If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.

This handout is for reference only. It may not include content identical to the powerpoint. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.

What Does it Mean When a Child Talks Late? Differential Diagnosis of Speech and Language Disorders in Toddlers and Preschools

October 1, 2015

Stephen Camarata, PhD

Vanderbilt-Bill Wilkerson Center

Stephen Camarata, PhD,
Professor, Bill Wilkerson Center Investigator,
John F. Kennedy Center for Research on Human Development
Vanderbilt University School of Medicine
Professor,
Psychiatry, Hearing & Speech Sciences

- stephen.camarata@vanderbilt.edu
- 615-936-5111

Support for Lab

- NIH: NIDCD, NICHD, NIMH
- Scottish Rite Foundation of Nashville
- Wallace Research Foundation
- Bill Wilkerson Center Research Fund

Presentation Outline

- What is Late Talking?
- Do All Late Talkers Need Treatment?
- DSM-5 Categories With Speech/Language Disorders as a Symptom
- Lessons from Autism: ASD, PDD-NOS, and Asperger Syndrome
- Differential Diagnosis vs Eligibility/Confirmatory

Presentation Outline (Cont.)

- Early Identification-Key Markers
- Controversial/Questionable Diagnoses (Sensory Integration, Childhood Apraxia of Speech, Auditory Processing Disorder)
- Treatment Considerations

Learner Outcomes

- 1. Identify the key differences between a differential diagnosis and an eligibility evaluation.
- 2. Describe the DSM-V conditions that include late talking (expressive language delay) as one diagnostic feature.
- 3. Differentiate Speech Disorder, Language Disorder, Social Communication Disorder and Autism Spectrum Disorder

Learner Outcomes (Cont.)

- 4. Describe the differences between social skills training in Autism Spectrum Disorder and Social Communication Disorder.
- 5. Identify the risk factors that differentiate nonclinical late talking (late blooming) from long term, persistent speech or language disorder
- 6. Describe how Labels Inform Treatment

What is Late Talking?

- When Onset of words is delayed
- Includes "Late Bloomers" and Children with Disabilities
- Literally, *all* children who talk late
- Late Talking may be a Symptom of disability or simply a developmental Stage

