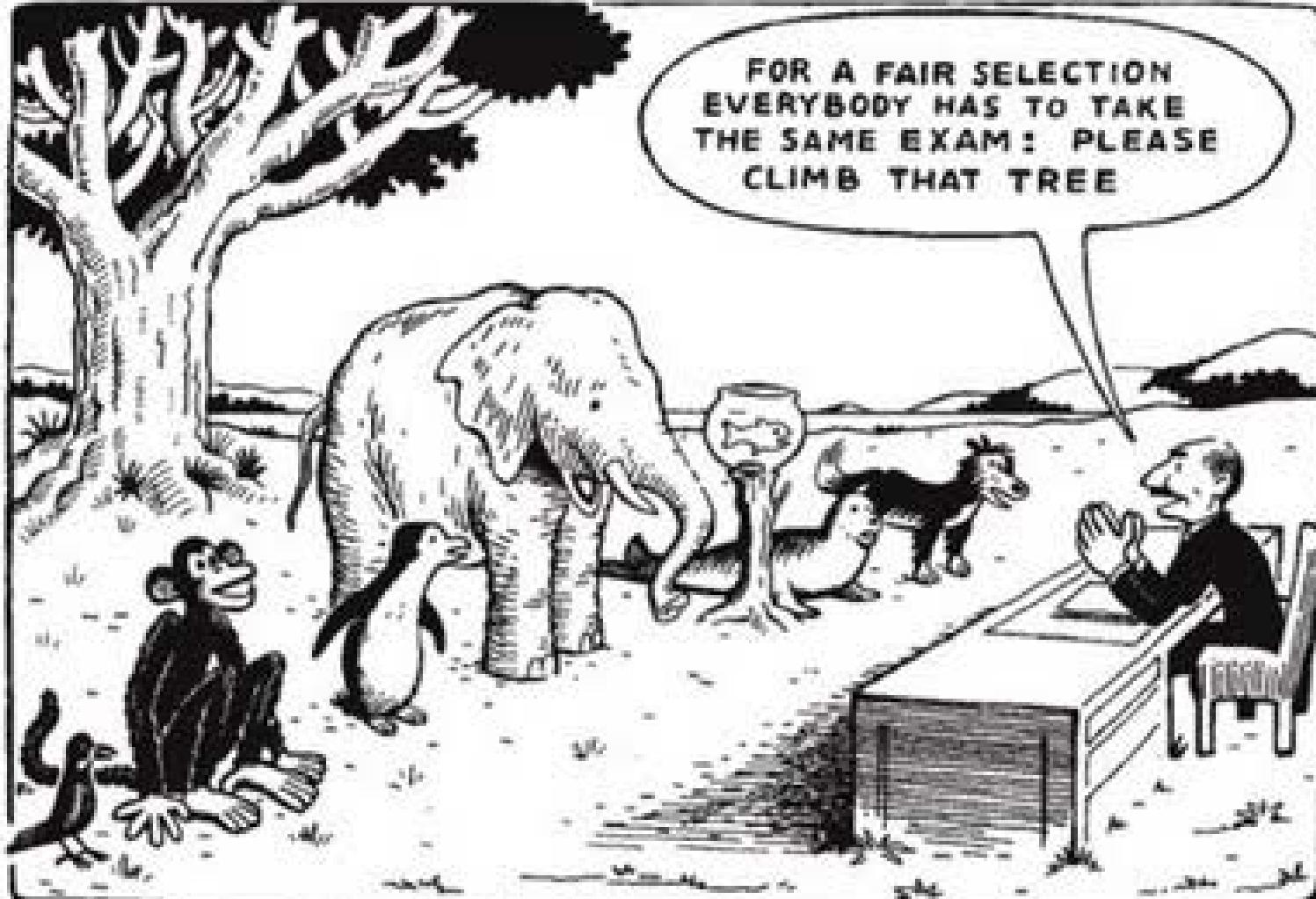


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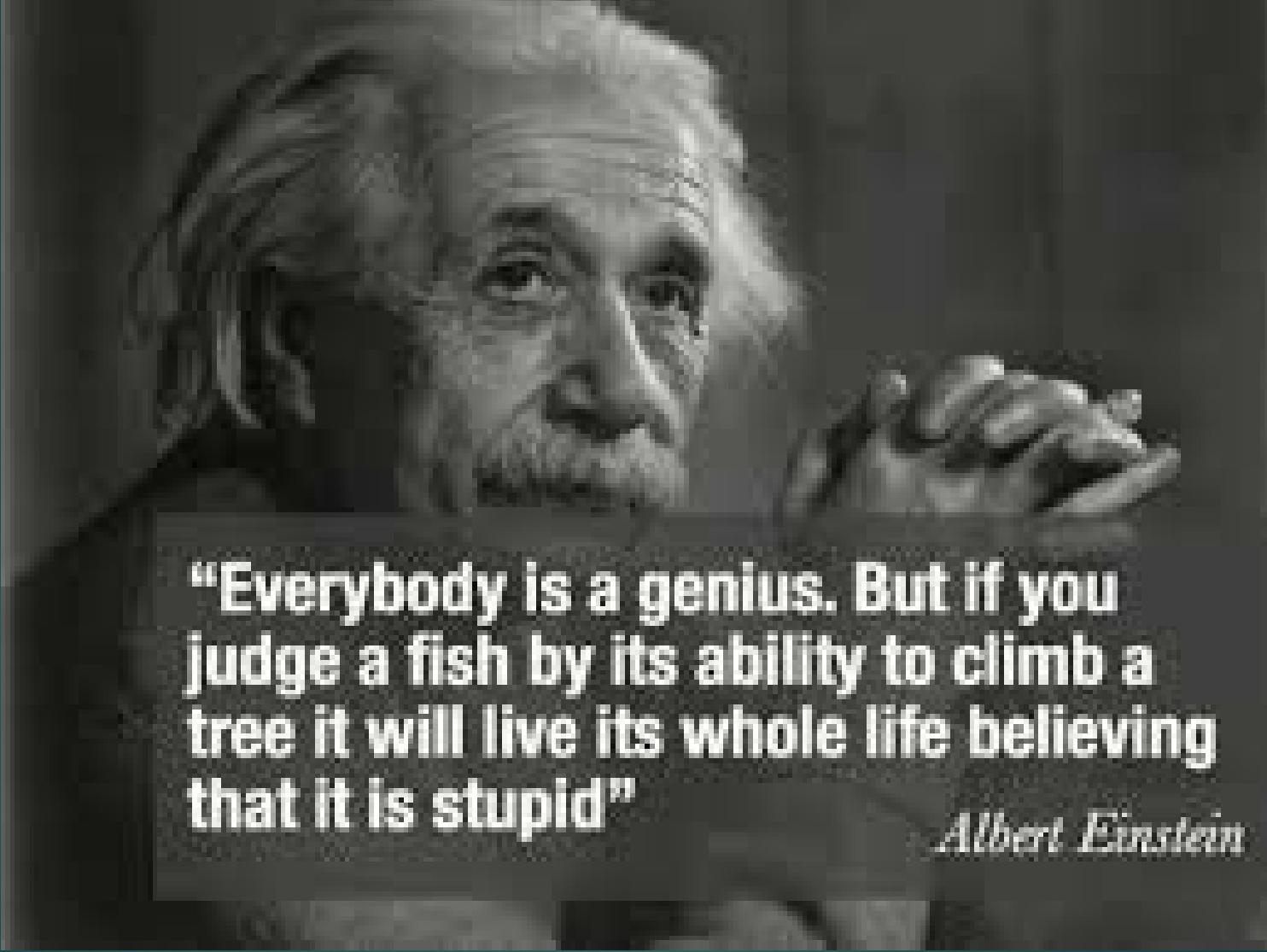
**Center for Autism and
Early Childhood Mental Health**

November 2014

College of Education and Human Services
*Center for Autism and
Early Childhood Mental Health*



FOR A FAIR SELECTION
EVERYBODY HAS TO TAKE
THE SAME EXAM: PLEASE
CLIMB THAT TREE



"Everybody is a genius. But if you judge a fish by its ability to climb a tree it will live its whole life believing that it is stupid"

Albert Einstein

- ▶ So, what is “autism” ?
- ▶ What does “autism” mean?
- ▶ What factors influence the meaning and assignment of the diagnosis?
- ▶ Does the term offer any “value added”?

Autism Spectrum Disorder

- ▶ Neurological disorder, with likely genetic origins, affecting the structure and function of the brain which controls reasoning, problem solving, memory, communication, sensory processing, regulation and motor planning.

Prevalance

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- ▶ In 2007, the CDC estimated that autism occurs in 1 in 150 children. Among the states studied, New Jersey had the highest rate of 1 in 94.
- ▶ In 2009, NIMH studies reported that the rate is likely 1 in 100, reflecting both better assessment, and “buried” in the data, a real increase in incidence.
- ▶ Autism is likely a multiply determined disorder, leading to the term “Autism Spectrum Disorder”.
- ▶ MARCH 2012: The CDC reports the diagnosis of autism has arisen 78% since 2000. Estimates now are that autism occurs in 1 of 88 children, and in boys the rate is 1 in 54

- ▶ Results of the 2007 and 2011-2012 National Survey of Children's Health (NSCH), using telephone calling.
- ▶ Based on 100,000 parents (less than 25% of those called agreed to answer questions.)
- ▶ **Prevalence rate of autism spectrum disorder among children aged 6-17 was 2% or 1 in 50, a significant increase from the 2012 report.**
- ▶ Unclear what this means – except that more research and more REFINED research are needed.

