

How the Science of Wonder Helps Our Kids Thrive

Deborah Farmer Kris

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CHAPTER ONE

THE WONDER OF NATURE

A child's world is fresh and new and beautiful, full of wonder and excitement. . . . If I had influence with the good fairy . . . I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life."
—Rachel Carson

Awe doesn't often make the headlines. But on April 9, 2024, the front page of *The New York Times* read, "A Divided America Agrees on One Thing: The Eclipse Was Awesome."

Though our town was about three hours south of the path of totality for that solar eclipse, a celebratory atmosphere permeated the community. The day before the eclipse, local online groups were overrun with residents hunting for eclipse glasses and others offering up their extras for free. One of my kids spent the afternoon constructing a moveable 3D eclipse model while the other built a pinhole camera. Many schools let out early. Libraries and community groups hosted watch parties.

My family kept it simple and put out lawn chairs and blankets in the front yard. Neighbors wandered over to join us, and a gaggle of kids climbed our Japanese maple tree to get closer to the sun. The birds went silent as we craned our necks toward the sky. As *The New York Times* reported, "For this moment, a wide swath of this country did the same thing, together, happily and in wonder. Our world of divisions and distractions—of TikTok and politics and disasters—fell away, leaving us quiet with our breath held in awe."[1]

Back in 2017, as the United States was getting ready for another solar eclipse, I had the chance to interview NASA scientist Amy Mainzer for PBS KIDS. (Your kids might know her as Astronomer Amy from the show *Ready Jet Go!*) I thought of her words as I watched the moon

swallow up the sun. “Eclipses offer us a powerful reminder of our place in the cosmos as we go about our daily lives,” she told me. “We sit on a small planet speeding around a gigantic sun, whirling through the galaxy.”[2] That’s what awe does: It reorients our perspective, reminding us of how small we are in the scheme of things. And despite our culture’s emphasis on celebrity and status, a healthy sense of “smallness” can be just what our kids need.

A Few Things We Know About Nature, Kids, and Awe

Not surprisingly, people name nature as a key source of awe. Since awe involves encountering something vast, then oceans, sunsets, thunderstorms, stretches of desert, and fields of flowers are awe-inspiring by definition.

But our kids don’t need awesome vistas to find wonder in the natural world. And kids often do more to pull their parents toward nature than the other way around. When my kids were four and seven, I wrote this about their relationship with the outdoors:

> As the spring days grow longer, my kids resist going to bed. Who can blame them? Bugs and birds are far more appealing than bath and bedtime. Everything they see sparks their wonder: ants swarming a dead beetle, bees drinking from flowers, plants pushing up through sidewalk cracks, peeper frogs croaking, dragonflies perching, and wild turkeys strutting down the street. They want to dig in the dirt, climb trees, blow on dandelions, and hunt for four-leaf clovers.

As parents, our challenge is less about getting our kids to enjoy nature, and more about how to slow down and make time to experience the natural world together—and how to help our kids keep that connection as they grow into adolescence and beyond.

The documented benefits of getting outside for kids of all ages are legion. Time in nature supports cognitive development, stress reduction, creativity, focus, mental and physical health, social skills, gross motor

skills, and environmental awareness.[3] Simply put, time outside makes kids healthier and happier in a host of ways.

Here's a fun fact: Did you know that the presence of greenery *outside* a school building may support the academic performance of students learning *inside* it? A study of Massachusetts elementary schools showed a relationship between the "greenness" of a school's environs and schoolwide academic performance. How did researchers measure this? Every spring in Massachusetts, students take the MCAS, a series of standardized tests. Using satellite images, researchers measured the vegetation levels around each school during testing season. They also adjusted the testing data to control for other demographics—things like family income level, student/teacher ratio, and attendance rates. In the end, they found that "results showed a consistently positive significant association between the greenness of the school in the Spring . . . and schoolwide performance on both English and Math tests, *even after adjustment for socioeconomic factors and urban residency*"[4] (emphasis added).

