

Author's Note, 2014

Welcome. You are coming upon *The Highly Sensitive Child* at a good time. While I do not find that the book itself requires revising since it was first published in English, it does need this Author's Note to inform you about the wealth of scientific research on high sensitivity which has occurred in the intervening years. This information will help you greatly as the parent of a highly sensitive child (HSC). It does not change the advice in this book on how to raise a sensitive child. It does, however, provide even more confidence that this trait, your child's wonderful way of being different, is based on solid facts.

Equally important, the following pages may help you demonstrate the reality of this trait to skeptical or uninformed relatives, fellow parents, child care workers, health care providers, teachers (so important), and even maybe your co-parent. Often those who care the most about your child are also most afraid that you are misinformed or overprotecting when you bring up the idea that your child is highly sensitive and that this is a normal variation that you wish to honor. This note may help you calm their fears. You might even consider giving this to some of them to read--just this note, if not the entire book. I will try to keep this brief.

[Level A]The Early Research

In Chapter One I describe the research up until 2002: How I began studying high sensitivity, the initial interviews with adults, the development of a measure for adults, the testing of that on hundreds of persons, and the distinguishing of it from related traits, such as introversion. We found, in fact, that although 70% of adult highly sensitive persons (HSPs) were introverts, 30% were extraverts, and Chapter One explains why this is. I also explain there that I did not discover a new trait, but one that has been misnamed because early studies of innate

temperament focused on a single observable behavior, often nothing but pausing before entering a new situation, and calling it shyness, introversion, inhibitedness, being slow-to-warm-up, or plain fearful. Although a sensitive child might become shy, introverted, fearful, and so forth, none of these captures the underlying trait, which usually cannot be seen in just one behavior. A better term for it may come along—the genes for it do not come with labels—but “high sensitivity” is my attempt to capture it. (In the scientific literature it is termed “sensory processing sensitivity,” not to be confused with Sensory Processing Disorder or Sensory Integration Disorder, as I explain in Chapter One.)

The first chapter also describes how I developed the questionnaire you will see in this book for parents, “Is your Child Highly Sensitive Child?”, using the same methods as for the adult questionnaire, but by interviewing parents and from that developing a number of questions that were given to over a hundred other parents. These were then honed down to those that hung together as a measure of high sensitivity—that is, if parents found one to be true about their child, they were likely to say yes to the others.

As with the questionnaire for adults, the items are surprisingly diverse, ranging from startles easily and disliking scratch clothing to using big words and noticing the distress of others. This is because the questions have to be about behaviors parents have noticed, but are based on an understanding of this deeper trait that goes beyond a wide range of behaviors to seeing the underlying reason for them all.

[Level A] Does DOES Describe Your Child?

These days I explain the underlying trait as having four aspects—that is, all four are present in a highly sensitive individual. Without all four, it probably is not the trait I am talking about. You can remember these as DOES. Depth of processing, being easily Overstimulated, being both Emotionally reactive generally and having high Empathy in particular, and being

aware of Subtle Stimuli, and I will use these four in this note to summarize the recent research that provides evidence for each of them.

[Level B] Depth of Processing

While being easily overstimulated and aware of subtle little things may be what most parents notice first about their HSC, depth of processing is really the underlying trait. This thorough processing or tendency to reflect can actually also happen unconsciously, but shows up in your child's deep questions, use of big words for his age after he has heard them once or twice, clever sense of humor, difficulty making decisions because he is thinking of so many possibilities, or being "slow to warm up" to new people and situations because he has to watch and think it over before joining in. As I emphasize in the book, not every child will demonstrate all of these, but all will show some sign of this deeper thought about things. True, a sensitive child or any child will also be "slow to warm up" due to real fear (as opposed to reasonable caution), but there must be some cue in the present situation that the child associates with a past negative experience. I seriously doubt that children are born indiscriminately fearful or shy—such a trait would not survive long in the human gene pool.

There is considerable new evidence about the depth of processing feature of high sensitivity. A study by Jadzia Jagiellowicz and colleagues of brain activity of adults (using functional magnetic resonance imaging, or fMRI) has found that when highly sensitive people (HSPs) are trying to see the difference between two slightly varied pictures, they show more brain activity than non-HSPs in areas that do just that--consider the complexities and details in a perception, not simply the superficial aspects. That is, they employ more those parts of the brain involved in "deeper" or more elaborate processing.

