

ENVIRONMENTAL SENSITIVITY: INQUIRY INTO
A POSSIBLE LINK WITH APPARITIONAL EXPERIENCE

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ABSTRACT

Psi researchers often use the term 'sensitivity' when theorizing that certain persons may be more apt to register anomalous influences than others. Through a review of the literature it is argued that some individuals are disposed toward a range of innate sensitivities that, in novelty as well as intensity, distinguish them from the general population. It is hypothesized that such persons will exhibit greater susceptibility to a range of environmental factors, including allergies, migraine headache, chronic pain and chronic fatigue, and that they will also report a higher than average degree of psi perception as well as apparent electromagnetic influence. A 54-item survey was designed by the author and completed by 112 individuals (62 self-described sensitives and 50 controls), to evaluate the following issues: the extent to which persons who describe themselves as 'sensitive' appear to be affected by such factors; whether their immediate family members may be similarly affected; to what extent environmental sensitivity parallels apparitional experience; and how such findings compare or contrast with replies to questions asked of a control group. On the basis of both the literature and the survey results, the author argues that sensitivity is a bona fide neurobiological phenomenon. While no single factor in a person's background is likely to distinguish him or her as 'sensitive', eight demographic or personality factors are found to be statistically significant. If further studies were to document similar results, a more tangible basis would be provided for the study of apparitional experience than has been possible to date.

INTRODUCTION

Psi researchers often use the word 'sensitivity' when theorizing that certain persons may be more readily affected by anomalous influences than others (e.g. Cornell, 2000). But what does it mean to be sensitive? The dictionary offers a four-part definition: (1) Capable of perceiving with a sense or senses; (2) Responsive to external conditions or stimulation; (3) Susceptible to the attitudes, feelings, or circumstances of others; and (4) Registering very slight differences or changes of condition (*American Heritage Dictionary of the English Language*, p.1180).

Evidence points to a wide variability of sensitivity, both *among* individuals and *within* the different stages of a person's life. The differences between individuals are well known. For example, women exhibit markedly greater sensitivity across all five senses (Velle, 1987). The perception of pain varies considerably from person to person (Coghlan, 2003), as does acuity in taste, smell and colour perception (Hollingham, 2004). Changes within a given person's lifespan are equally noteworthy (Smith, 1989; Watson, 2001), with sensitivity fluctuating due to the influence of hormones (e.g. a woman during ovulation), personal circumstances (e.g. following an injury sustained or a disease suffered), pre-programmed genetic conditions (e.g. the onset of nearsightedness), and age (e.g. the acuity of smell declines as both women and men get older). Additionally, it has been found that individuals who are

disadvantaged in one sense may enjoy greater sensitivity in another (Khamisi, 2005).

In recent years, researchers have begun to focus on the idea that certain types of people are seemingly predisposed toward extraordinary sensitivity, and to try to explain why. This body of research regards sensitivity from two equally valid perspectives: as a responsiveness to changing conditions *outside* of the individual; and as a reaction to minute changes in his or her *internal* state (Palmer, personal correspondence, March 11, 2003). Aron (1996), for instance, has coined the term 'Highly Sensitive Persons' (HSP), describing such individuals as prone, from birth, to be easily overwhelmed by sensory stimuli, deeply reflective, and unusually empathetic. Heller (2002) proposed the term 'sensory defensiveness' to describe individuals who demonstrate a notable inclination toward fearfulness, shyness, stress, and withdrawal. She notes that sensory defensiveness is often evident in infancy but that it can be brought on at virtually any age through severe trauma.

These observations echo earlier work by Bergman and Escalona (1949), who noted that certain children—ranging in age from 3 months to 7 years—were extraordinarily sensitive to stimulation (odours, sounds, colours, textures, temperatures), while their feelings were also easily hurt. Such children were observed rhythmically rocking themselves or covering their eyes and ears from unwelcome stimuli.

Recent findings have uncovered overlaps between four types of conditions that seem related to heightened sensitivity: migraine headache, chronic pain (clinically termed fibromyalgia), chronic fatigue syndrome, and depression. In each case, women are disproportionately affected (Center for the Advancement of Health, 2001, 2002). Persons with fibromyalgia often experience moderate to severe fatigue (Center for the Advancement of Health, 2001), people who suffer from depression are more likely to get migraine headaches—and vice versa (Center for the Advancement of Health, 2002), and both fibromyalgia and migraine appear to run in families (Center for the Advancement of Health, 2001), suggesting that a genetic predisposition may be present. Such overlaps lead researchers to suspect that the above conditions have a similar neurobiological basis. Hypersensitivity of various forms may be the result (Center for the Advancement of Health, 2001).

Hartmann (1991) has attempted to explain a broad range of sensitivities through the organizing principle of 'boundaries'. He proposes a spectrum of personality types from thick boundary to thin; persons with thick boundaries are 'solid', 'thick skinned' or even 'rigid', whereas thin boundary individuals are 'open', 'vulnerable' and 'sensitive'. A strong ability to immerse oneself in something (whether a personal relationship, a memory or a daydream) also characterizes the thin boundary person, according to Hartmann.

This ability to *immerse* oneself, occasioning the loss of one's normal sense of time and space, is termed 'absorption'. Tellegen and Atkinson (1974) found that absorption is closely related to both hypnotic susceptibility and dissociation. Along parallel lines, Wilson and Barber (1983) explored the phenomenon of fantasy proneness, sounding out individuals who, from an early age, immersed themselves in such vivid fantasy that the products of their imagination are experienced as 'real as real'. Just as Tellegen and Atkinson note that the

experience of deep absorption can be perceived as mystical or transcendent, Wilson and Barber's study participants tend to view themselves as psychically sensitive, reporting perceptions such as telepathy, precognition, being out-of-body, and seeing or hearing apparitions. Neither Wilson and Barber nor later researchers view these traits as pathological (Lynn & Rhue, 1988).