Here's a less-fun fact: Today's kids spend more time inside than any previous generation did. That's largely related to technology. According to a 2021 report from Common Sense Media, American tweens (eight- to twelve-year-olds) spend an average of five-and-a-half hours each day on screens, and teens are on screens for an average of eight-and-a-half hours daily.[5] In one study, 65 percent of US American parents surveyed reported playing outside every day during their childhood—but only 30 percent of their children do the same today.[6]

Nature is a readily available, yet underutilized, source of awe for our kids. As awe researcher Dacher Keltner writes, "It is hard to imagine a single thing you can do that is better for your body and mind than finding awe outdoors."[7]

Nature, Awe, and Mental Health

Psychologist Craig Anderson has spent years exploring the connection between awe and mental health.[8] His studies don't just take place in a

lab. As part of his research at the University of California, Berkeley, Anderson embarked on over a dozen white water rafting trips. And he took two types of study participants with him. The first group included young adult veterans who had experienced combat missions. The second group included teens from underserved communities who had been exposed to community violence. These teens "reported higher levels of [PTSD] symptoms than our veterans did," Anderson told me.

Anderson's team found that experiencing awe in nature predicted improved well-being in both groups. A week after the rafting trips, participants self-reported a 30 percent decrease in their PTSD symptoms. They also felt less stress and got along better with friends and family. Lab tests corroborated these perceptions. In comparing before-and-after saliva samples, researchers found that this intensive, nature-based experience reduced participants' stress hormones and inflammatory markers.[9]

One of the rafting participants was a college-age combat veteran. In a video about his experience on the trip, this young man noted that when he gets together with other veterans at a bar or social gathering, they usually ended up reminiscing about their time in the military, "almost like we're stuck in it." But when he went rafting with other young veterans, they were so absorbed in the sights, sounds, and emotions of the moment that "we ended up never talking about combat—I felt like we were all really living in the moment."[10]

When I talked to Anderson about those rafting trips, his enthusiasm for the potential of this research was palpable. He often paused while speaking, as if in recalling these moments in nature, he was reexperiencing the accompanying awe. But it would be "a shame if the only way we could get those benefits was by going white water rafting," he said. So, in a second study, Anderson's team asked college students to record positive experiences they had during their normal lives over a two-week period.[11] His team then went back and coded which positive experiences included being in nature, "things like, *oh, I took a few minutes to relax on the quad* or *I noticed that the flowers in North Berkeley were particularly gorgeous that day*." Here's what they found:

Students who "spent time in nature on a given day felt more satisfied with life that evening than those who didn't" and, building on this pattern, "students who spent more days in nature over the two weeks saw greater improvements in well-being during that time."[12] Anderson summarized it this way for me: The more that students "had these everyday experiences of nature, the more awe they felt and the better well-being they showed at the end of that two-week period." Anderson said that he envisions a day when doctors prescribe time outdoors as a concurrent, complementary mental health treatment: "The awe that we feel in the outdoors could be a useful part of our health care system."

What's the application for parenting? Anderson's research leads me to this question: If time in nature can measurably improve the mental health of young people, and especially those who have experienced combat and community violence, could regularly taking our kids outside serve as a protective measure? Could time in nature strengthen our kids' abilities to withstand life's stressors?

Plenty of researchers have established a relationship between nature and mental health. A study from the Medical College of Wisconsin found that "higher levels of neighborhood green space were associated with significantly lower levels of symptomology for depression, anxiety, and stress," after controlling for a wide range of factors.[13] The researchers concluded that "greening up" our neighborhoods could be a relatively low-cost, high-result "mental health improvement." And this isn't just true for urban areas. Scientists at Cornell University looked at how access to nature influenced the mental health of children living in rural areas. They found that nature acts as a buffer: "Specifically, the impact of life stress was lower among children with high levels of nearby nature than among those with little nearby nature."[14] And a 2024 NIH study found that young children (ages two to five) who lived near dense green spaces, such as parks or forests, had fewer symptoms of anxiety and depression.[15] According to the lead scientist, "Our research supports existing evidence that being in nature is good for kids. It also suggests that the early childhood years are a crucial time for exposure to green spaces."[16]

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