



**Simply stated, physical, psychological, and emotional trauma during childhood can result in damage to multiple brain structures and functions.<sup>2</sup>**

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# ACE Reporter

The findings of the Adverse Childhood Experiences Study, an ongoing collaboration between Co-Principal Investigators Vincent J. Felitti, MD, of Kaiser Permanente, and Robert F. Anda, MD, MS, of the Centers for Disease Control and Prevention.

## ADVERSE CHILDHOOD EXPERIENCES AND STRESS: PAYING THE PIPER

The *Pied Piper of Hamelin* is a legend purportedly documented by the Brothers Grimm: *Sometime during the 13th century, a village suffering from a plague of rats hires a piper to play his flute to lure the rats out of the village, and into the river, where they drown. When the town later refuses to pay the piper, he waits until all of the adults are at church one Sunday morning, then he lures all of the town's children into the mountains, never to be seen again.*

The Adverse Childhood Experiences (ACE) Study is “epidemiological” in nature. That is to say, it focuses on the public health aspects of disease, where it occurs, who is at risk, and measures the extent to which childhood trauma translates into poor health and social well-being later in life. As such, the ACE Study clearly demonstrates that children—and the adults we become—have long been “paying the piper” for the deeds of our parents, and others who perpetrate child abuse.

Recently, scientists whose focus is neurobiology (the study of the brain and nervous systems) compared the results of their research with the results of ACE Study research. The ACE Study was ideal for this purpose, not only because of the large number of people who participated in the Study (the sample size of over 17,000 people), but also because the Study was designed to assess numerous social,

behavioral, and health outcomes, rather than just one condition, or one category of conditions.

Participating neurobiologists analyzed the ACE Study data against demonstrated neurobiological defects that result from early trauma, changes to areas of the brain that mediate mood, anxiety, healthy bonding with other people, memory, and even where our bodies store fat.<sup>2</sup> After careful analysis, what they found is that “early experiences can have profound long-term effects on the biological systems that govern responses to stress...Disturbances [in neuron-development] at a critical time early in life may exert a disproportionate influence, creating the conditions for childhood and adult depression, anxiety, and post-traumatic stress symptoms.”<sup>1</sup>

These shared findings have “the potential to unify and improve our understanding of many seemingly unrelated, but often co-morbid [occurring at the same time] health and social problems that have historically been seen and treated as categorically independent in Western culture.”<sup>2</sup>

Why is this important? First, it is important to recognize that our “functional neuroanatomical and physiologic systems are interactive and integrated and that behaviors and health problems cannot generally

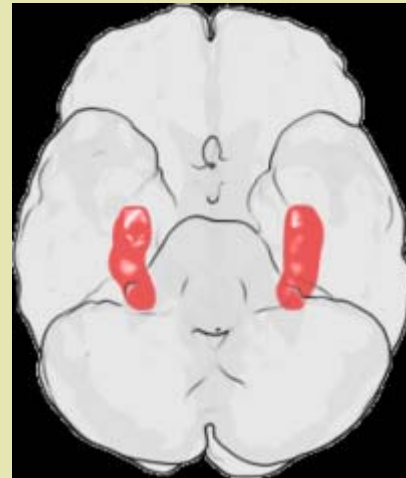
be attributed to the function of any single or particular system.”<sup>2</sup> Our bodies’ systems work together. Therefore, treating one aspect of a problem, without addressing the other aspects, cannot possibly solve the problem completely. Comprehending this essential relationship can help improve both preventive and primary care medicine, giving patients and their caregivers the information they need to achieve the best possible health and social outcomes.

Second, this convergence of colleagues and their data “adds support for numerous effects of childhood adverse experiences on physical health. Stress is known from animal studies to be associated with a broad range of effects on physical health, including cardiovascular disease, hypertension, hyperlipidemia, asthma, metabolic abnormalities, obesity, infection and other physical disorders.”<sup>2</sup> These findings provide the sort of substance that governments, organizations, and people in general typically require to become engaged, and to take action. Without scientific data, the long-term effects of childhood trauma are otherwise easily brushed aside in favor of a more comfortable and convenient denial of the problem.

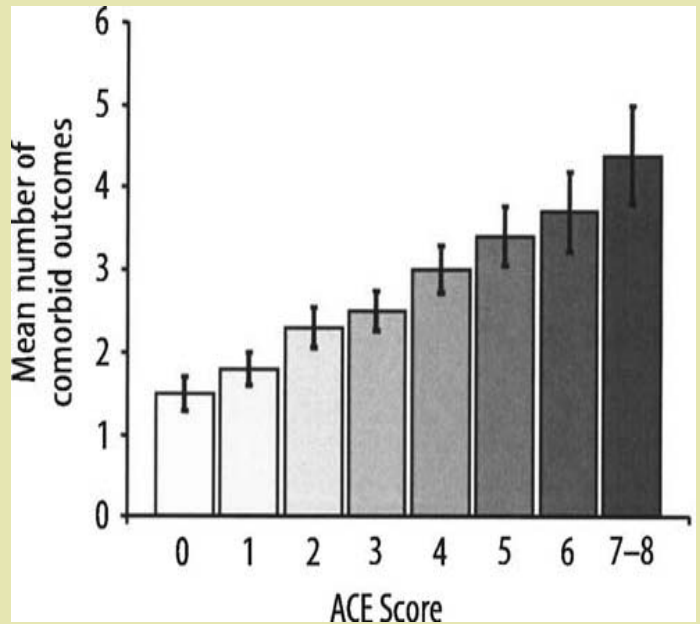
Third, we now know that “retrospective reports of childhood abuse [that was documented at the time of its occurrence] are likely to *underestimate* actual occurrence...[due to] effects of traumatic stress in childhood on the hippocampus”.<sup>2</sup> In other words, the incidence of child abuse is probably much greater than is reported, and even greater than remembered and acknowledged by the victims themselves. Not only is such trauma protected by secrecy and shame, but by the function of our own brains.

