

Sensory Processing Sensitivity and the Importance of Individuality and Personality in Veterinary Medicine



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KEYWORDS

- Sensory processing sensitivity • High sensitivity • Behavior problem
- Differential environmental susceptibility • Dog

KEY POINTS

- The personality trait “high sensitivity” or “canine sensory processing sensitivity” can be measured in dogs and shows parallels to high sensitivity in humans.
- High sensitivity in dogs affects how they are influenced by owner personality and communication.
- Considering high sensitivity in veterinary practice is likely to benefit all individuals, but especially high sensitive animals.

INTRODUCTION: INDIVIDUALITY AND PERSONALITY

To be yourself in a world that is constantly trying to make you something else is the greatest accomplishment.

(Ralph Waldo Emerson)

Ralph Waldo Emerson emphasized the importance of individuality already in the nineteenth century. He was, of course, referring to humans. “To be yourself in a world that is constantly trying to make you something else” — does this not apply to animals living in human society too? We expect such a great deal of adaptation to our ways of life, our language, even our moral and legal standards from our pets. Do we actually stop to see them as individuals, with their own personalities, subjective perceptions and experiences, individual needs and means of communication? Do we actually give them the opportunity to be themselves and thrive?

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Our human world seems to be increasingly developing into a duality: focus on individuality on the one hand and more standardization on the other. These two aspects are not always easy to unite. This duality is equally developing in animal health, behavior, and welfare. In a world focused on economic growth, veterinarians are exposed to the pressure of standardization and efficiency. At the same time, knowledge and understanding of animal emotions, cognition, personality, and genetics is growing and with it the appreciation of the importance of considering the individual in veterinary medicine in general and veterinary behavior medicine in particular.

The Cambridge Dictionary defines individuality as “the qualities that make a person or thing different from others,” that is, it requires the presence of several individuals and a comparison among these. One important aspect that contributes to individuality is personality. Personality encompasses individual differences in behaving, thinking, and feeling, which are stable over time and contexts.¹ Personality is therefore independent of how the individual compares to others, but although it can stand on its own, it can also be used to distinguish individuals from another. Several, individually more or less pronounced personality traits make up the whole of an individual’s personality. Some of these traits have been studied and described in animals as well, for example, shyness–boldness,² impulsivity,³ frustration⁴ as well as the personality trait at the center of this article, sensory processing sensitivity (SPS).^{5,6}

As veterinarians, we are confronted on a daily basis with the challenge of bridging the above-mentioned chasm: our approach is expected to be based on scientific evidence while considering at the same time the actual individual patient before us, who might not be behaving according to the statistically determined most likely norms.

The current state of our knowledge regarding SPS reflects this situation. Most of what we know about SPS stems from human research. Therefore, the information in this article concerning animals and SPS is in part extrapolated from human research and in part fed by the author’s own empirical experience.

In the following text, paragraphs referring to literature about humans will be presented in a normal font, whereas those concerning animals (dogs in particular) will be presented in framed boxes.

WHAT DO WE KNOW ABOUT SENSORY PROCESSING SENSITIVITY?

Sensory Processing Sensitivity in Humans

Research into the personality trait of “Sensory Processing Sensitivity,” also referred to as “high sensitivity” has grown rapidly since the term was first coined in 1997 by Aron and colleagues.⁷ Fifteen to twenty percent of the human population carry this trait independent of gender or culture.⁸ As with all personality traits, there is a normal distribution within the population and any specific individual lies on a spectrum of the trait that is more or less developed. Therefore, an individual is not either highly sensitive or not, but more or less so. Being a personality trait, it is part of what makes up the whole of this particular individual’s personality and is not considered to be pathological. This implies that an individual cannot be “diagnosed” as being “highly sensitive,” as little as introversion or extraversion can be diagnosed, but the trait is rather “measured” or described and considered to be part of the norm.

Simplified, individuals carrying this trait could be considered to have a “finer filter.” Elaine Aron describes the following four main characteristics of SPS using the acronym DOES⁹.