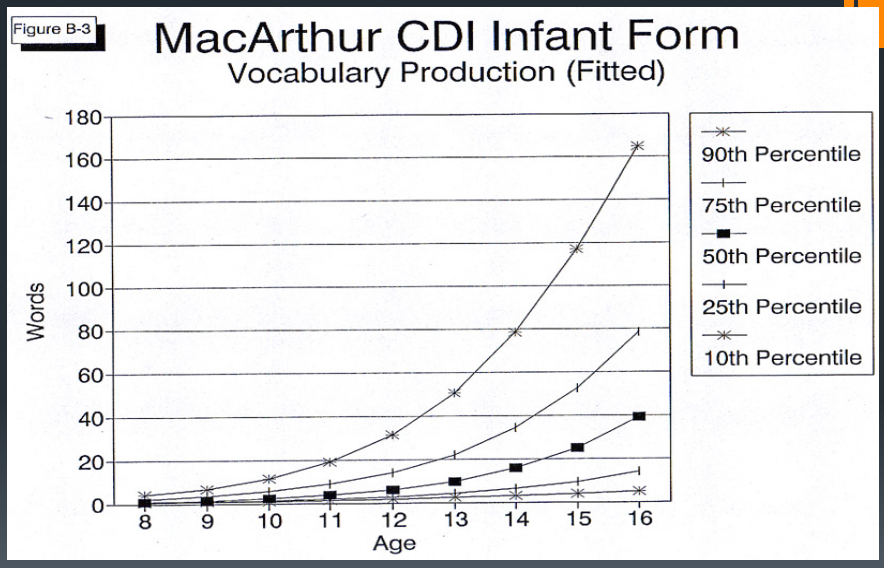


Figure B-2

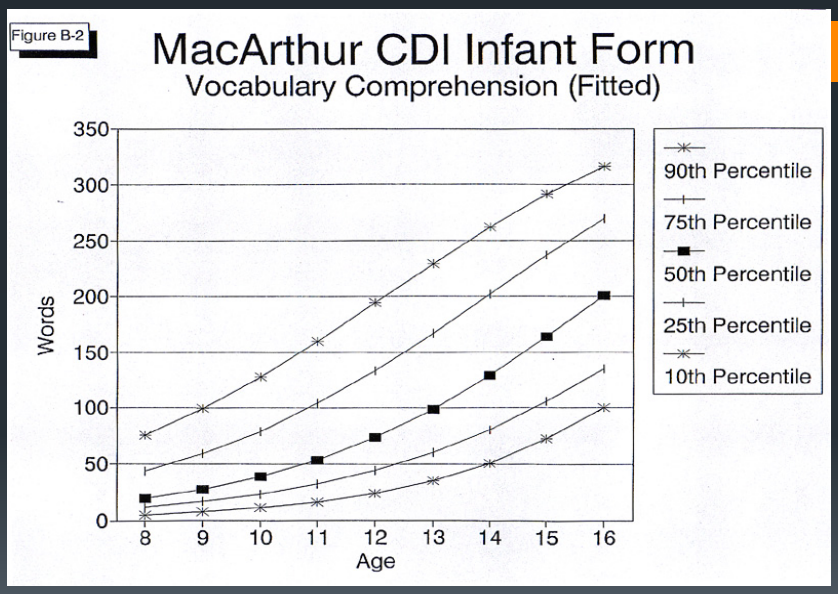
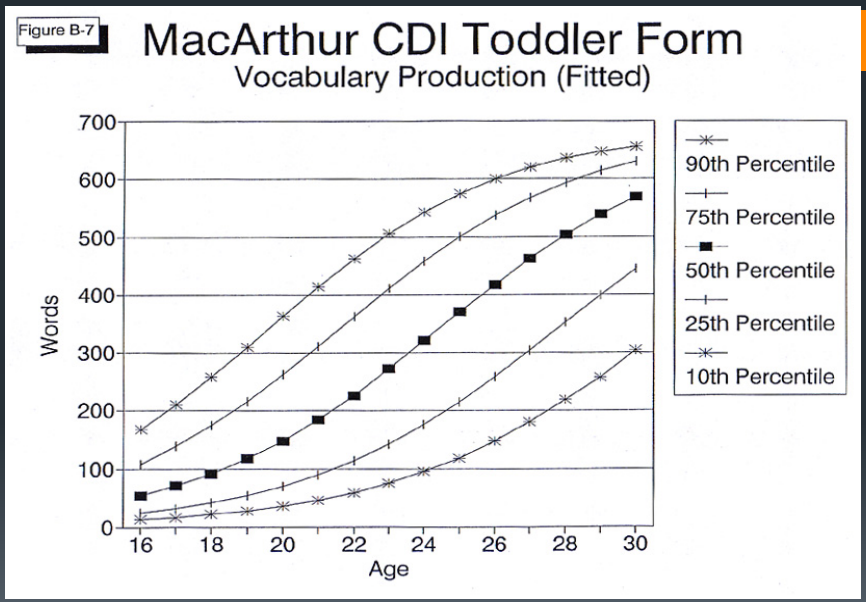


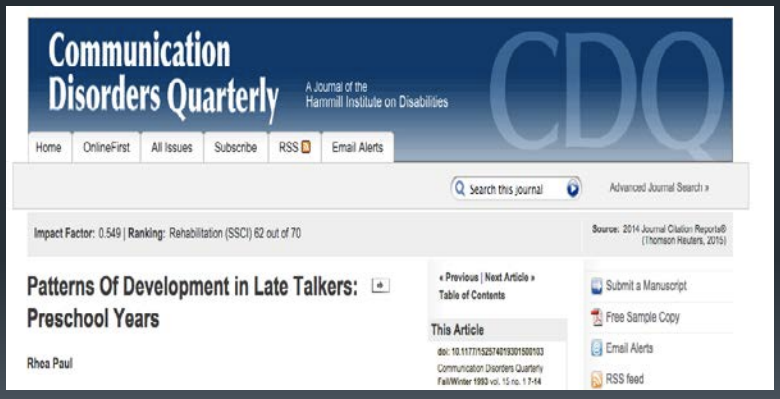
Figure B-7



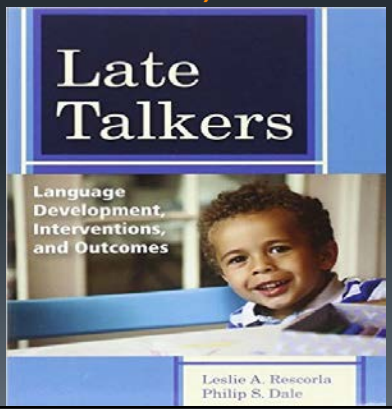
Do All Late Talkers Need Treatment?

- If one selected 100 late talkers at age 24 months, what percentage would normalize (in terms of vocabulary growth) by age 3? Without receiving any clinical intervention?
- None
- 10-20%
- 30-50%
- 50-70%
- More than 70%?

50% to 70%



Late Talking, by itself is not a consistent predictor of developmental disability or even long term language ability (Dollaghan, 2013)



It could be a NONCLINICAL developmental stage (and ***is*** at least 50% of the time)

- This form of Late Talking is a *developmental stage* that will ultimately resolve without treatment
- Often is seen with precocious visual spatial development

But that means Late Talking is a symptom of a CLINICAL condition at least 30-50% of the time.

