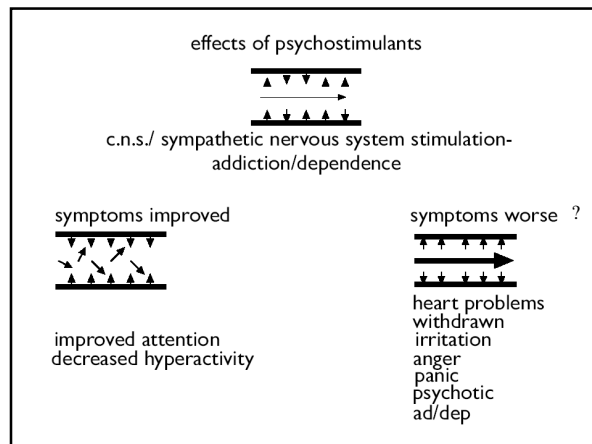
[Prisoners of the moment]



“Consciousness is always interested more in one part of its object than in another and welcomes and rejects, or chooses all the while it thinks”







## Perseveration

At the moment those with FASD are not able to consider their knowledge of the past nor their thoughts of the future. They forget to remember.

## Transition -from Perseveration

-a very uncomfortable experience  
leading to  
anger  
anxiety  
silent withdrawal

## Preventing/Reducing Perseveration/Transition Reactions

- SELF-SENSORY INPUT
- Feeling
- Seeing
- Hearing
- Medications

## Some clinical manifestations of the Primary Disabilities

## Concrete Thinking

- Only understanding what is literally said
- Taking things literally.
- Not able to understand when some thing is taken out of context and used differently.
- Yet may recognize concrete thinking when explained or applied to others.

## Concrete Thinking

Clarification

## Disorganized Narration

Patience

## Filling In The Gaps ?

- Those with FASD are not able to process accurately every word said to them
- They fill in the gaps with similar sounding or meaning words.
- Leading to misunderstandings and accusations of lying.
- The wrong words become part of their memory of what was said.

## Question?

- did child with , who killed a truck, walk such a road?

## Question?

- Why did the child with FASD, who was killed by a truck, walk onto such a busy road?

## Question?

- » Why did the child with FASD, who was killed by a truck, walk onto such a busy road?
- Because he was told not to RUN across the road
- -a different moment, a different meaning for those with FASD.

**FASD-**  
**a peripheral and sensory neurological condition**

**hypo-sensitive**  
**or both**  
**hyper-sensitive**

**Bowels and Bladder problems ?**  
**Hygiene issues**

**FASD hyper-sensitive**

**Hygiene problems e.g. cleaning teeth**  
**Tight clothing, creases and tags/labels**  
**Busy environment**  
**Bright light**  
**Loud noise**  
**Spicy foods**  
**Provide-**  
**Sensory integration, baggy clothes, appropriate environment, different hygiene techniques.**

**FASD hypo-sensitive**

**High pain threshold, insensitivity to cold**  
**Inappropriate hugging and touching**  
**Self mutilation**  
**Piercing**  
**Hygiene problems**  
**Bowel and Bladder- overflow incontinence, perseveration**  
**Provide- sensory integration, suitable clothing, fidget items**  
**-investigate bowels and bladder**

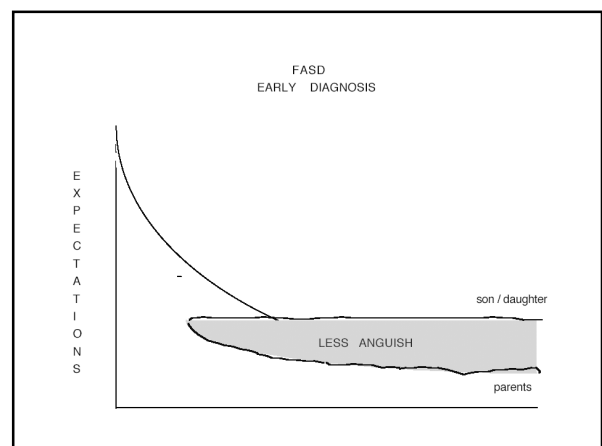
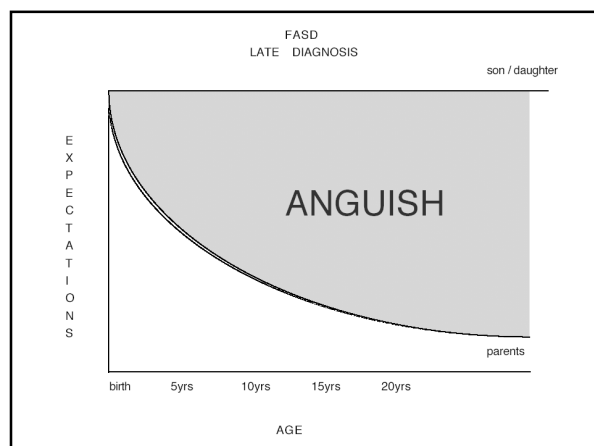
**Teachers remember-**

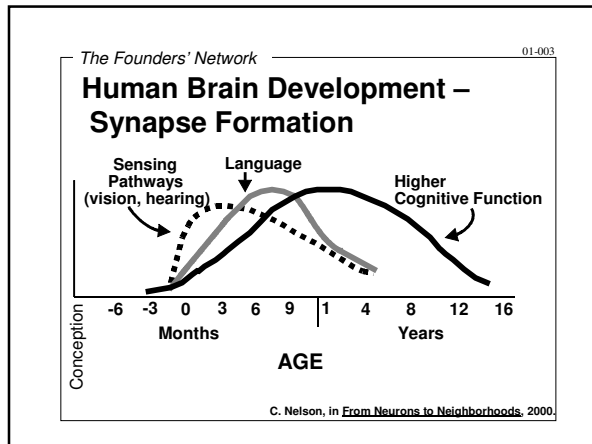
**Concrete thinking-only hears/understands what is literally said, misses the abstractions and omissions of every day speech.**

**Perseveration-[forgetting to remember, resistance to transition]**

**Try sensory input to interrupt perseveration and improve transitions.**

**Disorganized narration-be patient.**





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??????????

- How do the transgenerational epigenetic effects of alcohol on previous generations impact the developing fetus who is [a ]- being exposed to alcohol, [ b ]- not being exposed to alcohol?
- How does the parenting of FASD parents effect the normal development of their offspring who are not fasd?
- If pre-natal exposure to alcohol causes cognitive disabilities, why would it not cause mood disabilities?