Chapter 1

The highly sensitive person as a template for the highly sensitive dog

I first came across the term 'highly sensitive person' (HSP) when I read a book of that name by psychologist Elaine Aron, PhD.[1] It is based on research conducted by her and her husband, Arthur Aron, PhD.[2]

Not only am I a highly sensitive person, I'm a veterinarian, so of course my main interest is animals. Whenever I read something about how humans work, I invariably wonder whether the same thing applies to animals as well. Often it does; we are as much alike as we are different, and in some ways more alike than not.

So, when I read *The Highly Sensitive Person* 20 years ago, my mind immediately went to the highly sensitive animals I knew as patients and the one very special dog I was living with at the time, Miss Lilly. I'll weave a little of our story through Part 2.

In research circles, this normal personality trait is known as high sensory-processing sensitivity (SPS). This term refers to how deeply a person processes and responds to sensory information — sight, sound, smell, taste, touch, and the inner workings and internal states of our bodies. In humans, and in other species as well, there is a wide range of sensory-processing sensitivity, from the highly *in*sensitive individuals to the highly sensitive.

The importance of this distinction is that a person who experiences sensory information very deeply or who perceives and responds to even subtle sensory information — *i.e.,* a highly sensitive person — is more easily overstimulated and thus overwhelmed than a person with lower sensitivity. In other words, the threshold is lower in highly sensitive individuals.

This chapter is written around a summary of SPS in people by the leading researcher on SPS in dogs, veterinary behavior specialist Dr Maya Bräm, and her colleagues. It begins:[3]

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> ❝ A relatively new personality dimension in humans referred to as "sensory processing sensitivity" (SPS), or "high sensitivity," was first described by Aron and Aron in 1997. These authors define SPS as "a genetically determined dimension involving a deeper … cognitive processing of stimuli that is driven by higher emotional reactivity." ❞

Already, there are two key points that are relevant to us here:

1. High sensory-processing sensitivity is a *personality* trait — *i.e.,* it is a *normal variant,* not a disorder — and it is genetically determined.
2. It is characterized by *greater emotional reactivity* than that displayed by people without this trait or with less sensitivity.

'Personality' encompasses individual differences in thinking, feeling, and behaving that are stable over time and contexts.[4] Our personality is written into our genetic code, so it is one of the things that determine what we experience and particularly *how* we experience — how we perceive, interpret, and respond to — events throughout our lives.

Individuals with this personality trait can be thought of as having "a finer filter"[4] and all that goes along with it. Our finer filter is inevitably going to "catch" or notice more, and so we respond to subtle things that less sensitive individuals may not even notice. As for obvious things that everyone notices, we tend to respond earlier and with greater intensity than less sensitive individuals.

In the initial studies, high sensory-processing sensitivity was reported in 15–20% of the population — that's 1 in every 5 or 6 people — regardless of gender, race, or culture.[2] The Drs Aron now suggest the figure is around 30% (1 in every 3 or 4 people), with the same proportion having low sensitivity, and the other 40% lying in between.[5] So, no matter how you slice it, it's likely that you have several highly sensitive people in your life.

When viewed through the lens of evolutionary biology,[6] SPS is described as a trait of general reactivity or responsiveness to environmental stimuli that has been reported in more than 100 different species. Of particular note, the presence of a highly

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sensitive minority confers survival advantages to the group that are worth the biological costs to the highly sensitive individuals.

The subtext of this book is that highly sensitive dogs make wonderful companions *by virtue of their sensitivity,* although they do require some accommodations not needed by less sensitive dogs.

Dr Bräm and her co-authors go on:[3]

> ❝ SPS is hypothesized to have a genetic component, the phenotypic expression of which is influenced by the interaction with (pre-, peri-, and postnatal) environmental conditions. ❞

'Genotype' refers to our genetic inheritance, whereas 'phenotype' (as in 'phenotypic') refers to its outward expression, such as our unique physical and behavioral characteristics.

So, there's another key point:

While this personality trait has a genetic basis, its *expression* — the extent to which it is experienced and displayed by the individual and observed by others — is influenced by the individual's environment.

Those influences begin before birth (prenatally) and they extend through the birthing period (perinatally) into postnatal life.

The thing to note about genetic traits is that very few are all-or-none. The field of epigenetics (*epi-*, 'on top of' or 'extra to') is the study of how the infinite variety of environmental factors we're exposed to — internal and external, physical and nonphysical — influence the *expression* of our genes.