Thalbourne's concept of 'transliminality' relies implicitly on sensitivity, as he defines transliminality as the "tendency for psychological material to cross thresholds in or out of consciousness" (Thalbourne, 2000, p. 14). Highly transliminal persons are those who are unusually affected by highly-charged material emanating from the subconscious. His research, too, shows an association with paranormal perception, absorption, fantasy proneness, and a heightened sensitivity to environmental stimuli—referred to as 'hyperesthesia', that is, a hypersensitivity to environmental stimulation (Thalbourne, 2000, p. 7).

Recent studies of migraine headache indicate that people who suffer from this condition have a more sensitive nervous system than most (Lance, 1998; Schauffhausen, 2004). Any number of outside factors can trigger a headache: noise, glare, certain odours or foods, even the weather—particularly changes in humidity and barometric pressure (Lambert-Nehr, 2003). Some people even appear to be especially sensitive to the aurora borealis (the northern lights). These persons may harbour a form of electromagnetic sensitivity (Byrd, 2002). Shallis (1998) investigated this notion, finding that 80% of his survey population of self-described 'electrical sensitives' were women, 70% reported that they had allergies, 70% said that they were susceptible to environmental stimuli (loud sounds and bright lights), and 69% claimed to have had at least one psychic experience. Persinger (1998) has attempted an explanation, theorizing that persons whose temporal lobes are subject to electromagnetic activity are more prone to a variety of odd experiences, including paranormal perceptions. It should be noted that the evidence is far from clear-cut that persons who claim to be electrically sensitive actually *are* (Frick et al., 2005).

A variety of neuroimaging data, however, *do* support the proposition that persons who are sensitive in one way or another display a unique pattern of neural activity. Individuals with Irritable Bowel Syndrome, for instance (a dysfunction often linked to Chronic Fatigue Syndrome and fibromyalgia) demonstrate greater activation of a particular region of their brain than control subjects (Mertz et al., 2000). Persons who are highly hypnotizable evidence a more extensive pattern of blood flow in the brain following a hypnotic suggestion, versus when these same subjects were not hypnotized (Cocke, 2001). People who are depressed or fearful show greater activity on the right (behaviour inhibiting) side of the brain than more cheerful, outgoing individuals (Mlot, 1998). Even synaesthesia—the blending of senses that are usually separate and distinct—is demonstrable. Individuals who routinely 'hear' words in colour, for instance, reveal activity in the language and visual areas of the brain concurrently, whereas activity registers solely in the brain's language area for 'normal' individuals (Hornik, 2001). It bears noting that synaesthesia has an overt association with environmental sensitivity (CBS News, 2002; National Public Radio, 2000; Thalbourne, Houran, Alias & Brugger, 2001), while a link with paranormal perception has also been identified (Cytowic, 1995).

Taken together, the evidence points to sensitivity as a bona fide neurobiological phenomenon. It seems quite possible that, from birth onward, certain individuals are disposed to a number of conditions, illnesses, and perceptions that, in novelty as well as intensity, distinguish them from the general population. The author theorizes that sensitivity goes to the very heart of the dictionary definition: "capable of registering very slight differences or changes of condition". Persons who are extraordinarily sensitive *should* exhibit greater susceptibility to allergies, chronic pain and fatigue, migraine headache, and environmental stimuli ranging from sights, sounds and smells, to farther-flung electromagnetic influences. Such persons would also be expected to indicate a high degree of *emotional* sensitivity. It would be illuminating, too, if these individuals reported a high incidence of psi perceptions. Such experiences could represent yet another facet of an underlying neurobiological dynamic.

This paper's aim is four-fold: (1) to gauge the extent to which persons who describe themselves as 'sensitive' appear to be affected by the factors mentioned above; (2) to gather whether their immediate family members may have been similarly affected; (3) to determine the extent to which environmental sensitivity parallels apparitional psi perception; and (4) to compare and contrast these findings by asking similar questions of a sample of persons who do *not* describe themselves as innately sensitive.

METHOD

Materials

In conjunction with several reputable psi researchers and physicians familiar with environmental hypersensitivity, the author developed a wide-ranging survey encompassing 54 items. The survey can be found in its entirety in the appendix. (Note: as a newly constructed measure, the survey has not yet been the subject of psychometric assessment.)

The majority of questions (1 through 43) aim at gathering a composite picture of the individual's medical, emotional, and family history. Items asked about include:—

- Gender, age, handedness.
- Weight and perception of body shape (these items were included based on the anecdotal observation that many notable mediums—especially those who were female—have been heavy).
- Marital status, number of children, highest educational level attained.
- Self-assessment of temperament and tendency toward imagination.
- Birth order within the family, early or late arrival if known.
- Self-assessment of childhood happiness, incidence of remembered trauma.
- Whether the person ever smoked or grew up in a smoking household (based on the possibility that environmental tobacco smoke might be a factor in the respondent's health later in life).
- Satisfaction with level of physical/sexual contact in one's life.
- Medical conditions such as asthma, allergies, migraines, sleep disorder or

nightmares, depression or mood imbalance, eating disorder, exhaustion or chronic fatigue, schizophrenia, epilepsy, alcoholism, dyslexia.

- Perceived conditions such as electrical or chemical sensitivity, unusual sensitivity to sound and light, and synaesthesia (overlapping senses, such as hearing colours or tasting shapes). The last two items were added midway through the project.
- Severity and duration of any of the above conditions.
- Incidence of the above conditions in the person's immediate family.
- Trigger event, if any, that might be connected with the condition(s) noted.
- Whether the person has ever received a strong electric shock.
- Any seeming effect on electrical or mechanical devices.
- Medications taken and psychotherapy engaged in (questions aimed at ferretting out a person's experience of physical and emotional difficulties).