- How can we tell whether the late talking will persist without treatment?

What Can it Be?

- Point of Emphasis: Speech Pathologist has a CRUCIAL role in completing a differential diagnosis!
- After all, the problem is Late *Talking*

DSM-5 Categories With Speech/Language Disorders as a Symptom

- Communication Disorders
- Intellectual Disability (Formally called Mental Retardation)
- Autism Spectrum Disorder

Communication Disorder

- Phonological/Speech/Articulation Disorder
- Language Disorder
- Social Communication/Pragmatic Disorder

Intellectual Disability

- Global Slow Learning (significantly lower scores in verbal and nonverbal estimates of intelligence)
- Includes delayed onset of language and slow rates of language acquisition

Autism Spectrum Disorder

- Delayed onset of language
- Reduced MOTIVATION for social communication
- Repetitive Behavior and Restricted Interests

Social Communication Disorder

- "New" in DSM 5
- Long been known as "pragmatic disorder"
- Child is motivated to communicate, has some knowledge of language forms, but has difficulty with conversation and social skills.
- Previously often identified as "Asperger" but quite different than ASD

Role of Speech-Language Pathologist is Crucial!

- ADOS training example
- Grammar
- Syntax
- Echolalia

Lessons from Autism: ASD, PDD-NOS, and Asperger Syndrome

- What Happened to Asperger syndrome and PDD-NOS?
- Where did they go?

Nearly all children with ASD talk late, but only a fraction of the children who talk late have ASD

- Even most liberal estimate of ASD is 1:88
- SLI is approximately 1:10
- Doesn't include speech disorder or Intellectual Disability
- There is a less than 1 in 8 probability that a child who talks late is ASD

Differential Diagnosis vs Eligibility/Confirmatory

- Goal of assessment should be to determine what condition is evident.
- Should NOT be to confirm a particular condition (ie, ASD)

Changing Landscape

- It is not unusual for children who are clearly “only” language disordered or even solely phonologically disorder to be made “eligible” for services as “ASD”

Key Differential Markers

- Nonverbal IQ (Verbal IQ might be low, even when reasoning ability is average or above average)
- Speech (Phoneme Inventory)
- Nonverbal Social Skills
- Repetitive Behavior
- Restricted Interests
- For ASD or ID, the child will still show symptoms even if they learn to speak normally and had normal language ability

Controversial/Questionable Diagnoses (Sensory Integration, Childhood Apraxia of Speech, Auditory Processing Disorder

- These diagnoses are meant to be explanatory and seem to have some "face validity" but are vague and do not meet even basic psychometric standards
- Often used to justify a particular treatment (e.g., FastForward)

Problem 1: Autism vs ASD

- "About 1 in 88 children has been identified with an autism spectrum disorder (ASD) according to estimates from CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network."
- "ASDs are almost 5 times more common among boys (1 in 54) than among girls (1 in 252)."

CDC Press Release April 19, 2012

Does this Mean that 1 in 55 Boys will Grow up as "Rainman?"

From CDC Report

"The proposed revised diagnostic criteria for Autism Spectrum Disorder [DSM-V] would combine three subgroups currently under the DSM-IV-TR heading of Pervasive Developmental Disorders into one category and might require a child to display more pronounced symptoms to receive a diagnosis."

And…

- "The pooled Relative Risk was 1.95 ($p < 0.001$) showing that AD diagnostic stability was [significantly] higher than PDD-NOS. When diagnosed before 36 months PDD-NOS bore a 3-year stability rate of 35%." Rondeau et al 2010 (JADD)
- Note: The stability of AS was greater than 90%!

So…

- ASD stability: less than 35%
- Autism stability: greater than 90%

Finally…

- prevalence estimates are13 per 10,000 for AD and 20.8 per 10,000 for PDD-NOS (Fombonne 2005).
- But, all of these were pooled into "ASD" for the CDC estimates