CDC - 2014

- ▶ 11 states in the ADDM study (2010 data)
- ▶ Diagnosis by age 8
- ▶ 1 in 68 in the US
- ▶ 1 in 42 in boys and 1 in 189 in girls
- ▶ 1 in 45 in New Jersey, 1 in 28 in boys
- ▶ 30% increase since 2012 study

So - HOLD ON!

- ▶ What dose it mean?
- ▶ Is this a true "epidemic"?
- ▶ Is it an "epidemic" of the "diagnosis"?

Autism Awareness?

Autism Acceptance!

Autism APPRECIATION!

SELF -ADVOCACY MOVEMENT!

NEURODIVERSITY

Autism Spectrum Disorder

DSM IV

13

- ▶ Three core indicators
 - ▶ Social Impairment
 - ▶ Communication impairment
 - ▶ Stereotypies (repetitive behaviors) and limited range of play

DSM 5

Autism Spectrum Disorder

Must meet criteria

A, B, C, and D

A. Persistent deficits in social communication and social interaction across contexts, not accounted for by general developmental delays, and manifest by all 3 of the following:

1. Deficits in social-emotional reciprocity; ranging from abnormal social approach and failure of normal back and forth conversation through reduced sharing of interests, emotions, and affect and response to total lack of initiation of social interaction,

2. Deficits in nonverbal communicative behaviors used for social interaction; ranging from poorly integrated- verbal and nonverbal communication, through abnormalities in eye contact and body-language, or deficits in understanding and use of nonverbal communication, to total lack of facial expression or gestures.
3. Deficits in developing and maintaining relationships, appropriate to developmental level (beyond those with caregivers); ranging from difficulties adjusting behavior to suit different social contexts through difficulties in sharing imaginative play and in making friends to an apparent absence of interest in people

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

1. Stereotyped or repetitive speech, motor movements, or use of objects;
2. Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change;
3. Highly restricted, fixated interests that are abnormal in intensity or focus;
4. Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of environment;

Criteria C and D

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- ▶ C. Symptoms must be present in early childhood (but may not become fully manifest until social demands exceed limited capacities)
- ▶ D. Symptoms cause clinically significant impairment in social, occupational or other areas of functioning.

Autism Spectrum Disorder (299.00)

- ▶ More dimensional (less categorical)
- ▶ No longer a diagnosis of Asperger's Syndrome
- ▶ Sensory difficulty now a feature – but not primary
- ▶ Social (Pragmatic) Communication now listed (315.39)

- ▶ While the DSM-V now acknowledges "sensory processing", the editors chose not to include a primary diagnosis of "sensory processing disorder" when in fact studies like the one below- and many others - reveal that "autism" is typically a reflection of underlying neurological differences which have been described in the literature for the past 10+years!

BUT

- ▶ *The neurological profile that is emerging suggests differences that go beyond these domains.*
- ▶ *These classifications do not account for emerging brain research.*
- ▶ *There is no clear focus on “core” and “derivative” concerns*

The Growing Field of Neurological Findings in ASD: Selective Differences

- ▶ Increased brain volume and enhanced early growth rate
- ▶ Differences in “mirror neuron” systems
- ▶ Differences in limbic system- notably the amygdala (social processing and affect?)

And

- ▶ Neurosensory processing differences

So, what is your conceptualization of ASD?

Is ASD

► A “disorder of behavior”?

Or

► A difference in structure,
functioning and processing of the
brain and neurosensory system?

Assertion

Your conceptualization of ASD and your diagnostic classification system, will determine to a very large extent, your assessment and intervention planning.

Dr. Thomas Insel, the Director^{r25} of the National Institute of Mental Health (NIMH)

- ▶courageously called into question the utility of the DSM-V with regard to the ASDs, as the clustering of symptoms without taking into account the emerging neurobiological scientific findings, renders symptom descriptions and treatment less meaningful and effective.

He wrote:

"...(I)t is a promise from the NIMH to get beyond diagnostic categories based only on symptoms. Why is this important? For brain disorders, symptoms are generally a late manifestation of a years-long process. In medicine, early detection and early intervention have often been the best ways to improve outcomes."