Two notes are in order. First, the author judged an event as 'traumatic' if it concerned a severe or protracted illness, a serious accident, major surgery, familial abuse, or shock (e.g. witnessing a serious accident or being suddenly dislocated from one's home). These categories were meant to exclude as 'traumatic' the more common and less severe ups and downs of childhood, such as schoolyard taunting, being stuck in a tree, and having one's tonsils removed—all of which were mentioned by some respondents but excluded as traumatic by this researcher.

A second point concerns the author's rationale for asking about medications taken and psychotherapy engaged in. If emotional issues cause a person to enter into therapy, those same issues might make him or her more susceptible to environmental stressors and/or illness. Similarly, based on an individual's reliance on medications, one might infer such possibilities as: the presence of significant emotional issues; diminished physical resistance to illness; influence of said medications on a person's perceptions and behaviour. (In tallying the results, the less noteworthy medications, such as acne treatments, herbal remedies, etc., were excluded.)

The remainder of the survey (questions 44–54) asks whether the respondent has had an apparitional experience, i.e. the feeling or perception of something he or she could not verify was physically present. These questions do *not* inquire after the whole of psi phenomena; instead, they focus on a particular type of perception, i.e. apparitions. The author's supposition is that this class of experience may, at least in some cases, pertain to anomalous stimuli actually present in the external environment.

These final questions are intentionally open-ended, as contrasted with questions 1–43, which offer yes/no, multiple choice, and 1–5 scales for responding. The idea was to avoid leading the respondent through terms such as 'ghost', 'poltergeist', 'presence' or 'energy' and, instead, allow the individual to describe, in his or her own words, what was remembered about the experience. It should be noted that some respondents indicated a paranormal experience that was *not* apparitional (e.g. objects moving, precognition or telepathy). Rather than exclude these mentions arbitrarily, they were included in the tally.

Procedure

The survey was distributed to people who consider themselves highly sensitive. Three avenues were used to identify candidates and get the survey into their hands. Firstly, the project was promoted in newsletters or journals read by those with a likely interest in such matters, including the *Journal of the Society for Psychical Research*; the *Journal of Parapsychology*; the *Journal of the Society for Scientific Exploration*; *Frontier Perspectives*; the *Newsletter of the American Psychosomatic Society*; the *Newsletter of the Bioelectromagnetics Society*; the *Newsletter of the American Academy of Environmental Medicine*; and *Fate* magazine. Secondly, environmental physicians and others with whom the author had contact were requested to circulate the survey to their patients and colleagues. Thirdly, the survey was advertised in online forums devoted to environmental illness or psi phenomena, such as the electronic listserv run by paranormal investigator Dennis William Hauck.

Participants

The total number of completed surveys was 112. Within this 'N', 62 were received from individuals who were classified, based upon their responses to several selected questions (26, 29–31, 35, 44–45, 48–49, and 54) as sensitive, and 50 from a control group of persons who did not identify themselves as sensitive according to these criteria. Responses from controls were solicited via friends, family, and associates. The overwhelming majority of these control surveys (all but five) were completed by third parties who did not know the author personally. Care was also taken to ensure that control group respondents would be geographically dispersed, diverse in age, and predominantly female (matching, to the extent possible, the gender composition of the 'sensitive' survey population).

The survey contained a cover letter explaining the project's purpose and indicating that, while several of the questions might be considered intrusive, all responses would be held in the strictest confidence and aggregated for the purpose of compiling overall totals. The letter made clear that participation was voluntary and that the identity of every participant would be anonymous. A final page concluded the survey, offering each person the opportunity to consent to have the author or the author's representatives contact him or her for a follow-up interview. (A high proportion—56%—of the participants provided their consent: three-quarters of the sensitives and one-third of the controls.)

RESULTS

Base Demographics

Out of the 62 'sensitive' respondents, 44 were women and 18 were men (a ratio of 2.4 to 1). The average age of this group was 41.4 years. The control group encompassed 50 individuals: 33 women and 17 men (a ratio of 1.9:1). Their average age was 43.4 years.

A large proportion (62%) of the sensitives stated they were first-born or only children, this figure being higher for the women (66%) than the men (53%). Among the control group, 52% indicated they were first-born or only children.

This number was the same for the women and the men.

With regard to marital status, 40% of sensitives reported that they were single, 37% that they were married, and 18% divorced. Among the control group, a much higher proportion—62%—said they were married, 18% that they were single, and 6% divorced.

Nearly all of the sensitive respondents (93%) said that they had taken some college, graduated college, or gone on to post-graduate work. The figure is slightly lower for controls (88%).

Other Characteristics and Experiences

With regard to handedness, 73% of the sensitive group said they are right-handed, with no major difference between the sexes. 21% indicated they are ambidextrous (this figure is slightly higher for the women than the men). Among the control group, 88% said they are right-handed, with only one respondent (2%) saying she is ambidextrous.

Of the sensitive respondents, 24% indicated they were born prematurely or were a late arrival, and 10% said they were adopted. This compares with 18% of the control group who said they had been born prematurely or were a late arrival, and 3% who were adopted.

Of the sensitive group, 26% indicated that they had smoked at some time, with 35% saying that smoking was commonplace in their homes growing up. The percentages were higher among controls, with 40% saying they had smoked at some time and 48% noting tobacco smoke as prevalent in their households growing up.

When asked about psychotherapy, 45% of the sensitives reported that they had been in therapy at some point in their lives (for females = 50%; for males = 33%). This contrasted with just 26% of the control group who said they had ever been in therapy (for females = 33%; for males = 12%). Less contrast was evident in responses to the question, "Have you ever taken any type of medication for more than six months?" Here, 64% of the sensitive group said yes (73% of the women and 44% of the men), along with 62% of the control group (70% of the women and 47% of the men).

