



THE BIG PICTURE OF AUTISM: SCIENCE AND THEORY IN PLAIN ENGLISH

Lars Perner, Ph.D.
San Diego State University

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“If It [Were] Easy”

- ◆ Problems we face are often superficially similar to those faced by “neurotypicals”
 - Relationships
 - Understanding others
 - Conflict
 - Budgeting
 - Limited sensory abilities
- ◆ How we handle these problems

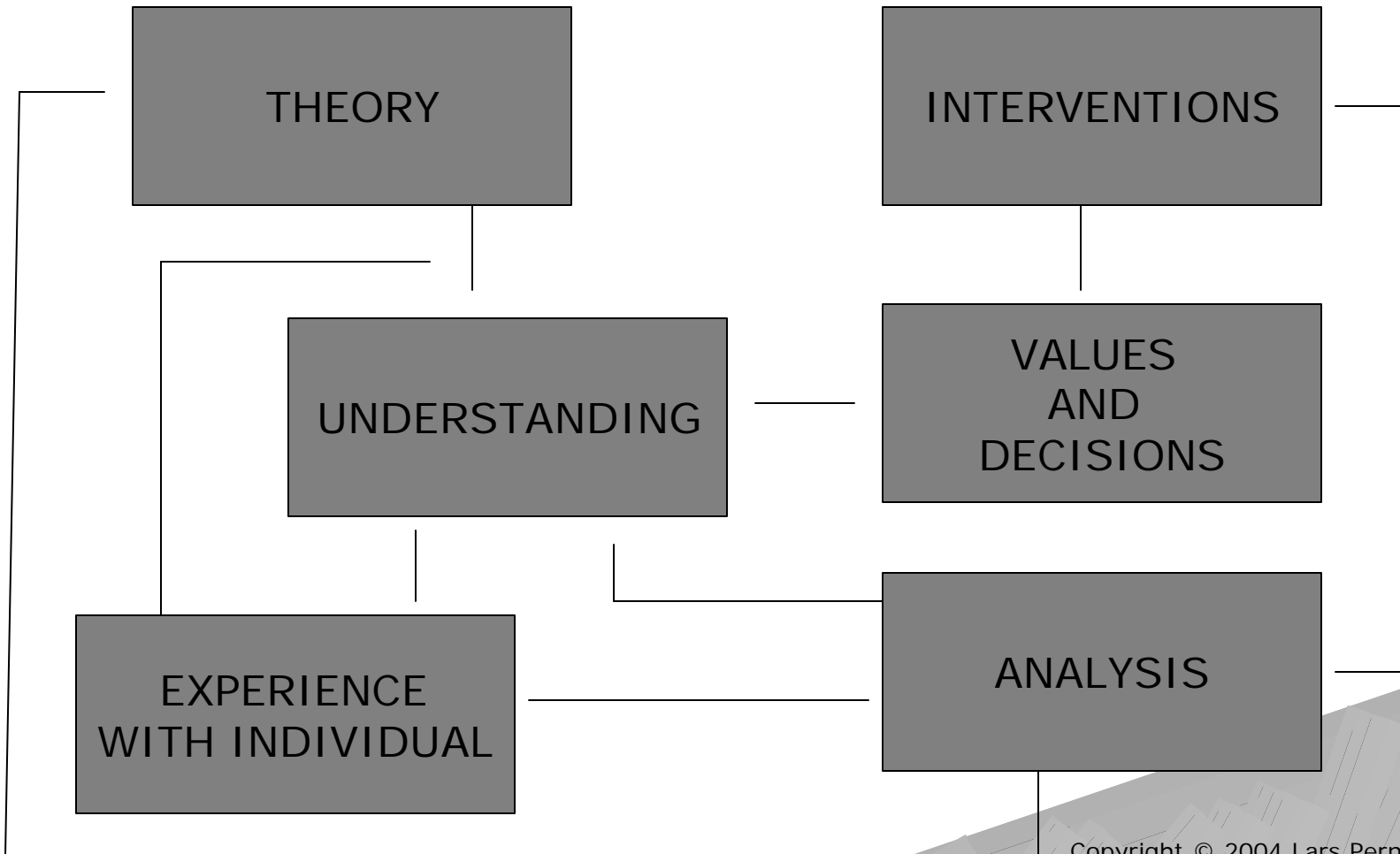
Purposes of This Talk

- ◆ Understand the many factors that influence autism in individuals
- ◆ Recognize individual variations and unique needs
- ◆ Build empathy with autistic individuals
- ◆ Get ideas on what to try and consider to help specific individuals

“There is nothing as
practical as a good theory.”

Kurt Levin

The Role of Theory



“It Takes Every Kinda’ Perspective to Go Around the Autistic Spectrum”

with apologies to

Robert Palmer

- ◆ Specialists and medical practitioners
- ◆ Teachers
- ◆ Parents
- ◆ Individuals on the Spectrum
- ◆ Biomedical researchers
- ◆ Psychologists and Counselors
- ◆ Theoreticians
- ◆ General population
- ◆ Other(?)