In another study, by ourselves and others, sensitive and non-sensitive persons born and raised in Asia or the U.S. were compared on how they handle perceptual tasks that are already

known to vary in how difficult they are—that is, how much brain activation or effort is required—depending on whether your culture is more collective, as in Asia, or more individualistic, as in the U.S. The brain of non-sensitive persons showed the usual extra effort when doing the task that is more difficult for people from their culture, but the brain of HSPs, whether born in Asia or the U.S., did not show any extra effort being made. It was as if they were seeing beyond their cultural expectations, to a deeper level of how things “really are.”

Research by Bianca Acevedo studied sensitive and non-sensitive people on a task involving viewing photos of strangers and loved ones and found the same results as Jagiellowicz of more elaborate perceptual processing by HSPs, but also more brain activity than others in an area called the insula, sometimes called the seat of consciousness because it integrates moment to moment knowledge of inner states and emotions, bodily position, and outer events to produce what we are presently aware of. If your HSC is more aware of what is going around inside and outside, this would be exactly the area of the brain one would expect to be especially active at those times.

[level B] Easily Overstimulated

A person who is more aware of everything going on outside and inside plus processing it more thoroughly almost has to wear out mentally and therefore physically (the brain is part of the body) sooner than others. For all children, so much is new in every moment, and we deliberately introduce new things as they grow, so that they often get overstimulated, tired, and distressed. However, this is much truer for HSCs, who are built so that they notice and think about everything new much more than other kids. Hence being easily overstimulated is a natural if unpleasant side effect of depth of processing.

I probably do not have to describe how an overstimulated child looks. You see some of it every day: Those surprising and distressing meltdowns on overstimulating outings, even on

“fun” days or vacations; the difficulty going to sleep or waking in the night after an exciting day; the reactions to change or to pain that seem so extreme. They seem almost physically hurt by loud noises. They complain about heat and cold, pebbles in a shoe, or wet or scratchy clothing. You learn that they need extra “down time” or quiet play. They don’t like surprise parties, and to avoid being overstimulated they may avoid all parties, team sports, or speaking up in class. You suffer when they are very good at something, then do not perform nearly as well when being watched or tested, for example in school, a musical recital, or “big” game.” And I hope you have noticed that they learn better from a gentle correction than a strong, overstimulating punishment. In short, no one feels good, performs well, or learns much when overstimulated, but that state comes sooner for HSCs.

As for experimental evidence that HSPs are more easily overstimulated, Friederike Gerstenberg in Germany compared sensitive and non-sensitive people on a tricky perceptual task of deciding whether or not a T turned in various ways was hidden among a great many Ls turned various ways on a computer screen. HSPs were faster and more accurate, but also more stressed than others after doing the task. Was it the perceptual effort or the emotional effect of being in the experiment? Whatever the reason, they were feeling stressed. Just as we say a piece of metal shows stress when it is overloaded, so do HSPs.

In research I am doing now on highly sensitive parents, they report being overstimulated both as parents and with all the social activity that comes with parenting, beginning with strangers speaking to them just because they are pregnant. Theodore Wachs found that given the same levels of home traffic and disorganization, mothers scoring high on the HSP Scale perceived their homes as more chaotic than non-sensitive mothers.

High sensitivity, however, is not *mainly* about being distressed by high levels of noise, a cluttered room, or constant change. Sensory discomfort by itself, without other aspects of the

trait, can be a sign of disorder due to *problems* with sensory processing rather than having unusually *elaborate or deep* sensory processing. For example, sometimes persons with autistic spectrum disorders complain of sensory overload, but at other times they underreact. It is as if they have difficulty recognizing where to focus attention and what to screen out, since when talking with someone they may find the face no more important than the shoes, whereas HSCs pay special attention to faces and other social cues. If a child cannot sort out at all what matters, naturally he feels overwhelmed by stimulation. Those on the autistic spectrum may even be more aware of subtleties in something they have fixated upon, but in social situations especially they are more often noticing something irrelevant.

[Level B] Emotional Reactivity and Empathy

Emotional reactivity is also closely related to depth of processing, in that our emotions tell us what to pay attention to, learn from, and memorize if necessary. Without emotions as motivators, nothing would be processed enough to remember it. This is part of why it is easier to learn a new language where it is spoken. Not only do we hear it all the time, but we really want to be able to speak to those around us. A child wants to remember how to keep warm, engage Mom's smile, talk Dad into giving a cookie, or earn a good grade, and how to avoid burned fingers, angry parents, or bad grades. Sensitive children, because they care more about everything, observe and learn these life lessons even better. One way they do it in social situations quite naturally is by having empathy—knowing what the other person is knowing, feeling what the other is feeling. Empathy combined with stronger emotions leads to compassion.