<http://www.nimh.nih.gov/about/director/2013/ten-best-of-2013.shtml>

Critical Dimensions to Consider

- ▶ "Core" versus "derivative" differences
- ▶ "Front-end" versus "back-end" conceptualizations
- ▶ *Comprehensive functional analysis of behavior (bio-psycho-social)*

Two Kinds of Functional Analysis of Behavior

Behavior = function of consequences

Behavior = function of biological, psychological and social factors (consequences)

Hypothesize about, assess and measure:

- Individual differences,
- Differences in brain structure, functioning and processing,
- Core vs. derivative
- Functional meaning of behavior
- Outcomes and change

Hoboken Proverb!

"If you drop a quarter in the middle of the block, you don't look for it at the corner where the light is better!"

For ASD - your concept and diagnostic system tells you where to shine your light!

BUT

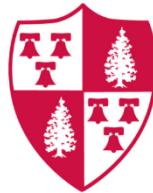
Is that where “autism” is?

Assertions

- ▶ Multidisciplinary research and new imaging capacities are resulting in information which outpaces the limitations of behavioral theory. The "Black Box" is opening!
- ▶ The field of "interpersonal neurobiology" has created a science of relationships as co-developers of each other.
- ▶ We are primed for a "Paradigm Shift" (Kuhn) in the field of ASD.
- ▶ The shift will lead to a new paradigm that is developmental-relational-neurobiological

READ A “FIRST PERSON” ACCOUNT!

- ▶ Thinking in Pictures, (2006) by Temple Grandin
- ▶ Look Me in the Eye: My Life with Asperger's (2007)
by John Elder Robison
- ▶ Carly's Voice: Breaking Through Autism (2012) by
Arthur Fleischmann with Carly Fleischmann
- ▶ The Reason I Jump (2007) by Naoki Higashida
- ▶ Nobody Nowhere 1992 by Donna Williams



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OVERVIEW

The *Center for Autism and Early Childhood Mental Health (CAECMH)* is a clinical, consultation/professional development, and research center concerned with the optimal development of infants, children and families, with and without developmental disabilities. .

Six Components

November 2014

- ▶ Community Presence and Partnerships
- ▶ Professional Development and Consultations
- ▶ Graduate Certificate Programs
- ▶ Clinical Services (pregnancy - 12)
- ▶ NJ ACE Coordinating Center
- ▶ Clergy and Faith Communities Professional Development

Community Presence and Partnerships

- ▶ Keeping Babies and Children in Mind
- ▶ The Significance of Touch
- ▶ Giving Birth and Being Born
- ▶ Zippy's Friends
- ▶ Annual TOCF Conference
- ▶ Coming: "Circle of Security"

Professional Development and Consultations

- ▶ School consultations on inclusion and individual differences
- ▶ IECMH Program Training and Consultations
- ▶ NJCWTP: Curriculum Development
- ▶ Parent Interventionist Project (PIP)
- ▶ Coming: Brazelton Touchpoints Center

Graduate Certificate Programs

November 2014

- ▶ DMAI
- ▶ ECMH

Clinical Services (pregnancy - 12)

NJ ACE Coordinating Center

Clergy and Faith Communities Professional Development

For Further Information

November 2014

Contact

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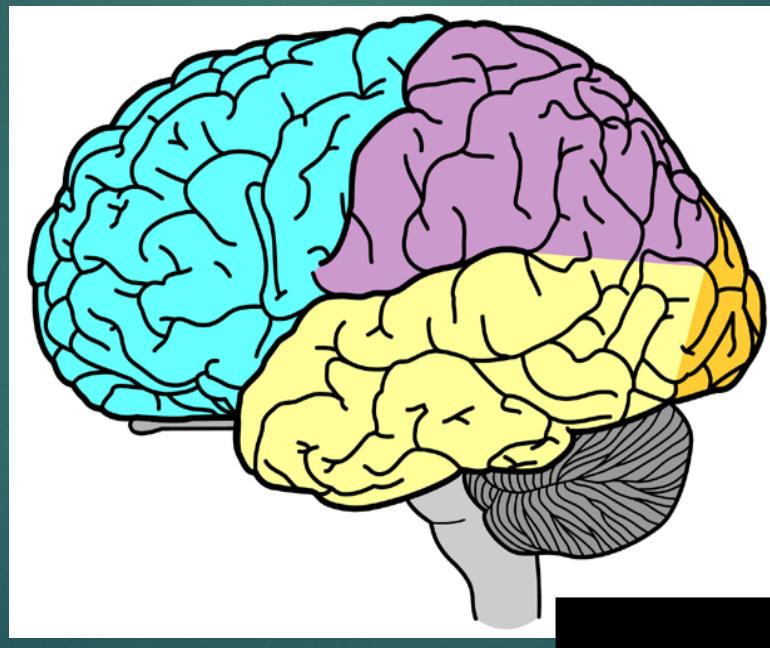
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Extra Slides