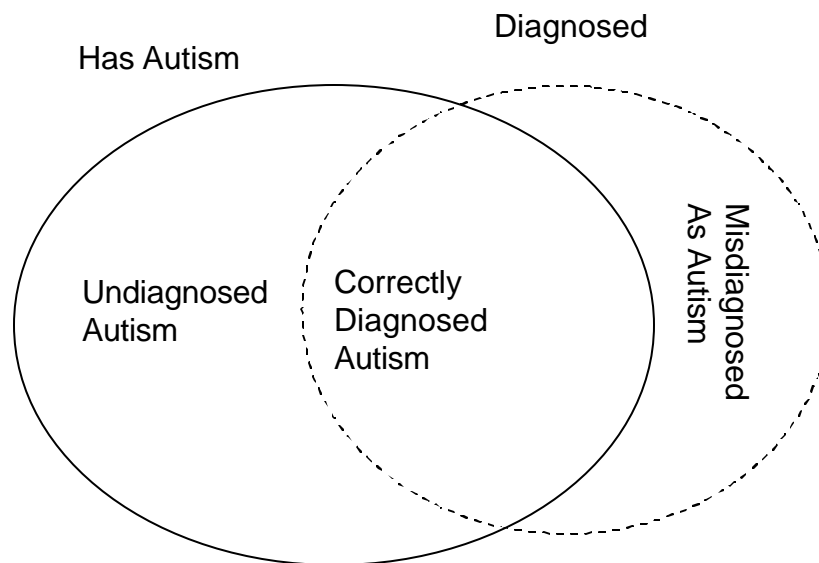
Why Do These Symptoms Go Together?

- ◆ Sensitivity to
 - Noise
 - Coarse materials
 - Food tastes
- ◆ Poor handwriting
- ◆ Difficulty maintaining eye contact
- ◆ Frustration with “spontaneous coordination”
- ◆ Difficulty imitating others
- ◆ Impaired spatial ability
 - Difficulty driving
 - Following maps
- ◆ Difficulty with sensory integration
- ◆ Difficulty doing arithmetic despite intelligence
- ◆ Depression

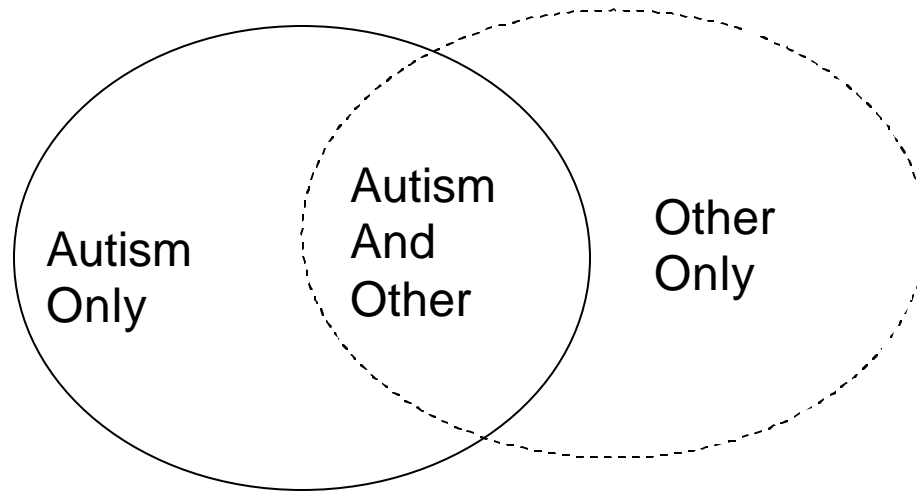
Diagnosis

- ◆ Diagnostic criteria are somewhat arbitrary
- ◆ May be needed for insurance and eligibility standards
- ◆ Frequently “fudged” to meet eligibility
- ◆ Future discoveries may help us better identify clusters of vulnerabilities