- D for Depth of processing: more highly sensitive individuals tend to want to understand and recognize associations; they typically collect and process information

before they act, that is, show a “stop and watch behavior” and take their time to make decisions.¹⁰

- O for Overstimulation: individuals scoring higher on SPS are more easily overstimulated by external (eg, visual, acoustic, olfactory, tactile) as well as internal (eg, changes in self-perception, medication, physical health issues, pain) stimuli.¹¹
- E for Emotional intensity: more highly sensitive individuals experience their own emotions intensely¹² and pick up on the emotions of others more easily.¹³ They are often considered to be highly empathetic.
- S for Sensory Sensitivity: individuals scoring higher on SPS tend to be more attentive (or sensitive) to subtle exteroceptive^{14–17} as well as interoceptive^{18,19} stimuli.

Sensory Processing Sensitivity in Animals

The only scientifically based information to date focusing on SPS *sensu stricto* in another species apart from humans is our research on dogs.^{5,20} However, possible relations to other traits or coping strategies have been suggested.⁹ Duality in coping behaviors has been described in a variety of animal species ranging from fish to monkeys, for example, proactive/aggressive versus reactive/passive behaviors,^{21–24} fast versus slow explorers,²⁵ shy versus bold individuals.^{26,27} The direct correlation of these behaviors with SPS has not been investigated, however considering “only” the behavioral output aspect, the more reactive/passive/shy behaviors could represent or be related to the “stop and watch” behavior described for more highly sensitive humans by Aron and colleagues.⁹ In order to survive, a population of social individuals must include a variety of personalities, for example, some individuals need to be more attentive to detail and warn the rest of the group of potential danger or notice subtle scents of food or water sources and weigh the pros and cons before acting. However, if the whole population consisted of only these more highly sensitive individuals, it would likely not last long, as gathering information and weighing all the options can be useful, but is of no help in the face of an immediate danger, such as a predator ready to attack. This is where less highly sensitive individuals are necessary, those who are quicker to make decisions and to act.

Canine Sensory Processing Sensitivity

The hypotheses and approach of our study looking into SPS in dogs were based on the knowledge acquired and shared in human psychology. The study consisted of a pilot phase designed to develop a questionnaire and a following international online survey to validate the questionnaire and to test the hypotheses proposed. For details of the studies please refer to the above-mentioned publications by Braem and colleagues.^{5,20}

MEASURING HIGH SENSITIVITY

The Highly Sensitive Person Scale

Aron and colleagues, in their first study, developed and validated the “Highly Sensitive Person” (HSP)⁷ scale. This original questionnaire—translated into several languages and adapted for children²⁸—was unidimensional. The average of the 27 questions led to a single “HSP score” lying between 1 and 7, with 1 representing the lowest and 7 the highest degree of SPS.

Since then, further studies have diverged from this one-dimensionality and described sub-traits, which tease apart the characteristics associated with more “negative affect,” such as being easily stressed and overwhelmed on the one hand, from those in relation to more “positive” aspects, such as being deeply touched by

arts and music, noticing details, and picking up on emotions^{29–31} on the other. Smolewska and colleagues²⁹ distinguish three sub-traits they refer to as ease of excitation, low sensory threshold, and esthetic sensitivity.

The Highly Sensitive Dog Scale

The results of our study on dogs revealed several parallels to SPS in humans.⁵

- The highly sensitive dog (HSD) scale: We were able to develop and scientifically validate an HSD scale consisting of 32 questions, which measures a trait that is comparable to SPS described in humans and to which we refer to as “canine Sensory Processing Sensitivity” (cSPS).
- Sub-traits of cSPS: A principal component analysis revealed three sub-traits comparable to those described by Smolewska and colleagues in humans,²⁹ representing aspects associated with more negative affect (termed “arousability” and “low sensory threshold”) and those with more positive affect (referred to as “emotionality”).
- Personality trait consistent over different contexts: The HSD score (the average of the 32 questions using a 1–7 Likert scale with 1 corresponding to low and 7 to high sensitivity) was greatly independent of factors described in the literature to influence behavior. These factors include dog (breed, sex, age, weight, physical health), owner (profession, SPS of owner, communication/training methods), and environmental (country of origin, living surroundings) factors.
- Personality trait consistent over time: Unpublished data from this author demonstrates a significant correlation of the cSPS score of puppies aged 9 to 12 weeks and the same dogs at 16 months of age ($P < .001$). This suggests stability over time and a predictive value of the questionnaire.