A Primer About Autism Spectrum Disorder and Emerging Brain Research



The Growing Field of Neurological Findings in ASD: Selective Differences

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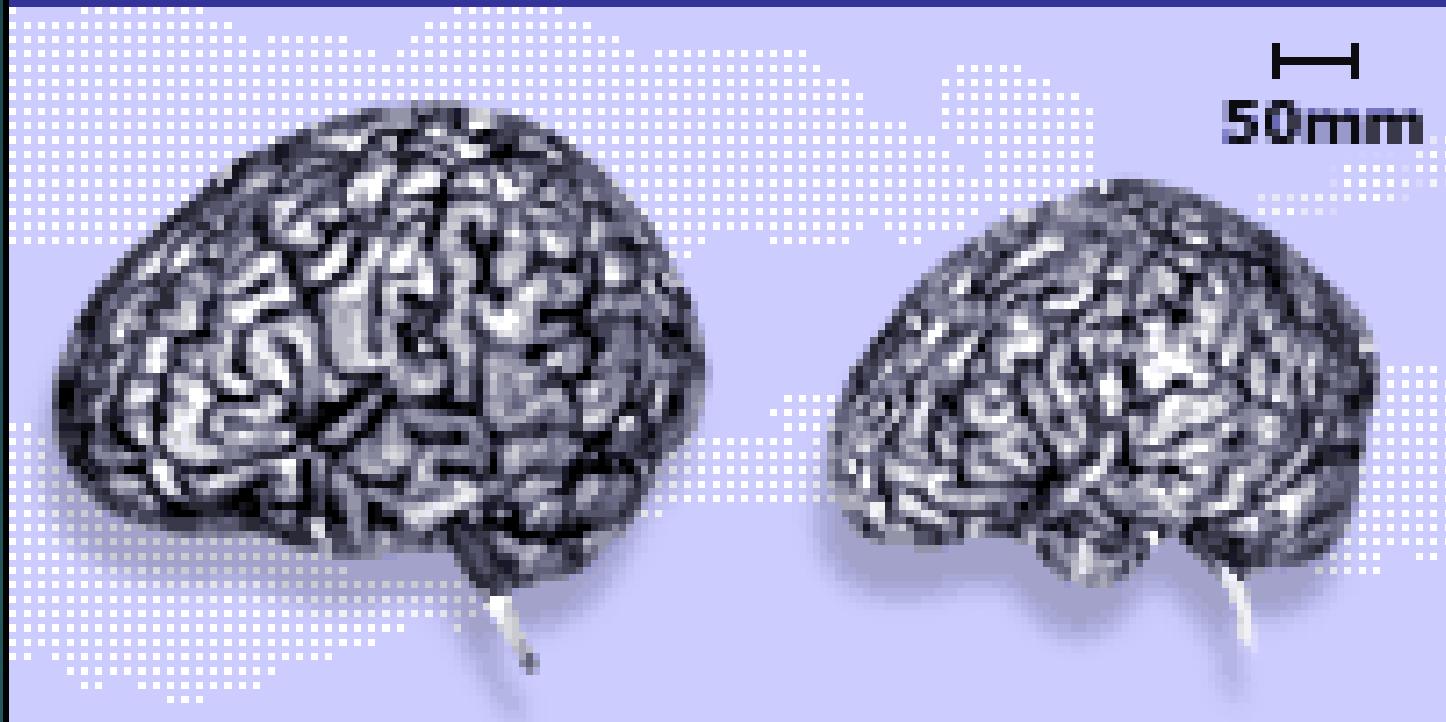
- ▶ Increased brain volume and enhanced early growth rate
- ▶ Differences in “mirror neuron” systems
- ▶ Visual Scanning patterns
- ▶ Differences in limbic system- notably the amygdala (social processing and affect?)

University of California, 2003

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- ▶ When the head size of infants who were later diagnosed with autism was measured, they were in the bottom 25% at birth. But by 12-14 months, their average head size was in the top 15%.
- ▶ From then on brain growth slowed

CHILDREN'S BRAINS



AUTISTIC CHILD AVERAGE NORMAL
CHILD

SOURCE: UNIVERSITY OF CALIFORNIA &
CHILDREN'S HOSPITAL, SAN DIEGO

Provisional Hypotheses

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- ▶ Excessive brain growth does not allow enough time for the child to properly process the experiences and emotions that guide and shape normal development and behavior.
- ▶ The normal process is believed to involve making and breaking internal connections in response to external stimuli, and the rapid growth interferes with this process.