Associated significance values for Chi-square statistics for these dimensions are as follows:—

Handedness	Premature or Late Arrival	Smoking	Psychotherapy	Medication
0.0099	0.4666	0.7882	0.0771	0.7616

Individuals' Self-Assessment

Concerning self-assessment of imagination, 53% of the sensitive group (58% of the women and 47% of the men) described themselves as highly imaginative. This contrasts with 38% of the controls (42% of the women and 29% of the men).

The item on self-assessment of temperament (introversion/extroversion) yielded several differences. Among sensitive respondents, the men were more likely—by a factor of 3.5 to 1—to characterize themselves as 'introverted or

restrained', whereas no such difference was apparent for the women. Among controls, the men similarly described themselves as 'introverted or restrained' but by a much larger margin (8:1). Women in the control group, on the other hand, were more inclined to see themselves as 'extroverted/emotive' (by a 5:1 margin).

On self-assessment of body type, sensitives of both genders were more apt to perceive themselves as thin, this being more true for the men (who indicated 'thin' 3 times as often as 'wide') than the women (who were only twice as prone to indicate 'thin'). Among controls, this trend was reversed among men (who saw themselves as 'wide' 1.5 times more frequently than 'thin') but not among women (who were still twice as prone to indicate 'thin').

The survey also inquired into satisfaction with the level of physical/sexual contact in one's life, with controls rating slightly higher satisfaction than the sensitive group. 37% of the sensitives (38% of the women and 33% of the men) rated their satisfaction high, whereas 25% rated their satisfaction low (24% of the women and 28% of the men). This compares with 51% of the control group who rated their satisfaction high (53% of the women and 47% of the men) and 23% who rated their satisfaction low (22% of the women and 27% of the men). Looked at on a 1-5 scale (1 equating to 'unsatisfactory' and 5 to 'ideal'), female sensitives scored an average of 3.5, as against female controls at 3.6; male sensitives scored a relatively low 3.0 as against male controls at 3.4.

Female controls were more likely than their sensitive counterparts to remember their childhood as happy. Among the control group, 55% (56% of the women and 53% of the men) said their childhoods were 'wonderful', with just 10% rating their childhoods as 'unhappy' (6% of the women and 18% of the men). In contrast, 23% of the sensitives (19% of the women and 33% of the men) reported that their childhoods were 'wonderful' while 35% rated them as 'unhappy' (40% of the women and 22% of the men); this overall difference is significant ($\chi^2 = 13.21, p < 0.001$). Evaluated on a 1-5 scale (1 equating to 'wonderful' and 5 to 'extremely unhappy'), female controls scored 2.0 as against female sensitives at 3.5; male controls scored 2.5 as against male sensitives at 2.4.

Sensitives were also more apt to note a traumatic event in their childhood, by 57% to 18% for the control group ($\chi^2 = 16.98, p < 0.001$). Among female sensitives, 57% recalled a traumatic event, versus 18% of female controls. The difference was similarly pronounced among men, with 50% of men in the sensitive group recalling a traumatic childhood event, contrasted with 18% in the control group.

Associated significance values for Chi-square statistics for these dimensions are as follows:-

Imagination	Temperament	Body Type	Physical/Sexual Satisfaction	Childhood Happiness	Childhood Trauma
0.5763	0.4388	0.0877	0.0308	0.0250	0.00003

Environmental Sensitivity/Medical Conditions — Individual

Table 1 shows the percentages, among persons characterizing themselves as

sensitive, who checked off a medical item—and the percentages indicating that their condition is or was severe:—

Table 1

Respondents' Medical Self-Profile

<i>Condition</i>	<i>Checked</i>		<i>Self-Rating as Severe</i>	
	<i>Sensitives</i>	<i>Controls</i>	<i>Sensitives</i>	<i>Controls</i>
Allergies	63%	34%	24%	6%
Depression	58%	20%	16%	4%
Migraine headaches	48%	14%	18%	4%
Exhaustion/chronic fatigue	43%	4%	13%	4%
Chemical sensitivity	40%	0%	13%	0%
Sleep disorder	39%	6%	6%	0%
Electrical sensitivity	37%	0%	13%	0%
Asthma	26%	16%	6%	4%
Mood imbalance	26%	2%	3%	0%
Eating disorder	18%	2%	8%	0%
Dyslexia	14%	0%	2%	0%
Alcoholism	6%	0%	3%	0%

One of the items added midway through the survey project — 'Unusual sensitivity to light or sound' — was checked frequently, to the point where it would have ranked near the top had the item been included in the survey from the beginning. This line was marked by 26% of the sensitive group, versus just 2% of the controls.

Two other items added midway asked about nightmares and synaesthesia (a scientifically recognized condition where separate senses co-mingle, causing the person to hear colours, taste shapes, etc.). 'Nightmares' was checked by 11% of the sensitive group and 6% of the control group. 'Synaesthesia' was checked by 6% of the sensitive group and 0% of the control group. Again, extrapolation suggests that nightmares could be experienced by one-fifth of self-described sensitives, and synaesthesia by upwards of 10%.

Associated significance values for Chi-square statistics for the medical self-report items are as follows:—

Allergies	Chemical Sensitivity	Electrical Sensitivity	Asthma
0.0024	0.0314	0.0390	0.0170

Environmental Sensitivity/Medical Conditions — Family

Table 2 shows the total number of close relatives (i.e. parents, children, siblings, grandparents, aunts and uncles) who the 62 sensitive respondents believed were affected by each condition:—

Table 2
Family Members' Medical Profile (Attributed)

Condition	Sensitives			Controls		
	No. of Relatives	Female	Male	No. of Relatives	Female	Male
Alcoholism	42	14	28	10	1	11
Depression/ mood imbalance	42	24	18	19	16	1
Allergies	31	20	11	8	4	4
Migraine headaches	25	22	3	10	5	5
Asthma	15	8	7	7	6	1
Sleep disorder/ nightmares	9	4	5	3	2	1
Chemical sensitivity	7	4	3	0	0	0
Electrical sensitivity	7	5	2	0	0	0
Schizophrenia	5	4	1	1	1	0
Dyslexia	5	1	4	1	0	1
Exhaustion/ chronic fatigue	3	3	0	1	1	0

No significant correlations were found for any of the above family medical conditions.