As a parent of an HSC, you know what this emotional responsiveness and empathy looks like, as when your child feels everything so deeply; cries easily; “reads your mind,” is a perfectionist or reacts intensely to making the slightest error; or notices the distress of others,

including school friends, family members, strangers, and sometimes animals especially (as when she learns that little lambs become lamb chops or polar bear cubs are drowning due to global warming).

We already knew from questionnaire studies and experiments that HSPs say they react more to both positive and negative experiences, but a series of experiments and brain activation studies done by Jadzia Jagiellowicz found that HSPs particularly react more than others to pleasant (e.g., puppies, kittens, and birthday cakes) and unpleasant photos (e.g., snakes and spiders), but to pleasant ones especially, and especially if they had a good childhood—we'll return to this in a moment. This reaction to positive pictures was not only in the brain areas associated with the initial experience of strong emotions, but also, again, in “higher” areas of thinking and perceiving, in some of the same areas as those found in the depth-of-processing brain studies.

E is also for empathy. In the brain study by Bianca Acevedo already mentioned, in which HSPs and non-HSPs looked at photos of the faces of both strangers and a romantic partners expressing happiness, sadness, or a neutral feeling, you recall that HSPs showed more brain activity in the insula, the area associated with consciousness itself. This was true in all cases, but even truer when looking at photos that showed emotions on the faces of their partners, either happy or sad. That seemed to be an indication that they were in an especially heightened state of awareness at those times, as we would expect if they felt the most emotion looking at these photos.

The HSPs also showed more activity than others in their mirror neuron system, especially when looking at the happy or sad faces of loved ones and happy faces of strangers—another strong result for HSPs being especially attuned to those for whom they feel emotions and to positive images generally. The brain's mirror neurons were only discovered about twenty years

ago. These neurons fire when we are watching someone else do or feel something, and fire as if we were doing or feeling that same thing. For example, these same neurons fire whether we are kicking a soccer ball, see someone else do it, hear the sound of a ball being kicked, or even hear or say “kick.” Other neurons keep us from acting as the other person is acting if we aren’t supposed to, but it may not be perfect. If you have ever felt your muscles twitch when watching an athlete or dancer make a vigorous or exciting move, you have met your mirror neurons.

These astounding neurons not only help us learn through imitation, but along with other parts of the brain that were especially active for HSPs in this study, mirror neurons help us know deeply what the other person plans or feels. That is, these special areas of the brain lead to empathy. With empathy we not only know from words and other cues how someone else feels, but actually feel that way ourselves to some degree. And again, HSPs had more brain activation in these areas that lead to empathy than the non-HSPs. No wonder your HSC is probably easily dismayed by cruelty or injustice.

[Level B] Sensitive to Subtle Stimuli

Being aware of subtle sounds, smells, details, and so forth is all part of being highly sensitive, of course. Some people have a particular sense that is highly developed, but for the most part, again, it is not that the sense organs are more responsive, but the higher levels of thinking and feeling that attend to and make subtle discriminations, which makes it a little difficult to distinguish it from depth of processing. Still, parents know about their HSC’s sensitivity to subtle stimuli, as when their child notices even slight changes in the appearance of people or places, as when a piece of furniture has been moved or removed; a “funny” odor that makes them refuse to enter a place; a bird song or airplane engine in the distance; or when older, a work of art, as if seeing more than others do. They notice a tone of voice, a glance, a snub or small sign of encouragement. Sensitivity to the subtle helps them in sports, the arts, and in

school, including sensing what teachers want. This keen awareness of course can vanish when a child is overaroused, as when under pressure or being tired from overstimulation. That is the nature of any nervous system. It can become overloaded.

As for research on this point, there are of course the brain activation studies, especially the first, in which subjects looked for subtle differences between photos versus obvious differences and HSPs' brains were far more active than non-HSPs' in those situations. Another example is the cultural study, in which the ease of perceiving a subtle difference was not affected by the HSP's culture, but it was for non-HSPs. I also already described a study done in Germany, in which HSPs and non-HSPs had to pick out Ts turned in various ways that were hidden among many Ls turned various ways. HSPs were faster and more accurate.

