

Risk and Resilience in Children: The Science that Underlies Congregate Care Reform



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Traumatic Stress, Kenney Krieger Institute

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Workshop Sessions

- **The Science of Risk and Resilience**
- **Translating the Science into Best Practice**
- **Clinical Vignette Workgroups and Discussions**

The Science of Risk and Resilience

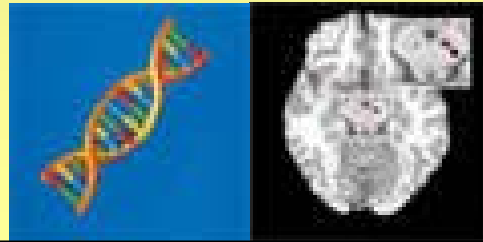


Overview

- **Yale CARE Program**
- **Introduction to Epigenetics**
- **Studies in Maltreated Children**
- **Introduction to Key Factors for Promoting Resilience**

Key Concepts

- Neuronal Plasticity
- Genomic Plasticity



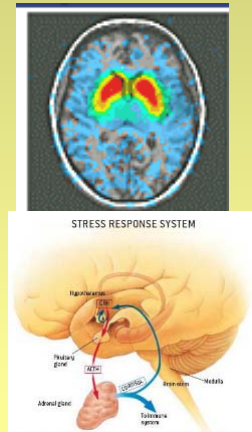
CARE Program

Child and Adolescent Research and Education Program



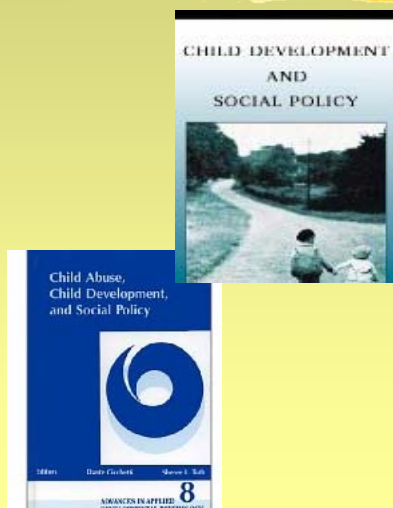
The CARE program was founded in 2001 and was dedicated to work with maltreated children and their families. The focus of the CARE program was broad and spanned from neurobiology to social policy.

The focus on *neurobiology*...



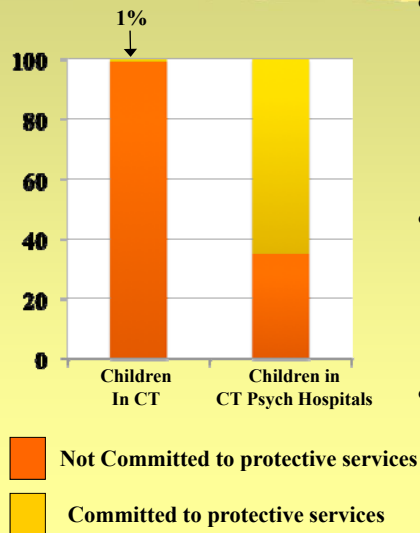
.. comes from preclinical (e.g. animal) and clinical studies that suggest that stress early in life can promote long-term changes in stress reactivity and brain development.

The focus on *social policy* ...



... comes from knowledge of the problems that can occur once children enter the system which increase the likelihood of long-term mental health problems (e.g. separation from attachment figures and siblings, multiple changes in placements, congregate care, re-abuse).

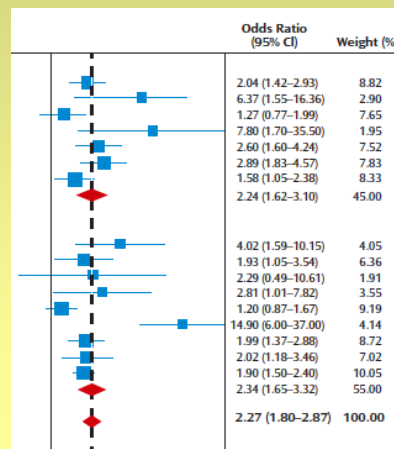
Maltreated Children are at High-Risk for a Range of Psychiatric and Other Problems



- Child maltreatment associated with significant academic difficulties (e.g., special education, grade retention, lower grades)
- Children involved with child welfare at high risk for PTSD, depression, suicide, substance abuse, and more
- Children in protective services custody are grossly over-represented in psychiatric hospitals

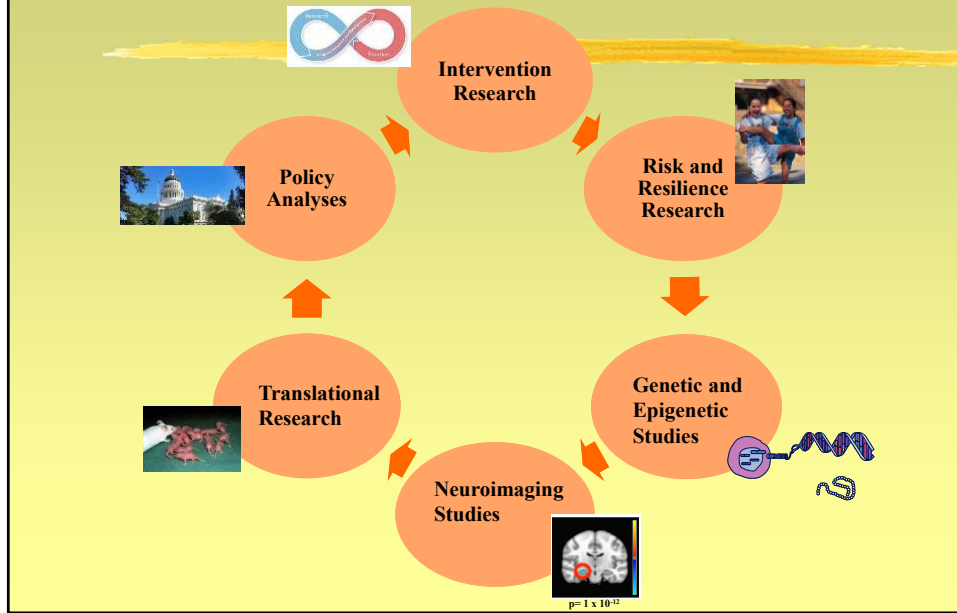
Individuals with History of Child Abuse More Likely to Have Chronic Course of Psychopathology

- More likely to have recurrent and persistent course of illness
- Less likely to respond favorably to evidence-based treatments

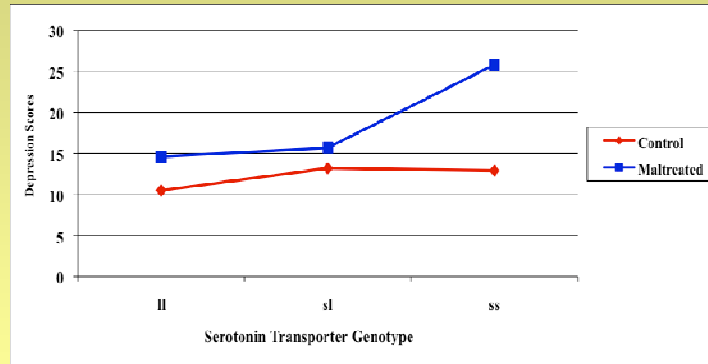


Nanni, Uher, & Danese (2012)

CARE Research Program

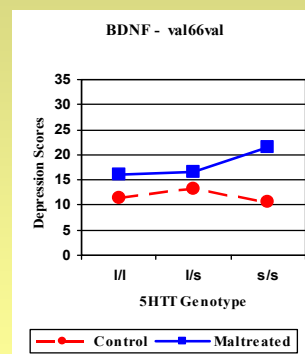
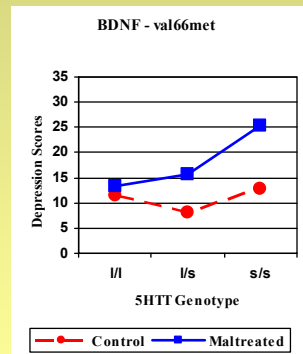


Serotonin Transporter Gene Moderates Risk for Depression in Maltreated Children



PNAS;2004;101:17317-17321

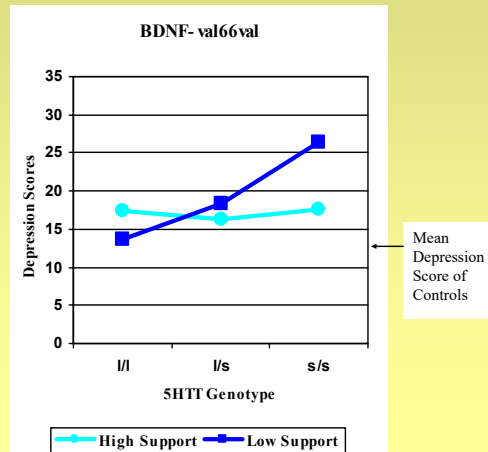
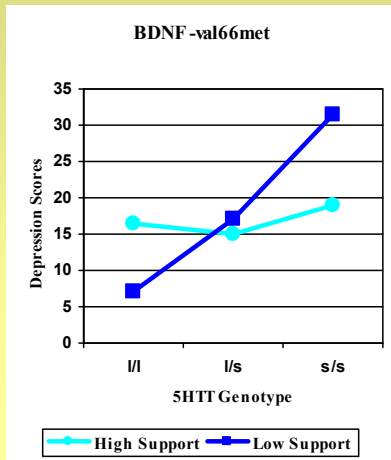
Serotonin Transporter x BDNF Gene x Environment Interaction