RELATION OF HIGH SENSITIVITY WITH OTHER PERSONALITY TRAITS

A common misconception in everyday life is that an individual is defined by only one personality trait. For example, the fact that a subject is “highly sensitive,” “empathetic” or “introverted” is thought to explain why they behave in a certain way. Reality, as so often, is more complex: an individual’s personality is the sum of the interaction of many traits. In addition, these traits may interact, increasing or decreasing a vulnerability for the development of psychological and/or physical health issues. It is therefore important to keep in mind throughout this article that we are only looking at one aspect, namely “high sensitivity,” of the complex personality.

Sensory Processing Sensitivity and Fearfulness, Neuroticism, Shyness, Introversion, and Sensation Seeking

The original unidimensional approach of SPS⁷ focused primarily on distinguishing high sensitivity from personality traits associated with negative affect, such as fearfulness, neuroticism, shyness, or introversion. Indeed, an overlap between these traits and SPS has been found, but they are not identical,^{7,32} that is, a more highly sensitive individual is also more likely to be fearful, neurotic, shy, or introverted, but this does not have to be the case. Correlations with sensation seeking³³ have also been found, which poses a challenge within itself to find the appropriate balance of sensation while not being constantly overstimulated.

Canine sensory processing sensitivity and Fearfulness and Neuroticism

As our research built on the approach taken by Aron and colleagues in 1997, it was in a first step important to determine whether what was being measured by the developed

questionnaire was distinct from the traits of fearfulness and neuroticism. Paralleling the findings in humans, cSPS overlapped with but was not identical to fearfulness and neuroticism. This means that a more HSD is also more likely to be fearful or neurotic, but this does not have to be the case.

DIFFERENTIAL SUSCEPTIBILITY

What makes one individual react more strongly to a particular situation or stressor than another? Personality seems to play an important role in the vulnerability to suffer from psychological and physical health issues. Considering the fine filter, deep processing of information and high emotionality related to SPS, it makes sense that more highly sensitive individuals would be more easily overwhelmed by more subtle and fewer stimuli than less highly sensitive individuals, that is, they are more easily stressed.

Even though everybody experiences it, stress itself is not a simple concept. It is in fact rather complex, consisting of a physical component on the one hand, which can be objectively “measured” or observed, such as changes in physiologic measures (eg, heart rate, temperature, and behaviors) and an emotional/psychological aspect on the other, which is subjective and not necessarily obvious to an “outsider.” In addition, stress can be caused by a wide array of triggers, both on the physical as well as the psychological level. Stress, its perception, and tolerance play an important role in the development and persistence of both psychological and physical illnesses.

Vulnerability: Sensory Processing Sensitivity and Mental Health

It did not take long for research to focus on the interaction of SPS with stress, well-being, resilience, and various mental health problems in humans. Indeed, this personality trait has been correlated with a higher perception of stress,¹¹ decreased well-being,³⁴ and lower resilience³⁵ as well as a higher vulnerability to several mental health issues including anxiety, depression, and burnout.³⁶ Highly sensitive individuals seem to be particularly susceptible to the subjective component of stress.

Despite sharing some similar aspects, such as sensory sensitivity and attention to detail and correlation with specific sub-traits of SPS with some neurodevelopmental disorders such as attention-deficit hyperactivity disorder or autism spectrum disorders, SPS has been shown to be distinct from these.³⁷

Differential Environmental Susceptibility: “for Better and for Worse”

For a long time, research has focused primarily on what is wrong, what renders individuals more vulnerable, what leads to stress, what signs indicate negative welfare and suffering, and what can be done to treat problems. In the 1990s, Seligman was one of the first psychologists to introduce the concept of “positive psychology”³⁸ in humans. In recent years, research in animal welfare has followed in these steps.³⁹

Differential (environmental) susceptibility embraces both the vulnerability and the vantage sensitivity aspects (i.e., what advantages a particular personality trait might entail) and thereby recognizes that individuals with certain predispositions might be more susceptible to be affected by both negative AND positive experiences, that is, not only be more vulnerable but also show greater plasticity.⁴⁰

SPS might just be one such a predisposing factor. More highly sensitive children who grew up in a negative, non-supporting environment were indeed more susceptible to developing mental health issues later on. However, more highly sensitive children whose environment was supportive and positive actually thrived more in life than their less highly sensitive peers.⁴¹ Teenagers scoring higher on SPS responded better to

antidepressant therapy than those scoring lower.⁴² Broadening the view to not only focusing on potential faults but also including possible advantages and strengths involved with this trait opens a wide range of opportunities not only to better understand the needs of the individual and devise treatment plans but also to prevent the occurrence of psychological and physical problems as well as fulfilling the individual's potential.