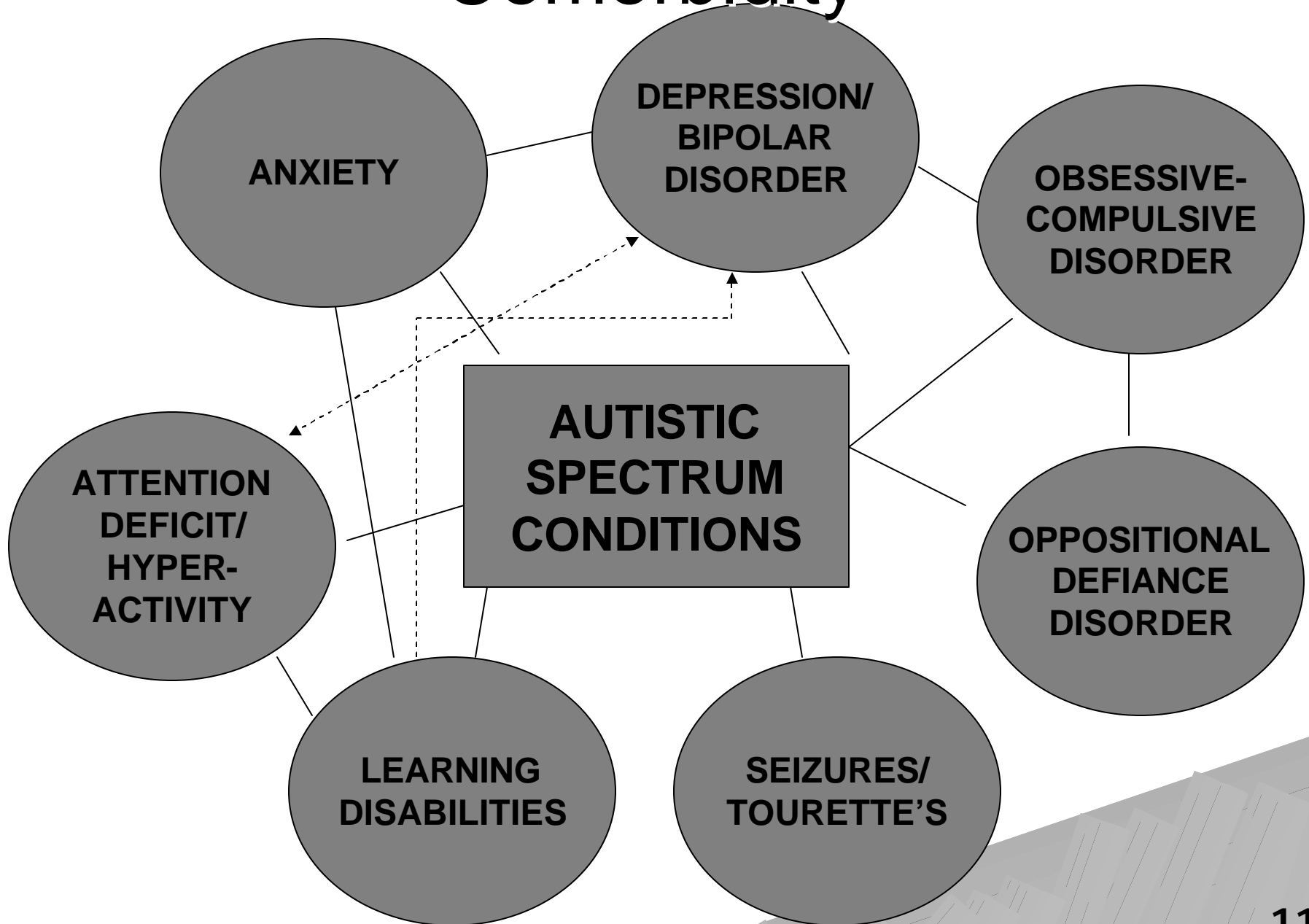
Diagnosis, Misdiagnosis, and “Undiagnosis”



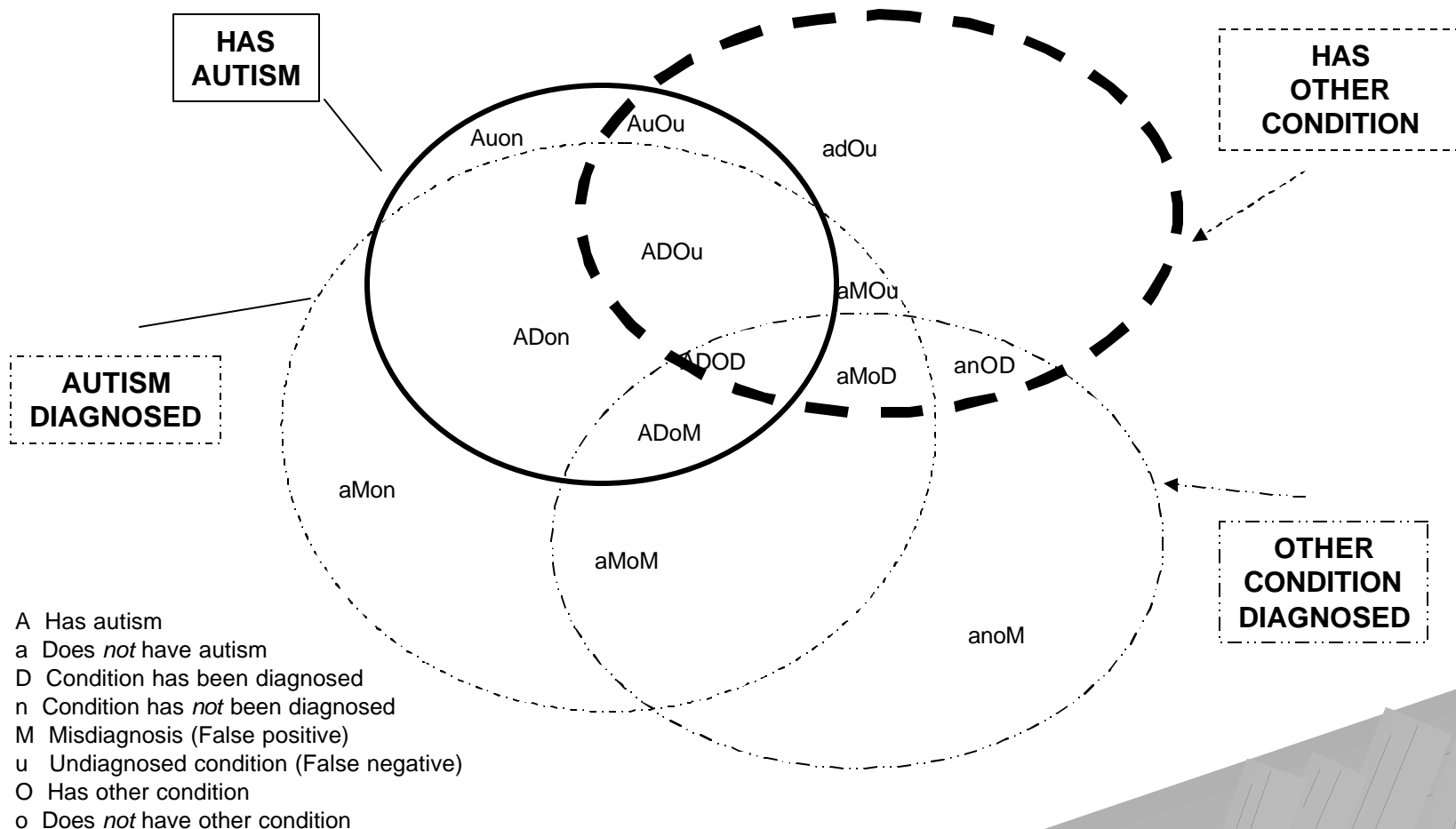
Complicating Things...