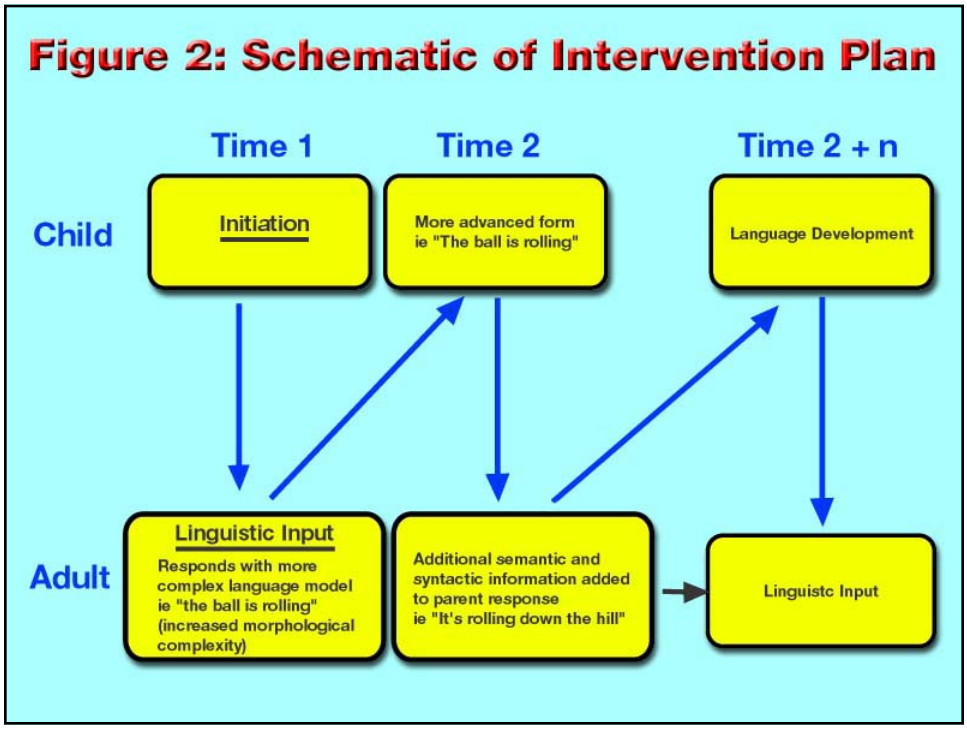
.

There is a low probability of spontaneous recovery in "Autism" but a high spontaneous recovery in the broader ASD

Indeed, at age 12 months to 30 months, nearly all children with delayed speech onset could be diagnosed with ASD

Confirmatory vs. Differential Diagnosis

- ASD
- Speech Disorder
- Language Disorder
- Social Communication Disorder
- Intellectual Disability



Treatment

- Eligibility informs treatment
- Example: Type 1 and Type 2 diabetes
- Differential Diagnosis is crucial

Rationale

- Evidence Based Practice
- Reimbursement
- Healthcare Reform
- Allied Health Caps
- State Guidelines

Early Intervention Works! Right?

"The strength of the evidence overall ranged from insufficient to low" Warren et al. 2011

What???!!!

We all “know” that EI works in ASD

How could a comprehensive meta-analysis show otherwise?

Testing for Intervention Effects in Variable Phenotype is Difficult!

The Lancet, June 2010

- "At the same time, today's study exemplifies the complexity of attempting to detect change in samples of young children with such a heterogeneous condition. There are very few positive published trials in autism, for behavioural interventions, traditional pharmaco-therapy, or complementary/alternative therapies."

Current State of the Evidence Base

- Literally hundreds of studies showing a range of behavioral interventions are effective in teaching children with ASD a pantheon of skills
- And for improving behavior
- But, weak evidence, at best, for EI

Problem 2: Culture of Superstition

Vaccines, Autism and Treatment

CNN January 5, 2011

- **Retracted autism study an 'elaborate fraud,' British journal finds**

"I do believe sadly it's going to take some diseases coming back to realize that we need to change and develop vaccines that are safe. If the vaccine companies are not listening to us, it's their f___ing fault that the diseases are coming back." http://www.time.com/time/health/article/0,8599,1888718,00.html#ixzz1qFAZnfv9.

Into this void: Autism "Treatments"

- Example: Secretin
- Example: Defeat Autism Now (DAN)
- Example: Facilitated Communication

Secretin

- Digestive Hormone
- Promoted as "Cure" for Autism
- Clinical Trial Discontinued Early

DAN (Defeat Autism Now) Physicians

- Chelation as “detox” for mercury in vaccines (thimerisol removed from vaccines more than decade ago)
- FDA: “Federal regulators are warning eight companies to stop selling so called ‘chelation’ products that claim to treat a range of disorders from autism to Alzheimer’s disease.” http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/UCM229436.pdf

FDA Warns Marketers of Unapproved 'Chelation' Drugs

Federal regulators are warning eight companies to stop selling so called 'chelation' products that claim to treat a range of disorders from autism to Alzheimer's disease.