Unusual Experiences

Of the sensitive respondents, 14% indicated that they had been struck by lightning or otherwise suffered a severe electric shock. This item was checked by a higher ratio of women than men (by 2:1). In contrast, none of the controls indicated that they had ever been struck by lightning. (The approximate chance of being struck by lightning in a given year in the United States is estimated at 1 in 700,000—O'Neill, 2003.)

A much higher number—37% of the sensitive group (42% of the women, 29% of the men)—claimed that their presence affects computers, lights or appliances in an unusual way. Only 6% of the controls (evenly divided among men and women) checked this item. When asked if the presumed electrical effect might have been triggered by any identifiable event, condition or circumstance, most sensitive respondents were unsure.

The final section of the survey asked about experiences where the respondent might have perceived something that could not be verified as being physically present through normal means. Nearly three-quarters (74%) of the sensitive respondents said they had had such an experience (82% of the women and 55% of the men). Virtually no one said they were unsure. This result contrasts with 16% of the controls who said they had had an apparitional experience (21% of the women and 6% of the men). However, another 14% of the control group indicated that they were unsure.

When asked to briefly describe these experiences, sensitives checked the following perceptual modes—with multiple categories being more the rule than the exception. A dash indicates that the item received no mention whatsoever.

Table 3

Apparitional and Other Psi Perceptions

<i>Perception</i>	<i>Sensitives</i>			<i>Controls</i>		
	<i>Women</i>	<i>Men</i>	<i>Overall No. of Mentions</i>	<i>Women</i>	<i>Men</i>	<i>Overall No. of Mentions</i>
Visual	28%	59%	23	—	—	—
General 'presence'	35%	29%	21	21%	6%	8
Auditory	30%	12%	15	9%	0%	3
Olfactory	28%	12%	15	6%	0%	2
Lights/energy	21%	18%	12	3%	0%	1
Objects moving	19%	6%	9	—	—	—
Emotional	12%	18%	8	—	—	—
Tactile	14%	6%	7	—	—	—
Precognition	9%	18%	7	3%	0%	1
Telepathy	5%	12%	5	—	—	—

Little indication was provided that apparitional experiences are apt to take place at any particular time of the day or season of the year. Of sensitive respondents volunteering such information, 37% indicated that the perceptions took place during evening hours or overnight, 28% recalled they had taken place during daylight hours, and the other 35% noted no discernible trend. Among the handful of controls who responded to this item, half said the experience had taken place during evening hours or overnight, and the other half noted no discernible trend. Neither was there any pattern to the season of the year when respondents said their perceptions had occurred.

Finally, 59% of the sensitive group (53% of the women and 80% of the men) indicated that someone they knew—even a pet—had reacted similarly to the alleged occurrence. Among controls, 88% said someone they knew had reacted similarly. Sensitive respondents (though not controls) mentioned pets as often as they did immediate family members as having shared these experiences.

Associated significance values for Chi-square statistics for these 'unusual experience' reports are as follows:—

Struck by Lightning	Affect Appliances	Apparitional Experience	Time of Day	Time of Year	Person or Pet Reacting
0.0062	0.0002	0.0000003	0.7862	0.2703	0.1173

DISCUSSION

Major Conclusions

The survey results support the hypothesis that certain people—perhaps due to their innate neurobiology—are much more susceptible to allergies, illness, depression, migraine headaches, nightmares, etc., than the general population. The same is evidently true of their immediate families.

The findings also support the contention that hypersensitivity may encompass a psi aspect, as the respondents are much more likely than controls to have had one or more apparitional experiences. That this link should appear is not surprising in view of the fact that, in order to gain participation, the survey was presented as examining both environmental *and* psi sensitivity. Additional investigation is needed to determine more precisely what demarcation may be found between persons who consider themselves to have (or better yet, are actually *diagnosed as having*) some form of environmental illness versus those who consider themselves psychically sensitive.

While no single factor in a person's background is likely to distinguish him or her as 'sensitive', eight demographic or personality factors are statistically significant: being female; being a first-born or only child; being single; being ambidextrous; appraising oneself as an imaginative thinker; appraising oneself as introverted; recalling a plainly traumatic event—or series of events—in childhood; and asserting that one's presence causes televisions, lights, computers, etc. to malfunction. These factors are assessed individually in the following section.

If additional surveys, carried out by other researchers, were to document similar results, the concept of sensitivity might be documented as having a genuine neurobiological basis. It might follow that persons having a certain degree or configuration of sensitivity could register (either consciously or unconsciously) anomalous influences in the environment that bypass most other people.

Assessment of Significant Findings

Gender Differences

While it is possible that women may simply be more interested than men in responding to a survey concerning subject matter of this kind, it is more likely that the high percentage of women among the sensitive group indicates a bona fide neurobiological difference. Indeed, females are significantly more sensitive than males in almost every sense modality (Velle, 1987). Furthermore, in humans and other species, the female is much more susceptible than the male to a range of autoimmune diseases (Martin, 1997).

The effect appears to derive, at least in part, from the activity of sex hormones (Velle, 1987). This effect is evident with migraine headache as well as fibromyalgia (Center for the Advancement of Health, 2001, 2002; Custred, 2002).

First-Born or Only Child

Given that first-borns represent just 35% of all children (Connellan, 2003), the tilt toward respondents (both sensitives and controls) who are first-born or only children may depend on these individuals being more conscientious than

later-borns and hence more likely to respond to surveys. However, some recent evidence suggests that first-borns are more likely to suffer from asthma, eczema and various allergies because they have a greater susceptibility determined *in utero* (Karmaus, Arshad & Mattes, 2001).