[level A]For Better and For Worse [translator: this is a phrase from wedding vows in English, not sure if it works in other languages. Feel free to choose another after studying the section's meaning]

If you are reading this book, you probably care very much about your HSC and are probably doing a very fine job of parenting already, so I do not want you to be overly worried by what I am about to say, but rather heartened that you can have such a positive effect on your child. Early in our research we discovered that being an HSP made one more likely to be unhappy and prone to worry. I suspected this had something to do with a person's history, with sensitive persons being especially affected by stress when young, and that is what we found. Those HSPs who on various measures reported unhappy childhoods were more likely to be depressed, anxious, and shy than non-HSPs with similarly unhappy childhoods. However, with a good enough childhood, they were as happy as others and perhaps even more so than others. That is, as you will see in a moment, HSCs are in position to gain more than other children from

good parenting and teaching.

The greater impact of childhood on adult HSPs was the main reason I wrote this book. It is so much easier to prevent problems in childhood than try to heal them in adulthood. It seemed as though HSPs are especially vulnerable. However, bits of research kept showing up that said something more, and I even mentioned a few of these studies in the book without fully grasping their significance. For example, I mention in the book W. Thomas Boyce and his colleagues who found in 1995 that “highly reactive” children in stressful environments have more illnesses and injuries, but in relatively low stress homes and classrooms had *fewer* illnesses and injuries than other children.

Since writing this book, however, “differential susceptibility” has become a hot topic of research on child development, with Jay Belsky and Michael Pluess leading the way in pointing out the mistake of only looking at the vulnerability that goes with being sensitive. HSCs, often described by others as highly reactive or easily stressed physically, shy or inhibited in their behavior, or having genes associated with depression or anxiety, all turned out to do *better* than other children when placed in good environments, such as high quality childcare. By “doing better” or “benefiting more” I mean everything from school grades and moral behavior to social competence, self-regulation, and security about being loved. If mothers were especially positive and nurturing, if parents were taught special parenting skills, if young girls were taught ways to manage depression, or if children from orphanages were moved to skilled foster care, these “susceptible” or “sensitive” children were always the ones who benefited the most, as though they were not only absorbing bad environments more than other children, but also taking in the good ones more.

Michael Pluess has especially focused on this positive half of the outcomes for sensitive children, calling it “Vantage Sensitivity” (referring to sensitivity being a general advantage).

One explanation for this “vantage” might be the particularly strong response of HSPs to photos of positive images or of faces with positive expressions. Given that humans in general are somewhat likely to react more to threats, this positive inclination may help HSCs attend to and benefit more than others from the positive around them—love, attention, good advice, beautiful art, interesting information, and all the rest.

Plus even contrasts vantage sensitivity with the idea of resilience, in that resilient people are those who are less affected by bad events, but then perhaps they have to be less affected by good ones, too, so that they might be “vantage resistant.” If you have ever had it implied that your HSC lacks resilience, you can keep this in mind.

The bottom line of this really huge body of research is not that that your HSC can end up being better than others in some way, as though life is a big horse race and you can make them more likely to win (although it might be a nice surprise to some of you who are especially worried about your HSC right now), but that you can bring out the best in your child, whatever that is, even more easily than other parents with other children can do. Your HSC is ready--more ready than others--to respond to everything helpful and wise that you have to offer.

[Level A]Finally, the Genetic Evidence

In Chapter Two I cited one of the earliest studies of differential susceptibility, reported by Stephen Suomi, who had already observed that a minority of rhesus monkeys born with a particular genetic variation that made them “up tight,” in that they are more affected by stress. But when given at birth to the most skilled mothers, this good mothering led them to become unusually competent, often becoming the leaders of their troops. I did not write then about the genetic variation behind these behaviors, as I had no evidence at the time that HSPs had this variation, but I do now.

As it turns out, rhesus monkeys and humans share a normal genetic variation in how

much serotonin is available in their brains. “Uptight” monkeys have the same variation as do humans who are “uptight”—that is, those who are easily made anxious and depressed. However, most people with that variation do not become anxious or depressed. Rather, the serotonin genetic variation is a major cause of differential susceptibility. That is, whether monkey or human, having this genetic variation bestows many benefits: Improved memory of learned material, better decision making, and overall better mental functioning.