Mirror Neurons

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- ▶ Discovered in 1995 by Giacomo Rizzolatti, Russian born Italian physiologist at the University of Parma in working with macaque monkeys.
- ▶ Since then, several indirect brain-imaging measures, including EEGs have confirmed the presence of a mirror neuron system in humans.

- ▶ He discovered that different neurons in the frontal lobes of monkeys fired when they performed different actions (e.g. pulling, pushing, grasping, etc.)
- ▶ HOWEVER, any given neuron fired when the monkey observed another monkey performing the same action! (Hence “Mirror” neurons)
- ▶ Rizzolatti and his colleagues recently discovered that mirror neurons may actually convey cues to interact when a person is “near” versus “far away”. (e.g. a “pucker” to kiss when done closely)

Implications in....

- ▶ Imitation
- ▶ Reading “affects”
- ▶ Empathy
- ▶ Interpreting “intentions” of others
- ▶ Responding to social cues of others

► Ami Klin, Ph.D:
Director,
Marcus Autism Center,
and
Director, Division of Autism
and Related Developmental
Disabilities, Emory University
Early Diagnostic Indicators
and Predictors of Outcome
in Autism Spectrum Disorders



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- ▶ Looked at the ways 2 year old children with and without autism responded to distortions in motion and sound of a cartoon-like animated video clip.

Klin, Lin, Gorrindo, Ramsey and Jones, 2009. Nature, 2009.

NIH-funded study

Two side-by-side animated clips

- ▶ “Points of light” at body joints of a moving figure, synchronized with voice and sound. Animation was shown upright and forward
 - ▶ Points of light” at body joints of a moving figure, shown upside and in reverse (not synchronized with voice and sound)
- Tracked eye movements of subjects while they looked at these animations on a split screen display

Findings

- ▶ 21 toddlers with autism had no preference while 39 non-autistic children clearly preferred the upright figure.
- ▶ BUT – when the upright figure played “Pat-a-cake” children with autism shifted their attention to that figure. In this figure the “points of light” actually “cause” the clapping sounds- and this physical synchrony only existed in the upright version.
- ▶ Interpretation: Children with ASD prefer audiovisual synchronies – BUT typical children attend to many other socially relevant (affective, facial expressions, intonation,etc.) cues.

Ami Klin, Ph.D., Yale Child Study Center,

- ▶ "Typically developing children pay special attention to human movement from very early in life, within days of being born. But in children with autism, even as old as two years, we saw no evidence of this. Toddlers with autism are missing rich social information imparted by these cues, and this is likely to adversely affect the course of their development.... Attention to biological motion is a fundamental mechanism of social engagement, and in the future, we need to understand how this process is derailed in autism. Starting still earlier, in the first weeks and months of life"

New Research – Klin and Team

Tracking eye movements on face (eyes, mouth, body) as young as 2 months of age and following infants to see point of differences between infants who develop ASD and those who do not!



Limbic System

“Emotion”

(also Physiology and Memory)



Image: www.brainconnection.com
© 1999 Scientific Learning Corporation

About the Limbic System and the Amygdala

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- ▶ “Serves as a source of social processing, stimulus appraisal and brain/body (“emotional”) arousal.”
-Daniel J Siegel (1999)
- ▶ THIS MEANS – that the structures in the core of the brain that make up the “limbic system” “process” the meaning of social situations, and connects present perceptions of a situation with the memories of past situations.

