

# 100 YEARS OF SOLICITUDE

## Do global traumatic events have a transgenerational effect?

**The past 100 years were witness to a barrage of highly stressful, life-threatening, anxiety-producing events: wars, large-scale disasters, assassinations, mass murders, and the obliteration of entire cities and the threat of annihilation of millions more people with nuclear weapons.**

Yet, important questions about the impact of these events have not been asked: Can there be a *transgenerational neurobiological effect* on the children and grandchildren of people who have been subjected to life-threatening, traumatic societal events? Could the psychobiology of widespread anxiety and worry (solicitude) be experienced not only by the generation that witnessed and lived through those devastating events, but also by their progeny, who were not yet born during the traumatic events? And could there be epigenetic consequences on a large scale, producing a generation that shares traits induced by the trauma experienced by the previous generation?

Did the rise of delinquency in the 1950s, followed by the anti-war rebellion, unprecedented sexual promiscuity, and substance abuse of the 1960s, be the result of genetic changes in the previous generation induced by living through World War II—after which the generation that grew up in the 1960s was born?

In the late Gabriel García Márquez's masterpiece novel, *One Hundred Years of Solitude*, the 1982 Nobel Laureate's chronicle of the Buendía family across 7 generations is replete with dark and insalubrious events. The fictional family's story is considered a metaphor for the tumultuous evolution of Márquez's native Colombia, but that story is consistent with the concept of transgenerational transmission of the biologic effects of stress, as each generation of the Buendía family manifests unusual, even pathological behaviors.

### **One hundred years of alarm, panic, and anxiety**

Psychiatrists are keenly aware of the impact of stressful events on their patients' mood and behavior, and of the association of life-threatening events with posttraumatic stress disorder (PTSD). For persons who suffer the generalized anxiety of PTSD, further stressful life events can aggravate their condition and result in additional anxiety and solicitude.

It is not surprising that anxiety has been documented as the most common psychiatric condition in the United States.<sup>1</sup> Consider the variety of perturbations that have induced alarm, panic, fear, and simmering anxiety on a global scale over the past 100 years—starting with World War I, exactly a century ago.

continued



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**Could PTSD and solicitude in one generation be transmitted to the next via epigenetic mechanisms?**

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**War.** The ruinous 4-year Great War was followed 20 years later by World War II, which caused tens of millions of casualties and the annihilation of Hiroshima and Nagasaki by the atomic bomb—escalating fear of nuclear warfare and radiation poisoning for decades to come. Add to that the Korean War, the Vietnam conflict, the First Gulf War, and the Iraq and Afghanistan wars. The war fatigue and mental exhaustion of the population are palpable.

**Economic upheaval.** After the Stock Market Crash of 1929 came the Great Depression, the recessions of the 1970s and early 1980s, another stock market crash in 1987, and, most recently, the financial crisis of 2008. Millions saw their wealth wiped out and their livelihoods disrupted, exerting enormous life-changing stresses on countless families.

**Disasters.** The sinking of the Titanic in 1912, the crash of the Hindenburg, the Three Mile Island nuclear accident, the meltdown of the Chernobyl and Fukushima Daiichi reactors, the space shuttle disasters, and the 9/11 terrorist attacks—all these trigger and perpetuate fear and worry about the one's own, and one's loved ones, abrupt and premature mortality.

**Epidemics.** Millions died in the 1918 influenza pandemic, prompting widespread societal fears that re-intensified during subsequent epidemics: polio in the 1950s, swine flu in the 1970s, SARS (severe acute respiratory syndrome) in the 1990s, West Nile Virus, and avian influenza.

**Assassination.** The shooting of Archduke Franz Ferdinand of Austria sparked World War I a century ago, but what baby boomers, such as me, vividly remember is our angst over the assassinations of President John F. Kennedy,

his brother Robert, and Rev. Dr. Martin Luther King, Jr; the attempted assassination of President Ronald Reagan; and the murder of John Lennon. Each assassination leaves a communal scar on millions, forever reminding them of the ephemeral nature of life at any rung of the social ladder.