Chelator, Behavior Balance DMG Liquid, AlkaLife Alkaline Drops, NutriBiotic Grapefruit Seed Extract, Natur-Leaf, Kids Clear Detoxifying Clay Baths, EBN Detoxifying Bentonite Clay, and the Heavy Metal Screen Test

- Maxam Nutraceutics/Maxam Laboratories: PCA-Rx, PC3x, AFX, AD-Rx, AN-Rx, Anavone, AV-Rx, BioGuard, BSAID, CF-Rx, CreOcell, Dermatotropin, Endotropin, GTF-Rx, IM-Rx, Keto-Plex, Natural Passion, NG-Rx, NX-Rx, OR-Rx, Oxy-Charge, PN-Rx, Ultra-AV, Ultra Pure Yohimbe, and the Heavy Metal Screening Test
- Cardio Renew, Inc: CardioRenew and CardioRestore
- Artery Health Institute, LLC: Advanced Formula EDTA Oral Chelation
- Longevity Plus: Beyond Chelation Improved, EndoKinase, Viral Defense, Wobenzym-N
- Dr. Rhonda Henry: Cardio Chelate (H-870)

FDA says consumers should avoid nonprescription products offered for chelation or detoxification. FDA-approved chelating agents are available by prescription only and are approved for use in specific indications such as the treatment of lead poisoning and iron overload. The agency says even the prescription medications carry significant risks, and they should only be used with medical supervision.

The products come in a number of forms, including sprays, suppositories, capsules, liquid drops, and clay baths.

Overall, FDA says there's been an increase in the number of nonprescription, chelation products that claim to cleanse

Facilitated Communication

- Augmentative Communication with Facilitator
- Hailed as "Breakthrough"
- False Charges of Abuse
- Scientific Studies Showed Hoax/Facilitator Source of Message

Still Practiced Autism National Committee

- The benefit of FCT in leading to FC as an acceptable and valid form of AAC has been established…
- *www.autcom.org/articles/PPFC.pdf (2008)*

What About Sensory Integration?

"parents should be informed that the amount of research regarding the effectiveness of sensory integration therapy is ***limited and inconclusive***. Important roles for pediatricians and other clinicians may include discussing these limitations with parents, talking with families about a trial period of sensory integration therapy, and teaching families how to evaluate the effectiveness of a therapy. Pediatrics 2012;129:1186–1189

Stakes are Very High!

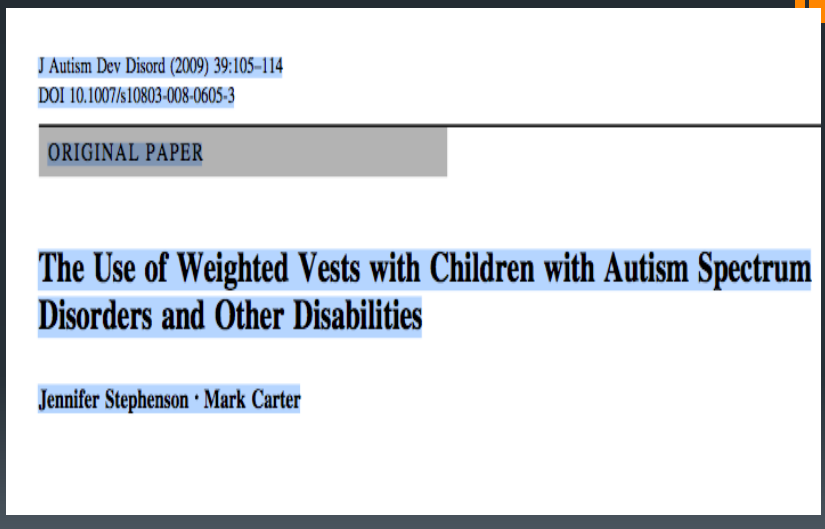
- Insurers and School Districts Increasingly Tying reimbursement to Evidence
- Competition for Rehabilitation Limits
- Affordable Care Act

Principles

- All interventions can be tested
- Unbiased Studies Must be Conducted
- Confirmatory Studies Not Conclusive
- Single Blind Studies Required

Fair Trials

- Must be Fair to Approach (piecemeal evaluation unfair)



J Autism Dev Disord (2009) 39:105–114
DOI 10.1007/s10803-008-0605-3

ORIGINAL PAPER

The Use of Weighted Vests with Children with Autism Spectrum Disorders and Other Disabilities