Canine Sensory Processing Sensitivity: Behavior Problems in Dogs

The hypotheses of our study^{5,20} were formulated bearing in mind the possible vulnerability to psychological and physical health problems as well as a higher susceptibility to environmental stimuli (in particular the interaction with the owner both on the level of personality as well as communication/training).

Again the results showed parallels to human psychology in that cSPS was positively correlated with the reported frequency of behavior problems, suggesting a possible vulnerability similar to that of SPS and mental health issues in humans.

Canine Sensory Processing Sensitivity and Differential Environmental Susceptibility

The concept of differential environmental susceptibility is of particular interest in the clinical context to understand symptoms, make diagnoses, develop treatment plans, and understand response to treatment, as well as prevent the development of problems.

In dogs too, high sensitivity seems to have a modulating effect on how environmental stimuli (owner personality (SPS), and communication/training methods in particular) affect the occurrence of behavior problems.

- *High sensitivity of dog and owner interact:* As hypothesized, the greater the difference between SPS of the owner and cSPS of the dog, the more behavior problems were reported for the dog. This was particularly the case if the dog was more highly sensitive than the owner. Formulated differently, the more similar dog and owner are in high sensitivity, the fewer behavior problems are reported, possibly suggesting a greater understanding of the dog's needs from the owner's side.
- *High sensitivity and positive punishment do not interact:* Based on the higher emotional intensity and deeper processing of information, we had hypothesized that the reporting of behavior problems would be higher in dogs scoring higher on cSPS when positive punishment (ie, the addition of something disagreeable, such as shouting at the dog or tugging on the lead) was used. This, however, was not confirmed: the reporting of positive punishment was correlated with more behavior problems independent of dog personality. Despite this result being correlational and not causal, placing this into the context of the existing literature and considering the clinical relevance, the potential important message is that positive punishment should be avoided in any dog, independent of its level of high sensitivity.
- *High sensitivity and negative punishment interact:* Somewhat surprisingly, but of no lesser practical relevance, negative punishment (ie, the withdrawal of something agreeable, such as attention or a reward) was found to interact with cSPS in regard to behavior problems. More behavior problems were reported for HSDs exposed to negative punishment than for less highly sensitive dogs exposed to negative punishment. Practically, this might suggest that more highly sensitive individuals might be more vulnerable to a lack of information.

High Sensitivity and Physical Health

As understanding of the complexity of the body and mind connection grows, the concept of psychosomatic illness or—using a more medical term—psychoneuroendocrinology and the contribution of stress on physical illness in medicine is appreciated.

With their higher subjective perception of stress, it is not farfetched to expect more highly sensitive individuals to also be more affected by physical illnesses for which stress is a relevant trigger, such as epilepsy or inflammatory-immunological diseases. On the other hand, individuals scoring higher on SPS tend to show more interoception, which might lead to them perceiving more subtle physical changes within their bodies and reacting more strongly to these.

In humans, several studies report results that suggest that differential susceptibility of highly sensitive individuals extends to some physical illnesses as well, such as chronic pain, gastrointestinal symptoms, and immune-mediated diseases including inflammatory bowel disease and Type I diabetes.^{11,37,43–46}

Within the framework of our study, we collected data regarding health issues and found a tendency for physical health issues being reported more frequently in more HSDs; however, the effect was not as strong as for behavior problems (data not yet published).

There was, however, a significant positive correlation of behavior problems and health issues independent of personality, further solidifying the hypothesis of a psychological–physical association in dogs.

GENETIC CORRELATES

Aron and colleagues suggested that SPS was a “genetically determined trait.” In the following years, several studies have investigated possible genetic associations, particularly regarding the metabolism of dopamine^{47,48} and serotonin.^{49,50}

There has been to date no research that has looked into a potential genetic basis of high sensitivity in dogs.