Biological Psychiatry;2006: 59: 673-680

Modifying Effects of Social Support

Maltreated Children's Data



Moratorium on Genetics Work



- Established August 2006 under new IRB leadership
- Forbidden to by State IRB to:
 - Recruit new maltreated children
 - Collect new DNA
 - Further characterize stored DNA specimens
 - Analyze collected data without IRB approval



State of Vermont
Department for Children and Families
 Family Services Division
 103 South Main Street, Osgood 3
 Waterbury, VT 05671-2401
www.dcf.state.vt.us/fsd/

Department for Children and Families *Agency of Human Services*
 Family Services Division
 Phone: 802-241-2126
 Fax: 802-241-2407

Telephone: 802-241-2126
 FAX: 802-241-2980

<http://dcf.vermont.gov>

E-mail: ~~cindy.walcott@ahs.state.vt.us~~

January 20, 2011

The department will cooperate with Dr. Hudziak, if this project receives funding and the require approvals by making recruitment materials available to families whose children ages 7-12 who have had a recent foster care experience

Sincerely,

Cynthia K. Walcott
 Deputy Commissioner
 Family Services Division



2/11/11 Learned Time is Running Out: Unused grant money to be returned 6/30/11



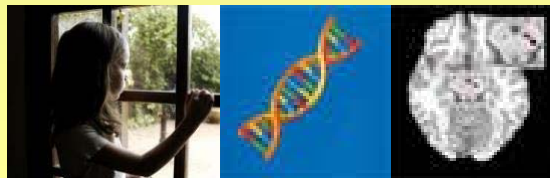
Could I get -

- **Permission to analyze stored DNA specimens ?**
- **Conduct pilot whole genome epigenetic study ?**

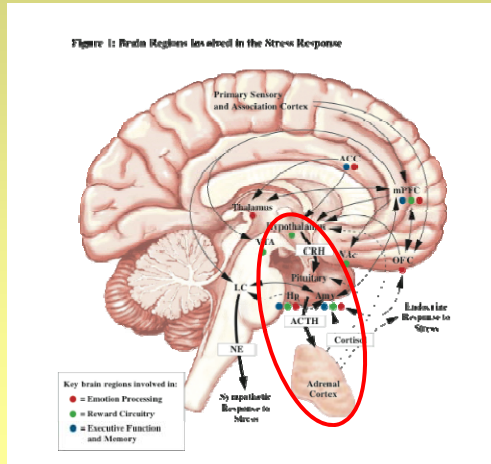
Countdown to Grant Closing



**Are epigenetic mechanisms implicated
in conferring risk for psychiatric and
other problems among individuals
maltreated as children?**



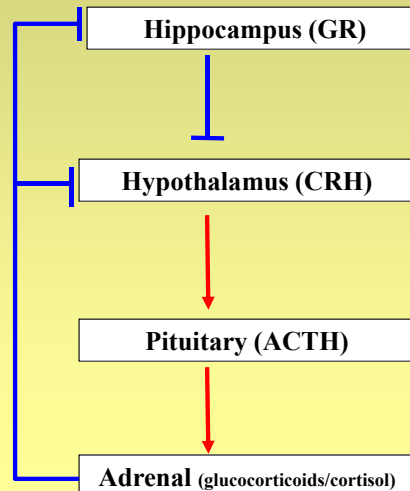
The Brain and the Stress Response



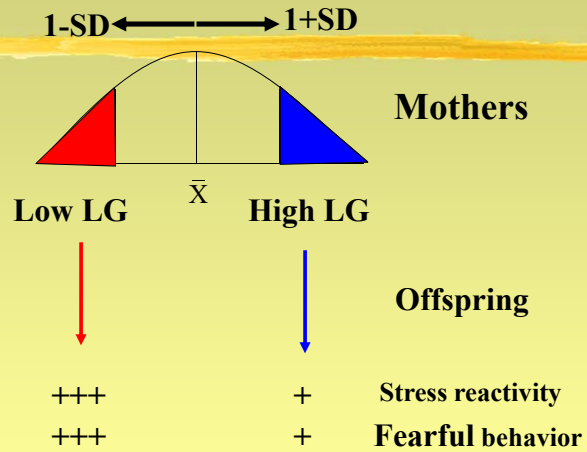
- The brain produces an orchestrated response to stress
- Many of the brain areas involved in the stress response are also a part of brain circuits that regulate emotion and behavior.

Weder & Kaufman, 2010

The Stress Response The HPA Axis



Maternal neglect in rodents



Kaffman & Meaney 2007

Maternal Behavior Programs the Brain and Stress Reactivity

Optimal Parenting – High Licking and Grooming (LG)



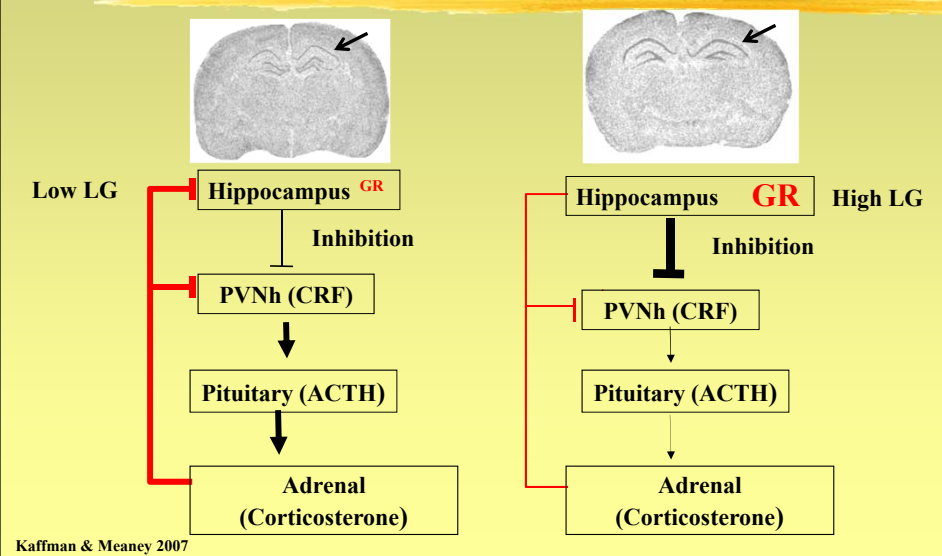
A. Kaffman, 2009

Differences in Maternal Care Associated with Behavioral Differences in Adulthood

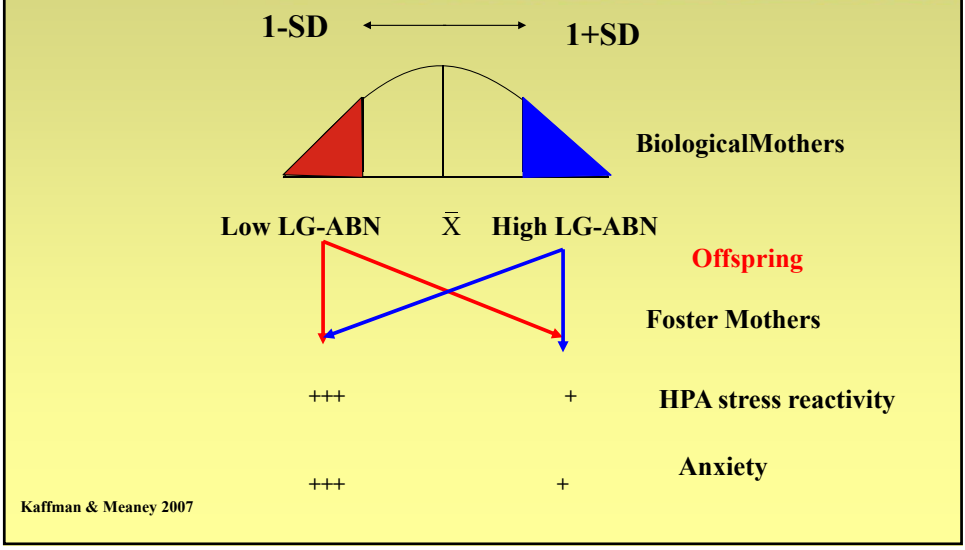


A. Kaffman, 2009

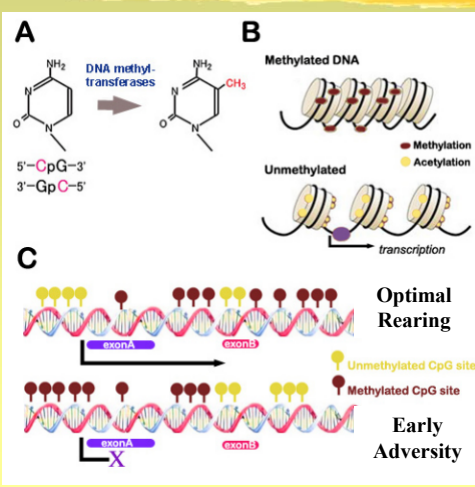
Maternal behavior promotes long-term changes in GR gene expression in the hippocampus



Cross-Fostering Experiments Show Differences in Stress Reactivity and Behavior Due to Differences in Maternal Care



Epigenetic (e.g. chemical) Modifications: How the environment (e.g. rearing) affects gene expression



- For a gene to be transcribed, DNA has to be unwound
- DNA methylation in the promoter region can silence genes by causing the DNA to stay coiled
- Rats subjected to non-optimal rearing have elevated GR gene methylation in the promoter, and therefore reduced GR gene expression – fewer glucocorticoid receptors to minimize the effects of stress!