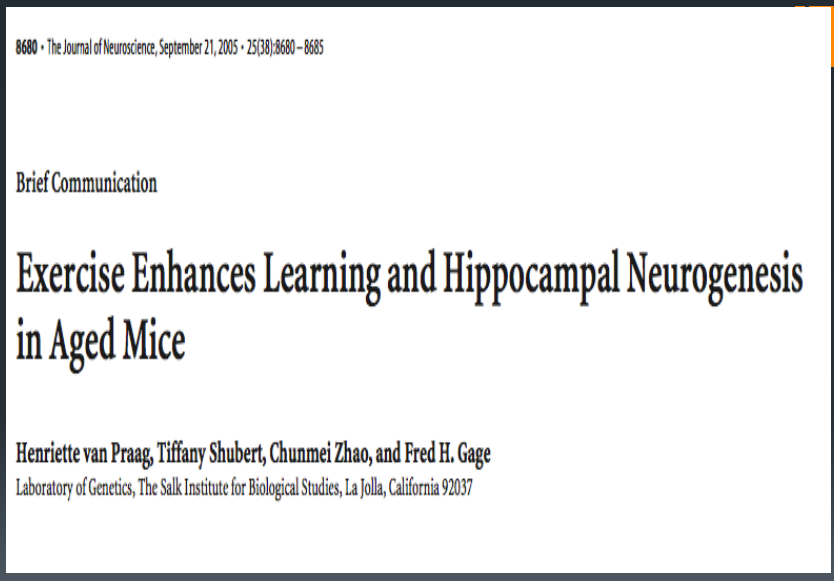
Jennifer Stephenson · Mark Carter

"While there is only a limited body of research and a number of methodological weaknesses, on balance, indications are that weighted vests are ineffective. There may be an arguable case for continued research on this intervention but weighted vests cannot be recommended for clinical application at this point."

Controlling for Confounds

Broad Strengths (Not Specifically Attributed to Sensory Approach

- Exercise
- Response to Child
- Child Choice
- Fun Activities
- Positive Clinician Affect



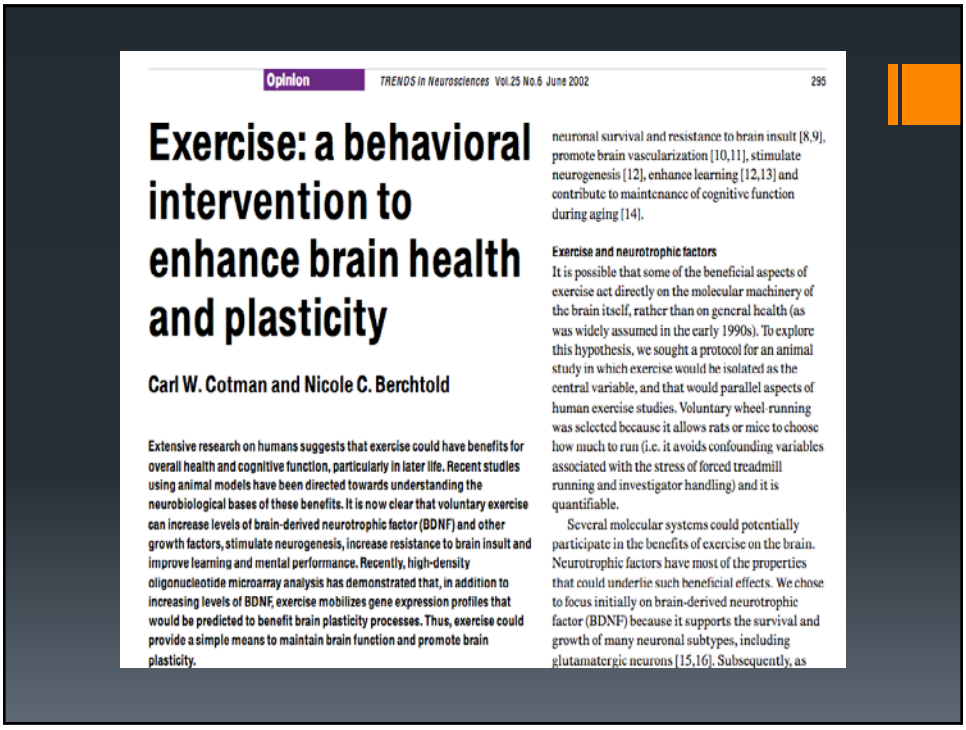
8680 • The Journal of Neuroscience, September 21, 2005 • 25(38):8680–8685

Brief Communication

Exercise Enhances Learning and Hippocampal Neurogenesis in Aged Mice

Henriette van Praag, Tiffany Shubert, Chunmei Zhao, and Fred H. Gage

Laboratory of Genetics, The Salk Institute for Biological Studies, La Jolla, California 92037