WHAT DOES THIS MEAN IN EVERYDAY LIFE AND CLINICAL PRACTICE?

- There are more and less highly sensitive dogs that react differently to environmental and, quite possibly, to internal stimuli. This means that they are likely to be more susceptible to influences and changes than less highly sensitive individuals are.
- High sensitivity in dogs can be measured using the validated HSD questionnaire.
- At least some of what we know from humans applies to dogs as well, that is, in practice, the acronym of DOES (ie, Depth of processing, Overstimulation, Emotional Intensity, Sensory Sensitivity) can be applied to dogs to gauge their sensitivity.

APPROACHING AND TREATING THE HIGHLY SENSITIVE VETERINARY PATIENT

Life is not about how fast you run or how high you climb, but how well you bounce
(Vivian Komori)

Grasping an animal’s personality as a whole could be one possible stepping stone to bridging the gap discussed earlier between a systematic scientific approach and the individuality of an actual patient. Based on the above-mentioned findings in humans and dogs as well as own empirical experience, the following are suggestions

of how—not exclusively, but particularly—more highly sensitive animals may benefit from veterinarians, especially behaviorists, recognizing and integrating this personality trait into their diagnostic process, handling, treatment as well as prevention plans. Despite the lack of solid scientific evidence to date, working by this assumption can only potentially benefit all individuals and would not do harm to any, and in the best case, it would help the individual to “bounce.”

Applying the Basic Characteristics Described by DOES to Canine Sensory Processing Sensitivity in Dogs

- D as in Depth of Processing: As more highly sensitive patients process information perceived by all sense organs more deeply, this implies that on the one hand, they need to receive information and on the other they need to be provided enough time to process it.
- O as in Overstimulation/arousal: Although all animals are confronted with many stimuli in a veterinary setting, the likelihood of a more highly sensitive individual being overwhelmed is greater. This is especially the case if there is a lack of information, there is a quick and intense physiologic and emotional response and there is no time to process.
- E as in Emotional intensity: Remember that these individual not only experience their own emotions intensely but are also particularly fine-tuned to pick up on the emotions and moods of their surroundings. This includes a potentially anxious or nervous owner or a stressed or insecure staff member. Any stress-related, emotional, mental, or physical health issues of the owners (or veterinary staff) are more likely to contribute to the stress levels of these patients.
- S as in Sensory sensitivity/Interoceptive sensitivity: Highly sensitive patients not only are more likely to be aware of react more strongly to visual, acoustic, tactile, olfactory and gustatory stimuli but are probably also more interoceptive. They might perceive and react more strongly to more subtle changes within their bodies, such as a subtle pinch of a nerve in a specific situation, a slight change in perception due to focal epileptic seizures, a hint of feeling nauseated or dizzy or feeling “different” in response to medication, which in a less highly sensitive individual might not lead to an emotional reaction, arousal, or change in behavior. This physical discomfort might only be expressed as changes in behavior rather than obvious physical symptoms, for example, increased restlessness at night, sudden fear of being touched or going on walks or going into the yard, development/aggravation of fear of sounds and so forth. Regarding treatment, this may imply that the more highly sensitive patient shows more side effects or stronger effects of medication, necessitating lower doses, slower increases or weaning off of medication, or adaptation of choice of medication. Their sensitivity can lead to these patients responding more favorably to physical treatment techniques, such as osteopathy or acupuncture, Tellington Touch, Canine Bowen Technique or, on the other hand, to them being more easily overwhelmed, especially initially, by physical touch.

What We Can Do to Help Our Highly Sensitive Veterinary Patients

- Give them time: The need to understand and collect information takes time, which is often not provided to our pets in our fast-paced lives. Moreover, because we integrate our animals into our lives, they often have no opportunity or way of communicating when they actually need a break or more time to process. Often, the only way possible for such an individual to convey this is by “behaving” differently, and often in ways that either are not recognized (eg, subtle

signs of stress or anxiety such as yawning, slowing down their pace, panting or breathing more shallowly) or actually bother the human surroundings (eg, by refusing to cooperate, stopping completely, being highly reactive, or aggressive). If they are not given this time or rest, this can lead to a state of chronic stress associated with more overt signs of psychological suffering, such as aggressive or “hyper” behaviors, as well as aggravation of physical symptoms such as excessive self-directed behaviors, interstitial cystitis, gastrointestinal symptoms, or immune-mediated diseases. Highly sensitive patients therefore need (more) time and more breaks both on a daily basis and during veterinary visits.