Contrary to common belief, our genes are not static. Yes, they are inherited, and in most regards we have only the genes we received from our parents at conception. (I'm not counting the genes that may be inserted into the DNA of infected cells by viruses or by artificial means such as synthetic or modified messenger RNA in some "gene therapy" products.)

However, our systems are highly responsive throughout life, as evidenced by the fact that gene expression can be up- or down-regulated (turned up or down) according to prevailing conditions

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inside and outside the body. By their very nature, our genes are highly responsive to our internal and external environments. So, to say that a trait is genetic is to tell only half the story.

In other words, our lives are not predetermined. Our genes are simply how we write our lives. To use a homier metaphor, our genes are the means by which we build, maintain, repair, renovate, and even improve our living 'homes' throughout life.

The authors continue:

> ❝ It involves a deeper processing of thought and emotions, greater likelihood of being overaroused, higher emotional intensity (both positive and negative) and higher sensitivity to subtle stimuli perceived by all modalities, *i.e.* visual, acoustic, tactile, olfactory, gustatory, proprioceptive. ❞

So, expression of this trait also includes the extent to which it causes *problems* for highly sensitive individuals and those around them.

For example, highly sensitive people are easily overaroused or overstimulated, so we are more likely to experience and express greater emotional intensity than others with less sensitivity who find themselves in the same situation.

By the same token, we also tend to be more thoughtful and empathetic than less sensitive people.

I hope by this point, early though we are in the book, you've already noticed how well all this human stuff describes our highly sensitive dogs.

Because each individual is unique in genetic inheritance and environmental influences, we each have our own unique experience of life. No two highly sensitive people — and no two highly sensitive dogs — have exactly the same experience of life.

While there are a lot of similarities and some common threads (hence this book), the completely unique combinations of genes and environment make for a richly textured range of life experiences, *and* the potential for change, even within this relatively narrow band of the sensitivity spectrum.

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Now, to the anatomical and physiological:

> ❝ These characteristics of SPS have been suggested to be a consequence of deeper and more complex cognitive processing, and not to be linked to an actual higher acuity of the sense organs. ❞

Translation: our eyes don't see any better than those of less sensitive people, we just *notice* more; and our hearing may not be any better, we just *listen* more attentively.

> ❝ Different levels of SPS have been shown to be linked to differences in the dopaminergic neurotransmitter systems and the serotonergic system, with parallels suggested between high SPS and the s-allele of the serotonin transporter linked polymorphic region (5-HTTLPR). ❞

I won't spend much time now on these granular details, but I will make two quick notes. First, here are two physiological mechanisms which go some way toward explaining the variations in expression of sensitivity in people, and presumably in animals.

Polymorphism (as in 'polymorphic region') refers to two or more possible variations associated with the same gene or closely related set of genes. Its word origins are Greek: *poly-,* many or multiple; and *-morph,* shape or form.

For example, Labrador Retrievers come in three specific and genetically determined coat colors: yellow, chocolate, and black. And even within these 'primary' colors, there are variations, such as silver, charcoal, champagne, and fox red. These colors all represent specific polymorphisms within the three genes that code for the trait of 'coat color' in this breed.

As we'll see in Chapter 2, specific behavioral traits in dogs display a variety of polymorphisms even within the one breed. It is likely that high sensory-processing sensitivity in dogs is associated with similar polymorphisms to those found in highly sensitive people.

Second, these two neurotransmitters or 'messenger molecules' (dopamine and serotonin) are fundamental to how we think and feel, and thus to how we behave. I'll discuss them in more detail in Part 2.

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> ❝ Several [functional] MRI studies have also shown differences in brain functioning between individuals scoring higher and lower on SPS. Individuals scoring high on SPS showed less cultural differences in the judgment of visual stimuli, higher activation of brain regions linked to awareness, empathy, integrating and distinguishing own emotions from other's, and of the mirror neuron system in the face of social affective stimuli, *i.e.,* in response to photos of their partner's or a stranger's happy, sad, and neutral faces. ❞

Again, highly sensitive people are generally more perceptive and empathetic. Of course, when we're feeling overwhelmed we can sometimes act like jerks — but at least we *know* we're being jerks and we *feel bad* about it! ☺

As for the recognition of others' emotions, both in person and in photographs, there are many studies of horses[7] and dogs[8] which show that these highly social, long-domesticated animal species can recognize different human emotions even in photos of human faces on paper or on screen. (The references I've cited here are just two examples; there are many.)

This ability applies not just to the faces of people familiar to the animal, but also to strangers.

"Don't lie to me, Edward; I can read you like a book!"