**Mass murder.** The past 100 years began with the Armenian genocide in 1918, followed by the Holocaust of World War II, the Munich Olympics killings, the Jonestown massacre, the Oklahoma City bombing, and, to name a few, the mass murders at Columbine, Virginia Tech, Newtown, and Fort Hood.

**Natural disasters** can wreak havoc on peoples' lives. Consider the annual tally of hurricanes (a long list, some—such as Katrina and Sandy—more infamous than others). Add to those storms the earthquakes, tsunamis, erupting volcanoes, floods, and blizzards, and the result is suffering and anxiety on a massive scale, even among those who are not affected directly.

A surprising facet of these disquieting events is the *resiliency of people*. Life goes on, despite the agony, despair, and solicitude instigated by deadly events. But of those who buckle under the weight of adversity, many end up in a psychiatric clinic or hospital, and are disabled by their symptoms.

## Even 'good' change can be disquieting

Juxtaposed against these awful events are 100 years of an array of positive, uplifting discoveries, inventions, and medical advances that have completely transformed our lives. Consider: electricity, clean water, women's right to vote, automobiles, air and space travel, air conditioning, and highway systems; the momentous discoveries of penicillin, antipsychotics, antidepressants, and

mood stabilizers; television, the telephone (evolving from dumb to smart), vaccines, oral contraceptives, genetic discoveries, brain imaging technology, and home appliances (refrigerators, microwave ovens, dishwashers); and not at all least, personal computers and the Internet.

But even these advances can generate anxiety and solicitude: Fear of flying, anyone? Embarrassment about a selfie gone viral on the Web? Worry about being a carrier of a breast cancer gene? Claustrophobia inside an MRI scanner?

### Hypothesizing about the transfer of anxiety

Could PTSD and solicitude in one generation be transmitted to the next via epigenetic mechanisms (that is, by over-expression or silencing of genes involved in brain development) and could this transmission result in unusual wide-scale stress reactivity? Might this be an example of the infamous Lamarckian “inheritance of acquired characteris-

tics” at the molecular genetic level, in which the anxiety of traumatized parents is transmitted to their offspring? Or could transmission be mediated by being reared in the emotionally oppressive environment of a family still reeling from the effects of war, disaster, and mass murder?

Such questions might sound rhetorical, but they present a reasonable hypothesis that can be answered by research. Findings from animal studies suggest that such a phenomenon might occur in humans.<sup>2</sup> If those findings are validated, opportunities for preventing societal solicitude might emerge.



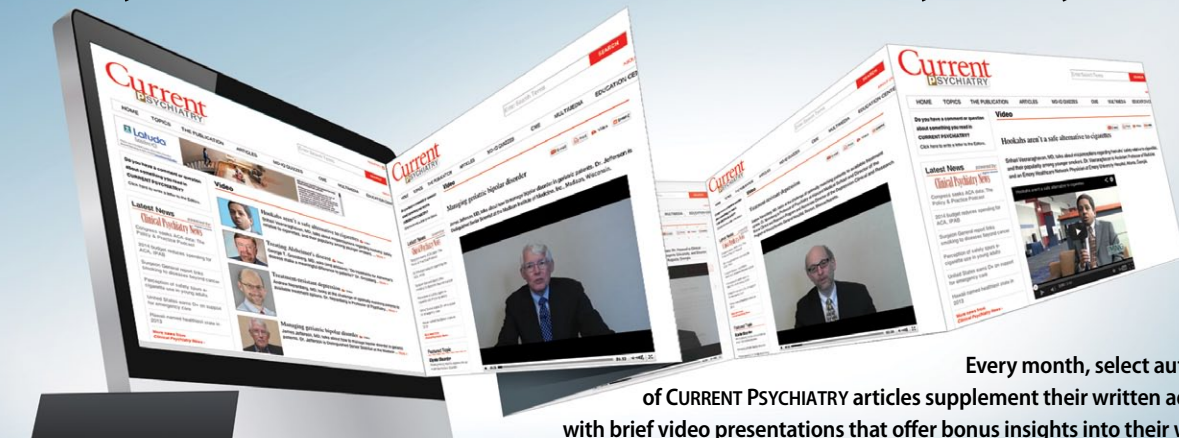
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**Could transmission be mediated by being reared in an emotionally oppressive environment?**

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