Adapted from Taylor, 2006

Child Abuse and Epigenetic Mechanisms of Disease Risk

A Methylation Pilot Study

**Sample: 96 Maltreated children
96 Community control children**

**Method: Illumina 450 K BeadChip
a whole genome study**



(Am J Prev Med 2013;44(2):101–107)

Maltreated vs. Comparison Children

- Maltreated and control children had significantly different methylation values at a total of 2,868 CpG sites ($p < 5.0 \times 10^{-7}$, all sites)
- Significant CpG sites were identified on all 23 chromosomes
- 20% of significant CpG sites in intergenic regions

Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults

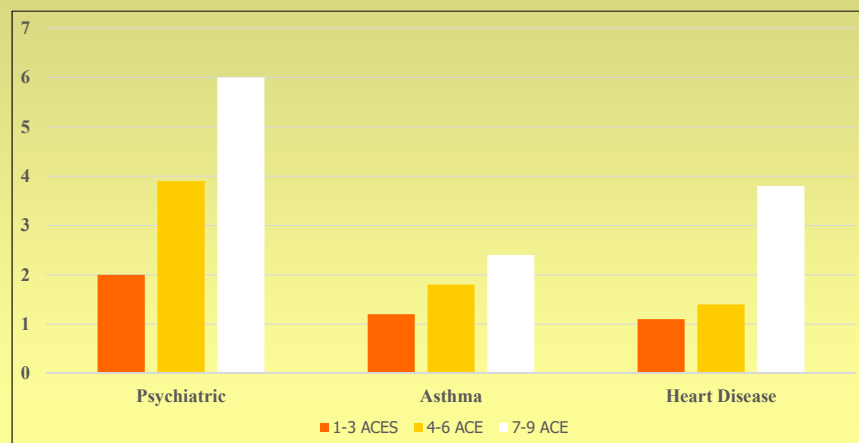
The Adverse Childhood Experiences (ACE) Study

Vincent J. Felitti, MD, FACP, Robert F. Anda, MD, MS, Dale Nordenberg, MD, David F. Williamson, MS, PhD, Alison M. Spitz, MS, MPH, Valerie Edwards, BA, Mary P. Koss, PhD, James S. Marks, MD, MPH

- **Child maltreatment and other adverse childhood experiences are non-specific risk factors for multiple psychiatric disorders, and several health risk behaviors including smoking, overeating, and excessive alcohol and drug use.**
- **Above and beyond the effect of these risk behaviors, adverse childhood experiences predict ischemic heart disease, stroke, respiratory problems, diabetes, and cancer.**

Association of Adult Health Conditions by ACE Score

Gilbert et al., Am J Prev Med 2015;48(3):345-349



Biological Process Networks Associated with the Genes which are Differentially Methylated in Maltreated and Control Children

Networks	pValue	Ratio	
Cancer			
Signal transduction_WNT signaling	8.513E-06	44	177
Psychiatric and Substance Use Disorders			
Development_Neurogenesis_Axonal guidance	5.019E-05	51	230
Heart Disease			
Cardiac development_Wnt_beta-catenin, Notch, VEGF, IP3 and integrin signaling	2.388E-03	32	150
Respiratory Disease			
Cell cycle_G1-S Interleukin regulation	2.979E-03	28	128
Diabetes			
Signal transduction_Leptin signaling	3.605E-03	24	106
Inflammation			
Inflammation_IL-2 signaling	3.100E-05	29	104
Gene Regulation			
Translation_Regulation of initiation	2.556E-04	31	127

Although replication is required, this study suggests that epigenetic mechanisms may be associated with risk for health problems later in life in maltreated children. This study lays the groundwork for future studies examining health and methylation measures to further characterize the role of epigenetic mechanisms in conferring risk for medical problems in individuals with histories of early adversity.

Follow-Up Study - New Cohort Child Maltreatment and Obesity

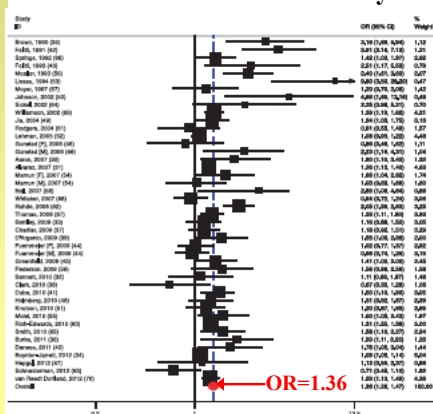
- 168 children, 53% female, 95% European Americans
- Saliva samples were collected for DNA specimens
- Trauma was characterized using the Yale-Vermont Adversity in Childhood Scale (Y-VACS), a dimensional measure of adverse experiences that integrates data from multiple sources (e.g., parents, children, protective service records).
- Measures of waist circumference attained and height and weight to calculate the BMI.



Child Maltreatment and Obesity

- Obesity is the first medical health problem apt to be observed in children
- Strong meta-analytic support for the association between child maltreatment and obesity across the lifecycle

Meta-Analysis: Child Maltreatment and Obesity



Danese & Tan, Molecular Psychiatry, 2014, 19:544–554

Trauma Experiences Predict Indices of Obesity

Body Mass Index				Waist Circumference			
Source	Wald Chi-Square	Df	Significance	Source	Wald Chi-Square	Df	Significance
Sex	2.5	1	.11	Sex	0.05	1	ns
Age	80.7	1	.0001	Age	82.3	1	.0001
Race	5.1	1	.025	Race	5.7	1	.02
Child Trauma	7.8	1	.008	Child Trauma	6.6	1	.01

Methylation and Trauma Measures Together Predict BMI (N=168)

ID	Gene Symbol	Chr	Gene Location	Methylation p-value	Trauma p-value	Interaction p-value
cg10264529	<i>PCK2</i>	14	TSS1500	7.53E-09	0.224387393	0.01049749
cg14929207	<i>DHRS13</i>	17	TSS1500	3.70E-08	0.977986536	0.27904021
cg16110788		7	Intergenic (Enhancer)	4.79E-08	0.231236082	0.04760218
cg14855841	<i>CXCL10</i>	4	TSS1500	7.59E-08	0.560370604	0.00276939
cg26103104			Intergenic	4.31E-07	0.768020567	0.53347103
cg01555853	<i>KCNS3</i>	2	TSS200	4.45E-07	0.191831691	0.04891355
cg15990629	<i>BCAT1</i>	12	Body	0.229195283	0.711035734	4.42E-09
cg22806444	<i>C17orf28</i>	17	1 st Exon (Regulatory)	0.01231404	0.14989789	1.94E-08
cg26764244	<i>GNGL2</i>	1	TSS1500	0.926680384	0.959533548	2.14E-08
cg17489690	<i>PRDM16</i>	1	Body	0.381971041	0.673957986	2.52E-08
cg01507128		19	Intergenic	0.098346424	0.424211318	5.55E-08
cg16557308	<i>OSBPL9</i>	1	Promoter Associated	0.204359068	0.528220779	6.27E-08
cg18839416	<i>C1orf158</i>	1	TSS1500	0.250931818	0.707153426	6.34E-08
cg05559960	<i>MADD</i>	11	TSS200	0.228359447	0.927961462	6.60E-08
cg24741066	<i>PXDN</i>	2	Body (Enhancer)	0.185359313	0.25783914	2.66E-07
cg26737766	<i>GALE</i>	1	Promoter Associated	0.093330626	0.531049042	2.75E-07

PCK2 and *GALE* involved in glucose metabolism; *CXCL10* correlates significantly with measures of visceral fat area in obese children; *BCAT1* identified as a candidate risk gene for obesity; *PRDM16* is involved in the differentiation of brown adipose tissue; *OSBPL9* encodes a group of intracellular lipid receptors; *MADD* implicated in type 2 diabetes; *PXDN* deletions associated with early onset obesity.

Replicated Findings: Methylation and Trauma Measures Together Predict BMI

ID	Gene Symbol	Original Cohort (N=168)			Replication Cohort (N=74)		
		Methylation p-value	Trauma p-value	Interaction p-value	Methylation p-value	Trauma p-value	Interaction p-value
cg10264529	<i>PCK2</i>	7.53E-09	ns	ns	.003	.02	ns
cg16110788		4.79E-08	ns	ns	.03	.03	ns
cg26103104		4.31E-07	ns	ns	.02	.03	ns
cg22806444	<i>HIDI</i>	ns	ns	1.94E-08	.02	.04	ns
cg26737766	<i>GALE</i>	ns	ns	2.75E-07	.11	.04	.066 +

Legend. The covariates age, sex, race, cell type (CD14, CD34, buccal), and the first three principal components to account for population stratification were included in all analyses.

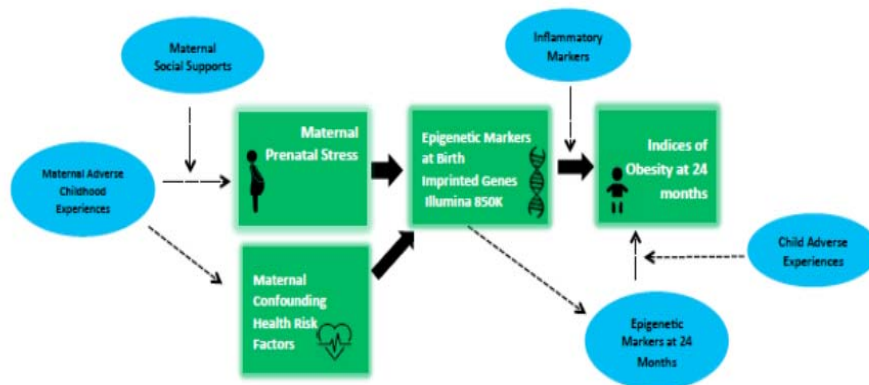
PCK2 encodes for an enzyme in the mitochondria involved in glucose metabolism.