The authors of the canine study summarized SPS this way:[3]

> ❝ These findings suggest the existence of a physiological basis for the differences in perceiving, processing, and responding to information shown by highly sensitive individuals.
>
> Therefore, SPS can influence the manner in which people process information in their environment and, hence, the interaction between the environment and SPS can affect their psychological wellbeing. ❞

In other words, the more deeply or subtly a person experiences and interprets the world around them, the more profoundly that person is affected by the things around them — for better and for worse.

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Positive and negative aspects

A study of 1,434 teenage twin pairs in the UK found that genetics explained 47% of the variations in Highly Sensitive Child scores* among the group — *i.e.,* high sensitivity had a heritability of 0.47.[9] Environmental influences explained the remaining 53%.

> * Sensory-processing sensitivity in people is most commonly assessed with the Highly Sensitive Person (HSP) questionnaire. Variations developed for assessment of children (Highly Sensitive Child questionnaires) are based on who is completing the survey: a parent, a teacher, or the child him/herself.

In other words, high sensory-processing sensitivity has a genetic basis in people, but environmental influences play an equally important role in its expression.

Even more interesting to me, the genetic influences underlying sensitivity to *negative* experiences were distinct from those involving sensitivity to *positive* experiences.[9]

In the past few years, a group of Dutch researchers developed and tested a more comprehensive sensory-processing sensitivity questionnaire (the SPSQ) than the original HSP questionnaire (which I'll discuss at the end of the chapter).

They added specific items to the HSP questionnaire from various other surveys and instruments used in clinical psychology and research, arriving at 43 items divided into six categories: emotional and physiological reactivity; sensory discomfort; social-affective sensitivity; sensory sensitivity to subtle internal and external stimuli; (a)esthetic sensitivity; and sensory comfort/pleasure.

Of particular interest to me, they separated the individual characteristics of high SPS into negative (Table 1) and positive (Table 2) aspects.[10] These tables are shown side-by-side on the next two facing pages.

Then the researchers looked at the components that are associated with distress and, conversely, with resilience …

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Table 1. Specific items on the SPSQ that represent the NEGATIVE aspects of high sensory-processing sensitivity in people.[10]

Emotional and Physiological Reactivity	Sensory Discomfort
I feel rushed when I have to do too much in a short time.	I find harsh sounds very annoying.
I get nervous when too much happens at once.	Brightly colored, flickering lights are disturbing to me.
I get upset when people try to make me do too many things at once.	I am often bothered by light that is too bright.
I am easily upset in stressful situations.	I don't like loud music.
I am easily upset by changes in my life.	Very bright colors sometimes bother me.
I am easily bothered by crowds or chaotic situations.	I am easily disturbed by bright light or strong odors.
I feel uncomfortable when too much is happening around me.	I am easily bothered by noise.
I am sensitive to internal physical tension.	I find certain screeching sounds very annoying.
I am easily infected by other people's moods.	
When I have to do something competitive, I get so nervous that I perform below my capabilities.	
I try to arrange my life in such a way that I avoid annoying or overwhelming situations.	

SPSQ, Sensory-Processing Sensitivity Questionnaire

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Table 2. Specific items on the SPSQ that represent the POSITIVE aspects of high sensory-processing sensitivity in people.[10]

Social-Affective Sensitivity	Sensory Sensitivity to Subtle Internal and External Stimuli
I can usually see when someone masks their feelings with a smile.	I am quickly aware of changes in my body, such as temperature.
It usually strikes me when the tone of a person's voice does not match their words.	I immediately feel when my mouth or throat gets drier.
Looking into someone's eyes gives me a good idea whether or not they are telling the truth.	I feel the slightest contraction of hunger in my stomach.
It usually strikes me when people try to pretend not to be afraid.	I often feel my heart beating.
Sometimes I notice sad eyes hidden by a smile.	Barely visible visual details attract my attention.
When people feel uncomfortable, I know how to put them at ease.	I often notice weak [faint] odors.
I sometimes seem to understand things intuitively.	
I have a rich and complex emotional life	Sensory Comfort/Pleasure
Esthetic Sensitivity	I really enjoy a relaxing activity.
I can be very touched by a beautiful work of art or music.	I enjoy humor and funny situations.
When I listen to music, I usually notice subtle tones in the music.	I feel good when I'm with people I love.
I often notice the emotional side (charge) of paintings and photographs.	Watching a nice movie makes me feel good.
I enjoy subtle odors, flavors, music, and art.	I enjoy small or subtle things.