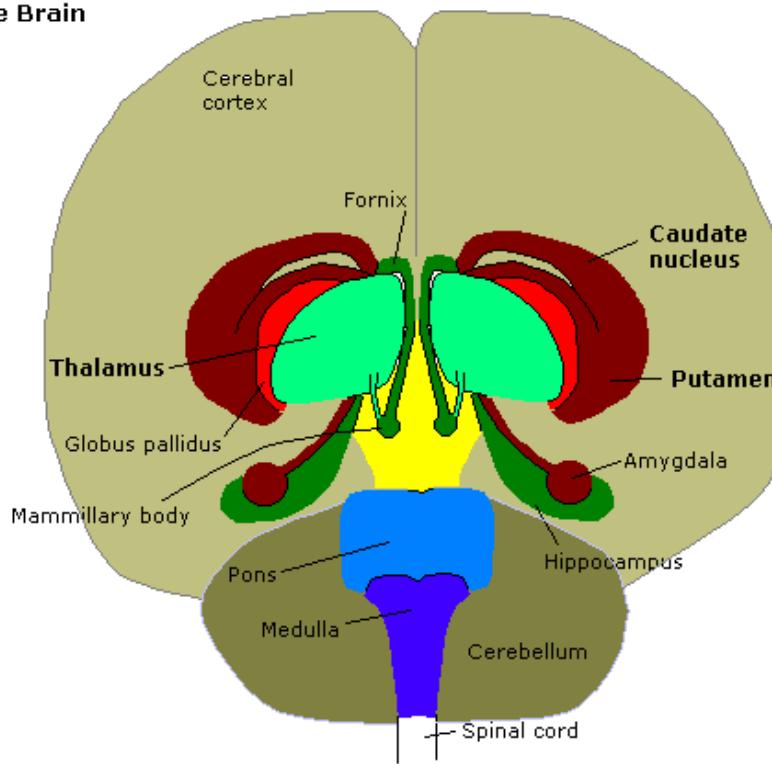
Amygdala

- ▶ This structure is part of the Limbic System- and in the development of brains in babies, this structure (based on real experiences with caregivers and the world) begins to get “wired” to “process” (interpret the meaning of) new experiences. Because the amygdala is connected to other brain regions, what happens in the amygdala affects the entire brain!

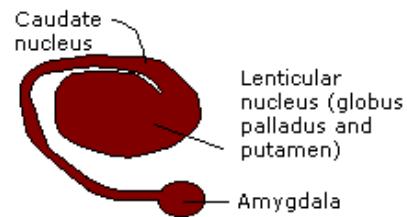
In other words, unlike Las Vegas....

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What happens in the amygdala ***DOES NOT STAY*** in the amygdala!!!

The Brain

The brain as viewed from the underside and front. The thalamus and Corpus Striatum (Putamen, caudate and amygdala) have been splayed out to show detail.

Corpus Striatum

The Amygdala in children with autism

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Researchers found that the amygdala was, on average, 13 percent larger in young children with autism, compared with control group of children without autism. In the study, published in a 2010 Archives of General Psychiatry, researchers scanned 50 toddlers with autism and 33 children without autism at age 2 and again at age 4. The study adjusted for age, sex and IQ.

But

- ▶ Research on amygdala in older persons (typical) shows a positive correlation between volume and social relationships!
- ▶ The increased size in the amygdala is associated **BOTH** with impairments in children with autism **AND** with increased social complexity and connections in older neurotypical children and adults!

HOW IS THAT POSSIBLE?



The Amygdala and ASD

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Speculation that it grows quickly in childhood, interfering with social processing by remaining too activated, then shrinks or slows in growth rate as a child ages.