Being Single

A possible interpretation of the higher proportion of sensitives who are single is that they have personal issues that make marriage more problematic. Alternatively, since the average age of the control group was slightly higher, it could be that some of the 'sensitive' respondents are *approaching* an age where they will get married, rather than an age at which they *are* married.

Being Ambidextrous

One especially interesting finding is that the ability to use either hand—and not left-handedness *per se*—occurs significantly more often among persons who consider themselves sensitive. A possibility worth exploring is that, in these individuals, a higher degree of interchange exists between the brain hemispheres that control the body's two sides. It is intriguing that the corpus callosum—an elongated bundle of nerve fibres that carries information between the hemispheres—is wider in women than in men. This difference has been found *in utero* (Durden-Smith & de Simone, 1983). Perhaps it explains two of the survey findings: why women are disproportionately sensitive, and the greater extent to which self-described sensitives are also ambidextrous.

Self-Assessment as Imaginative

The fact that the sensitives (both men and women) rate themselves significantly higher on imagination than the controls suggests to the author that such individuals are more inclined to equate their 'sensitivity' with imagination, i.e. a penchant for perceiving the world differently. It is equally possible, of course, that the equation runs the other way round—that fantasy proneness and being on the high end of absorption, suggestibility and transliminality scales tends to prompt individuals to view themselves as different, sensitive, or psychically attuned (Houran & Lange, 1996a, 1996b; Thalbourne, 2000; Wilson & Barber, 1983).

Self-Assessment as Introverted

The survey item on self-assessment of temperament (introversion/extroversion) yielded an interesting gender difference. Self-perception of sensitivity is evidently conducive to the self-perception of introversion—but only for women. Men—especially among the control group—appear to consistently consider themselves introverted or restrained in emotional style and temperament. This discrepancy, the author would venture, has at least as much to do with learned cultural style as with biology.

Recall of Traumatic Events

A distinction between sensitives and controls is especially pronounced when it comes to noting a traumatic event in childhood, as well as a family history of alcoholism or depression. Sensitivity appears to correlate with (though not necessarily be caused by) trauma. Several researchers have sought to establish

that psi perceptions are indeed *conditioned by* trauma, especially chronic childhood abuse (Irwin, 1992, 1996; Ross & Joshi, 1992). Irwin (1992) and Terr (1991), for example, argue that personality traits such as dissociation, fantasy-proneness, absorption, and belief in the paranormal all develop in childhood as an escape mechanism from an especially stressful environment.

The present author posits, however, that children who are *born* sensitive may be prone toward these same personality characteristics. Very young children have been observed reacting intensely to certain sounds, colours, aromas, textures, or temperatures (Aron, 1996; Bergman & Escalona, 1949; Heller, 2002). If the given stimulus were pleasing to such children, they would delve into it (absorption); if it were noxious, they would seek an escape route. In a poignant evocation of some of these early defence mechanisms, Bergman and Escalona describe children rhythmically rocking themselves and covering their eyes and ears from the unwelcome stimuli. The private world these children entered into could be construed as a crucible for introspection, fantasy-proneness, and dissociation.

Perceived Electrical Sensitivity

One of the survey's most interesting and statistically significant results is the extent to which persons who consider themselves sensitive claim that their very presence affects lights, computers, and other electrical appliances in an unusual way. This could, of course, be viewed as an extension of the idea (outlined above) that such characteristics as fantasy proneness, absorption, suggestibility, and transliminality lead certain people to attribute highly improbable explanations to fairly typical occurrences (Houran & Lange, 1996a, 1996b; Irwin, 1992, 1996; Ross & Joshi, 1992; Thalbourne, 2000; Wilson & Barber, 1983). However, as an unusually high percentage of the sensitive respondents indicated that they had been struck by lightning or otherwise suffered a severe electrical shock (a memorable and potentially verifiable event), the author proposes that electrical sensitivity may represent a bona fide aspect of sensitivity — and one whose neurobiological effect might be independently gauged.

Additional Points of Interest

The item 'unusual sensitivity to light or sound' deserves further attention in any characterization of environmental sensitivity. Although it was added midway through the project, one-quarter of the sensitive group marked it. When asked the open-ended question, "How long has this condition affected you," nearly two-thirds of those responding (16 people) wrote "all my life" or "since infancy". While the sample size is too small to draw firm inferences, this result suggests that at least one form of sensitivity may have its origins very early in life.

Likewise, the incidence of synaesthesia among self-described sensitives presents a fascinating opportunity for study. If, as has been theorized, synaesthesia results from the retention of early neural connections (Baron-Cohen, 1996; Moreno-Davis, n.d.), the role of *environmental factors* in sensitivity could be more precisely sketched based on the extent to which such factors (e.g. childhood trauma) were indicated in the completed surveys of synaesthetes.

Another fascinating point concerns a gender difference in the survey's findings of apparitional experience. Male sensitives checked the visual mode twice as often as any other—whereas the response by female sensitives was much more varied. What this suggests in terms of the role of sense perception in potential anomalies is unknown but deserves further study. It should be noted that, in other surveys of apparitional experience (e.g. those performed by Celia Green and Erlendur Haraldsson), *vision* is the predominant perceptual mode—much more so than in the present survey (Stokes, 1997; Watson, 1979). The author suspects that gender and age will be shown to be major factors in individuals' anomalous sense perception, such that survey results are bound to differ given the varying demographic of their participants.

One additional and very unexpected finding is the higher percentage of controls than sensitives who assert that their unusual experience has been shared by someone: a relative, friend or pet. This result can be appraised in the following light. First, if psi influences are indeed at work in a given situation, we might expect various people (or animals)—and not just the 'subject' individual—to react. Secondly, in the face of an ostensible psi experience, the non-sensitive individual might be inclined to look to someone nearby for validation of whatever he or she is perceiving, whereas a sensitive might be more inclined to trust his or her own perceptions.