SPSQ, Sensory-Processing Sensitivity Questionnaire

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negative aspects

Distress was associated with the negative aspects of high SPS. Anxiety, depression, fatigue, and other health issues related to depression (listlessness, sleep disorders, eating disorders, *etc.*) were all significantly more likely, and resilience was significantly lower, in people who scored high for these negative aspects.[11]

positive aspects

Resilience was associated with the positive aspects of high SPS. These aspects had little influence on anxiety, depression, fatigue, or other health issues, but they effectively counteracted the negative aspects of SPS on resilience.[11]

The higher a person scored for the positive aspects of SPS, the greater their resilience to stress. This point comes up again in Chapter 4, which is about stress in dogs, and in Part 2, which is really all about building resilience in our highly sensitive dogs.

Revised HSP questionnaire

Research on sensory-processing sensitivity in people is ongoing. In fact, Drs Aron and colleagues recently developed a revised Highly Sensitive Person questionnaire (HSP-R).[12]

The original was designed to generate a score which represents a person's overall sensitivity on a scale from 1 (not at all) to 7 (extremely). However, it focused a little too much on the negative or problematic aspects of a person's experience of sensitivity, notably overstimulation, downplaying the positive or beneficial aspects.

Enter the HSP-R. This one is designed to better reflect all aspects of sensory-processing sensitivity by weighting both the negative and the positive aspects equally. It reduces the negative framing of the original questionnaire and includes a few new items that focus on the more positive experiences of sensitivity.

The HSP-R is shown in Table 3 at the end of the chapter. It consists of 18 questions, equally divided among six categories.

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Like the original HSP questionnaire, each question is given a score from 1 (not at all) to 7 (extremely). In the study on developing and validating the HSP-R, the average score for the 1,000 British and American adults who participated was 4.6. Most people scored between 3.7 and 5.5.

Compared with the original HSP questionnaire, which the participants also completed, the HSP-R skewed slightly toward the more sensitive end of the spectrum. The average original HSP score was 4.1, with most scores between 3.2 and 5.1.

So, it appears that the revised HSP questionnaire may have slightly overcompensated in its efforts to weight the negative and positive aspects more evenly, slightly overemphasizing the positive. Not surprisingly, slightly more people self-identified as highly sensitive when using the revised questionnaire (although I scored the same on both).

I haven't decided whether that's a good or a bad thing, but I am certain of one thing: greater awareness of individual differences in sensitivity, and particularly of the validity and importance of highly sensitive individuals, is a very good thing for everyone.

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To sum up, high sensory-processing sensitivity is both a challenge and a blessing. Notice that I didn't say 'curse'. Our sensitivity enables us to experience and express great joy.

Yes, there may be great distress and even some physical symptoms, too, if we're not paying attention and taking good care of ourselves. But when I focus instead on the richness and enjoyment my sensitivity affords me, I can only smile and be glad that I was born this way.

In the next chapter, we'll explore what all this looks like in dogs. Although there is nowhere near as much data on high sensory-processing sensitivity in dogs, what we do have is compelling. There is indeed such a thing as the highly sensitive dog, and it looks and acts remarkably like the highly sensitive person.

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Table 3. The revised Highly Sensitive Person questionnaire (HSP-R).[12]

Social Sensitivity	Overstimulation
Do you easily recognize what others are feeling?	Are you easily overwhelmed by things like bright lights, strong smells, coarse fabrics, or sirens close by?
Are you good at anticipating how someone may feel about a situation?	Do you become unpleasantly aroused when a lot is going on around you?
Do other people tell you that you are good at understanding what they are feeling or thinking?	Are you bothered by intense stimuli, like loud noises or chaotic scenes?
Sensitivity to Positive Experiences	**Depth of Processing**
Are you deeply moved by the arts or music?	Do you tend to reflect on things deeply?
Do you notice and enjoy delicate or fine scents, tastes, sounds, works of art?	Do you like deep conversations?
Do you tend to get deeply immersed in music?	Do you find yourself thinking about philosophical questions?
Sensitivity to Details	**Emotional Reactivity**
Do you notice when things have been moved around?	Are you easily affected by feedback (both negative and positive)?
Do you tend to notice subtle signs of changing seasons (winter, spring, *etc.*)?	Do you generally react strongly to your experiences, whether you show it or not?
Do you seem to notice changes in the weather more than others do?	Are you easily affected by the mood of people around you?

Give each question a score between 1 (not at all) and 7 (extremely). Add the scores for all 18 questions, then divide the total by 18 to get your HSP-R score. Most people score between 3.7 and 5.5.

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