

Keynote Address: Stress and Health Across the Lifespan

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As Shelley Taylor tells it, it was twenty years ago when a colleague knocked on her office door and said she absolutely must join this new psychological society if she wanted to be taken seriously as a scientist.

Taylor did become a Charter Member of the Association for Psychological Science (called, at the time, the American Psychological Society), and her scientific contributions since that time were so significant that the society named her an APS Fellow, then a William James Fellow Award winner (in 2001), and, most recently, she was Keynote Speaker at the APS 20th Annual Convention in Chicago.

In a sense, Taylor's positive upbringing in psychological science — and the healthy career that ensued — can be considered a metaphor for the major theme of her talk. Research clearly shows that a nurturing childhood can protect a person against stress and illness throughout a lifespan, she said, whereas a troubling youth can significantly increase one's risk for an unhealthy future.

“A harsh early environment predicts the early onset of chronic disease,” said Taylor, who is Distinguished Professor at the University of California, Los Angeles. She spoke to a packed room of almost 1,000 convention attendees.

The correlations in positive rearing and health have shown up time and again in Taylor's work. Psychological resources such as self-esteem, optimism, and social support — though often illusory — literally help the body take care of itself, Taylor has found.

People with these mental tools show healthier heart rates and blood pressures in response to stress compared to those raised in difficult environments. They are even better able to manage illnesses as severe as cancer and, if infected with HIV, show a “less rapid progression of the AIDS virus,” she said.

At the same time, researchers have shown a strong connection between low socioeconomic status and adverse health outcomes. Cold, neglectful family environments increase the risk for major chronic diseases later in life.

What's more, such families are not necessarily abusive, Taylor said. She has been surprised how fairly normal family interaction can affect health in a negative way.

In all, Taylor has found, a person's biological and neurological functioning, coping methods, and genetic expression all change based on his or her early — and even current — environment.

Exactly why stress in youth has such a lingering and potent impact on health is the major impetus for Taylor's work. “I want to see how the psychological and the biological pieces fit,” she said.

Let the Studies Show

Taylor outlined several experiments that support her profound and important conclusions.

In one study, 92 subjects, aged 18 to 25, were given a laboratory stress exam. During the test, the participant would count backwards from 9,995, by 13, as rapidly as possible.

To produce additional stress, every so often the experimenter would tell subjects to count faster or to start over because they were wrong. “It is not fun,” Taylor said.

Participants who came from harsh backgrounds responded poorly to the added anxiety, Taylor and her colleagues found.

In response to stress, a person’s cortisol level typically increases, then falls back to a normal level. The levels of subjects from non-nurturing environments, however, rose then plateaued — suggesting that these stress management systems had lost some of their natural resiliency. In males from this group, Taylor also noticed elevated heart rates and blood pressures.

Such results led Taylor to conclude that one’s surroundings can actually alter biological makeup — wearing down a person’s ability to handle stress over time and causing a gradual attenuation of the body’s defenses.

“A harsh family environment indeed appears to be associated with potentially compromised biological regulatory responses to stress,” she said.

A second study suggested neurological changes in the way children from tough family environments managed stress, too.

Taylor’s group showed 30 subjects a series of distressed faces and studied the responses in the amygdala and right ventrolateral prefrontal cortex. Sometimes the participants observed the faces, and sometimes they labeled the corresponding emotion. The control group merely identified the gender.

In the observation, task children raised in harsh environments showed low activity in their amygdalae. The response is unusual, said Taylor, perhaps an indication that such people have learned to tune out stress more readily.

In the labeling task, however, the brain is forced to engage with the faces more closely. This time, subjects with difficult upbringings showed a significantly stronger amygdala response than did those from nurturing families.

Both sets of results suggest brains that are failing to regulate the amygdala normally. The conclusion, said Taylor, is that when harshly raised kids are forced to engage with a stressful atmosphere they react to it more strongly — and don’t recruit other neural areas to mollify these stressors — than people raised in good support systems.

“Growing up in a risky family environment, then, seems to have an effect on neural processes,” she said.

A third study concluded that the impact of one’s childhood permeates all the way to the genetic level.

Taylor focused on one gene, known as the serotonin transporter gene, implicated in a heightened risk for depression by previous research. When she delved into the early experiences of 118 subjects who have the short form of this gene, though, Taylor found a significantly higher risk for depression among those raised in troubling environments.

She also noticed exactly the opposite in subjects whose upbringing was considered healthy. So even among a pool of subjects at risk for depressive symptoms, a warm family atmosphere significantly reversed the risks of depression, when compared to people with difficult pasts.

“The nurturing environment was actually protective against depression,” Taylor said.

A Positive Side

The positive side to Taylor’s research is that good social support systems can have significant impacts on health.

One study of 20 participants illustrated this conclusion. The subjects endured a battery of stress tests. In the first, each person thinks he or she is playing catch with two other subjects in other brain imaging scanners. Over time these co-participants, which are actually just illusions, exclude the main subject from the game. In another test, the subjects give a speech to a yawning, non-responsive audience. A third test consists of the aforementioned counting-backwards task.

The participants with strong social support displayed lower dorsal anterior cingulate cortex activity and lower cortisol responses to stress — in short, their bodies produced more regulated reactions.

Another study of 120 subjects also indicated that people from supportive backgrounds had healthier neurological profiles. In a functional imaging study that involved the aforementioned face observation task, optimistic subjects showed lower amygdala activity than did those from disruptive environments.

The Next Step

The totality of Taylor’s research lends support for a general model of the effects of stress on health outcome. To see whether her results can predict long-term health changes, Taylor has collaborated with Cardia, a 15-year study of more than 3,000 African American and white males and females.

So far, she has found some connection between low socioeconomic status and metabolic function, which relates to cardiac health, as well as an “acceptable” fit for her model’s ability to predict a marker of coronary heart disease.

Her best result came from applying the model to changes in blood pressure; it proved a good fit for all four subsets of the Cardia sample population.

In the end, though, the ability to predict future health problems is only as good as the methods to prevent them.

Despite her work’s frequent focus on bleak futures, Taylor remains upbeat that treatment will one day

fill part of the health void left by a person's poor upbringing.

"You would think if we can identify some of the upstream path we ought to be able to modify some of the downstream path," she said. "We will see."

– Eric Jaffe

The work Taylor presented was conducted in collaboration with Naomi Eisenberger, Matthew Lieberman, Lisa Burklund, Barbara Lehman, Clayton Hilmert, Teresa Seeman, and Baldwin Way.