Equally important, this multi-disciplinary approach to research encourages future collaboration among scientists, all working at solving different pieces of what we are beginning to understand is the same puzzle. As the puzzle takes shape, the pipers lose ground.

Image courtesy of: [http://en.wikipedia.org/wiki/Hippocampus#Role\\_in\\_general\\_memory](http://en.wikipedia.org/wiki/Hippocampus#Role_in_general_memory)



A view of the underside of the human brain. The front is at the top; the back of the brain, is at the bottom of the image. The hippocampus (one on either side of the brain), as shown in red, plays an important role in human memory.



The higher the ACE Score, the greater the likelihood that multiple, negative outcomes will happen to the child abuse survivor, at the same time.

## PAYING THE PIPER FOOTNOTES

<sup>1</sup> The Biology of Child Maltreatment, Harvard Mental Health Letter, June, 2005

<sup>2</sup> Anda, RF, Felitti, VJ, Bremner, JD, et al. The Enduring Effects of Abuse and Related Adverse Experiences in Childhood: A convergence of evidence from neurobiology and epidemiology, Eur Arch Psychiatry Clin Neurosci 2006;256:174-186

## WHAT'S YOUR ACE SCORE?

Rob Anda, MD, MS, Co-Principal Investigator of the ACE Study, recently developed this mini-version of the ACE Study Questionnaire, to help people calculate their own ACE Scores. The ACE Score is the basis for rating the extent of trauma a person experienced during childhood, and to predict the likelihood that s/he will experience one or more forms of health, behavioral, and/or social problems. You now have the opportunity to calculate your own ACE Score by answering the questions below.

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household **often or very often**...  
Swear at you, insult you, put you down, or humiliate you?  
or  
Act in a way that made you afraid that you might be physically hurt?  
Yes No If yes enter 1 \_\_\_\_\_
2. Did a parent or other adult in the household **often or very often**...  
Push, grab, slap, or throw something at you?  
or  
Ever hit you so hard that you had marks or were injured?  
Yes No If yes enter 1 \_\_\_\_\_
3. Did an adult or person at least 5 years older than you **ever**...  
Touch or fondle you or have you touch their body in a sexual way?  
or  
Attempt or actually have oral, anal, or vaginal intercourse with you?  
Yes No If yes enter 1 \_\_\_\_\_
4. Did you **often or very often** feel that ...  
No one in your family loved you or thought you were important or special?  
or  
Your family didn't look out for each other, feel close to each other, or support each other?  
Yes No If yes enter 1 \_\_\_\_\_
5. Did you **often or very often** feel that ...  
You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?  
or  
Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?  
Yes No If yes enter 1 \_\_\_\_\_
6. Were your parents **ever** separated or divorced?  
Yes No If yes enter 1 \_\_\_\_\_
7. Was your mother or stepmother:  
**Often or very often** pushed, grabbed, slapped, or had something thrown at her?  
or  
**Sometimes, often, or very often** kicked, bitten, hit with a fist, or hit with something hard?  
or  
**Ever** repeatedly hit at least a few minutes or threatened with a gun or knife?  
Yes No If yes enter 1 \_\_\_\_\_
8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?  
Yes No If yes enter 1 \_\_\_\_\_
9. Was a household member depressed or mentally ill, or did a household member attempt suicide?  
Yes No If yes enter 1 \_\_\_\_\_
10. Did a household member go to prison?  
Yes No If yes enter 1 \_\_\_\_\_

Now add up your "Yes" answers: \_\_\_\_\_ This is your ACE Score.

DONE CAL-  
CULATING  
YOUR SCORE?  
NOW WHAT?

If you want to read more about what your ACE Score means, based on the findings of the ACE Study, see: <http://www.cdc.gov/nccdphp/ace/findings.htm>

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### **AUTHENTIC VOICES INTERNATIONAL**

Authentic Voices International (AVI) is a grassroots group of adult survivors of child abuse. AVI members come from all walks of life. What we have in common is a history of childhood trauma and a present desire to put an end to child abuse and neglect. We do this by applying our many, diverse skills and talents to dispel the ignorance, secrecy, and shame that allow child abuse to flourish. Learn more about us at:

[www.authenticvoices.org](http://www.authenticvoices.org)

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