HIDI associated with body fat mass regulation, preadipocyte number and adipocyte size in rats.

GALE gene encodes UDP-galactose-4-epimerase which catalyzes two distinct but analogous reactions with important metabolic consequences

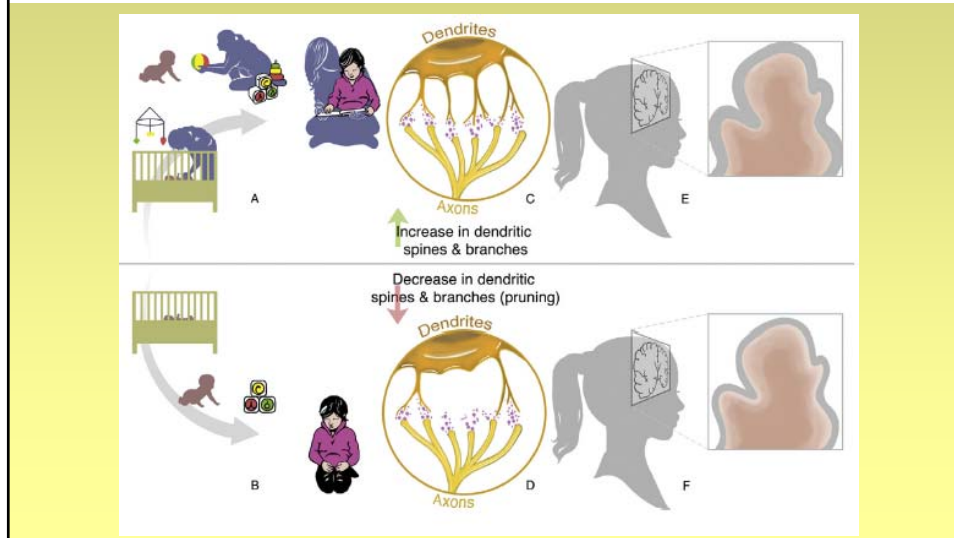
New Grant: Social adversities, epigenetics, and the obesity epidemic

- Recruit 470 high risk women in the third trimester of pregnancy and follow mothers and infants through the first two years of life



Neglect as a Violation of Species-Expectant Experience: Neurodevelopmental Consequences

Katie A. McLaughlin, Margaret A. Sheridan, and Charles A. Nelson
Biological Psychiatry, October 2017; 82:462–471



Bucharest Early Intervention Project

- **Largest longitudinal study of institutionalized children less than 2 years old ever conducted**
- **First randomized controlled trial of foster care as an intervention for institutionalization in abandoned infants and toddlers in Bucharest, Romania**

<http://www.bucharestearlyinterventionproject.org>

Bucharest Early Intervention Project

- **Study began in Fall 2000**
- **136 infants aged 6 to 30 months were randomly assigned to a high-quality foster care intervention or continued institutional care**
- **A control group of never institutionalized children also included in the study**
- **Children were followed through age 12 and those in the intervention group showed improved brain activity (EEG), attachment, internalizing symptoms, language and some measures of cognition**

Key Findings

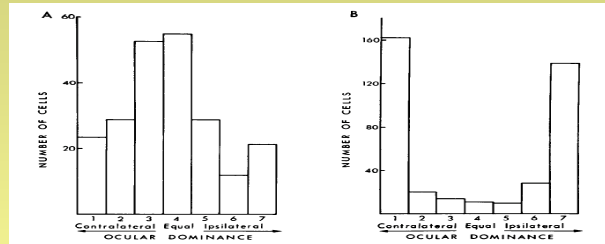
- **Language deficits in particular are not well explained by existing models and appear better explained by the newly proposed theory of neglect as a violation of species-expectant experience**
- **Most neural and developmental consequences of deprivation are not permanent but are amenable to intervention due to neuroplasticity**

CLINICAL IMPLICATIONS



Epigenetic modifications are frequently long-lasting, but they are not necessarily permanent.

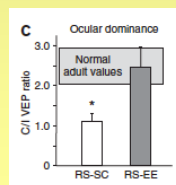
Visual Cortex, Species-Expectant Experience, and Critical Periods Concept



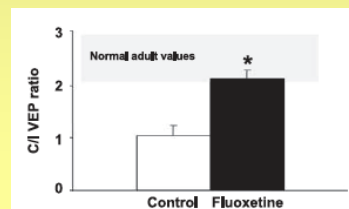
The concept that experiences early in development during limited critical periods could lead to **permanent** changes in brain development was strongly influenced by Wiesel and Hubel's classic experiments on monocular deprivation.

Emerging Findings – Negative Effects can be Reversed

NEW DATA: Ocular dominance changes due to epigenetic mechanisms. Normal visual acuity and ocular dominance can be restored via pharmacological and environmental interventions. Visual deprivation early in life need not lead to permanent changes in vision and brain structure.

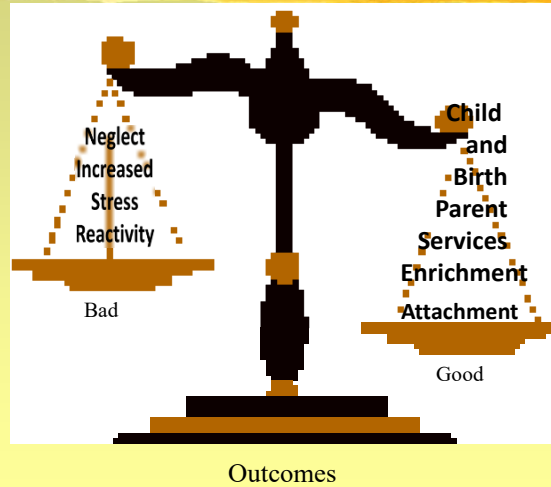


Environmental Enrichment
Sale et al., 2007

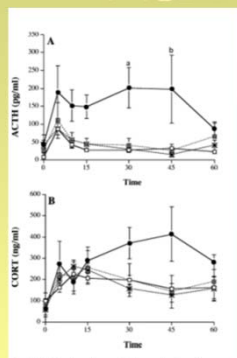


Fluoxetine Treatment
Maya Vetencourt et al., 2008

Promoting Resilience in Maltreated Children: Tipping the Scale in Favor of Positive Outcomes



Optimal 'foster care' reverses HPA axis and behavioral changes associated with early adversity



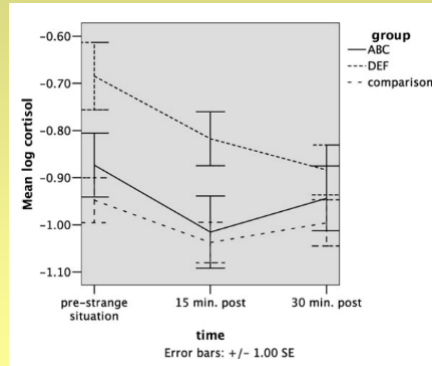
- - Ideal Rearing
- - Deprived Rats
- - Ideal Rearing + Foster Care
- ▣ - Deprived + Foster Care

- HPA axis and other changes associated with early adversity are not permanent
- The quality of the subsequent caregiving environment can modify effects
- Stress reactivity of deprived rats provided optimal 'foster care' comparable to ideally reared animals

Huot, Plotsky, et al, 2004

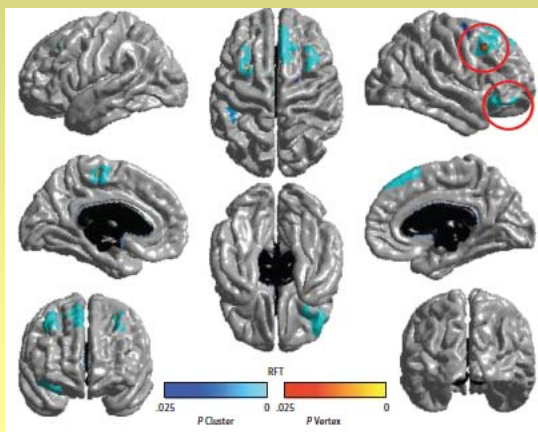
Effects of an Attachment-based Intervention on Cortisol of Infants in Foster Care

- Randomized controlled trial (ABC vs. DEF)
- Stress reactivity assessed in laboratory strange situation paradigm
- Post-intervention: Cortisol secretion of infants that participated in ABC intervention comparable to non-maltreated controls
- 3-Year Follow-up: HPA axis gains retained (Bernard, Hostinar, Dozier, 2015)



Dozier et al., 2008

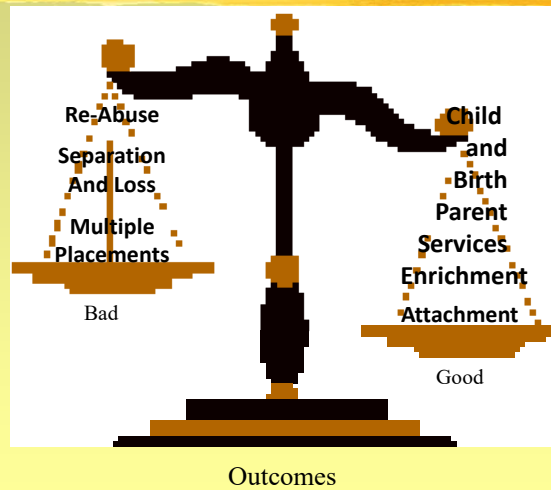
Positive Parenting Reduces Impact of Poverty on Brain Development