Comorbidity



Autism and Other Conditions: Seeing the Whole Picture



Pervasive Developmental Disorders (PDDs)

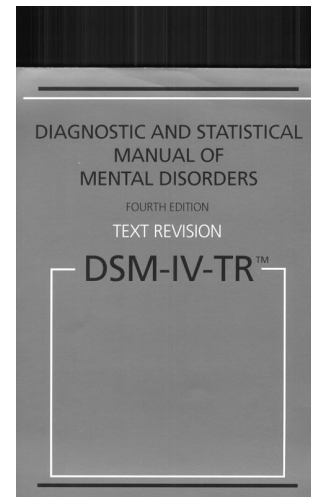
◆ Categories

- Autism
- Asperger's Syndrome
- Rett's
- Pervasive Developmental Disorder—Not Otherwise Specified (PDD-NOS)
- Childhood Degenerative Disorder

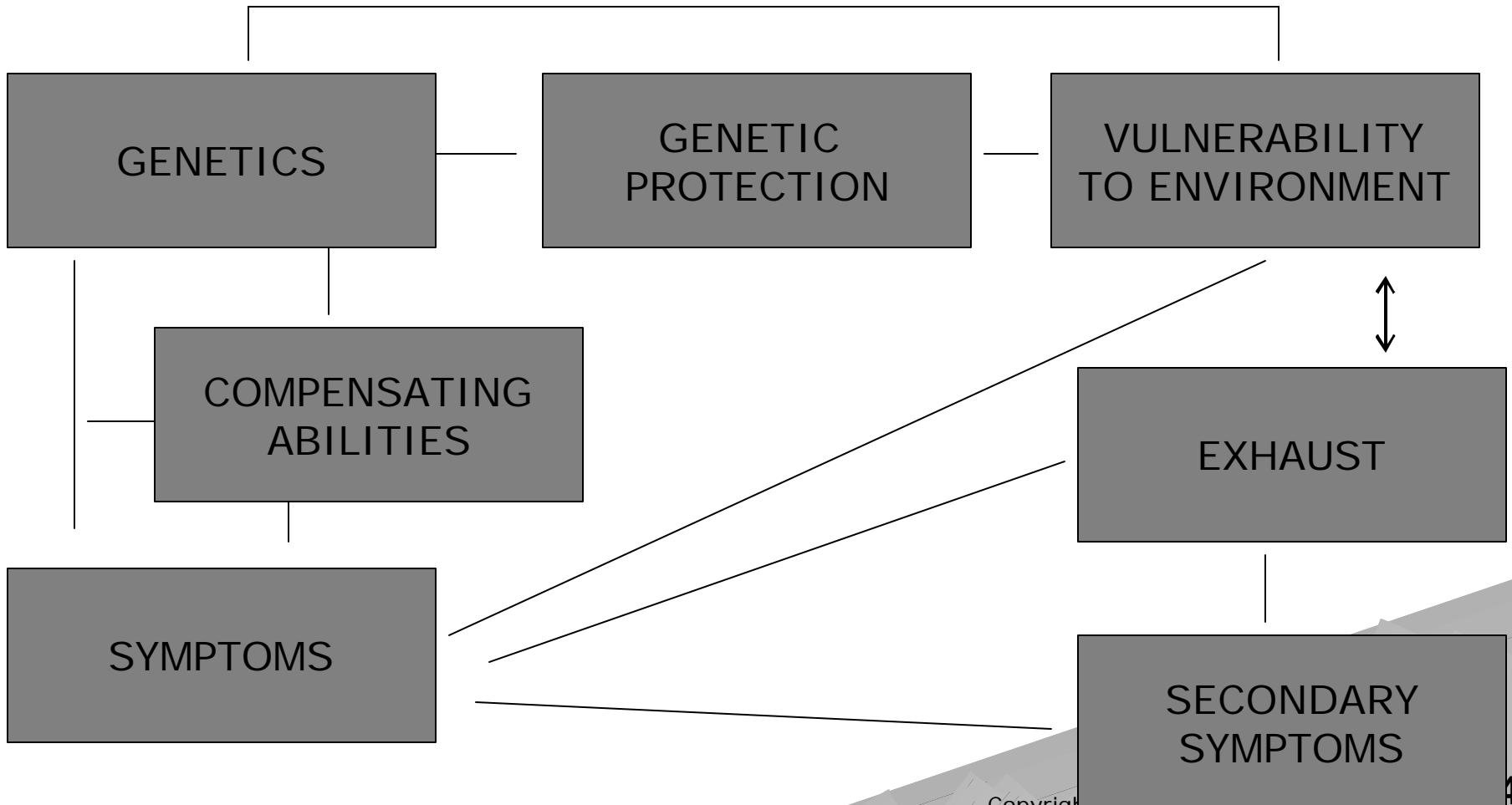
◆ Differences

- Within-group
- Between-group

- ◆ Meaningfulness of diagnostic distinctions
- ◆ Rigidity of criteria
- ◆ Arbitrary nature of standards



Causes of and Influences on Autism



Genetics

- ◆ Varying estimates of the numbers of genes involved
- ◆ Interaction of multiple genes
 - Fraternal vs. identical twins
- ◆ Genetic redundancy and protection

El Niñofication



- ◆ The tendency to move to one *extreme* or the other on performance or behavior
 - Examples
 - ◆ Sensitivity
 - ◆ Confrontation
 - ◆ Math or verbal abilities