CAVEATS ON SURVEY RELIABILITY AND SCOPE

As noted earlier, the survey instrument is brand new and has not been validated. Beyond that, it seems appropriate to state three quite obvious limitations to this type of research.

First, most of the survey questions are retrospective; that is, subjects were asked for their recollections and self-assessment. Even assuming that every subject responded to the best of his or her ability and with utmost candour (which may not be true, as outright fabrication is certainly one possibility), responses may still be coloured by a number of factors, including poor or insufficient recall, perceptions unsupported by objective, clinical criteria, credulity, vivid imagination or hypochondria, and the mere fact that the person was feeling poorly at the time he or she was responding.

In particular, persons beset with anxiety or stress are more likely to notice—or imagine—physical symptoms. This could certainly influence self-reports of environmental sensitivity. By the same token, it should be added that a person can harbour a legitimate illness and not feel unwell, at least in the early stages (Martin, 1997).

A second limitation is the relatively low number of persons in the control group. Without having a motivating interest or 'stake' in the survey, controls for this type of exercise are difficult to come by. A larger control population would enable better comparisons to be made regarding the prevalence of conditions associated with sensitivity (e.g. allergies, migraines, chronic fatigue, alcoholism, depression, or nightmares) as well as better inferences to be drawn regarding the occurrence of such conditions within families.

Third, beyond presenting a few self-assessment items (imagination, temperament) and one question concerning psychotherapy, the survey did not attempt to profile respondents according to scales common in parapsychological

research: namely those that assess for hypnotisability, absorption, somatisation, transliminality, proneness to dissociation, magical thinking, and belief in the paranormal. Inclusion of survey questions reflecting these concepts—while clearly relevant—would have made the instrument unwieldy and diminished the likelihood that anyone would take the time to complete it. The author believes a credible argument can be made, however, that a survey assessing heightened sensitivity implicitly touches on the above concepts. Indeed, early childhood sensitivity may be a harbinger of these and similar personality characteristics.

FUTURE INVESTIGATION

Based on constructive feedback gained throughout the survey process, the author has refined the survey instrument, which now presents 62 questions. In addition, it is recommended that Hartmann's Boundary Questionnaire be given to all self-described sensitives, as it would be enlightening to know how 'thin' such individuals score on his thick-thin personality scale. (The Boundary Questionnaire is quite well-established, having been administered to more than 2,000 people since its inception—Hartmann, 1998.)

As noted above, synaesthetes represent an ideal group for eliciting further insight on the phenomenon of sensitivity. Dowsers also do, given the possibility that they possess a degree of electromagnetic sensitivity that aids them in their pursuit of underground water sources. If future studies were to document results similar to those presented here, firmer evidence would be provided for the neurobiological basis of anomalous experience.

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APPENDIX

**ENVIRONMENTAL SENSITIVITY: A SURVEY
INVESTIGATION OF HUMAN FACTORS**

This survey is intended to glean information concerning factors in a person's background and his/her likelihood to be particularly "sensitive" in some way. Please answer honestly and matter of factly. While the nature of this survey makes it necessary to ask some rather personal questions, please know that your responses will be combined with those of other anonymous respondents—and kept confidential. If you have any questions, contact the survey's author, Michael Jawer, mjawer2001@yahoo.com. Thank you very much for participating.

- 1) Your age: ___ (years)
- 2) Gender: Male ___ Female ___
- 3) Are you currently (check one): Married ___ Divorced or separated ___
In long-term partnership ___ Single; never married ___ Widowed ___
- 4) Do you have children? (biological, not adopted) Yes ___ No ___
- 5) If so, what are their ages and genders?
 Child one: age ___ M ___ or F ___
 Child two: age ___ M ___ or F ___
 Child three: age ___ M ___ or F ___
 Child four: age ___ M ___ or F ___
 Child five: age ___ M ___ or F ___
 Child six: age ___ M ___ or F ___
- 6) Highest educational level attained (check one):
 Some high school ___ College graduate ___
 High school graduate ___ Post graduate work ___
 Some college ___ Graduate degree(s) ___
- 7) Height: ___ feet ___ inches
- 8) Weight: ___ pounds
- 9) How would you describe your body type? Please mark one of the numbers below:
 Thin _____ Wide
 1 2 3 4 5
- 10) Are you right-handed? ___ Left-handed? ___ or Ambidextrous? ___
- 11) How would you describe your tendency toward imagination? Please mark one of the numbers below:
 Think Literally _____ Think Imaginatively
 1 2 3 4 5
- 12) How would you describe your temperament? Please mark one of the numbers below:
 Introverted/Restrained _____ Extroverted/Emotive
 1 2 3 4 5
- 13) Please note your interests or hobbies below (list up to 4)
 Hobby or interest one: _____
 Hobby or interest two: _____
 Hobby or interest three: _____
 Hobby or interest four: _____

14) How satisfied are you with the level of physical/sexual contact in your life? Please mark one of the numbers below:

Unsatisfactory					Ideal
1	2	3	4	5	

15) How many siblings do you have? _____

16) Please indicate birth order, i.e., what 'number' sibling are you? _____

17) To your knowledge, were you born prematurely? Yes ___ No ___ Not sure ___

18) To your knowledge, were you a late arrival? Yes ___ No ___ Not sure ___

19) If yes to either question 17 or 18, approximately how long before or after your due date were you born? (leave blank if unsure)

Within 1-2 weeks ___ 3-4 weeks ___ More than a month ___ Unsure ___

20) Were you raised by, or are you now living with, an adoptive family? Yes ___ No ___

21) How would you rate your childhood? Please mark one of the numbers below:

Wonderful					Extremely Unhappy
1	2	3	4	5	

22) Was there any particular event or experience in childhood or adolescence that could be characterized as 'traumatic,' i.e. physically threatening or emotionally wrenching? If no, leave blank. If yes, please describe below, indicating how old you were at the time.

23) Do you smoke, or have you?