Opinion TRENDS in Neurosciences Vol.25 No.6 June 2002 295

Exercise: a behavioral intervention to enhance brain health and plasticity

Carl W. Cotman and Nicole C. Berchtold

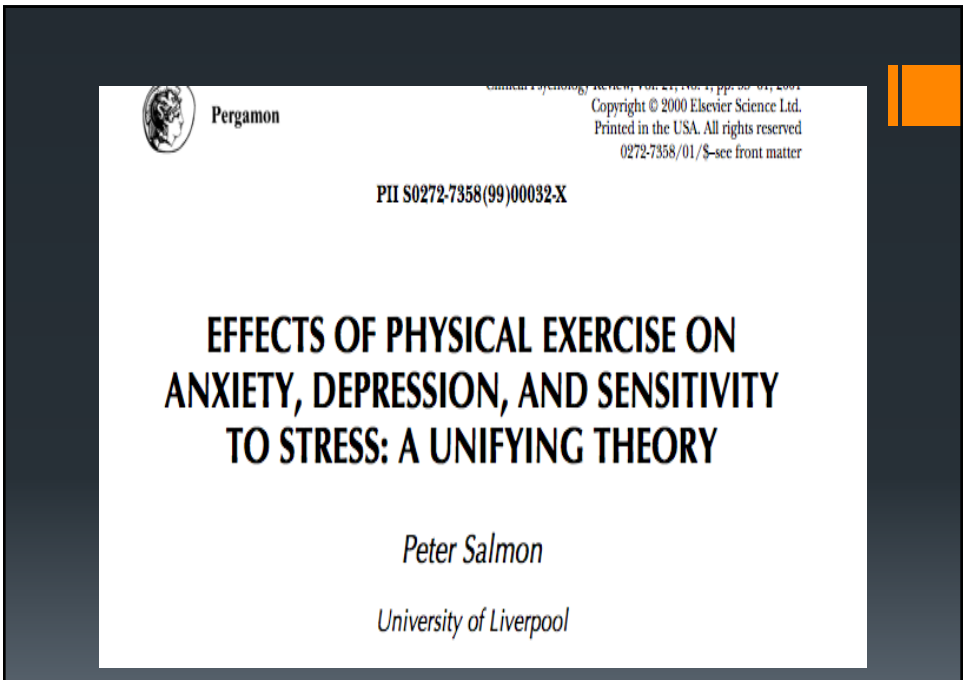
Extensive research on humans suggests that exercise could have benefits for overall health and cognitive function, particularly in later life. Recent studies using animal models have been directed towards understanding the neurobiological bases of these benefits. It is now clear that voluntary exercise can increase levels of brain-derived neurotrophic factor (BDNF) and other growth factors, stimulate neurogenesis, increase resistance to brain insult and improve learning and mental performance. Recently, high-density oligonucleotide microarray analysis has demonstrated that, in addition to increasing levels of BDNF, exercise mobilizes gene expression profiles that would be predicted to benefit brain plasticity processes. Thus, exercise could provide a simple means to maintain brain function and promote brain plasticity.

neuronal survival and resistance to brain insult [8,9], promote brain vascularization [10,11], stimulate neurogenesis [12], enhance learning [12,13] and contribute to maintenance of cognitive function during aging [14].

Exercise and neurotrophic factors

It is possible that some of the beneficial aspects of exercise act directly on the molecular machinery of the brain itself, rather than on general health (as was widely assumed in the early 1990s). To explore this hypothesis, we sought a protocol for an animal study in which exercise would be isolated as the central variable, and that would parallel aspects of human exercise studies. Voluntary wheel-running was selected because it allows rats or mice to choose how much to run (i.e. it avoids confounding variables associated with the stress of forced treadmill running and investigator handling) and it is quantifiable.

Several molecular systems could potentially participate in the benefits of exercise on the brain. Neurotrophic factors have most of the properties that could underlie such beneficial effects. We chose to focus initially on brain-derived neurotrophic factor (BDNF) because it supports the survival and growth of many neuronal subtypes, including glutamatergic neurons [15,16]. Subsequently, as



Pergamon

0272-7358/01/$–see front matter

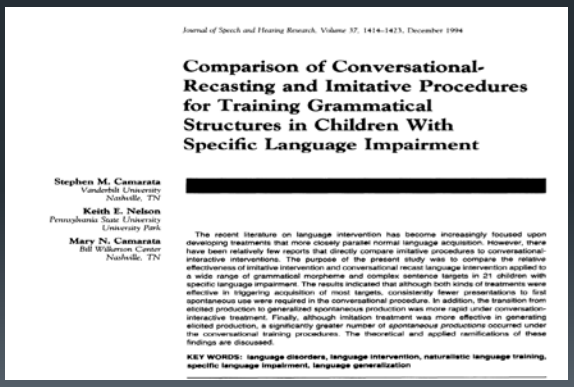
PII S0272-7358(99)00032-X

EFFECTS OF PHYSICAL EXERCISE ON ANXIETY, DEPRESSION, AND SENSITIVITY TO STRESS: A UNIFYING THEORY

Peter Salmon

University of Liverpool

Increasing Transactions



Journal of Speech and Hearing Research, Volume 37, 1414–1423, December 1994

Comparison of Conversational-Recasting and Imitative Procedures for Training Grammatical Structures in Children With Specific Language Impairment