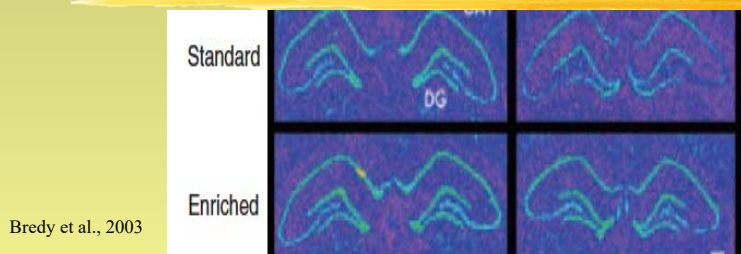
Positive parenting moderates the impact of poverty on brain development in key areas involved in emotion regulation and executive function (e.g., dorsal PFC, orbital PFC, amygdala)

Whittle et al., JAMA Pediatrics, 2017

Promoting Resilience in Maltreated Children: Tipping the Scale in Favor of Positive Outcomes

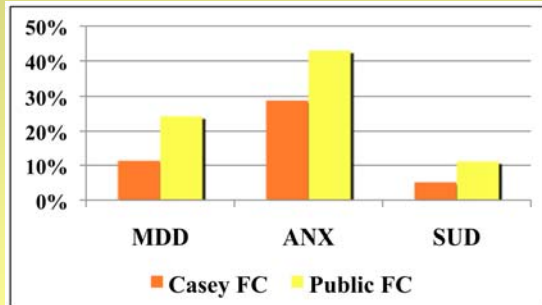


Enrichment can reverse the neurobiological and behavioral effects associated with early adversity



- Rats provided high-LG and low-LG (neglectful) parenting as infants, provided standard or enriched environments as early adolescents
- The enriched environment (e.g., cognitive and physically challenging experiences) reversed gene expression changes in the hippocampus associated with fearful and non-adaptive behavior.

Mental Health Outcomes of Casey and Public Foster Care Young Adult Alumni



Kessler et al., 2008

Rates of anxiety disorders (e.g., PTSD) in both groups is elevated compared to community controls

- Casey youth provided multiple enrichment opportunities (e.g., counseling, tutoring, summer camps)
- Enriched foster care associated with significantly better physical and mental health outcomes



- Enrolls freshman bottom 25% of their class
- Matches students with a team of 5 volunteers
- Customizes support for each child
- Provides support for ~10 years

92%

of students who have been in Thread for 5 years have graduated high school

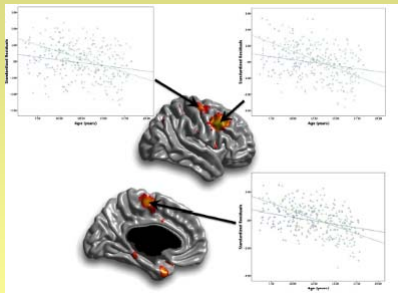
90%

of students who have been in Thread for 5 years have been accepted to college

80%

of student alumni have completed a 4 or 2 year degree or certificate program

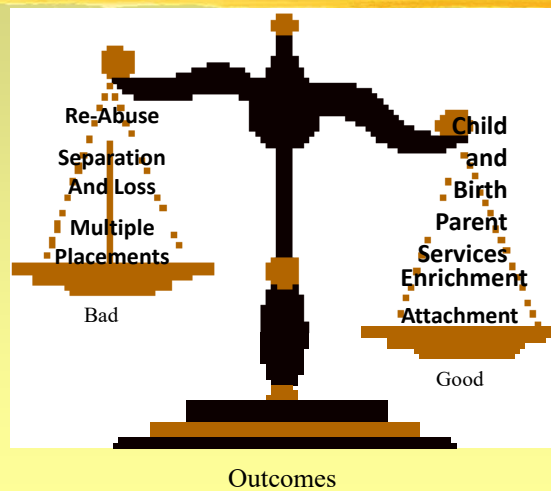
Music Training and Cortical Thickness Maturation of the Brain



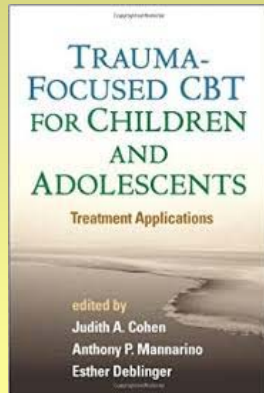
Hudziak et al., JAACAP, 2014

Musical instrument playing was not only associated with more rapid cortical thickness maturation within areas implicated in motor planning and coordination, visuospatial ability, but also brain areas involved in emotion and impulse regulation

Promoting Resilience in Maltreated Children: Tipping the Scale in Favor of Positive Outcomes



TF-CBT with Foster Care Children

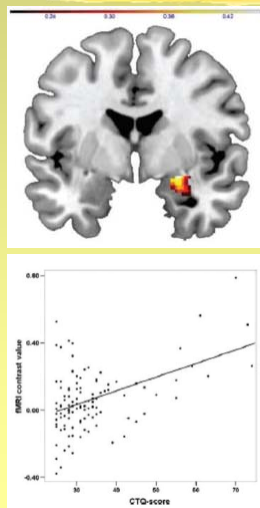


<http://tfcbt.musc.edu/>

- TF-CBT associated with significantly greater improvement in PTSD and emotional and behavioral problems than TAU
- TF-CBT ½ as likely to experience placement disruption
- TF-CBT 1/10 as likely to run away

Data presented by J. Cohen 10/28/10

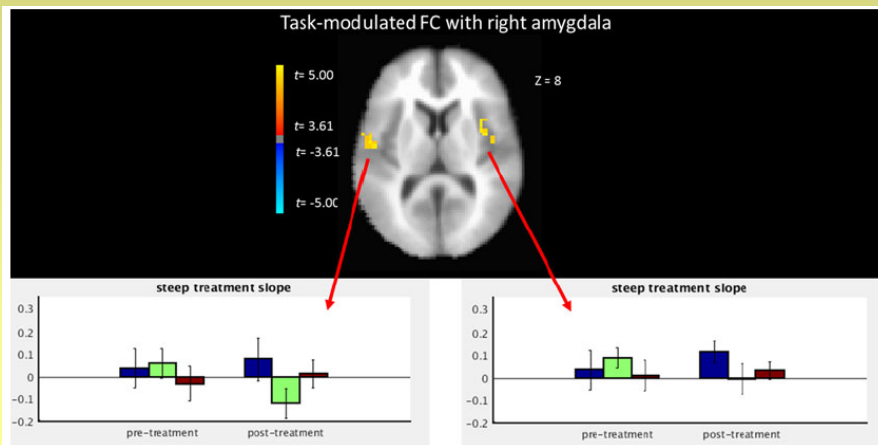
Child Maltreatment, Anxiety, Depression, and Amygdala Response to Threat Stimuli



Syed & Nemeroff, 2017, Chronic Stress

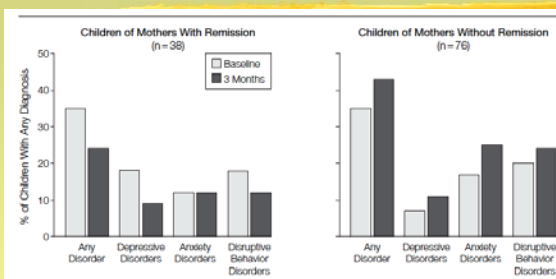
- Child maltreatment is associated with increased risk for depression, anxiety, and PTSD
- The presence of these disorders are associated with increased reactivity of the amygdala to threat stimuli
- Findings related to child maltreatment, depression and anxiety, and amygdala reactivity are highly replicated

Changes in Amygdala Functional Connectivity with Successful TF-CBT



Cisler et al., 2016

Treatment of Parental Psychopathology



Weissman et al., JAMA 2006

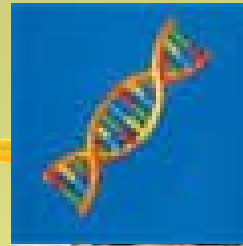
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- 11% decrease in rates of diagnoses in children of mothers whose depression remitted; 8% increase in rates of diagnoses in children of mothers whose depression did not.

Key Concepts

- Neuronal Plasticity
- Genomic Plasticity

Key Factors for Resilience

- Attachment
- Enrichment
- Child and Parent Services



Take Home Messages From Research



A history of early adversity need NOT lead to bad outcomes. There are many factors that can tip the scale in favor of positive outcomes for children.

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Translating the Science into Best Practice

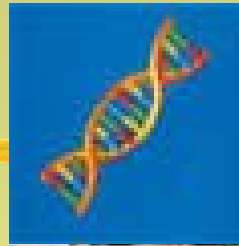


Key Concepts

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Attachment



American Journal of Orthopsychiatry
2014, Vol. 84, No. 3, 219–224

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Consensus Statement on Group Care for Children and Adolescents: A Statement of Policy of the American Orthopsychiatric Association

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Consensus Statement Position

This consensus statement on group care affirms that children *and adolescents* have the need and right to grow up in a family with at least 1 committed, stable, and loving adult caregiver. In principle, group care should never be favored over family care. Group care should be used only when it is the least detrimental alternative, when necessary therapeutic mental health services cannot be delivered in a less restrictive setting.