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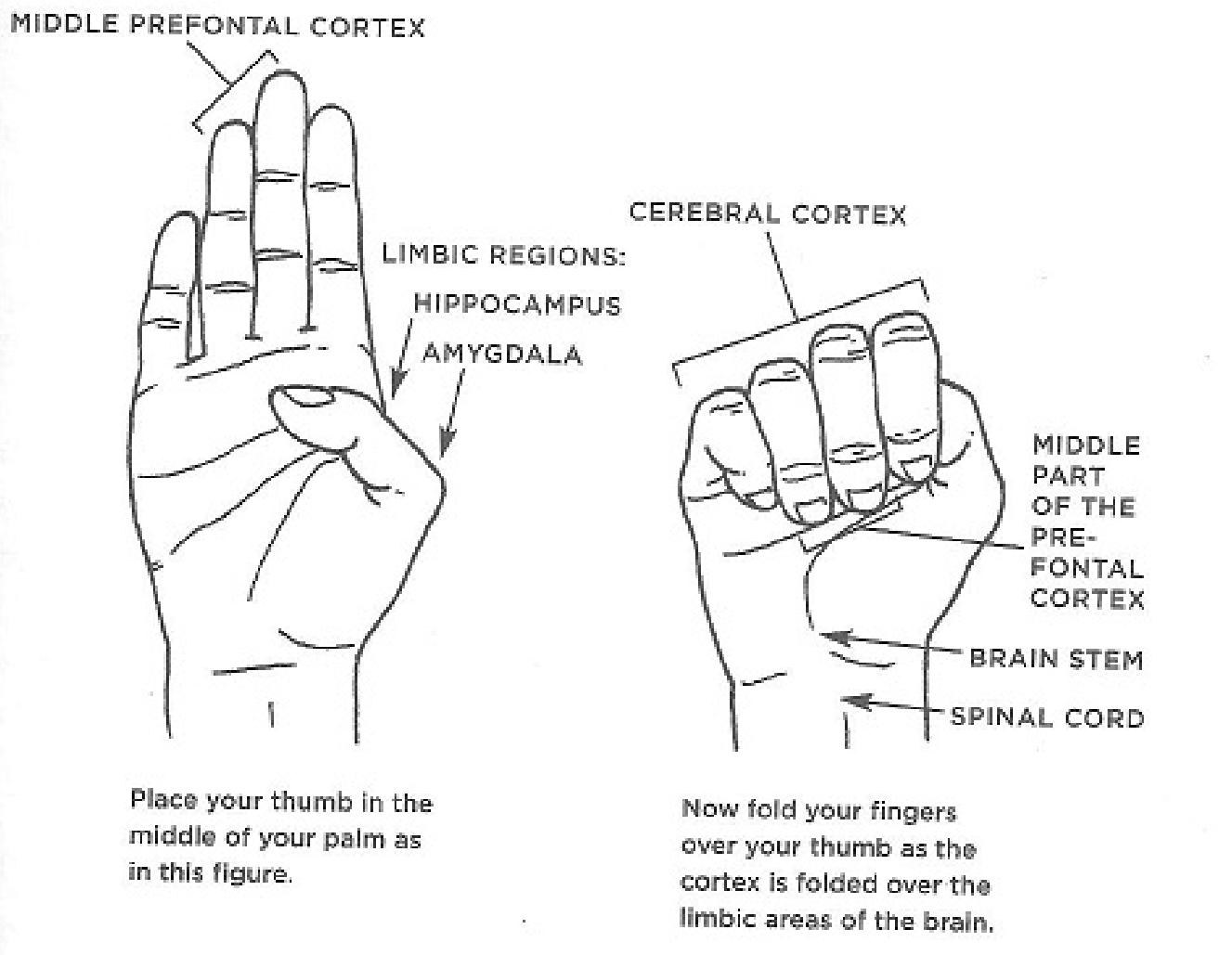
- ▶ The new findings suggest that social fear in autism may initially trigger a hyperactive, abnormally enlarged amygdala, which eventually gives way to a toxic adaptation that kills amygdala cells and shrinks the structure, propose
- ▶ The brain's fear hub likely becomes abnormally small in the most severely socially impaired males with autism spectrum disorders, researchers funded by the National Institutes of Health's (NIH) National Institute of Mental Health (NIMH) and National Institute on Child Health and Human Development (NICHD) have discovered.

In both cases....

The sub-cortex hi-jacks the cortex!

Dan Siegel – “Hand Model of the Brain” (Mindsight, 2010)

Gerard Costa, Ph.D. 2014



Daniel Siegel

The “Hand Model of the Brain”

“Lift up your fingers and you'll have an image of how we ‘flip our lids’ and head down the ‘low road’ in our interaction with others.”

Mindsight (2010), p. 22

For our purposes, this means...

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- ▶ Children with autism have brain differences that may lead them to respond to “normal” events as if they were traumatic.
- ▶ In these situations, the child likely has neurobiological vulnerabilities that transform typical experiences into ones which are experienced as powerful and dangerous stimuli and which overwhelm the child’s capacity to regulate his or her emotions and behaviors.

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Other Differences

- ▶ American Academy of Neurology 2008 study found that 65% of the children studied with autism, had deficits in the functioning of cellular mitochondria, resulting in muscular deficits and weaknesses
- ▶ Dr. Lucy Miller (Univ. of Colorado) found that 78% of children with autism in her study had significant symptoms of sensory processing disorder. although many children have SPDs who are not diagnosed with autism.

Diane Williams, Ph.D. (2008)

“What should the environment input be? Interventionists should start thinking about what a typically developing brain can do. Next, they should consider what a brain with autism cannot do.” (2008, p.15)

Source: Williams, D. (2008). What neuroscience has taught us about autism. ZERO TO THREE, 28, 11-17.

- ▶ "... the brain with autism will process information in idiosyncratic ways." (p.15)
- ▶ Certain processing tasks (like reading) require, "large, highly integrated brain networks." (p.14). Persons with ASD appear to have less integrated brain systems.

Stanley Greenspan, "The Challenging Child"

Gerard Costa, Ph.D. 2014

"Imagine driving a car that isn't working well. When you step on the gas the car sometimes lurches forward and sometimes doesn't respond. When you blow the horn it sounds blaring. The brakes sometimes slow the car, but not always. The blinkers work occasionally, the steering is erratic, and the speedometer is inaccurate. You are engaged in a constant struggle to keep the car on the road, and it is difficult to concentrate on anything else."