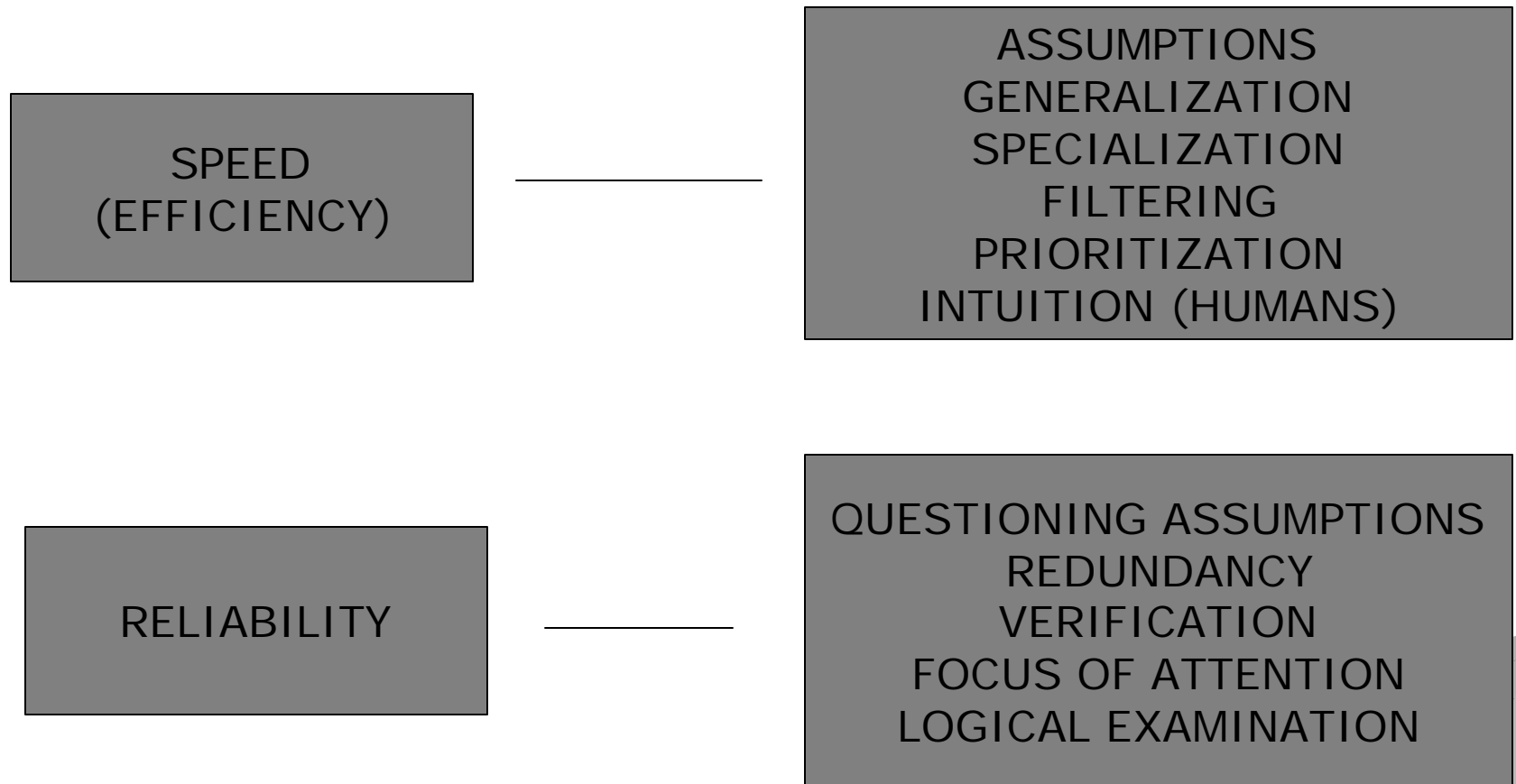
Brain Structure

- ◆ Specialization of brain areas (e.g., amygdala)
- ◆ Brain scan studies
- ◆ “White” vs. “gray” matter
- ◆ Neural connections
 - Learning
 - Survival and “pruning”