DISABILITY RIGHTS INTERNATIONAL

UN Disability Committee recognizes groundbreaking rights for children

September 28, 2017 - Washington, DC - The United Nations Committee on the Rights of Persons with Disabilities has explicitly stated that every child has a right to grow up in a family, not in an institution or group home, in response to comments submitted to the Committee by Disability Rights International.



Pergamon

Child Abuse & Neglect 29 (2005) 627–643

Child Abuse
& Neglect

SAFE Homes: Is it worth the cost? An evaluation of a group home permanency planning program for children who first enter out-of-home care[☆]

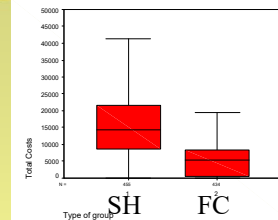
Allen D. DeSena^a, Robert A. Murphy^d, Heather Douglas-Palumberi^a, Gary Blau^b,
Blandina Kelly^c, Sarah M. Horwitz^a, Joan Kaufman^{a,*}

Objective: To evaluate the SAFE Homes (SH) program, a short-term group care program for children between 3 and 12 years of age who enter care for the first time. The program aims to improve case outcomes by consolidating resources to facilitate assessment and treatment planning.

Results: Prior to the initiation of the SAFE Homes program, 75% of the children who entered care in the State experienced three or more placements in the first year. The outcomes of both the SH and FC cases were significantly improved over pre-SAFE Home State statistics. The FC group, however, had comparable or better outcomes on most variables examined. In addition, the total cost for out-of-home care for the children in FC was significantly less, despite the fact that the two groups spent similar amounts of time in care (average time in care: 7 months). This finding held when the total placement cost was calculated using the State reimbursement rate of \$206.00 per day for SAFE Home care (SH: \$20,851 ± 24,231; FC: \$8,441 ± 21,126, $p < .001$), and a conservative SAFE Home program fee of \$85.00 per day that only considered the child care and custodial staffing costs uniquely associated with the program (SH: \$13,314 ± 21,718; FC: \$8,441 ± 21,126, $p < .001$).

Congregate Care Costs More

While the SH and FC children spent a comparable time in placement, the total cost for the out-of-home care of the children who were originally placed in the SAFE Homes was twice the total out-of-home care expenditures of the children who went to traditional foster care with NO clinical benefit



The cost of placing children in non-family based longer-term placements is estimated to be 7-10 times higher than the cost associated with family based settings (National Center for State Courts, 2017)

Bucharest Early Intervention Project

- Largest longitudinal study of institutionalized children less than 2 years old ever conducted
- First randomized controlled trial of foster care as an intervention for institutionalization in abandoned infants and toddlers in Bucharest, Romania

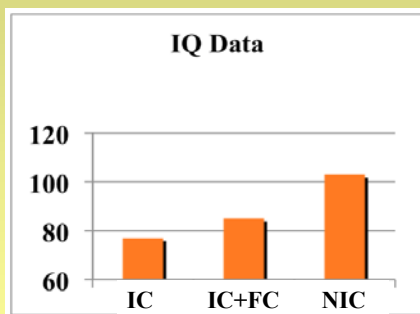


<http://www.bucharestearlyinterventionproject.org>

Bucharest Early Intervention Project

- Study began in Fall 2000
- 136 infants aged 6 to 30 months were randomly assigned to a high-quality foster care intervention or continued institutional care
- A control group of never institutionalized children also included in the study
- Children were followed through age 12 and those in the intervention group showed improved brain activity (EEG), attachment, internalizing symptoms, language and some measures of cognition

Institutional Care Associated with Negative Outcomes for Children Across Multiple Domains of Functioning



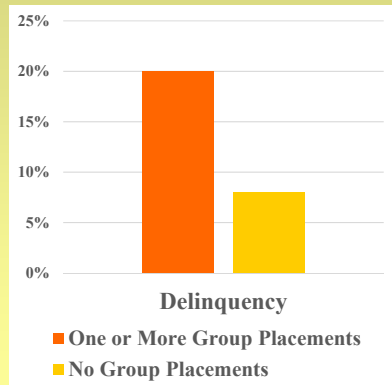
IC = Continuous Institutional Care
IC+FC = Foster Care after Institutional Care
NIC = Never Institutionalized

Nelson, Zeanah, et al., 2007

- Long-term changes in stress reactivity
- Elevated rates of psychiatric disorders
- Cognitive deficits
- Improvement in some domains with move from to Institution to family foster care
- The less time spent in Institutional care, the greater the developmental gains

Group Care Increases Risk for Delinquency Dramatically

Ryan et al., 2008

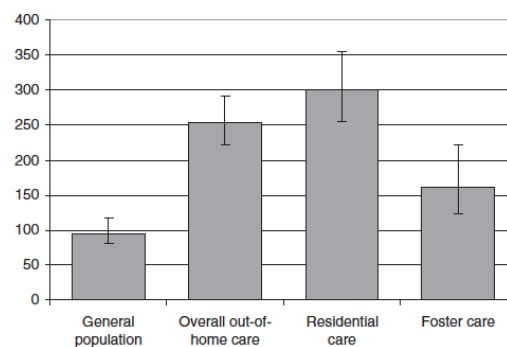


- N=8227 (7-16 years old)
- Propensity matched sample
Sample Matched on: Age at first placement; Race; Gender; Total number of placement changes; Placement changes related to AWOL; Placement changes related to child behavioral problems; Physical abuse as the primary reason for placement
- After accounting for all the above factors – group care increases the risk for delinquency 2.5 fold

Residential Care is Associated with an Increased Risk for Physical Abuse

- Youth 12-17
- Rate of physical abuse for youth in residential care twice the rate of youth in foster care and approximately 3 times the rate of youth in the general population

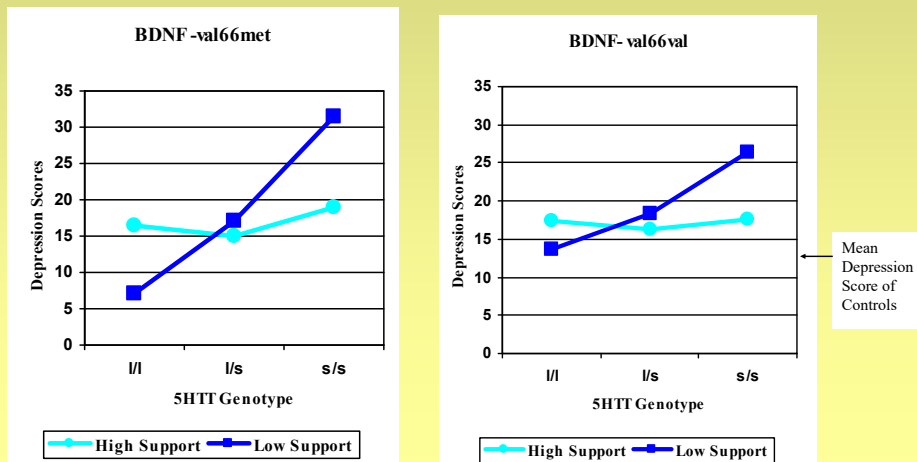
Rates of Self-Reported Physical Abuse (N=329)



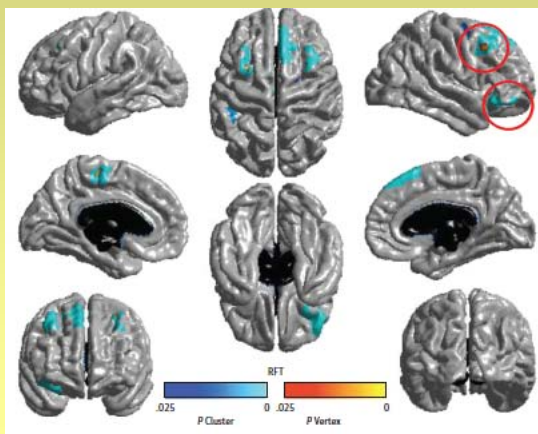
Positive Attachment Relationships Ameliorate the Risk for Depression Associated with Child Abuse and Genetic Vulnerability

Maltreated Children's Data

Kaufman et al., 2006



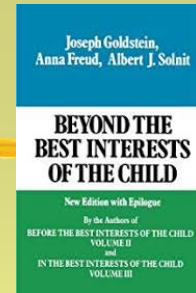
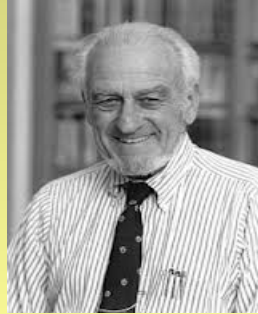
Positive Parenting Reduces Impact of Poverty on Brain Development



Positive parenting moderates the impact of poverty on brain development in key areas involved in emotion regulation and executive function (e.g., dorsal PFC, orbital PFC, amygdala)

Whittle et al., JAMA Pediatrics, 2017

Albert Solnit, MD



“ ... All the best professionals, does not one good parent make ...”