Stephen M. Camarata
Vanderbilt University
Nashville, TN
Keith E. Nelson
Pennsylvania State University
University Park
Mary N. Camarata
Bill Wilkerson Center
Nashville, TN

The recent literature on language intervention has become increasingly focused upon developing treatments that more closely parallel normal language acquisition. However, there have been relatively few reports that directly compare imitative procedures to conversational-interactive interventions. The purpose of the present study was to compare the relative effectiveness of imitative intervention and conversational recast language intervention applied to a wide range of grammatical morpheme and complex sentence targets in 21 children with specific language impairment. The results indicated that although both kinds of treatments were effective in triggering acquisition of most targets, consistently fewer presentations to first spontaneous use were required in the conversational procedure. In addition, the transition from elicited production to generalized spontaneous production was more rapid under conversation-interactive treatment. Finally, although imitation treatment was more effective in generating elicited production, a significantly greater number of *spontaneous productions* occurred under the conversational training procedures. The theoretical and applied ramifications of these findings are discussed.

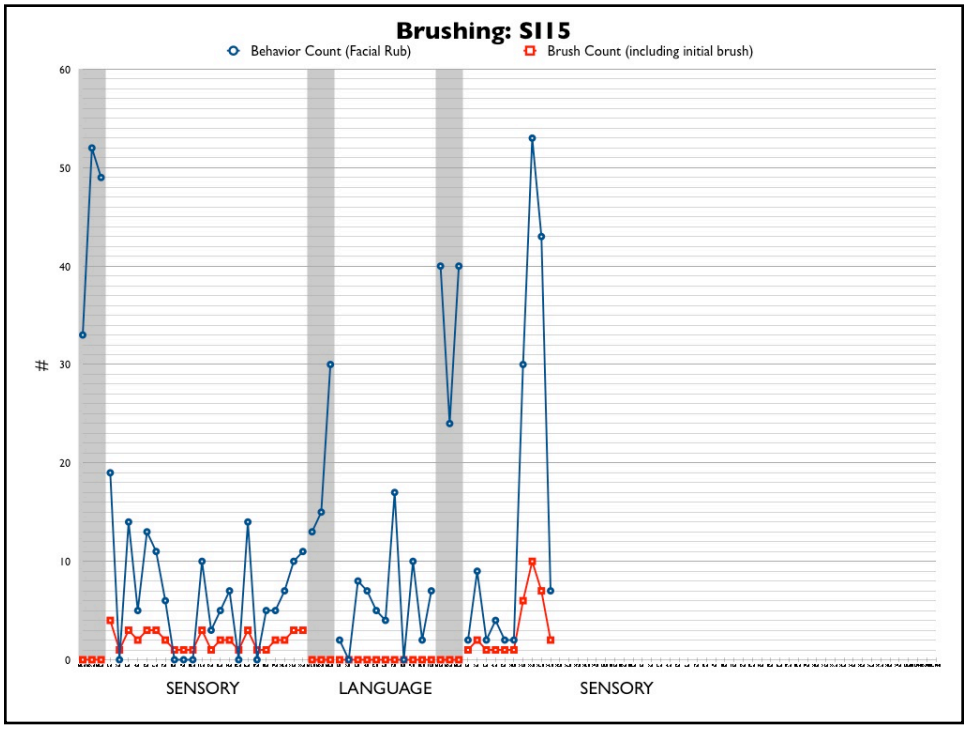
KEY WORDS: language disorders, language intervention, naturalistic language training, specific language impairment, language generalization

SI Effectiveness Evaluation Requires Multiple Elements

- Procedures
- Setting
- Training
- Engagement
- Fidelity

Controlling for Confounds: Single Subject Design

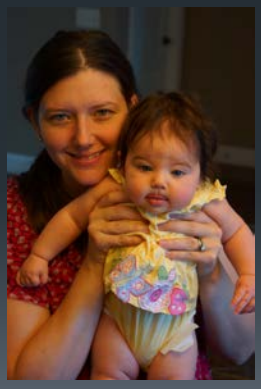
- Movement
- Auditory/Visual Inputs
- Language and Communication

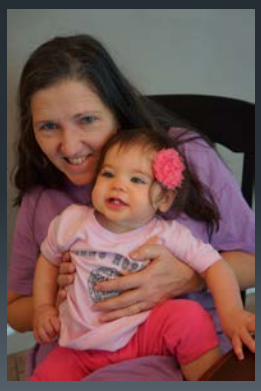


"Brushing" worked!
But, there is a confound with language intervention
And, clinician talked to child while she was brushing

Mendellian vs Behavioral Genetics

Mendellian “Trait” Genetics





Behavioral Genetics (at least metaphorically, not YOGA!)