 - Structure of neurons and dendrites

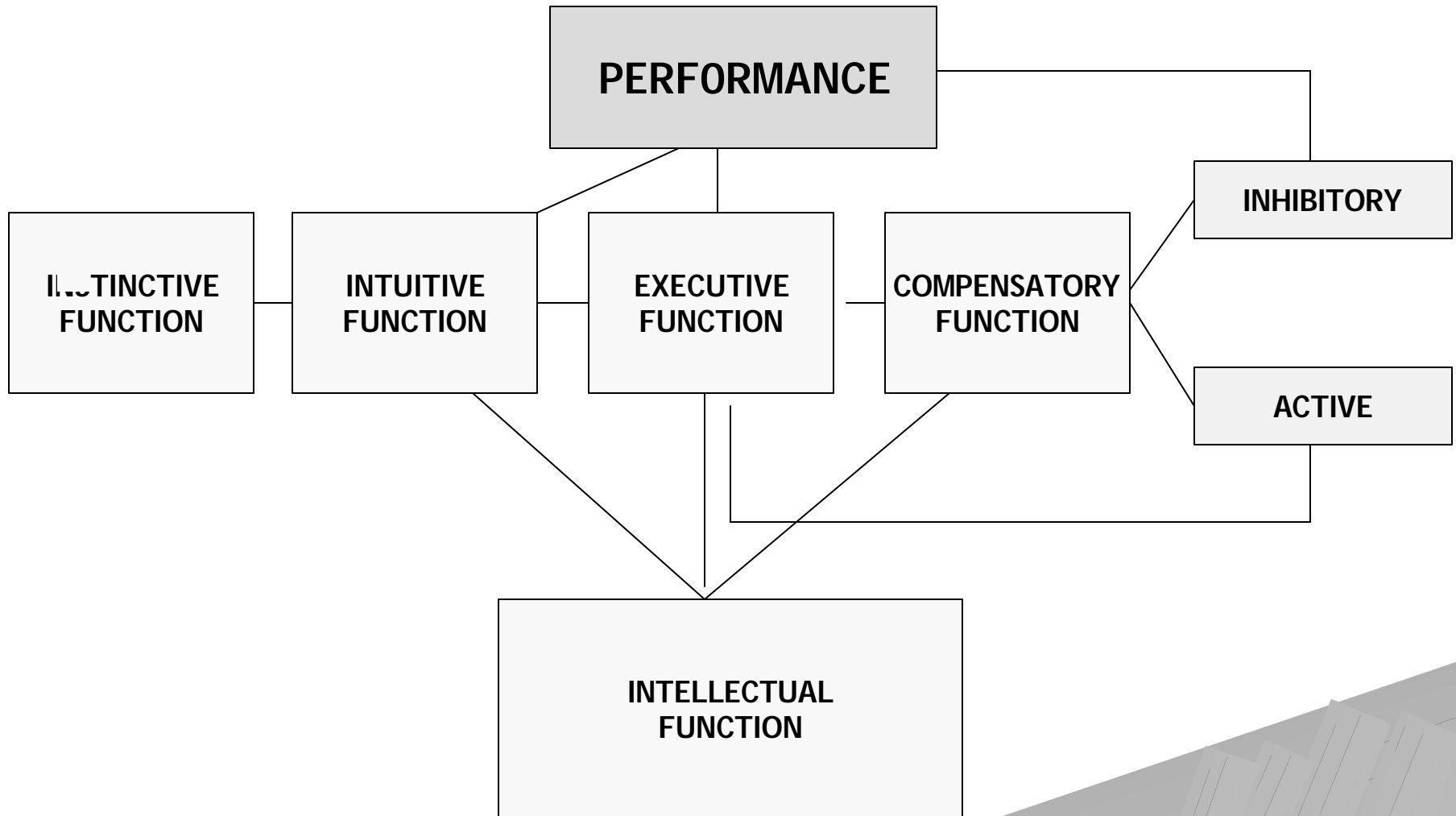
Neurotransmitters

- ◆ Total of 52 known
- ◆ Especially important in autism:
 - Dopamine
 - Norepinephrine
 - Serotonin
 - Oxytocin
- ◆ Interaction of transmitters