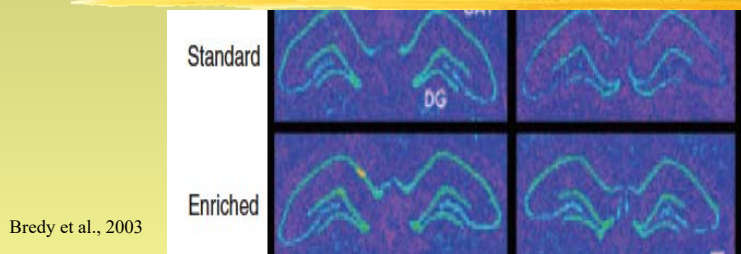
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Enrichment

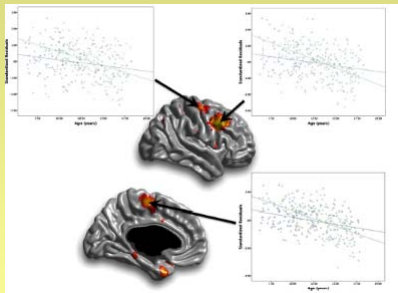


Enrichment can reverse the neurobiological and behavioral effects associated with early adversity



- Rats provided high-LG and low-LG (neglectful) parenting as infants, provided standard or enriched environments as early adolescents
- The enriched environment (e.g., cognitive and physically challenging experiences) reversed gene expression changes in the hippocampus associated with fearful and non-adaptive behavior.

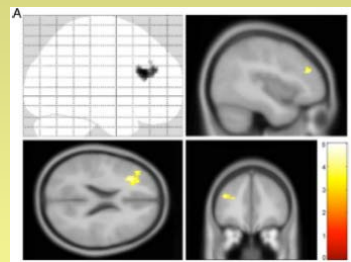
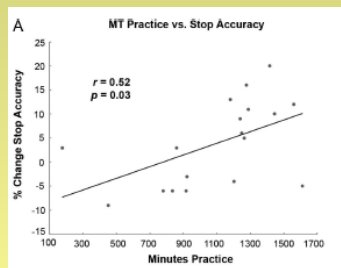
Music Training and Cortical Thickness Maturation of the Brain



Hudziak et al., JAACAP, 2014

Musical instrument playing was not only associated with more rapid cortical thickness maturation within areas implicated in motor planning and coordination, visuospatial ability, but also brain areas involved in emotion and impulse regulation

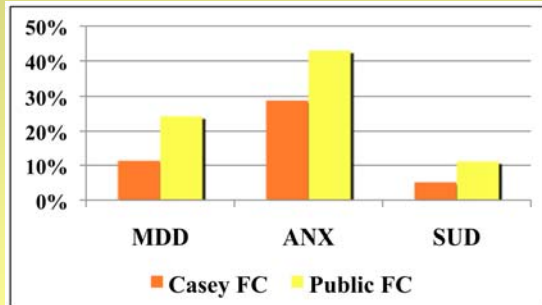
Neural Plasticity following Mindfulness Intervention



- RCT – Mindfulness vs Shared Reading & Learning
- Mindfulness intervention associated with increased dIPFC activation during emotion inhibitory control task
- dIPFC key structure in top-down executive control

Allen et al., J Neuroscience, 2012

Mental Health Outcomes of Casey and Public Foster Care Young Adult Alumni



Kessler et al., 2008

Rates of anxiety disorders (e.g., PTSD) in both groups is elevated compared to community controls

- Casey youth provided multiple enrichment opportunities (e.g., counseling, tutoring, summer camps)
- Enriched foster care associated with significantly better physical and mental health outcomes



- Enrolls freshman bottom 25% of their class
- Matches students with a team of 5 volunteers
- Customizes support for each child
- Provides support for ~10 years

92%

of students who have been in Thread for 5 years have graduated high school

90%

of students who have been in Thread for 5 years have been accepted to college

80%

of student alumni have completed a 4 or 2 year degree or certificate program

College Tuition Waiver



Policy for Wards: The Connecticut Department of Children and Families (DCF) shall pay higher education expenses for tuition, fees, room and board, books, tutoring and health care remaining after calculating educational grants and scholarship awards, until the young adult's twenty-third (23rd) birthday.

Policy for Children Adopted from DCF: The Department will provide financial assistance to youth who were adopted through the Department's foster care program by the youth's eighteenth (18th) birthday and who plan to attend an accredited college, university, or institution of higher learning upon completion of their high school education. The adoption must have taken place after December 31, 2004.

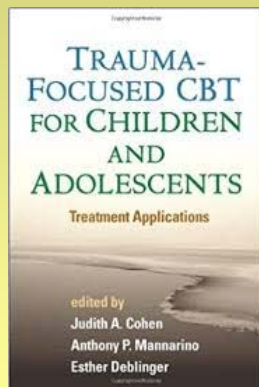
Child and Parent Services



Trauma Focused Cognitive Behavioral Therapy (TF-CBT)

- Strongest evidenced based treatment (3-21)
- Targets PTSD and other trauma symptoms
- Adaptations to address traumatic grief
- PRACTICE components
Psychoeducation – Relaxation – Cognitive coping – Trauma narrative – In-vivo mastery of trauma reminders – Enhancing safety (<https://tfcbt.musc.edu>)

TF-CBT with Foster Care Children

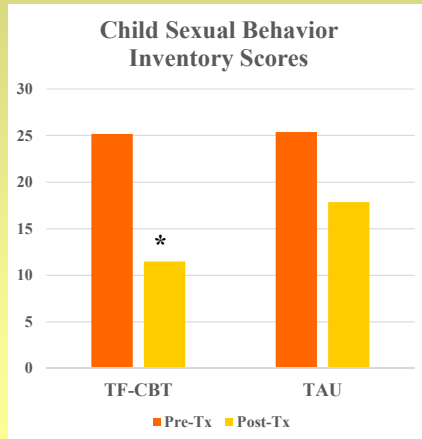


<http://tfcbt.musc.edu/>

- TF-CBT associated with significantly greater improvement in PTSD and emotional and behavioral problems than TAU
- TF-CBT ½ as likely to experience placement disruption
- TF-CBT 1/10 as likely to run away

Data presented by J. Cohen 10/28/10

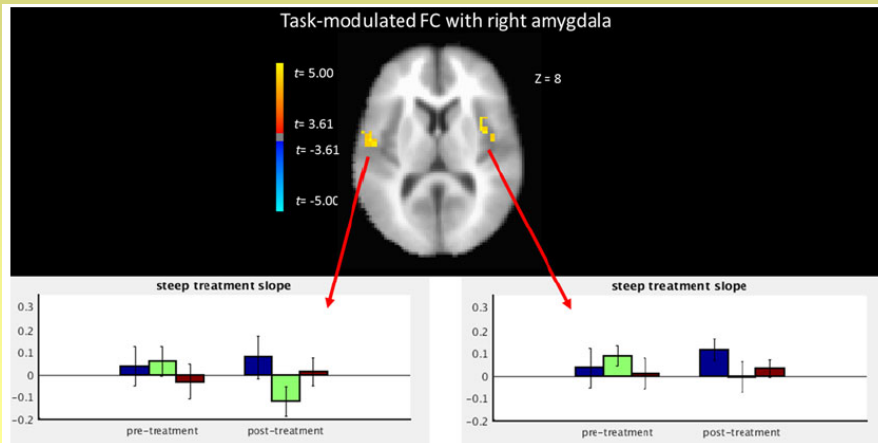
TF-CBT Effectively Targets Sexual Acting-out Behaviors



- TF-CBT effective tx for children with sexual abuse histories and sexual acting out behaviors
- 6 children in TAU group removed from study due to persistent sexual inappropriate touching of other vs 0 children in TF-CBT

Cohen & Mannarino, 1996

Changes in Amygdala Functional Connectivity with Successful TF-CBT



Cisler et al., 2016

Dialectical Behavior Therapy (DBT)

- **Trauma informed, promising practice for youth ages 12-18 who have a history of complex trauma exposure**
- **Utilizes DBT- an evidenced based treatment**
- **Treats adolescents who are engaging in tension reduction behaviors such as substance abuse, self-injurious behaviors, high-risk sexual behaviors, or elopement**

Multiple Effective Outpatient Treatments for Adolescent Substance Misuse

- **Motivational Interviewing** (with other interventions)
- **Cognitive Behavioral Interventions**
- **Family System Interventions**
- **12-Step Facilitation Programs**
- **DBT-S for youth with self-injurious and other high risk behaviors and substance misuse**

Treatments can effectively be provided in outpatient and day treatment settings

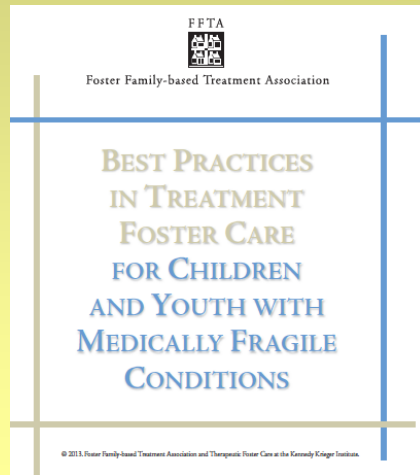
Multisystemic Therapy (MST)

- **MST home-based model that targets individual, family, peer, school, and neighborhood factors that increase risk for criminal behavior**
- **Effective with juvenile sex offenders and youth with a broad range of delinquent behaviors**
- **Associated with decreased rates of criminal behavior in the parents and siblings of youth treated with MST**

Multidimensional Treatment Foster Care (MTFC)