Yes, I currently smoke ___ No, I have never smoked ___

Yes, I used to smoke ___

24) If yes to question 23, please indicate how long you smoked (or have been smoking):

1 to 3 years ___ 4 to 6 years ___ 7 to 9 years ___ 10 years or more ___

25) Was tobacco smoke commonplace in your house when growing up?

Yes ___ No ___

26) Have you ever suffered from any of the following? (check any that apply; if not, leave blank):

Asthma	___	Dyslexia	___
Allergies	___	Chronic fatigue/exhaustion	___
Migraine headaches	___	Depression	___
Chemical sensitivity	___	Mood imbalance	___
Electrical sensitivity	___	Schizophrenia	___
Sleep disorder	___	Epilepsy	___
Eating disorder	___	Alcoholism	___
Unusual sensitivity to light or sound	___		
Synaesthesia (overlapping senses, such as seeing numbers in color)	___		
Other (please describe)	_____		

27) To your knowledge, has a family member (child, sibling, parent, grandparent, aunt or uncle, first cousin) suffered from one of the conditions listed above?

Yes ___ No ___ Not sure ___

PLEASE NOTE: If you did not check off an item in question 26 and indicated 'no' to question 27, please skip ahead to question 33.

28) If yes to question 27, who is/was that family member(s) and what is/was the condition?

Relation _____	Condition _____
Relation _____	Condition _____
Relation _____	Condition _____
Relation _____	Condition _____
Relation _____	Condition _____

29) If you checked off an item in question 26, over how long a period of time has this condition (these conditions) affected you?

Condition checked _____	Length of time _____
Condition checked _____	Length of time _____
Condition checked _____	Length of time _____
Condition checked _____	Length of time _____
Condition checked _____	Length of time _____
Condition checked _____	Length of time _____

30) Please rank the severity of the condition(s) noted in the previous item on a scale of 1 ('mild') to 5 ('severe'):

Condition one:	Severity ____
Condition two:	Severity ____
Condition three:	Severity ____
Condition four:	Severity ____
Condition five:	Severity ____
Condition six:	Severity ____

31) Please rank the frequency of symptoms suffered in connection with the condition(s) noted above, on a scale of 1 ('occasional') to 5 ('constant'):

Condition one:	Frequency ____
Condition two:	Frequency ____
Condition three:	Frequency ____
Condition four:	Frequency ____
Condition five:	Frequency ____
Condition six:	Frequency ____

32) Are you aware if there was any 'trigger' event or exposure that brought on the condition(s) noted above? If not, leave blank. If yes, please describe briefly below.

33) Have you ever been struck by lightning or suffered a severe electric shock?

Yes ____ No ____

34) If yes, approximately what age were you when the electric shock took place? Age ____

35) Does your presence ever appear to affect electrical or mechanical devices (such as watches, computer monitors, home appliances, automobile ignitions, etc.)?

Yes ____ No ____

36) If yes, please note which device(s) and describe, if possible, the circumstances below. If no, skip to question 39.

37) If yes to 36, how long ago did you first start to notice this effect? _____

38) If yes to 36, did the effect begin occurring before or after the 'trigger event' you may have noted in your response to question 32?
Before ____ After ____ Unsure ____

39) Have you ever been in psychotherapy? Yes ____ No ____

40) If yes, briefly indicate the reason(s) for psychotherapy:

41) Have you ever taken any type of medication for more than 6 months?
Yes ____ No ____

42) If yes to above, indicate medication(s):

Drug one: _____
Drug two: _____
Drug three: _____
Drug four: _____
Drug five: _____
Drug six: _____

43) If yes to question 41, please indicate to the best of your recollection over what dates you were/are taking the medication(s):

Dates of use (drug one): _____
Dates of use (drug two): _____
Dates of use (drug three): _____
Dates of use (drug four): _____
Dates of use (drug five): _____
Dates of use (drug six): _____

44) Have you ever seen, heard, smelled or felt something in your presence that you couldn't verify as physically there?

Yes ____ No ____ Unsure ____

45) If no, skip to question 54. If yes, briefly describe the sensation or phenomenon experienced.

46) Please indicate what time of day this experience took place, and what time of year.
(Leave blank if you are unsure)

Time of day: _____ Time of year: _____

47) Approximately what age were you when you had this experience (these experiences)?
Age ____

48) Has this experience or something similar to it recurred?

Yes ____ No ____ Not sure ____

49) If yes to above, how frequently has this type of experience recurred?

Once ____ Rarely ____ Intermittently ____ Frequently ____

50) If yes to question 48, indicate what time of day and what time of year the recurring experience took place. (If recurrence has been more frequent, indicate time of day and time of year only if you can discern any commonality.) Leave blank if you are unsure.

Time of day: _____ Time of year: _____

51) If yes to question 48, briefly describe the sensation or phenomenon experienced (if different from your answer to question 45):

52) Has anyone you know (even a pet) reacted similarly in the circumstances you described?
Yes ___ No ___ Unsure ___

53) If yes, what is the relationship between you and the person(s) or animal(s) involved?
(Check as many as are appropriate)

- Immediate family _____
- Other relative _____
- Friend _____
- Pet _____
- Other (please describe) _____

54) Is there anything further you would like to add that might be relevant to this survey?

Thank you very much for your time and interest in taking this survey. Your responses will provide an extremely helpful base of information to assess the relation between personal history and environmental sensitivity. All information provided will remain confidential.

In future, if you are willing to grant us a follow-up interview, please give your permission by filling in the portion below. We will hold your name and address in confidence, and contact you only if we wish to speak with you personally. If you would rather not, simply leave this area blank.

Name _____
Address _____
Phone _____ Email _____

I give my permission for Michael Jawer, the author of this survey, and/or his associates, to contact me in relation to this survey for the purpose of scheduling a follow-up interview. I understand all information provided, whether in writing or in person, will remain strictly confidential.

Signature _____ Date _____