Two Competing Objectives for Computers and Brains



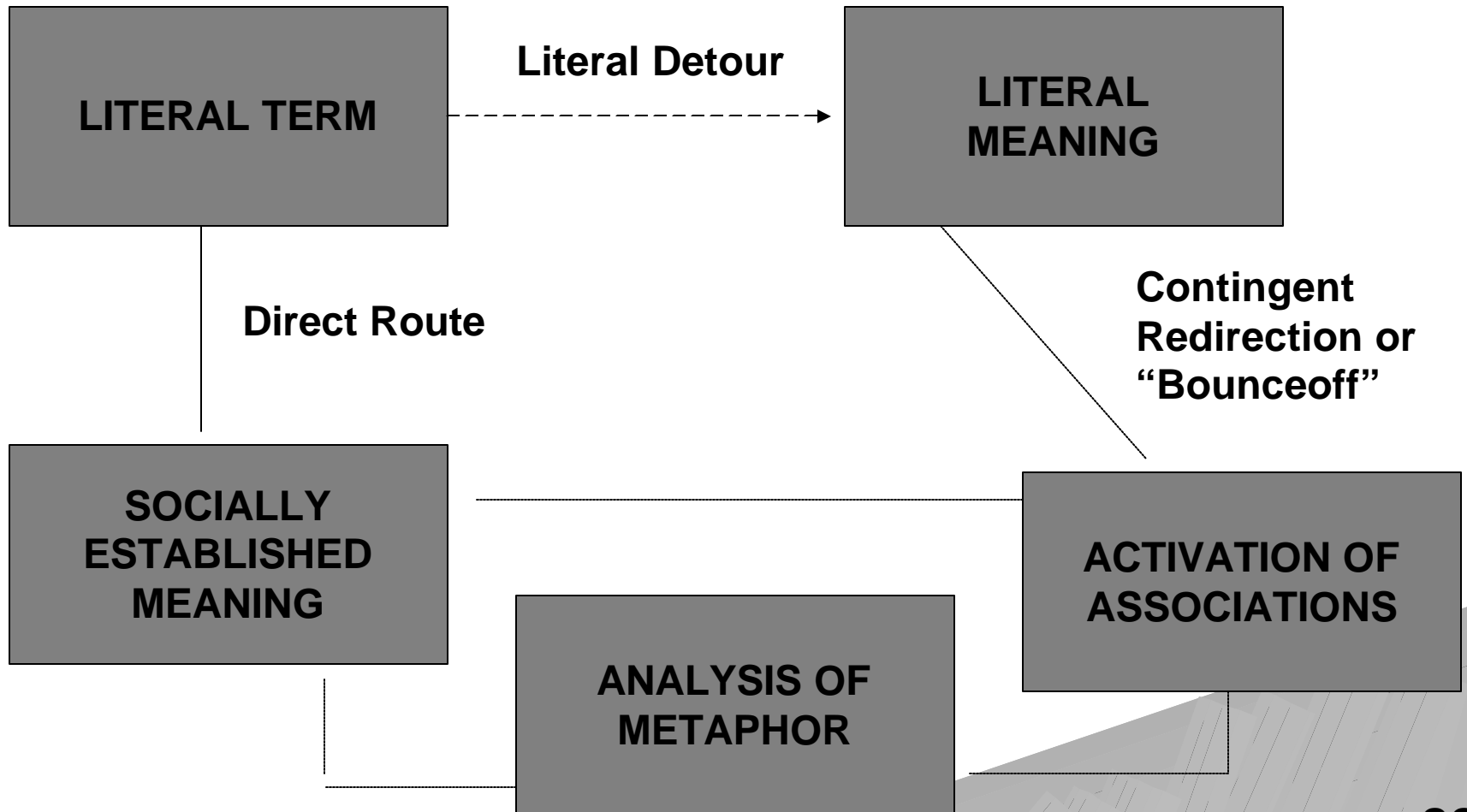
A FIVE FUNCTION MODEL OF THE PERFORMANCE OF INDIVIDUALS ON THE AUTISTIC SPECTRUM



Abstraction and Generalization

- ◆ Individuals with autism often have difficulty in
 - Generalizing from one situation to another
 - Understanding and/or accepting “exceptions”
 - Understanding certain non-concrete ideas (BUT...)
 - Understanding non-literal language
 - Deciphering symbolic (graphical) representation