- Optimize stimulation: More highly sensitive individuals need or even seek information, are aware of details and process information more deeply. This process in itself has the potential of leading to intense emotions and quickly being overstimulated and overwhelmed (also typical characteristics of more highly sensitive individuals). The challenge for the environment is to find the right amount and type of stimulation and the balance of stimulation and rest for the particular individual, especially in everyday situations. This is also a central aspect that needs to be considered in preventive work and treatment of highly sensitive patients, especially those showing behavior problems. If we can manage to optimize stimulation and experiences for the particular individual, we might be able to help this animal thrive as opposed to him or her being overwhelmed. This can mean that, for example, puppy classes are individually adapted because uncontrolled social interactions and play might not be suitable for every puppy. Exposing puppies to a whole range of possible stimuli during this socialization phase might actually be counterproductive for some individuals, while promoting curiosity, individuality and allowing choice as opposed to focusing on complete obedience might in the long-term promote psychological health and the human–animal bond, especially in the HSD. In the context of a veterinary visit, reduction of fear, anxiety, and stress applies to all animals independent of their personality. More highly sensitive individuals, however, might especially benefit from these measures.
- Provide information and a sense of control: Unpredictable and uncontrollable situations and interactions have the potential of increasing anxiety, fear, and stress in any individual. Considering differential susceptibility, however, individuals scoring higher on cSPS might be more affected by a lack of as well as an increase of predictability and controllability, in a negative and positive way, respectively, both in daily life and in the veterinary context.
- Promote relaxation: Stress reduction not only involves optimizing stimulation to the animal’s need but also included active encouragement of relaxation, especially by tapping into the sensory sensitivity and emotional intensity aspects of cSPS. Some animals respond well to physical therapies such as osteopathy or Tellington Touch, others to relaxing odours, for example, lavender or valerian essential oils, some to calming sounds such as classical music, and others just need a calm, peaceful environment in the presence or absence of the owner.
- Offer emotional support: Allowing the owner to be present as an emotional support system for the animal can help, as long as the owner is not overly anxious him or herself. If additional anxiety issues are present in the veterinary context, use pre-veterinary anxiolytic medication. Again, this can help animals of all personalities, but highly sensitive and anxious individuals may especially benefit.
- Be aware of your own behaviors and emotions: The highly sensitive patient is also especially aware of your body language, your emotions, your own stress and anxiety levels. It is important to stop and watch, even just for a moment

and even if it does not correspond to your own personality, to subtly observe the patient, take a deep breath and adapt your way of communicating with the animal and its owner, if necessary.

- Internal support: SPS in humans is accompanied by an increased vulnerability to develop mental health problems. We also need to keep in mind that cSPS is not the only personality trait that defines the individual and other traits present in dogs, such as anxiety, may predispose to mental health problems as well. Therefore, psychoactive medication can be indicated in as needed situations or on a daily basis, both in patients suffering from primarily psychological as well as physical illnesses with a potentially high psychological stress component, such as epilepsy⁵¹ or interstitial cystitis.^{52,53} Keeping in mind the potential higher inter-ceptive sensitivity of highly sensitive patients, it is wise to start these individuals on lower doses and to gradually increase these if necessary and to generally adapt a slow weaning process of medication when possible.

One could conclude—in the sense of the Emerson quote presented at the beginning—that one of the greatest responsibilities of the (behavior) veterinarian is exactly this: to help create an environment, in which the individual animal can be itself.

CLINICS CARE POINTS

- Time and patience.
- Optimize stimulation.
- Provide information.
- Offer a sense of control, give them a choice and thereby a voice.
- Actively promote relaxation.
- Offer emotional support.
- Be aware of your own behaviors and emotions.
- Introduce changes gradually, including drug dosages.

DISCLOSURE

The author declares that she has no relevant or material financial interests that relate to the research described in this paper.

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