Since I wrote this book and explained about those monkeys, research done in Denmark by Cecilie Licht and others suggests, not surprisingly, that HSPs have the same genetic variation. Since this genetic variation is only found in these two primate species, humans and rhesus monkeys, and both are highly social and able to adapt to a wide range of environments, one wonders if this adaptability is due to the highly sensitive members of a group being better able to notice the subtleties, such as which new foods can be safely eaten and which dangers to avoid, allowing them to survive better in a new place.

Not every HSP or HSC has this genetic variation in available serotonin. We think there are many genetic paths to high sensitivity. Another variation, in seven dopamine genes, was found by Chen and others in China to be associated with scores on the HSP Scale. There may be other ways, too, that someone would become highly sensitive, especially given the new research on what is called epigenetics, or how genes themselves are altered by environments, but I think sensitivity is *mostly* genetically determined because of another advance in the scientific research, the evolutionary reasons for high sensitivity.

[level A]Evolutionary Evidence

I made two points in Chapter One that at the time were based on a little data and a lot of observation, but now the evidence is much stronger. The first was that this trait cannot be a disorder, problem, or disadvantage, given that it has evolved in other species as well as humans.

I mentioned three, but the actual list is now over 100. In all of these, the majority of members of the species are not sensitive to subtle aspects of their environment, but a minority are. Max Wolf in Germany, along with some colleagues, used a computer simulation of how this sensitivity or “biological responsivity” might evolve. Basically, it is that sometimes it pays to pay attention to subtle details and process deeply your information about how the world works, comparing the situation now to all that you know about similar situations in the past. And sometimes all of that is just a waste of time, especially if it is a lot of work for your nervous system to do this. Hence not everyone will be sensitive, but a minority will be. Indeed, if everyone were sensitive, it would be no advantage to anyone to be--if everyone in a traffic jam knows a way to get around it and takes that alternate route, it becomes as crowded as any other.

Imagine that your sensitive child has figured out a small spot that is the shadiest place on the playground on a hot day. Most of the kids are hot and fairly miserable but don't notice. We don't know if your child is going to survive better in the long run than these more oblivious children, but it could be that because he responds more to what he learns, he will also take better care of his health, notice when his tires are bald, and protect his children from danger.

Biologists are now giving considerable thought to these variations in “personality” within a species. One effect is that it is so obvious that none of these variations would continue unless they offered some unique strategy that helps some individuals survive. That is, your child's temperament, no matter how unusual, is still here in the gene pool for a good reason.

[level A]It's All or None

Yet another idea I raised early in this book and that is now better demonstrated is that sensitivity is not a dimension, like height or weight, with most people being in the middle. It is more like being right or left handed—all or nothing, with a majority being one way and a minority the other way. This was true for a trait that seemed similar to high sensitivity,

inhibitedness in children, but now we have evidence for sensitivity itself, from Franziska Borries doctoral thesis at the University of Bielefeld in Germany. In a study of over 900 people who took the HSP Scale and other measures too, she used a particular statistical method that distinguishes between categories and dimensions. She found that unlike how people scored on most other tests, being highly sensitive is indeed a category, not a dimension. You either are or you are not, and your child is an HSC or is not. You can explain that when people say, “She’s not so different--everyone’s a little sensitive.”

Of course no self-report or parent-report measure is perfect. Many will score in the middle for reasons not having to do with the trait itself. For example, some people tend to answer everything towards the middle, and sometimes another, independent trait, such as a child’s high curiosity or anger-proneness, may mask sensitivity a bit. Every HSC, and every person, is unique after all.

[level A]Parenting an HSC Means Giving a Huge Gift to the World

I reread the book before writing this note, expecting that I would only be repeating myself if I said what I will next, but I did not see much there about what has become the most important message that I can give you: The world needs well raised HSPs. It is desperate for them. What could we need more right now than people who think carefully, feel deeply, notice the subtle details, and end up having the big picture? We would need one thing more, however--that is that such people have the courage to speak up and push back when non-sensitive people do not see, think, and feel deeply enough.

Seeing that children grow up well is not easy, but it helps to know how to do it and that it matters. I hope this book not only helps you know how to raise your HSC, but to grasp how much it truly matters. If parents and teachers help HSCs value themselves, develop their own viewpoint, and find ways to communicate effectively with the non-sensitive people around them,

that by itself could improve life on earth in a major way. Whatever else you are doing with your life, having brought into the world an HSC, you are now contributing so much to all of us by simply providing this child with a good start in life. Thank you.