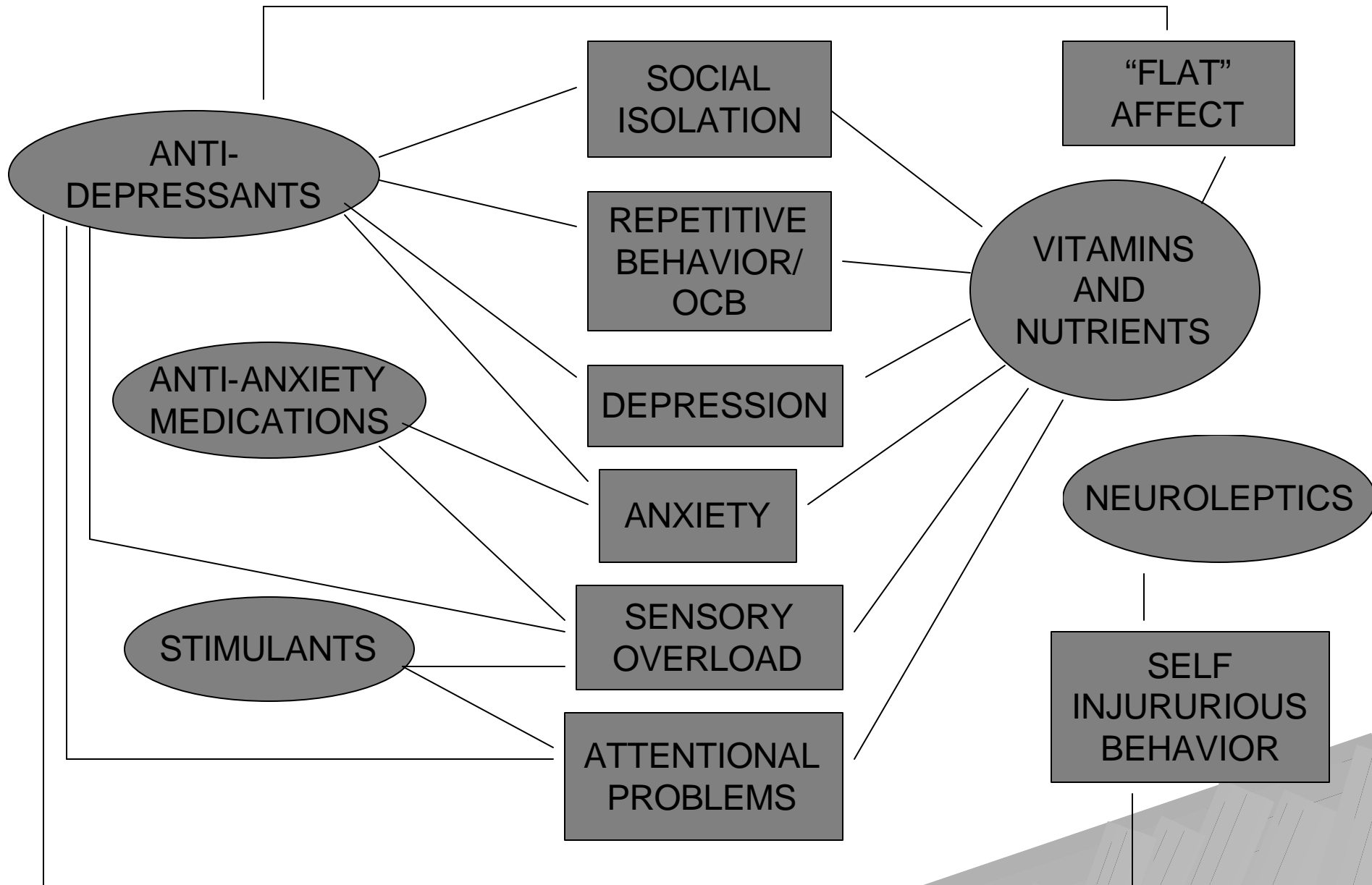
The Literal Detour



Arbitrary Medical Standards

- ◆ Schizophrenia takes precedence over autism/AS/PDD-NOS
- ◆ Autism/AS/PDD-NOS take precedence over ADD/ADHD
- ◆ Symptoms of depression may be “secondary” and may or may not be diagnosed separately

Medical Treatments (In Addition to “Talk” Therapy)



Notes on Medications

- ◆ Very large individual variations in
 - Needs
 - Effectiveness
 - Side effects
- ◆ Interactions
- ◆ Frequent side effects
- ◆ Paradoxical effects—may have *opposite* of expected effects
- ◆ Individuals with autism often respond to *minute* quantities
- ◆ Tolerance
- ◆ Loss of effectiveness

Medical Studies

- ◆ Test vs. placebo groups
- ◆ Criteria
 - Average improvement
 - Improvement within a subgroup
- ◆ Trial size and random variations