- **Family-based intervention for delinquent youth with foster parents trained to implement behavioral reinforcements**
- **MTFC effective with a range of delinquent behaviors – MTFC vs Group Care associated with lower rates of recidivism, and fewer subsequent days in detention centers**
- **In long-term follow-up MTFC associated with lower rates of drug use and fewer pregnancies**

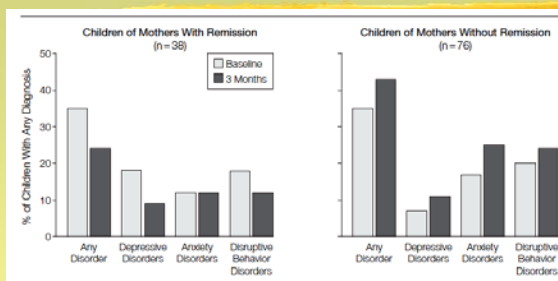
Therapeutic Foster Care for Medically Fragile Children



- 10% foster care children medically complex or fragile (AAP)
- TFC requires interdisciplinary team – SW, RN, foster parents
- Comprehensive training
- 24/7 emergency support
- Respite Care
- Home accommodations
- Permanency Planning

Spring 2018 Hopkins to sponsor symposium on placement challenges of medically-complex children

Treatment of Parental Psychopathology



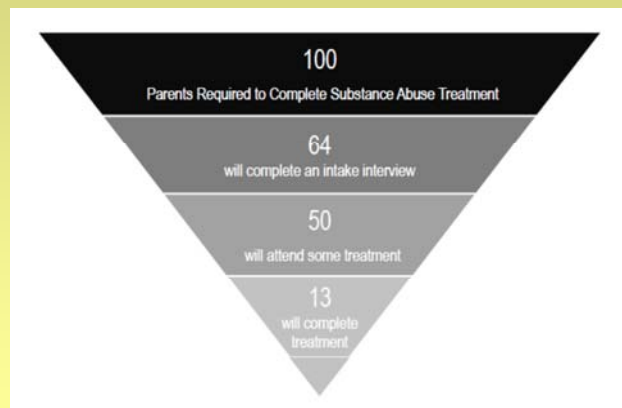
Weissman et al., JAMA 2006

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Child Welfare and Substance Abuse

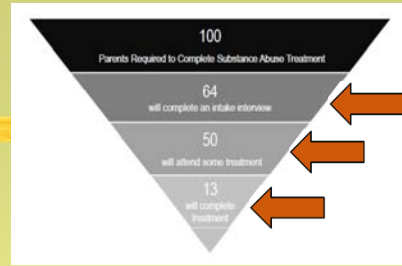
- **60%-70% child welfare cases have SUD**
- **80%-90% of children who enter foster care have parents with SUD**
- **Among child welfare cases, parental substance abuse is associated with:**
 - **Higher rates of child re-victimization;**
 - **Longer stays in care;**
 - **Higher rates of termination of parental rights and child adoption**

Drop off Points for Parents involved in Child Welfare Accessing Substance Abuse Services



General Accounting Office Report, 1998

Family Treatment Drug Courts (FTDC):

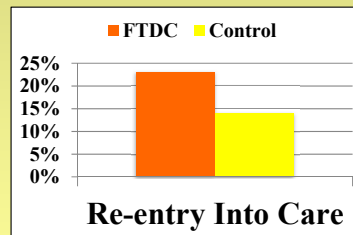


- First FTDC established in Reno 1994
- As of 2009, over 272 FTDC nationwide
- Modeled after drug courts in criminal justice system
- Assessments completed in court
- Recovery coaches
- Frequent drug testing
- Regular, weekly, court hearings
- Rewards, sanctions, and frequency of court hearings dependent on treatment compliance

Family Treatment Drug Courts (FTDC):

Three FTDC evaluations – one with historical controls, one with overflow controls, and one propensity matched controls

- Treatment Entry:
FTDC > Control
90% vs 54%
- Treatment Completion:
FTDC > Control
68% vs 32%
- Days in Care:
FTDC < Control
605 vs 1000 days

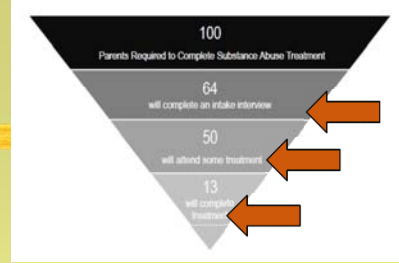


Re-Entry into Care:
FTDC > Control
23% vs 14% (ns)

Building Stronger Families (BSF):

Swenson, Henggler, Panzarella et al., 2009
Schaeffer, Swenson, et al., 2013

- Home-based model that integrates MST and RBT interventions
 - PTSD interventions for parents
 - 24/7 on call clinician - ~ 6-month intervention
 - Frequent urine drug testing in home – 3 times per week
 - Family safety plans developed with parent, CPS, and natural supports
 - 87% of parents referred - engage in tx (N=54)
 - 93% of parents who initiate treatment - complete treatment
 - Majority of BSF cases retained home (75%) - at discharge, 86% with family
 - Propensity Matched Sample Study – BSF versus TAU – BSF associated with lower rates of substantiated re-abuse at 2-year follow-up and improved parent and child well-being



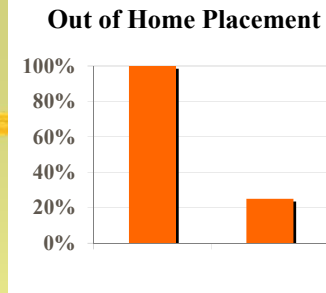
FTDC vs. BSF

Comparison of FTDC and BSF Models

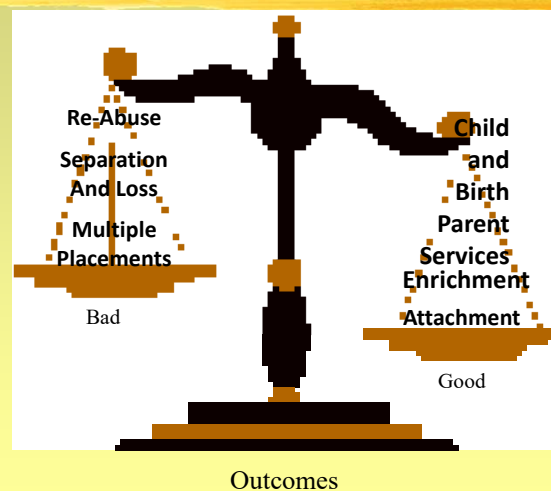
	FTDC	BSF
Intensive case management	Yes	Yes
Frequent urine testing	Yes	Yes
Integrated parenting, SUD, MH services	Sometimes	Always
Location of SUD treatment	Office	Home
Frequency of judicial oversight	Up to weekly	Every six months
Out-of-home placement of children	Majority of cases	Minority of cases

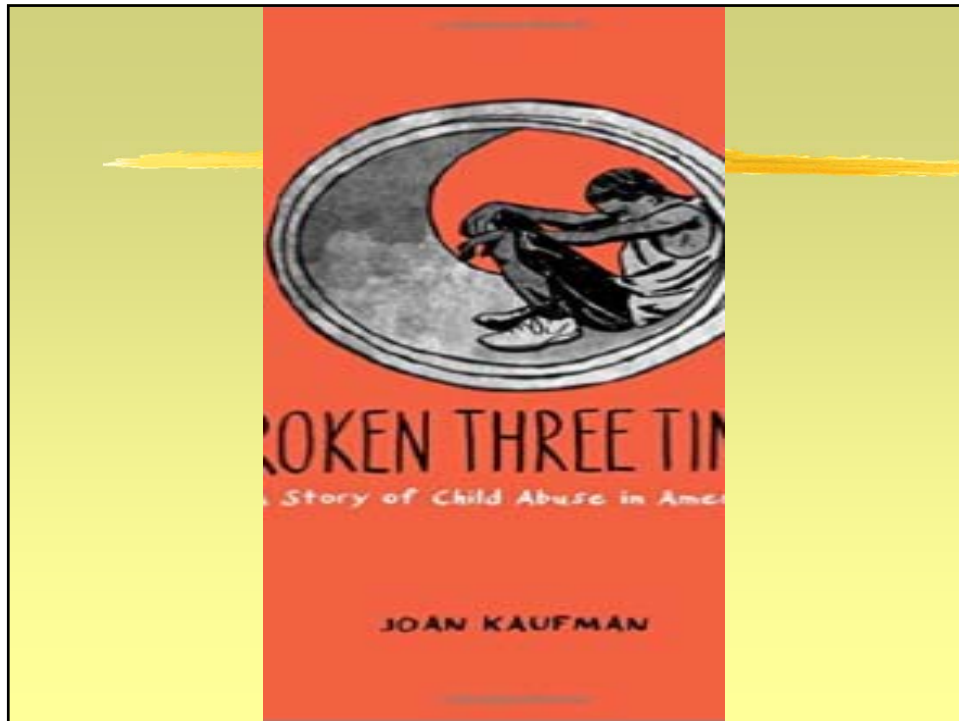
FTDC vs. BSF

- Comparable rates of treatment engagement and treatment completion
- FTDC – 100% out-of-home placements. Durations range from 400-650 days – reunification rate 40%-70%
- FTDC – high rates of re-entry into care (23%)
- The majority of BSF cases retained safely at home (75%). At discharge, 86% with family



Promoting Resilience in Maltreated Children: Tipping the Scale in Favor of Positive Outcomes





Clinical Vignette Workgroups and Discussions

Clinical Vignettes

Key Factors for Resilience

- Attachment
- Enrichment
- Child and Parent Services

